

LEADING RESEARCH THEMES AND ASSOCIATED KEYWORDS IN THE AUSTRALIAN HIGHER EDUCATION LITERATURE 2007-2012

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ABSTRACT

This paper is focused on a Higher Education Research and Development Society of Australasia (HERDSA) commissioned report that was aimed at identifying prominent 'Australian' higher education research themes across three leading and variegated Australian journals between 2007-2012. At the request of the funding body, the journals included: (1) Higher Education Research and Development; (2) Studies in Continuing Education; and (3) Journal of University Teaching and Learning Practice. From a review of the relevant literature, 225 'Australia-based-and-first-authored' journal articles revealed 16 prominent themes. Extraction of keywords from each of those articles, numbered 594 unrepeated terms. To better enable the counting of the frequency of each theme, keywords acted as focal indicators. Collectively, the most prevalent themes in ranking order were: (1) Student Experience Perceptions; (2) Learning and Teaching; and (3) Research into Higher Education. Conversely, research gaps were found to include: (14) Critical Thinking; (15) Disadvantage; and (16) Transition and Retention. Explication of the literature review process, the 16 themes uncovered, and examples of related keywords will be communicated.

Keywords: Australian Higher Education, Prominent Themes, Keywords.

1. INTRODUCTION

There has been considerable investment in teaching and learning projects and programs in Australia over the last few years. In some cases, these have generated notable outcomes that are strongly informing subsequent practice, while others have largely passed unnoticed. While some research areas or 'themes' have been identified as foci for the Australian Learning and Teaching Council's (ALTC) 'Good Practice Reports', there has been little attempt to review the broader scope of research concentration in tertiary education teaching and learning that have emerged in the Australian HE sector over the last five years (Palmer, 2012). Neither has there been a review of the emerging issues that should be explored and the degree to which future activities could complement the knowledge so far accrued.

2. BACKGROUND

This commissioned project was conducted during the period 1 April - 15 July 2012 with the overall goal of contributing to the enhancement of scholarship, research and practice relating to Australian tertiary teaching and learning (Palmer, 2012). This was achieved by undertaking a comprehensive review of what has been learnt in the last five years (2007-2012) to better enable knowledge sharing opportunities to discuss the results and explore future directions. Sources of evidence needed to be diverse to have the best chance of providing a comprehensive picture of the Australian HE research landscape.

This project involved two stages: Stage One—a review of the focus and learnings that have been generated from recent scholarship, research and related publications relating to the Australian tertiary education teaching and learning sector; and Stage Two—drawing on the results of Stage 1, developing and/or encouraging appropriate avenues for the sector to explore and build on those findings through scholastic learning and exchange. This paper is based solely on Stage One and the leading research question: *What knowledge and learning have*

been achieved to date in relation to Australian tertiary education and learning research and scholarship? The overarching aim was to examine and capture dominant knowledge and learning areas—represented as ‘themes’—in Australian HE teaching and learning scholarship and research. The five broad objectives were:

- 1) to *review* the focus and learnings that have been generated from recent scholarship, research and related publications relating to Australian tertiary education teaching and learning;
- 2) to *provide* a detailed summary of the knowledge that has been achieved to date in relation to tertiary education teaching and learning research and scholarship;
- 3) to *examine* the research and scholastic approaches that have been employed over the last five years, with suggestions as to ways these could be enhanced in the future;
- 4) to *offer* some broad insights related to on-going or new tertiary education teaching and learning issues or themes that would warrant further investigation; and
- 5) to *develop* and *encourage* appropriate avenues for the sector to explore and build on the results through scholastic learning and exchange (Velliaris et al., 2012, pp. xvii-xviii).

3. RESEARCH METHOD

This article presents an investigation of the work by Australia-based and first-authored researchers in the three high quality Australian ‘HE’ journals: (1) Higher Education Research and Development—HERD; (2) Studies in Continuing Education—SCE; and (3) Journal of University Teaching and Learning Practice—JUTLP. The volumes and issues reviewed are listed in Table 1 below. This paper is focused on the 16 main themes identified in the literature, explication of each theme, underlying issues that may warrant further investigation, and associated keywords used to help thematise each Australian article.

The more articles were read, the more familiarity increased, and the task of recognising common themes became simpler. The hermeneutic back-and-forth checking was constant within, between and among readings. With reference to Table 2, 16 themes were distinguished and found to encompass the full range of articles surveyed. Analysis involved the progressive refinement of themes that emerged, which were subject to continual scrutiny until they could accommodate all perspectives indicated by the articles. All 225 works were categorised via Endnote bibliographic software according to the 16 themes identified in Table 2; each journal article featured one prominent theme, but often possessed two and no more than three themes in combination (Velliaris, 2014a, 2014b; Velliaris, et al., 2012; Velliaris & Willis, 2013). This process was conducted by one researcher, thus great care was taken to ensure consistency/reliability of classification across: (a) researchers; and (b) time.

Table 1. Volumes and issues of three journals included in report (Velliaris, 2014b, p. 26; Velliaris, et al., 2012, p. 1)

YEAR	HERD	SCE	JUTLP	TOTAL
2007	Vol. 26 (1-4) = 19	Vol. 29 (1-3) = 7	Vol. 4 (1-2) = 8	34
2008	Vol. 27 (1-4) = 15	Vol. 30 (1-3) = 5	Vol. 5 (1-2) = 10	30
2009	Vol. 28 (1-6) = 26	Vol. 31 (1-3) = 4	Vol. 6 (1-2) = 10	40
2010	Vol. 29 (1-6) = 38	Vol. 32 (1-3) = 4	Vol. 7 (1-2) = 14	56
2011	Vol. 30 (1-6) = 28	Vol. 33 (1-3) = 7	Vol. 8 (1-3) = 14	49
2012	Vol. 31 (1-2) = 11	Vol. 34 (1) = 1	Vol. 9 (1) = 4	16
TOTAL	137	28	60	225

Table 2. Prevalence of research theme in all three journals between 2007-2012 (Velliaris, 2014b, p. 29; Velliaris, et al., 2012, p. 13)

RESEARCH THEME	HERD	SCE	JUTLP	TOTAL
Student Experience - Perceptions	47 (1st)	13 (1st)	30 (2nd)	90
Teaching & Learning	32 (3rd)	6	35 (1st)	73
Research into Higher Education	38 (2nd)	5	5	48
Work-Integrated Learning	16	10 (2nd)	1	27
Internationalisation	20	-	3	23
Academic Language & Learning	17	-	4	21
Assessment & Feedback	3	1	13 (3rd)	17
Health & Wellbeing	11	-	3	14
Higher Degrees by Research	6	7 (3rd)	1	14
Leadership & Professional Development	6	2	5	13
Student Experience - Social	4	-	9	13
Graduate Attributes	9	1	2	12
Education Technology	4	-	7	11
Critical Thinking	7	-	1	8
Disadvantage	3	3	2	8
Transition & Retention	4	-	3	7

4. FINDINGS & DISCUSSION

The following section discusses each research theme in ranking order, as well as a brief overview of 'some' of the findings in relation to that theme.

RANKING 1: Student Experience – Perceptions (n=90)

It was evident that the need for greater accountability and improvement in the quality of teaching has become an issue in Australian HE as many articles had a student survey/questionnaire/evaluative component (Velliaris, et al., 2012, p. 43). This theme was frequently coupled with many other themes as a means of providing diagnostic feedback to academic staff about the effectiveness of their teaching and to validate to the HE sector that instructional performance is carefully monitored. The standard structure of associated research articles tended to be: (1) the introduction of a modified or 'new' teaching method; (2) questionnaires distributed amongst students via lecture presentations; and (3) focus groups with less experienced university students and/or interviews with more confident and/or experienced undergraduates and/or postgraduate-level students.

RANKING 2: Teaching & Learning (n=73)

The vast majority of articles touched upon teaching and learning elements to some degree (Velliaris, et al., 2012, p. 40). Associated articles were largely linked with *Student Experience - Perceptions* i.e., student feedback questionnaires, rather than the sharing of successful/unsuccessful teaching strategies across small and large cohorts of students. Studies on teaching and learning collected much student data, which was often the catalyst for curriculum design changes. Certain disciplines, namely Business Studies, Health Sciences and Education were well-represented, but the degree to which pedagogical practices could be transferred across to other disciplines was limited.

RANKING 3: Research into Higher Education (n=48)

Most of these articles did not collect data, but were rather focused on local and national issues such as: academic development; changing HE contexts; knowledge landscapes; competition in global HE; integrating teaching and research; and university mission and identity statements (Velliaris, et al., 2012, p. 42). A potential related theme, which did not have a strong presence at the time of this research was *External Stakeholders* i.e., parents, community members,

industry partners, union representatives, and other non-university staff. Some articles collected data from such parties, but as it was not linked with any HE population, it had nowhere to be recorded.

RANKING 4: Work-Integrated Learning (n=27)

This theme was well-represented in the literature, particularly in the SCE, where 36% incorporated this subject matter (Velliariis, et al., 2012, p. 47). Indeed, Australian universities have demonstrated heightened investment in the concept of *Work-Integrated Learning* as a strategy for enriching student experiences while providing pathways leading to better employment opportunities. There was a wealth of information on work experience, work placement, workplace learning, work readiness, work-based pedagogies, workers as learners, worker identities, and workplace-based courses and assessment. Most of the associated articles collected data from discipline areas with direct links into a profession, such as Business Studies, Education and Health Sciences.

RANKING 5: Academic Language & Learning (n=23)

This theme was well-represented in two of the three journals surveyed (Velliariis, et al., 2012, p. 36). Enculturation/acclimatisation, social adjustment and learning difficulties experienced by international students were extensively researched. Other more general articles tended to distinguish what percentage of the demographic data was representative of international students, as though to suggest that the research may have been ‘different’ with/without such an international presence; perhaps a perception that [Australian] teaching methods and learning style preferences among local and international may have an impact. Associated articles were focused on facilitating the transition of international (i.e., predominantly Chinese) students into Australian HE, typically in the discipline area of Business Studies.

Of the 23 papers, associated articles pertained largely to first-year undergraduate students’ capacity to acculturate to academic life, through either: (a) a centralised teaching and learning unit; or (b) discipline-specific workshops (Velliariis, et al., 2012, p. 20). In general, university students tended to be divided into two main groups: (1) native speakers; and (2) non-native speakers, regardless of the many language-skill variations that may be found along the spectrum. There appeared to be an obvious lack of attention paid specifically to local students who may need academic language and learning support. Larcombe and Malkin (2008, p. 320) stated in their paper that there needs to be caution against the ‘tendency to consider ‘international’ or overseas fee-paying students as the only cohort in need of, or likely to benefit from, English language development and academic writing programs’.

RANKING 6: Internationalisation (n=21)

The theme of *Internationalisation* was well-represented in two of the three journals surveyed. As the HE context is increasingly characterised by global competition in which knowledge is a prime factor for economic growth, internationalisation has become more market-oriented, aiming to attract talented students and highly skilled workers as key resources for the knowledge economy.

As stated by Healy (2009b cited in Gamble, Patrick, & Peach, 2010, p. 536), ‘China and India continue to provide Australia with the largest sources of international students’. Many articles commenced with the term ‘international students’ but inevitably turned their focus to Chinese students with little recognition of other Asians. Two papers addressed Indian student issues (Johnson & Kumar, 2010; Nyland, Forbes-Mewett, & Marginson, 2010), but the vast number of papers focused on the challenges Chinese students face in attempting to make sense of disciplinary requirements, as well as their perceived passive nature—related to their CHC—in HE settings in contrast to their openness amongst each other in social settings.

Observations suggested that overall, Chinese students must participate more fully in order to make them more valued members of the HE community, which would seem to be insensitive to individual personalities and preferences. Moreover, fostering intercultural

interactions between academic teaching staff and students needs careful planning and monitoring, rather than being a naïve expectation.

<p>THEME 1.</p> <p>Student Experience - Perceptions</p>	<p>attitudes/expectations/perceptions, course evaluation, course experience questionnaires, evaluation methods, first-year experience, focus groups, interview narratives, overall satisfaction, peer connections, peer review, student engagement, satisfaction levels, SELTs/SETLs/SETs, student evaluations, student feedback, student learning, learning experiences, student learning references, student student ratings/satisfaction/feedback, studentsatisfaction, student voice. readiness, student</p>
<p>THEME 2.</p> <p>Teaching & Learning</p>	<p>andragogy/pedagogy, AUQA/TEQSA, benchmarking, blended learning, collaborative learning, conceptions of learning, content analysis, course design, cross-disciplinary teaching and learning, curriculum improvement, curriculum planning/ mapping/design/redesign, curriculum/curriculum development, disciplinary discourses, discipline-specific educational design/planning, effective teaching, flexible delivery, Indigenous content, inquiry-based programs, lifelong learning, performance/performativity, program/course conception, psychology of learning reflection, research-led teaching, Scholarship of Teaching & Learning (SoTL), student engagement, student-centred/lecturer-centred approach, lecturer-as-learner, teaching and learning centres, teaching and learning policy, teaching critical thinking, teaching methods/responsibilities/approaches, teaching quality, team teaching, unit/course/program planning.</p>
<p>THEME 3.</p> <p>Research into Higher Education</p>	<p>academic communities of practice, academic development, Early Career Academics (ECAs), enterprise university, funding policies/structures, global ranking/university ranking, GO8/IRU/NGU, government support, higher education policy, institutional perspectives/policies and practices, institutional self-governance, institution-wide initiatives, international comparisons, marketing strategy, massification of higher education, mission and identity, national competitive grants, nature and rigour of research methods, performance/quality assurance, research and teaching nexus, research capacity building, research universities, researching teaching, scholarly publishing, teaching informed research, university mission and strategy/university policy.</p>
<p>THEME 4.</p> <p>Work-Integrated Learning</p>	<p>client projects, clinical or fieldwork educators, clinical supervisors/preceptor, clinic-based learning, community, service/community-based learning, cooperative education, experience-based education, field placement/ fieldwork, industry partners, internship program, learning through participation, non-formal learning, placements/practica/practice settings, practicum/practicum placements, profession/ professionalism/professional experience, project-based learning recognition of prior learning, reflective practitioners, rotations/simulations/attachments, service learning, supervised practice, transition to practice, vet/vet studies, vocation, work/life experience, work placement/practice/learning, work ready, work-based pedagogy/student learning, worker as learner, worker identities, workplace-based courses.</p>

Figure 1. Themes 1 - 4 and their associated keywords presented in alphabetical order

RANKING 7: Assessment & Feedback (n=17)

Boosted largely by a strong presence in the JUTLP, these articles were focused on ‘assessment’ rather than ‘feedback’ and were eclectic in nature, including online, self-, peer- and continuous-forms of assessment (Velliariis, et al., 2012, p. 22). Moreover, given academic time restraints, large student numbers, and students’ more product-driven attitudes, ‘summative’ rather than ‘formative’ tasks dominated curriculum design. Of interest would be a greater focus on: (1) formative assessment techniques and practices across specific discipline areas; and (2) student anonymity in summative assessment tasks and the capacity of HE lecturers to apply objective judgement.

First, there were articles that indicated, for example, that academic writing workshops were conducted and surveys were administered to ascertain students’ perceptions of the degree to which the extra assistance was considered valuable, but the focus was more on the evaluation than the task itself. Indeed, embedding formative assessment(s) at key points during instruction yields information that HE lecturers can use to identify and respond to problem learning areas, but greater explication of successful task(s) that facilitate a more process-driven approach would be beneficial for shared practice. Second, it seems inherent in human nature that in assessing the value or worth of students’ summative assignments/examination papers, expectations play an anchoring role. According to Brennan (2008, p. 43), ‘[a] basic premise of the theoretical literature in this area is that knowledge of the identity of the student...has the potential to create bias in the mind of the examiner’. This issue can be addressed to different degrees by anonymising assessment, but how Australian HE institutions are endeavouring to tackle this process remains under-reported.

RANKING [EQUAL] 8: Health & Wellbeing (n=14)

There were no articles in these journals written from the ‘disability service’ of any tertiary institution; nor papers related to a school/faculty/discipline working with their institution’s disability service to ensure that appropriate arrangements are made for students with disabilities, whilst maintaining the academic integrity and core requirements of the individual courses (Velliariis, et al., 2012, p. 31). Academic teaching staff appeared to be reporting on the majority of students in their programs. There were two articles by Martin (2010) and Stallman (2011) based on student mental health issues. Anxiety, stress and depression are conditions that exist across all HE settings, but the degree to which they exist may not be proportionally represented in the literature. It would be interesting to note which programs/courses are considered most stressful and the potential reasons why, as well as any correlation with student attrition rates in those programs/courses.

Universities committed to the principles of ‘health for all’ can be a tremendous asset to their staff and students, to the communities in which they are located, and to the wider society where their graduates will eventually assume professional roles. Despite growing interest in issues of inclusion, the voice of disabled students themselves was rarely reported in these journals. By listening to the voice of disabled students as they reflect on their learning experiences in HE, valuable information may be gathered about this topic. While there is pressure for HE to respond to the principle of equal opportunit(ies), how and to what extent they are implemented in practice remains largely unspecified. The 14 articles that did focus on this theme were extremely interesting and provided a welcome addition to the HE research mix.

RANKING [EQUAL] 8: Higher Degrees by Research (n=14)

Articles were based on PhD studies from the perspective of academic staff and not the candidates themselves (Velliariis, et al., 2012, p. 34). Predominantly, studies pertaining to *Higher Degrees by Research* (HDR) issues were focused on the supervisory role i.e., the

‘pedagogy of supervision’ pre-examination. As stated by Wright (2003 cited in Hopwood, 2010, p. 104), ‘we must move beyond a focus on the supervisor and seek to understand the student in a sociocultural context in which other relationships are seen as significant, including those with friends and family’. There will be a plethora of other relationships—academic, personal and professional, as well as intellectual, pragmatic and emotional—which HDR students develop during their candidature, and deeper sociocultural studies of these other influences would be beneficial (Hopwood, 2010, p. 109).

There was one research paper that examined the difference between a professional doctorate and a PhD (Lee, Brennan, & Green, 2009). While there may be countless students enrolled in professional doctoral programs in Australia, a clear matter of concern for institutions should be the widely held view that a professional doctorate lacks the international currency and status of the PhD and is of lesser quality. Questions about the comparability of standards between the professional doctorate and the traditional PhD often revolve around the contrast between the single focus of the PhD thesis and the plurality of learning outcomes which characterises the professional doctorate.

Potential doctoral candidates may see the traditional PhD as too discipline-bound and inflexible. More research could be focused, therefore, not only on clarifying the distinctive features of professional doctorates, but also on (a) developing a profile of which universities are offering professional doctorates and in which subjects; (b) identifying the rate of growth of professional doctoral programs; and (c) studying students’, lecturers’ and employers’ perceptions of the value of a professional doctorate as compared to a PhD.

RANKING [EQUAL] 10: Leadership & Professional Development (n=13)

This theme was predominantly focused on ‘leadership’ issues rather than ‘professional development’ (Velliariis, et al., 2012, p. 38). Of interest were the papers related to ‘mentoring’ and ‘peer observations’, particularly when part of a well-established institution-wide strategic approach to enhancing the overall quality of teaching, learning, and scholarship. Mentoring was often associated with introductory or foundation-type inductions for ‘new’ academic staff and as an element in accredited postgraduate programs in HE. However, greater clarity of who, when, where and how mentors are chosen and perform their duties is needed. The literature on mentoring new staff was scattered, little known and largely conjectural. Further, the one-on-one interaction of the dyadic relationship formed between mentors and mentees has many possibilities to enhance ‘both’ individuals’ growth and advancement and should be viewed as a partnership that simultaneously enables leadership and professional development.

<p>THEME 5.</p> <p>Internationalisation</p>	<p>Asia/Asian students, attitudes/belief systems, Confucian Heritage Culture (CHC), cross-cultural issues, cultural and linguistic diversity, educationally diverse, enculturation/acculturation, English language proficiency, ESL/EFL/NESB/TEFL, ethnocentricity, exchange programs/global tours, global issues/global economic crisis, Global Nomads (GNs), global skills shortage, globalisation, intercultural, intercultural competency/understanding, intercultural student interaction, international education/students, internationalising the curriculum, joint programs, language education/support/testing, intercultural proficiency, migration, multicultural/multilingual, national bias, offshore programs, racism/ discrimination/prejudice, refugee students, skilled migration, sociocultural adjustment, study tours, Third Culture Kids (TCKs), TOEIC/TOEFL/IELTS, transnationalism/transnational students.</p>
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<p>THEME 6.</p> <p>Academic Language & Learning</p>	<p>academic acculturation, academic development/discourse, academic integrity, academic literacy, academic misconduct/intellectual fraud, academic performance/requirements, academic standards, academic voice, approaches to study, discipline-specific discourse demands, English for academic purposes, essay/report writing, generic skills, intellectual fraud/integrity/virtues, learning styles, plagiarism/collusion, prior learning experiences, self-plagiarism, time management, writing centres, writing groups/skills/support, Turnitin.</p>
<p>THEME 7.</p> <p>Assessment & Feedback</p>	<p>academic performance, accreditation, achievement, alignment, anonymity, bench marking, bias, criteria, diagnostic testing procedures, equitable admissions procedures, final examination/marks/grades/results, formative and summative, generic skill assessment, guidance, mid-semester test, overall performance, peer assessment, post-diagnostic tasks, progress reporting, question inventory, screening measures, student performance, test validation/reliability, university admissions.</p>
<p>THEME 8</p> <p>Health & Wellbeing</p>	<p>academic health, anxiety/stress/depression, apathy/motivation, Asperger Syndrome, campus security, chronic fatigue, confidentiality, counselling/consultations, disability services, dyslexia, emotional intelligence, hearing and visual impairment, institutional policies and practices, lived experiences, maturation, mental health, morale and distress, Obsessive Compulsive Disorder (OCD), OH&S, physical/learning disabilities, procrastination, resilience, social support networks, Student Learning Disorders (SLDs), support services, time management skills.</p>

Figure 2. Themes 5 - 8 and their associated keywords presented in alphabetical order

RANKING [EQUAL] 10: Student Experience – Social (n=13)

Originally, this theme was titled the *Student Experience*. Increasingly it was seen that there were two important facets to students’ university life. Evaluations based on students’ teaching and learning experiences were distinct from their social experiences, which often had more personal links with transition and retention. In comparison to *Student Experience - Perceptions* (n=90), articles related to the *Student Experience - Social* (n=13) surfaced significantly fewer times.

The assumption underpinning the use of student evaluations is that since teaching is primarily undertaken to benefit students, they are best placed to judge its effectiveness. Student evaluations appeared, however, to be more of a tool to evaluate the performance of teaching staff and identify poor teaching for remediation, and attempt to validate and prove to the research community the enormous effort and success that has been achieved through one’s own teaching program/unit. It is essential that the analysis of student responses is as much about the students’ engagement with the course and the success of their learning as it is about the lecturer’s role in teaching and supporting learning. An over-reliance on student perceptions and reporting of that data dominated the literature on this theme.

RANKING 12: Graduate Attributes (n=12)

Graduate Attributes (GAs) were largely associated with *Work-Integrated Learning* (WIL) (Velliariis, et al., 2012, p. 30). That is, academic outcomes, graduate capabilities, work preparedness, and employability were all interconnected. What constituted employability and which GAs are required to foster employability in tertiary students, was a common lead-research question. As stated by Bridgstock (2009), this issue should involve more than mapping generic competencies onto existing curricula. It should involve partnerships between faculties, careers services and employers to develop and implement programs that address, for example, career management competence and instil a sense of ‘lifelong’ learning.

RANKING 13: Educational Technology (n=11)

Educational technology did not feature prominently across the three journals and articles were not overly technical (Velliariis, et al., 2012, p. 28). That is, they tended to refer to more common forms of technology implemented in HE programs, such as online reflection logs/blogs and other information/workshop-type activities. In other words, the focus of these articles was mainly on teaching and learning strategies that incorporated technology, rather than on the technology itself.

Today, aside from Technical Skills (TS), access to appropriate infrastructure and related educational technology is essential for all students. Some students may be disadvantaged if they live in regions with poor connectivity, or have software that is incompatible with institutional software, or if they do not have access to any technology at all (Pillay, Irving, & Tones, 2007, p. 219). Thus, a significant proportion of Australian students may be educationally disadvantaged in online learning for example, as difficulties associated with resolving infrastructure, access and other technical problems are often significant factors in the decision of students to drop-out/disengage with course content.

<p>THEME 9</p> <p>Higher Education by Research</p>	<p>APA scholarships/other scholarships, completion/non-completion, doctoral candidates/students/education, doctoral supervision, doctoral writing, doctorate, Early Career Researchers/Academics (ECAs), emerging scholars, Honours/Masters, journal editing, knowledge creation, lifelong learning, oral defence, PhD/professional doctorates, postgraduates, procrastination, professional development, professional doctorate, professional experience, professional skills, quality assurance, research students/skills/training, self-determined learning, self-directed study, self-efficacy, self-evaluative processes, self-sabotage, stress and time management, supervision/pedagogy of supervision, thesis examination, thesis submission, writing programs, writing support/groups.</p>
<p>THEME 10.</p> <p>Leadership & Professional Development</p>	<p>academic board, career advancement, change and innovation, educational development, governing bodies, leadership vision and mission, management, mentors/mentoring, organisational management, peer assessment, peer coaching/partnership/ support, peer-to-peer learning power, professional autonomy, professional growth plans, project leadership/management, promotion, reward and recognition, roles and responsibilities, staff development program, strategic leadership, teaching grants, tenure, trustees, university council, vice-chancellors.</p>
<p>THEME 11.</p>	<p>clubs and societies, empathy, enculturation/acclulturation, extra-curricular activities, group work/skills, informal learning spaces, integration and isolation, interactions, intercultural competence, local and international student(s) interaction, orientation week, participation, peer</p>

Student Experience - Social	assessment, peer learning, peer learning support, peer observation, peer partnership, peer relations, peer review, peer support, peer-to-peer learning, perceived effectiveness, sense of belonging, social choice, social inclusion, social media, social networking, social relationships, student engagement, study groups, tutorials, volunteerism.
THEME 12. Graduate Attributes	academic outcomes, career management, career readiness/workplace readiness, curriculum mapping, employability, expectations, generic skills, graduate capabilities/outcomes/skills, lifelong learning, preparedness, self-efficacy, standards of achievement, student outcomes, transferable/key/core/generic/ lifelong skills, university graduates
Figure 3. Themes 9 - 12 and their associated keywords presented in alphabetical order	

RANKING [EQUAL] 14: Critical Thinking (n=8)

The articles on *Critical Thinking* in HERD were linked to the Special 2011 Edition = Volume 30 Issue 3 titled *Critical thinking in higher education* (Velliariis, et al., 2012, p. 24). Most of those papers involved implementing critical thinking activities/strategies into curricula to better provide an educative environment where students can hone their critical skills. Articles agreed that HE educators need to immerse students in an educative community of critical thinking in order to: (a) encourage a deeper understanding of subject matter; (b) challenge and transform students’ epistemic conceptions; and (c) cultivate critical dispositions. How to design appropriate learning experiences that develop students’ critical thinking skills is still a matter for experimentation, debate, reflection and shared dialogue. While it was initially thought that this theme would feature more prominently beyond the special edition, there were few works that were otherwise focused on this theme.

RANKING [EQUAL] 14: Disadvantage (n=8)

Disadvantage did not have a strong presence in the three Australian journals surveyed during the research period in articles first-authored by Australia-based researchers (Velliariis, et al., 2012, p. 26). There may be other Australian or non-Australian academic journals focused on issues pertaining to HE disadvantage, but a greater presence in the mainstream is warranted, as it placed second-to-last of the 16 themes. Apart from Scull and Cuthill’s (2010) work titled *Pacific Islander immigrant communities in Southeast Queensland*, there was little reference to the implementation of institutional strategies to help increase access to HE by specific minority/equity groups.

RANKING 16: Transition & Retention (n=7)

In last position, research suggested that a wide range of factors impact upon first-year student retention. They are more likely to leave HE if they: (a) lack commitment to the institution; (b) lack commitment to a specific career direction or degree; (c) were not well advised about enrolment options; or (d) if they feel socially disengaged (Willcoxson, 2010, p. 627). Withdrawal in the ‘later years’, however, is said to be related to more ‘personal’ aspects—health, finance, social integration, clarity of career direction and self-efficacy in relation to academic capacity—although institutional commitment, accessibility of teaching staff and helpfulness of feedback have also had some influence on decisions to withdraw. Research directed at second- and third-year students should be focused on areas more problematic to them. Examination of correlations with reference to year of study will validate the need for retention programs that target more than just ‘first-year’ students.

As stated by Danaher, Bowser and Somasundaram (2008, p. 278), ‘[c]omparative analysis across organisational and disciplinary units provides another window into exploring and extending the understanding of student departure’. Danaher’s (2008) article took an intra-organisational comparative approach through the examination of faculty and program attrition

rates of students who joined an Australian university in the first-term of 2004. The faculty with the highest attrition had a rate two and-a-half times that of the faculty with the lowest rate. Certainly, there is the risk that staff will be unwilling to engage with data that provides internal comparisons, through a reluctance to be seen as critical of their peers and thereby engendering disharmony. Nevertheless, it seems necessary for institutions to explore the causes of variations in attrition rates within their institutions (Danaher, et al., 2008, p. 278).

THEME 13. Educational Technology	analytics, assessment/assessment ePortfolios, asynchronous / synchronous discussion, blogging, computer assisted learning, data mining / data protection, digital futures, discussion boards, distance education, eAssessment / eLearning /ePortfolios, file sharing, flexibility/flexible learning, games / gamification, immersive environments, information literacy, learning ePortfolios, multimedia, multiple-owner ePortfolios, offshore studies, online contextualised learning activities, online courses/learning/surveys, outreach, personal development ePortfolios, presentation ePortfolios, rich media technologies, simulations, social media, virtual reality, Web 2.0/Web 3.0/Web apps/Web3D.
THEME 14. Critical Thinking	arguments, beliefs/bias, community of inquiry, creative problem-solving, critical reading and writing, critical researcher, critique/analysis, debate, dialectical thinking, ethics, inference, inquiry, intellectual autonomy/ empathy, opinion vs. fact, Problem-Based Learning (PBL), questioning and reasoning, reflective practice, subjective vs. objective, surface vs. deep-level learning/thinking.
THEME 15. Disadvantage	access/limited access, community engagement, disability, distance students, diversity, enabling education programs, equity/equity groups/sub-groups, ethnic minorities, Fairway schools, female academics, first-generation, flexibility, gender differences, gradients of disadvantage, higher education access, illiteracy/literary rates, Indigenous learners/students, low educational outcomes, mature-age students, non-traditional students, outreach, personal disadvantage, primary caregivers, reducing disadvantage, refugee students, remote candidature/rural and isolated students, simultaneous equity group membership, social inclusion/social justice, socio-economic deprivation, socioeconomic issues, Socio-Economic Status (SES), under-representation, unemployed.
THEME 16. Transition & Retention	acculturation, at-risk students, attendance rates, attrition/attrition prevention, course selection, expectations, failure rates, first-year/first-year experience, high school performance, institutional effectiveness, isolation/isolation vs. engagement, preparedness/self-efficacy, social networks, student experience, time management, undergraduates.
Figure 3. Themes 9 - 12 and their associated keywords presented in alphabetical order	

6. SUMMARY & CONCLUSION

This project represented a successful collaboration between HERDSA and *The University of Adelaide* with impacts that will be experienced in the years following 2012. A rich source of data was established to enable analysis, application, and dissemination to continue and contribute to the growing body of Australia scholarly literature. HERDSA used a variety of methods to disseminate the key project findings, including: a final comprehensive report

published and disseminated via the website; development of promotional materials; papers and conference presentations by members of the project team; project updates; and a project forum to name but a few examples. Indeed, Australian HE institutions can find many issues to address from this study, as well as international scholars looking to publish works in Australia.

In summary, research into HE over the last five years by Australian researchers was shown to be broad and there was a consistent thematic trend across journal publications, conference presentations and successful grant applications. Overall, there were signs of strength and consistency across the sector in all forms of dissemination and academic thought and although there were key figures represented strongly in the field they did not dominate publications or successful grant applications. Building on the achievements of the university sector offers a tremendous opportunity to expand the contribution that universities make to Australia. The challenge is to find robust ways to continue to engage in ongoing research developments/collaborations that can sustain a successful and fruitful Australian 'community of practice'.

7. ACKNOWLEDGEMENTS

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8. REFERENCES

- Brennan, D. J. (2008). University student anonymity in the summative assessment of written work. *Higher Education Research & Development*, 27(1), 43-54. doi: 10.1080/07294360701658724
- Bridgstock, R. (2009). The graduate attributes we've overlooked: enhancing graduate employability through career management skills. *Higher Education Research & Development*, 28(1), 31-44. doi: 10.1080/07294360802444347
- Danaher, P. A., Bowser, D., & Somasundaram, J. (2008). The student departure puzzle: do some faculties and programs have answers? *Higher Education Research & Development*, 27(3), 271-280. doi: 10.1080/07294360802183820
- Gamble, N., Patrick, C.-j., & Peach, D. (2010). Internationalising work-integrated learning: creating global citizens to meet the economic crisis and the skills shortage. *Higher Education Research & Development*, 29(5), 535-546. doi: 10.1080/07294360.2010.502287
- Hopwood, N. (2010). A sociocultural view of doctoral students' relationships and agency. *Studies in Continuing Education*, 32(2), 103-117. doi: 10.1080/0158037x.2010.487482
- Johnson, R., & Kumar, M. (2010). The Monsoon Wedding phenomenon: understanding Indian students studying in Australian universities. *Higher Education Research & Development*, 29(3), 215-227. doi: 10.1080/07294360903532008
- Larcombe, W., & Malkin, I. (2008). Identifying students likely to benefit from language support in first-year Law. *Higher Education Research & Development*, 27(4), 319-329. doi: 10.1080/07294360802406791
- Lee, A., Brennan, M., & Green, B. (2009). Re-imagining doctoral education: Professional Doctorates and beyond. *Higher Education Research & Development*, 28(3), 275-287. doi: 10.1080/07294360902839883

International Conference on Multidisciplinary Trends in Academic Research, September 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- Martin, J. M. (2010). Stigma and student mental health in higher education. *Higher Education Research & Development*, 29(3), 259-274. doi: 10.1080/07294360903470969
- Nyland, C., Forbes-Mewett, H., & Marginson, S. (2010). The international student safety debate: moving beyond denial. *Higher Education Research & Development*, 29(1), 89-101. doi: 10.1080/07294360903277364
- Palmer, E. (2012). An investigation into the nature of higher education research in Australia *HERDSA News* (Vol. 34 No. 3, pp. 1 & 3). NSW, Australia: Higher Education Research and Development Society of Australasia Inc.
- Pillay, H., Irving, K., & Tones, M. (2007). Validation of the diagnostic tool for assessing Tertiary students' readiness for online learning. *Higher Education Research & Development*, 26(2), 217-234. doi: 10.1080/07294360701310821
- Scull, S., & Cuthill, M. (2010). Engaged outreach: using community engagement to facilitate access to higher education for people from low socio-economic backgrounds. *Higher Education Research & Development*, 29(1), 59-74. doi: 10.1080/07294360903421368
- Stallman, H. M. (2011). Embedding resilience within the tertiary curriculum: a feasibility study. *Higher Education Research & Development*, 30(2), 121-133. doi: 10.1080/07294360.2010.509763
- Velliaris, D. M. (2014a, 25-26 September). *Actual and perceived areas of concentration and the gaps in Australian higher education research 2007-2012*. Paper presented at the 4th International Conference on Education, Research & Innovation (ICERI), Bangkok, Thailand.
- Velliaris, D. M. (2014b, 18-21 May). *Prominent themes in Australian higher education research 2007-2012*. Paper presented at the West East Institute (WEI): International Academic Conference, Bali, Indonesia.
- Velliaris, D. M., Palmer, E., Picard, M., Guerin, C., Smith, S. D., Green, I., & Miller, J. (2012). Australian tertiary learning and teaching scholarship and research 2007-2012 (pp. 1-182). Adelaide, Australia: The University of Adelaide.
- Velliaris, D. M., & Willis, C. R. (2013, 1-5 December). *Understanding the gaps in Australian higher education research*. Paper presented at the Australian Association for Research in Education (AARE), Hilton Hotel, Adelaide, South Australia.
- Willcoxson, L. (2010). Factors affecting intention to leave in the first, second and third year of university studies: a semester-by-semester investigation. *Higher Education Research & Development*, 29(6), 623-639. doi: 10.1080/07294360.2010.501071

PREVALENCE OF HEPATITIS C VIRUS ANTIBODIES AMONG BLOOD DONORS IN OMDURMAN REGION IN SUDAN

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ABSTRACT

Infection with HCV is a major cause of transfusion associated hepatitis, cirrhosis and hepatocellular carcinoma. This study was conducted with an objective to estimate the prevalence rate of anti HCV antibody among voluntary blood donors attending the transfusion department at Omdurman hospitals. A cross –sectional study was conducted from 2nd of January to 27th of March 2007. The rapid test method was used and confirmed with the ELISA (third generation).The population included 1672 Sudanese person. The age of the donors (all males) was between 18 – 45 years with a mean of 36 years. Anti-HCV antibody was detected in 1.016% of the study population. The prevalence of anti –HCV among voluntary blood donors was 1.02 %. Routine screening for HCV should be conducted for all blood donors before they are accepted for donation.

Keywords: HCV, Prevalence Rate, Blood Donors.

1. INTRODUCTION

Hepatitis C is a blood borne, infectious, viral disease that is caused by a hepatotropic virus called hepatitis C virus (HCV). The infection can cause liver inflammation that is asymptomatic but may lead to chronic hepatitis which causes cirrhosis and liver cancer(Letter, 1999). HCV is a member of a large family of the viruses that includes the causative agents of yellow and dengue fevers. The disease is known to have two stages; the acute phase(Jaeckel et al., 2001) and the chronic phase(Johnson et al., 1993) with different clinical signs (Zignego, Ferri, Pileri, Caini, & Bianchi, 2006). In USA and Western Europe, the complications of hepatitis and cirrhosis were the most common reasons for liver transplantation.

The prevalence of HCV infection varies in different parts of the world: in Scandinavia, it was less than 0.59 %(Choo, Houghton, & Kuo, 1989) and, in Egypt, it was over 20 %(Frank et al., 2000). In a study on strains of viral hepatitis antibodies in the Sudan, HCV markers were positive in 3% of the patients studied compared to 82% positive for Hepatitis B virus (HBV) markers(Dimitry M.E 2000).

In a study in Juba (the capital of the Southern region in the Sudan until the year 2011 and now the capital of the newly formed Southern Sudan State), 3% of the population were carrying HCV antibodies, suggesting that the incidence of HCV infection was not high in the study group (McCarthy, El-Tigani, Khalid, & Hyams, 1994). However, in another study, the prevalence of HCV in heamodialysis patients in the Sudan was reported to be 34.9 % (Suliman et al., 1995).

Diagnosis of the disease is rarely made during the acute phase of the disease because infected people experience no symptoms and/or until sever symptoms develop. The diagnosis of the chronic phase is also challenging due to the absence or lack of specificity of symptoms until advanced liver disease occurs which could take decades. Occasionally, HCV is diagnosed as a result of targeted screening such as

blood donation or contact tracing (Thompson, Hernberger, Wale, & Crofts, 1996). Thus, the contradicting reports, the lack of the studies in this field and the absence of information were leading factors to conduct the present study to determine the prevalence of HCV antibodies among voluntary blood donors attending the transfusion departments at Omdurman hospitals in the Sudan.

2. MATERIALS AND METHODS

This study was conducted during January-March 2007. The study was carried out in four hospitals in Omdurman area: Omdurman Teaching Hospital, Omdurman Pediatric Hospital, Ombadah Hospital and the Military Hospital. The donors were males over 18 years old. They were randomly selected in the four hospitals. Consent forms were prepared and approval of all subjects included in the study were obtained before blood was taken. In addition to the blood samples, all donors were interviewed and a questionnaire was filled to obtain information on age, place of living, family relationship with patients, occupation and history of blood donation.

The methods in use for routine screening of voluntary blood donors in the Sudan in the blood banks of the hospitals are: the rapid screen test, third generation of ELISA and Polymerase chain reaction (PCR).

In this study the one step cassette style Anti-HCV serum/whole blood Test was used. The sealed pouch was opened, the cassette test kit was removed from the pouch and used as soon as possible. 3.0 µl of serum/whole blood sample was added by an accurate pipette. Three drops (120 µl) of diluents was added into the reagent well of the cassette test kit. The result was read after 10 minutes incubation in room temperature. The positive result was confirmed by using HCV Ab third generation Enzyme Immunoassay for determination of anti HCV antibody in human serum and plasma. This was prepared and produced by DIA-PRO Diagnostic Bioprobes Srl via columella n 31 20128 Milano-Italy. The assay procedure was done by placing the required number of micro wells in a holder. The 1st well was left empty for the operation of blanking. 200 µl of negative control were dispensed in triplicate. 200 µl Calibrator in duplicate and 200 µl positive control in single proper wells. 200 µl of sample diluents were added to all wells, then 10.0 µl of sample were dispensed in each properly identified well, the plate was shaken gently. 50.0 µl assay diluents were dispensed in to all the controls and samples wells. The color of samples was checked whether it turned to dark blue. The micro plate was washed with an automatic washer by delivering and aspirating 350 µl well of diluted washing solution. 100 µl Enzyme conjugate were pipetted into each well. The 1st blanking well was covered with a sealer. It was checked that the red colored component has been dispensed in all wells. The micro plate was incubated for 45 minutes at 37°C and washed. 100 µl chromogen/substrate mixtures were pipetted into each well. The blank well was included. Then the micro plate was incubated at room temperature for 15 minutes. 100 µl sulphuric acid were pipetted into all the wells using the same pipetting sequence to stop the enzymatic reaction. Addition of the acid turned the positive control and positive samples from blue to yellow. The data were entered in a master sheet and analyzed by the Statistical Packages for Social Sciences (SPSS).By using Quai square .And expressed in numbers and percentages

3. RESULTS

The total of the donors was 1672 Sudanese males. Their ages ranged from 18-45 years old (Table 1). None of the subjects was a health care worker. The questionnaire

revealed the following: no one had a history of blood transfusion, self injection with intravenous drugs, heamodialysis, received intravenous immunoglobulin's, having endoscopic procedures and the only medical surgical procedure done to the majority of them (1598, 95.6%) was circumcision (Table 2). 830 reported a history of performing native procedures: 110 (6.57%) had cupping (bleeding); 320 (19.13%) had cutting marks on the face (a local tradition to differentiate the tribes, now disappearing), 200 (11.96%) had cupping and marks on the face and 200 (11.96%) had their teeth broken (Tables 2 and 4). Clinical signs: 97 (5.8%) had a history of jaundice, 107 (6.4%) with abdominal pain, 207 (12.13%) had joint pain and 1233 (73.7%) complained of fatigue.

103 of the donors (6.16%) were HBV infected and 43 (2.57%) had HIV infection. Two of subjects in the HCV seropositive tested were positive for HBV but not for HIV. HCV antibodies were detected in 17 (1.016%) of the donors, Table 5. They were distributed in four age groups, between 25–45 years old (Prevalence 1.35%). None of them had a history of blood transfusion, drug abuse, heamodialysis, high risk sexual behavior, intravenous immunoglobulin receipt, native procedures, surgery or endoscopic procedures except circumcision.

Table 1: Distribution of Blood donors by age groups

Age group	Frequency of the population	Percentage of the population
18 – 24	418	25%
25 – 31	531	31.77%
32 – 38	342	20.45%
39 – 45	195	11.66%
46 – 52	186	11.12%

Table 2: Risk Factors among Blood Donors

Risk factor	Frequency of the population	Percentage of the population
Circumcision	1598	95.58%
Native procedures	830	49.64%
High risk sexual behavior	0	0%
Blood transfusion	0	0%
Self injection with i.v drugs	0	0%
Intravenous immunoglobulin's	0	0%
Dialysis	0	0%

Table 3: Frequency of native procedures among blood donors

Native procedures	Frequency of the Population	Percentage of the Population
Yes	830	49.64%
No	842	50.36%
Total	1672	100%

Table 4: Types of native procedures among blood donors

Native procedures	Frequency of the population	Percentage of the population
Marking of face	320	19.13%
Cupping	110	6.57%
Cupping + marking of face	200	11.96%
Broken teeth	200	11.96%
Total	830	49.62%

Table 5: Prevalence of hepatitis C virus among blood donors

Prevalence of HCV	Frequency	Percentage of infection
Positive	17	1.02 %
Negative	1655	98.98%
Total	1672	100%

4. DISCUSSION

The blood banks in the Sudan have very strict rules to follow. Firstly, no blood is to be taken from anyone below 18 years of age and females are not allowed to donate blood. Therefore, those who were examined do not actually represent the whole population. In fact they represent only males in the age group 18-45 years old. Secondly, anyone who donated blood within the previous three months will be rejected. Thirdly, the banks do not accept blood from anyone who will expose the patient or the donor to any health risk. One of these risks is the medical surgical procedures. However, the native procedures and circumcision do not affect the patient nor the donor in any way. Fourthly, the blood banks usually request the patient who needs blood to bring volunteers to donate blood. In this way they keep substituting the blood they lose. However, those donors will be examined clinically and the blood donated will be examined for hepatitis, HIV, malaria and/or any blood infectious transmitted disease. Any blood infected from a donor will be discarded.

The prevalence of HCV reported here is less than two percent from all donors, whether rejected or accepted. In a similar study conduct by a group working in

Mekkah, Saudi Arabia(Ahmad et al., 2003), found the prevalence rate of HCV among Saudi blood donors to be 1.7% and among non-Saudi donors to be 6.6%(Letter, 1999). On the other hand, the prevalence of HCV among Egyptians was reported in several studies (Frank et al., 2000). It was suggested that a major risk factor that affect HCV transmission, in Egypt, and therefore the prevalence is the personal history of parental anti schistosomal therapy (PAT) (Frank et al., 2000). A review of the Egyptian PAT mass –treatment campaigns, revealed a high prevalence of HCV among the families in which the parents were treated during these campaigns.(Frank et al., 2000) Although schistosomiasis is endemic in the Sudan, the prevalence of the disease in Khartoum State, where the study was carried out, is very low. Khartoum State is implementing a control programme among the school children and providing anti-schistosomal drug for those infected only. None of the subjects in this study reported infection with schistosomiasis or having received anti schistosomal therapy.

A report from Al-Damam, Saudi Arabia (Fathalla et al., 2003), stated that the infection with the virus begins in the early age group of 10-15 years old. The age group of those infected with HCV, in this study, is the 25-45 years old. This is the reproductive age group in the Sudan and the income of those infected will be affected. Although this study was conducted during 3 months, and only 17 subjects were found infected, it is estimated that the number of those infected during the whole year will be a 100 individuals and all of them will be reservoir for the disease.

The percentage of those infected with HBV and HIV were almost six times and three folds respectively of those infected with HCV. These are alarming figures and utmost care should be given to the examination of these diseases, especially the HIV, among blood donors. It will be ideal to use very specific and sensitive technology to screen the blood from the donors. It is recommended that routine examination of the population at the age group 20-45 to be carried out on a regular basis and free. In fact, the Sudan is now encouraging any one to examine HIV free on a voluntary basis.

The blood was screened for HCV, HBV and HIV by the rapid direct binding screening test. It is a rapid test for the presence of the antibodies of the three viruses. The test is very sensitive, rapid and the results are read visually without any instrumentation. ELISA is a sensitive and accurate technology to test for antibodies. The results by the two methods are the same. It is, therefore, recommended to use the easier method in the hospital for routine work which is the rapid direct binding screening test.

5. REFERENCES

- Ahmad, M. S., Mahtab, A. M., Abdullatif, A., Tashkandy, M., Kashreed, M., & Maulana, A. (2003). Prevalence of antibodies against the hepatitis C virus among voluntary blood donors at a makkah hospital. *Saudi Journal of Kidney Diseases and Transplantation*, 6(2), 122.
- Choo, Q.-L., Houghton, M., & Kuo, G. (1989). NANBV diagnostics and vaccines: Google Patents.
- Dimitry M.E , K. A. G. a. T. A. (2000). *Prevalence of hepatitis C virus antibodies and associated hepatitis B virus markers among Sudanese patients with acute viral hepatitis in Khartoum*. University of Khartoum.
- Fathalla, S., Al-Jama, A., Badawy, M., Sabry, H., Awad, O., Abdulaziz, F., & El-Najar, M. (2003). Prevalence of hepatitis C virus infection in the Eastern Province of

Saudi Arabia by RE-DNA second generation and supplemental EIA tests. *Saudi medical journal*, 15(4), 120-121.

Frank, C., Mohamed, M. K., Strickland, G. T., Lavanchy, D., Arthur, R. R., Magder, L. S., . . . Anwar, W. (2000). The role of parenteral antischistosomal therapy in the spread of hepatitis C virus in Egypt. *The Lancet*, 355(9207), 887-891.

Jaeckel, E., Cornberg, M., Wedemeyer, H., Santantonio, T., Mayer, J., Zankel, M., . . . Manns, M. P. (2001). Treatment of acute hepatitis C with interferon alfa-2b. *New England Journal of Medicine*, 345(20), 1452-1457.

Johnson, R. J., Gretch, D. R., Yamabe, H., Hart, J., Bacchi, C. E., Hartwell, P., . . . Alpers, C. E. (1993). Membranoproliferative glomerulonephritis associated with hepatitis C virus infection. *New England Journal of Medicine*, 328(7), 465-470.

Letter, A. B. C. N. (1999) (Vol. 13).

McCarthy, M. C., El-Tigani, A., Khalid, I. O., & Hyams, K. C. (1994). Hepatitis B and C in Juba, southern Sudan: results of a serosurvey. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 88(5), 534-536.

Suliman, S., Fessaha, S., El Sadig, M., El-Hadi, M., Lambert, S., Fields, H., & Ghalib, H. (1995). Prevalence of hepatitis C virus infection in hemodialysis patients in Sudan. *Saudi Journal of Kidney Diseases and Transplantation*, 6(2), 154.

Thompson, S. C., Hernberger, F., Wale, E., & Crofts, N. (1996). Hepatitis C transmission through tattooing: a case report. *Australian and New Zealand journal of public health*, 20(3), 317-318.

Zignego, A., Ferri, C., Pileri, S., Caini, P., & Bianchi, F. (2006). Extrahepatic manifestations of Hepatitis C Virus infection: a general overview and guidelines for a clinical approach. *Digestive and liver disease*, 39(1), 2-17.

RELATIONSHIP OF BOLTON'S RATIOS AND TOOTH-SIZE DISCREPANCY

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ABSTRACT

The aim of this study was to determine whether there are differences in the influence of tooth size discrepancies among malocclusion groups in the general population; to know if there are any effects of tooth size discrepancies from region to another, and to study Bolton's ratio of tooth size discrepancy in relation to malocclusion treatments. A quantitative study was carried out using many studies published in the English language from various population groups from different countries. Well defined guidelines for conducting analyses of observational studies were followed by electronic database (Entre Pub Med, www.ncbi.nlm.nih.gov). Additionally, a Direct database (www.sciencedirect.com) will be performed, and data will be collected on the following items for the retrieved studies: year of publication, study design, materials (study sample, control sample,) methods of measurement, authors' conclusions, and reference lists of relevant articles would be screened.

Keywords: Tooth Size Discrepancy, Bolton's Ratio, and Malocclusion.

1. INTRODUCTION

The main purpose in comprehensive orthodontic treatment is to achieve optimal final occlusion, overjet and overbite. Tooth sizes and arches discrepancies of maxillary and mandibular are important factors for reaching this goal. The sizes of the maxillary and mandibular teeth are defined as mesio distal widths (Bolton, 1958). The relationships between the maxillary and mandibular teeth must be in specific dimensions, to ensure secure intercuspation, overbite and overjet. Orthodontists have different opinions about focusing on the significance of tooth size discrepancy and the necessity to measure it clinically (Othman & Harradine, 2006) even though, in most individuals the natural teeth are fit together in proper way. However, about 5% of population has tooth size discrepancies which may cause Malocclusion (Proffit, Fields Jr, & Sarver, 2007).

A number of studies have shown that the prevalence of significant of tooth size discrepancy is rather high. Some researchers have established a relationship between tooth size discrepancy and malocclusion, such as (Sperry, Worms, Isaacson, & Speidel, 1977); (Nie & Lin, 1999); (Alkofide & Hashim, 2002); (Araujo & Souki, 2003). They found that Class III subjects had greater mandibular tooth size excess than the Class II and I. Others showed class II malocclusions had greater maxillary tooth size excess than other Classes (Nie & Lin, 1999). However, other studies reported no significant differences (Crosby & Alexander, 1989; Uysal, Sari, Basciftci, & Memili, 2005).

On the other hand, many causes may influence the size and shape of dental arches, for instance bone growth, genetics, tooth eruption and inclination, ethnic history, and function (Hassanali & Odhiambo, 2000; Lavelle, Flinn, Foster, & Hamilton, 1970). Many studies have been conducted concerning the evolution of arch width and transverse craniofacial, to calculate

changes due to treatment, setbacks and growth(Cortella, Shofer, & Ghafari, 1997; KNOTT, 1972).Several researchers studied the transverse morphology and development of Class I compared with Class II division 1 and class II division (Lux, Conradt, Burden, & Komposch, 2003; Staley, Stuntz, & Peterson, 1985).While very few studies were included, four types of anteroposterior occlusion were compared.

2. OBJECTIVE

Tooth size discrepancy: Bolton’s analysis

In Bolton (1958) conducted the best known study of tooth size discrepancy in relation to malocclusion treatments. He used his method in cases to analyze mesio-distal tooth size ratios between maxillary and mandibular teeth with standard occlusion. He measured the greatest mesio-distal width of all the teeth, excepting the second and third molars on each case.

Bolton (1958) collected forty-four dental casts from patients who were orthodontically treated (non-extraction) with excellent occlusion, and eleven untreated subjects. As samples, he selected “big group of excellent occlusion casts with extreme care” from ten private practices in Washington and Oregon, and from the University of Washington, Department of Orthodontics. Bolton used a three-inch needle point divider and a finely calibrated millimeter ruler to measure the greatest mesio-distal diameter from first molar to first molar for each dental cast. This data was used by Bolton to establish the means and statistical measures of dispersion for two ratios that he published for use in assessment of the interarch relationship, to aid in orthodontic diagnosis and treatment planning. Bolton recorded and measured the sum of the mesio-distal tooth sizes of the mandibular arch (from first molar to first molar), and divided this sum by the mesio-distal tooth sizes of the maxillary arch (from first molar to first molar). Then he multiplied this value by 100 to gain the percentage of mandibular and maxillary tooth discrepancy. He named this value the “over-all ratio”. He used the same method to calculate a percentage relationship between anterior teeth (from canine to canine), and termed “anterior ratio” Bolton expressed his ratios as follows:

Sum 3-3 (mandibular)	
Sum 3-3 (maxillary)	X 100 = Anterior Ratio
Sum 6-6 (mandibular)	
Sum 6-6 (maxillary)	X 100 = Total Ratio (Over-all ratio)

Formulas used to determine the ratio of the anterior teeth, canine to canine (3-3), and the ratio of both posterior and anterior teeth, first molar to first molar.

Methods of measuring mesio-distal tooth dimension

It is essential to have a quick and easy method of measurement if it is to be employed widely. In the same way, no method of measurement is strong without clear and thorough documentation of reproducibility. Traditionally, the methods of measuring a tooth’s mesio-distal size on dental models can be defined as manual methods, and use either a Boley gauge (Vernier calipers) or needle-pointed dividers(Shellhart, Lange, Kluemper, Hicks, & Kaplan, 1995).

Other previous studies (Othman & Harradine, 2006; Proffit, 2000; Tomassetti, Taloumis, Denny, & Fischer Jr, 2001) have found the advantages of using the digital method for measuring Bolton's tooth width analysis. The anterior and posterior ratios can be quickly calculated by using a digital caliper linked to computer. In this finding, a digital caliper was used to calculate only the mesio-distal tooth size of the samples.

Currently, there is a new method using an A RMI 550, a three dimensional measuring device (SAM Präzisionstechnik GmbH, München, Germany), which was used to evaluate the models to the nearest 0.01 mm (Figure 1). Measurements were taken of the mesio-distal tooth widths of all teeth, according to the method described by Lundström (1954).

Materials and Methods

The main goal of the study were to conclude whether there is a difference in tooth size discrepancies among difference malocclusion groups in population and between genders, to know if there are any influence of tooth size discrepancies from country to another, and to know the relationship between the tooth size discrepancy and malocclusion.

Collecting results from previous studies was our first task, followed by storing them in order to build database. The search of literature is not complete in the strict sense, and it cannot be covered the whole world, but our hope is to include all the most important previous studies, in addition to making smaller study. Next, we explored the databases through several methods and steps.

Table 1: Descriptive Comparison of Anterior Ratio and Overall Ratio for Malocclusion groups

Author(s)	Country	Gender	Year published	Number of cases	Anterior Ratio	Overall Ratio
Singla Anil, Mahajan Monika	Himachali	Males	2010	50	77.89	92.42
		Females		50	77.45	91.62
Banu SAĞLAM AYDINATAY	Turkey	Males	2010	86	78.28	91.255
		Females		110	78.27	91.435
Hüsametlin Oktay and Esengül Ulukaya	Erzurum, Turkey	Males	2009	216	78.892	92.434
		Females		284	78.896	92.118
Mihovil Strujić et al;	Croatia	Males	2009	127	78.39	91.71
		Females		174	77.81	91.60

Table 2: Descriptive Comparison of Anterior Ratio and Overall Ratio for gender

Author (s)	Country	Occlusion Type	Year Published	Number of cases	Anterior Ratio	Total Ratio
Kristina Lopatiene, Aiste Dumbravaite	Lithuania	I	2009	71	78,075	92,937
		II		91	77,703	92,506
		III		19	78,084	93,083
Iffat Batool, Assad Abbas, S. Ausaf Ali Rizvi, Irum Abbas	Pakistan	I	2008	37	77,67	91,64
		II		68	80,14	90,79
		III		30	79,58	91,13
Tancan Uysal.; Zafer Sari, ; Faruk Ayhan Basciftci; Badel Memili,	Tukey	I	2005	156	78,56	91,90
		II-1		157	78,50	91,12
		II-2		34	79,00	91,94
		III		113	78,83	91,69
Hamid Reza Fattahi , Hamid Reza Pakshir and Zohreh Hedayati	Iran	I	2006	50	79,44	91,85
		II-1		50	77,73	90,65
		II-2		50	78,72	91,09
		III		50	80,16	93,14

Observational studies, such as cross-sectional surveys, cohorts and case-control studies were included.

The studies of population were based on non-patients studies, which included both adults and adolescents. Also, we have included studies that covered only adolescents.

The terminology used in review papers on TSD was utilized to identify MeSH and free text terms. A comprehensive search was performed by combining the terms “tooth size discrepancy”, “Bolton Ratio”, “malocclusion groups”, “relationship between Bolton ratio and malocclusion”, “TSD”, “cause of malocclusion”, and “tooth size”. The references of all relevant studies and existing reviews were screened for additional relevant publications.

For each paper the following information was extracted:

title, author, year of publication, aim of the study, number of cases, participation rate population, numbers of male and female subjects, sample information about the population, country of study, criteria and definition of TSD, type of sampling, overall and anterior ratio (in percentage), malocclusion groups and references.

Our last step was to be more precise and to specify in the research. We selected around 50 articles published in English that fit to our criteria. We divided our study into three schedules: the first compared the results in different populations; the second discussed differences in dental classes; and the last was concerned with comparisons between genders.

3. RESULTS

A breakdown of the search results by databases can be seen in Table 1. After checking for duplicates and excluding studies that did not fulfill the selection criteria, the 1989 was earliest year of publication, and the latest 2011. (94%) of the studies were published during the last ten years.

The aim of our study was to determine the correlations between tooth size discrepancies among malocclusion classes in many population samples, which included the gender and comparing the results of all researches which we selected. Mentioned worth, that the importance of tooth size discrepancies in orthodontic diagnosis has widely mentioned in the literature and accepted by the orthodontic community because the relationship between the upper and lower anterior and posterior dentition is related to the orthodontic finishing excellence (Othman & Harradine, 2006; Paulino, Paredes, Gandia, & Cibrian, 2008; Uysal et al., 2005).

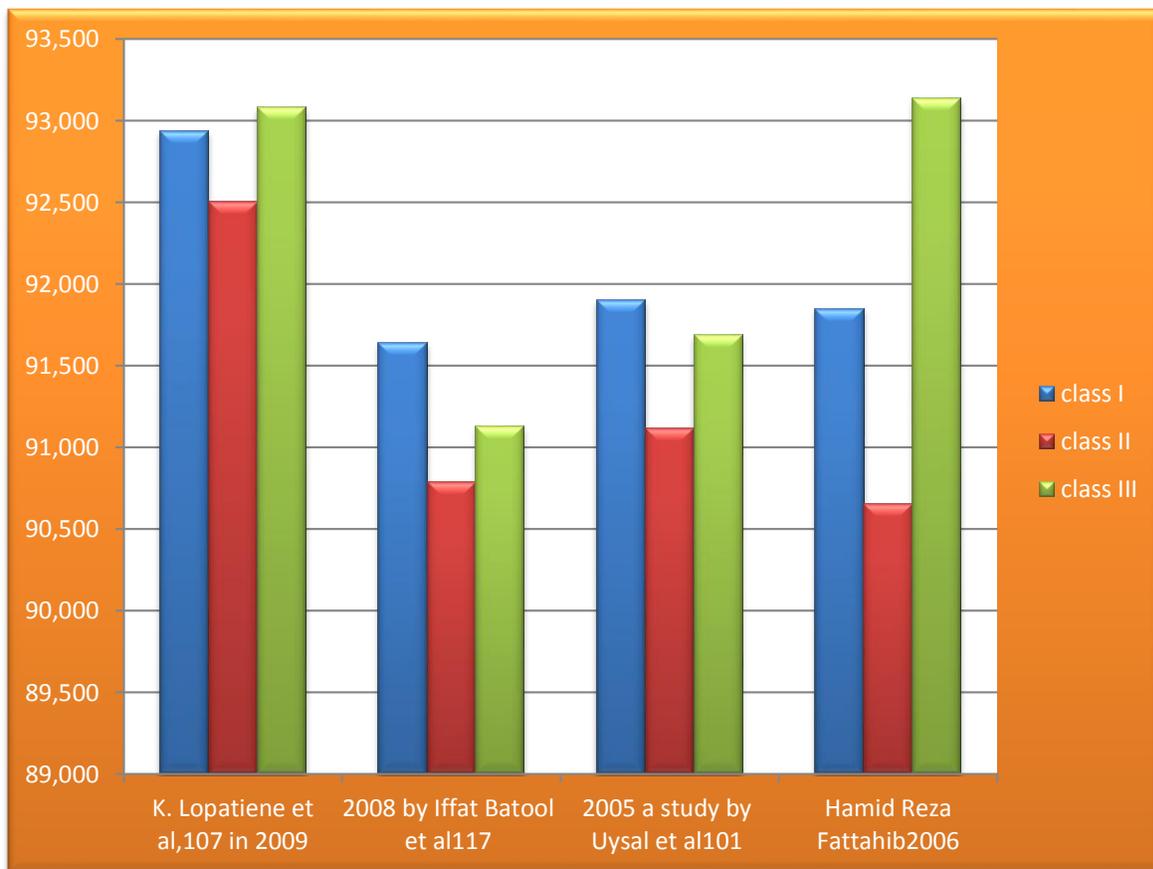


Chart 1: Descriptive Comparison of Anterior Ratio and Overall Ratio for Malocclusion groups.

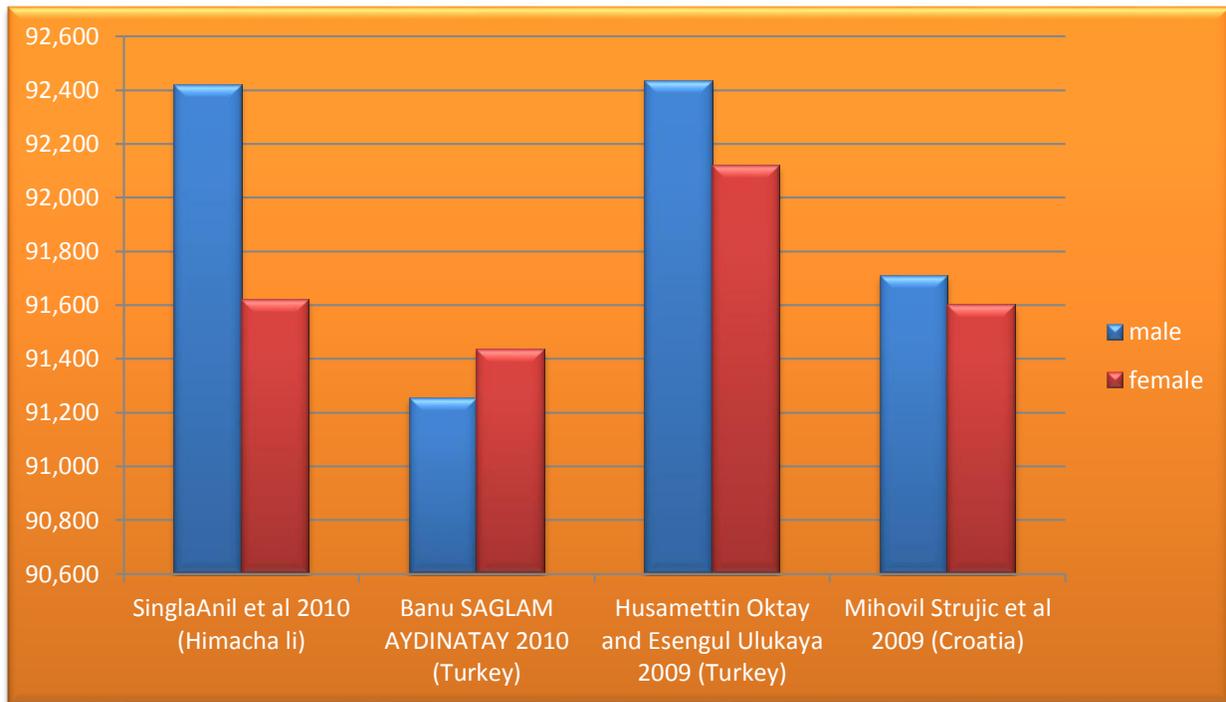


Chart 2: Descriptive Comparison of Anterior Ratio and Overall Ratio for gender

With the many controversies related to the prevalence of tooth size discrepancy among malocclusion groups, it is not surprising that the estimation of this prevalence has varied considerably. Concern has been expressed regarding the lack of generally accepted standards for definitions, methods of investigation, and presentation of results. These factors probably explain more of the variations than do any real differences between samples.

This study was used to evaluate the results of about 50 studies regarding the prevalence of TSD among malocclusion groups, and tried to explain the associated factors. Any investigators have used ± 2 SD, equivalent to about 3mm or more, for corroborating a clinically significant discrepancy. This number is corrected by removal of the tooth structure and/or prosthetic alteration.

For our research, we selected several studies which compared TSDs among malocclusion classes (Tables 1, 2). However, these studies have different data generally. These studies have selected randomly from several ethnic groups (Saudi Arabian, Chinese, Nepalese, Lithuanian, Turkish, Brazilian, Iranian, Japanese, Irish, Jordanian, Pakistani, British, American (white and black), Iraqi, Croatian, Thai, Malaysian, Indian, Belgian, Peruvian and Spanish).

Several authors found that there were no significant differences between malocclusion groups for instance. However, other authors found significant differences between malocclusion groups.

Most studies found no differences in the mean Bolton ratio between the sexes, and in those studies which found a difference, it was small.

The differences in the results between this study and other investigations might be attributed to differences in sample size, methods of analysis, and the large standard deviations found in this study.

4. CONCLUSION

1. The comparison between different malocclusion groups:
 - A. The overall and anterior Bolton ratio comparison showed no statistically significant difference between Angle Class I, II, and III in about 45 % of studies.
 - B. The results of this study indicate that the prevalence of Tooth Size Discrepancy among malocclusion groups is about 55% of studies in different population.
 - C. The results revealed that 70 % of studies which had TSD among malocclusion groups that Class III malocclusion had a significantly greater prevalence of tooth size discrepancies than those with Class I and Class II malocclusions.
2. The population comparisons:
 - A. The anterior Bolton ratio comparison in different populations revealed that 74% (4668 cases) of studies didn't show any significant differences, whereas 26% (1230 cases) of study revealed significant differences (See in table 3).

	Number of Studies	%
77.2±1.65	25	74%
> 1.65	9	26%

Table 3:

Distribution of anterior ratios using Bolton's published mean of $77.2 \pm 1.65\%$

- B. The overall Bolton ratio comparison in different populations showed that 97% (5738 cases) of studies had no significant differences; whereas only 3% (160 cases) of studies showed significant differences (see in Table 4).

	Number of Studies	%
91.3± 1.91	33	97%
>1.91	1	3%

Table 4: Distribution of posterior ratios using Bolton's published mean of $91.3 \pm 1.91\%$.

3. Gender comparisons:
Around 40% of gender studies revealed significant differences between (males and females studies) comparing with Bolton ratio of tooth size discrepancy, and whereas approximately 60% of studies showed that no statistically significant differences in the prevalence of TSD with regard to gender.

Final conclusion showed that the estimation of this prevalence has varied considerably because of many controversies related to the prevalence of tooth size discrepancy among malocclusion groups.

5. REFERENCES

- Alkofide, E., & Hashim, H. (2002). Intermaxillary tooth size discrepancies among different malocclusion classes: a comparative study. *Journal of Clinical Pediatric Dentistry*, 26(4), 383-387.
- Araujo, E., & Souki, M. (2003). Bolton anterior tooth size discrepancies among different malocclusion groups. *The Angle Orthodontist*, 73(3), 307-313.

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Global Illuminators, Kuala Lumpur, Malaysia.

- Bolton, W. A. (1958). Disharmony In Tooth Size And Its Relation To The Analysis And Treatment Of Malocclusion*. *The Angle Orthodontist*, 28(3), 113-130.
- Cortella, S., Shofer, F. S., & Ghafari, J. (1997). Transverse development of the jaws: norms for the posteroanterior cephalometric analysis. *American Journal of Orthodontics and Dentofacial Orthopedics*, 112(5), 519-522.
- Crosby, D. R., & Alexander, C. G. (1989). The occurrence of tooth size discrepancies among different malocclusion groups. *American Journal of Orthodontics and Dentofacial Orthopedics*, 95(6), 457-461.
- Hassanali, J., & Odhiambo, J. W. (2000). Analysis of dental casts of 6-8-and 12-year-old Kenyan children. *The European Journal of Orthodontics*, 22(2), 135-142.
- KNOTT, V. B. (1972). Longitudinal study of dental arch widths at four stages of dentition. *The Angle Orthodontist*, 42(4), 387-394.
- Lavelle, C., Flinn, R., Foster, T., & Hamilton, M. (1970). An analysis into age changes of the human dental arch by a multivariate technique. *American journal of physical anthropology*, 33(3), 403-411.
- Lundström, A. (1954). Intermaxillary tooth width ratio and tooth alignment and occlusion. *Acta Odontologica*, 12(3-4), 265-292.
- Lux, C. J., Conratt, C., Burden, D., & Komposch, G. (2003). Dental arch widths and mandibular-maxillary base widths in Class II malocclusions between early mixed and permanent dentitions. *The Angle Orthodontist*, 73(6), 674-685.
- Nie, Q., & Lin, J. (1999). Comparison of intermaxillary tooth size discrepancies among different malocclusion groups. *American Journal of Orthodontics and Dentofacial Orthopedics*, 116(5), 539-544.
- Othman, S., & Harradine, N. (2006). Tooth-size discrepancy and Bolton's ratios: a literature review. *Journal of orthodontics*, 33(1), 45-51.
- Paulino, V., Paredes, V., Gandia, J., & Cibrian, R. (2008). Prediction of arch length based on intercanine width. *The European Journal of Orthodontics*, 30(3), 295-298.
- Proffit, W. R. (2000). *Contemporary orthodontics* (3rd edn ed.).
- Proffit, W. R., Fields Jr, H. W., & Sarver, D. M. (2007). *Contemporary orthodontics* (4th ed.): Elsevier Health Sciences.
- Shellhart, W. C., Lange, D. W., Kluemper, G. T., Hicks, E. P., & Kaplan, A. L. (1995). Reliability of the Bolton tooth-size analysis when applied to crowded dentitions. *The Angle Orthodontist*, 65(5), 327-334.
- Sperry, T. P., Worms, F. W., Isaacson, R. J., & Speidel, T. M. (1977). Tooth-size discrepancy in mandibular prognathism. *American journal of orthodontics*, 72(2), 183-190.
- Staley, R. N., Stuntz, W. R., & Peterson, L. C. (1985). A comparison of arch widths in adults with normal occlusion and adults with Class II, Division 1 malocclusion. *American journal of orthodontics*, 88(2), 163-169.
- Tomassetti, J. J., Taloumis, L. J., Denny, J. M., & Fischer Jr, J. R. (2001). A comparison of 3 computerized Bolton tooth-size analyses with a commonly used method. *The Angle Orthodontist*, 71(5), 351-357.
- Uysal, T., Sari, Z., Basciftci, F. A., & Memili, B. (2005). Intermaxillary tooth size discrepancy and malocclusion: is there a relation? *The Angle Orthodontist*, 75(2), 208-213.

VEGETATIONAL COMPOSITION AND DIVERSITY ALONG EROSION PRONE AREAS OF CANILI PANTANBANGAN ROAD NETWORK IN AURORA PROVINCE, PHILIPPINES

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ABSTRACT

This study was aimed to determine the benefits and long term effects of using coconets and biologs to arrest erosion on disturb areas due to construction of road network leading to Aurora Province, Philippines. It is also aimed to determine the vegetation that grows on the different mesh size as to their common name, family name, and scientific names, also to identify which is the most diverse vegetation on the study area.

Three years after the termination of the research study entitled Field Testing of Bio Engineering Techniques Using Geo-Textile and Bio-logs to Mitigate Soil Slope Erosion in Maria Aurora National Highway, Philippines, 3plots measuring 2m x2m were established on the top, middle and bottom portion of the 3 study sites.

Each plot were observed of the presence of vegetation, species present were counted and identified to their common name, family name, and scientific name, observations were carefully recorded and tabulated and was subjected to comparison among the 3 study sites. Principal component analysis (CPA) a two dimensional principal analysis was applied to determine the similarity of the different plots.

Result of the study showed that Site 1 contained 11 plant species, Site 2 contained 15 plant species, and Site 3 contained 9 plant species, it further revealed that 8 plant species are common in 3 study sites.

Top 5 vegetation species are effective for reducing erosion namely Vetiver Grass (Viteverizaniodes' Monto), Pakupak (Pteridophyta), Ipil-ipil(Leucanaleucocephala), Perennial Peanuts(Arachisglabrata), and Hagonoy. It is also found out that most of the plants in the study area are Vetiver Grass (Viteverizaniodes' Monto), and Hagonoy (Chomoleomodorata).

Keywords: Coconets, Bio-logs, Diversity, Principal Component Analysis, Succession.

1. INTRODUCTION

Philippines has been too busy for the development on how to be a globalize country which almost forget the massive deforestation made by the community as to answer poverty. Innovation and development also establish destruction of forest which may cause calamity like flood, typhoon, etc. Bio-engineering project helps vegetation succession where in plants have the capacity to live because of the use of coco fiber as mitigation to erosion. Coco-coir logs are reliable erosion control products which are designed to assist in the stabilization and vegetation of hillsides, banks, shorelines and other areas prone to erosion. Logs are constructed with compact interior and have been densely packed with coconut fibers. Fibers are then covered with exterior coir mesh netting that helps fibers keep in place. Bio-engineering technology use to prevent soil erosion in slopping areas and in river banks as being suggested. The coconut husk is a by-product of copra production, it can be processed into coco-nets similar to that of geo-textile, in the presence of coco-nets natural vegetation grows in the study sites.

Erosion is a natural process that affects our environment; in fact, soil erosion is one of the most serious forms of land degradation which affects the population and the environment. While erosion is a natural process, human activities have increased by 10-40 times rate at which erosion is occurring globally. Excessive erosion cause problem such as desertification, sedimentation of water way, and ecological collapse due to the loss of the nutrient rich in the upper soil layer.

Human activities that cause destruction such as logging forest clearing or shifting cultivation, agriculture and grazing, and also by frequent fires. The latter, frequently resulted from human disturbances, regenerate naturally and speedily to secondary young forest. Many mechanisms can trigger succession of the second including facilitation such as tropic interaction, initial composition and competition-colonization trade off. The factor that controls the increase in abundance of a species during succession may be determined mainly by seed production and dispersal micro climate, landscape structure bulk density, pH, and soil texture (Henry Cowles, 1899).

There are many prevention and remediation practices that can curtail or limit erosion of denude soils. Hence, the researchers would like to undergo a study to overlook at the experiment done by the research team in vegetating erosion area in Canili-Pantabangan, Aurora Province, Philippines.

Objectives of the Study

General Objective

Generally, this study aimed to determine the Three Year Vegetation Succession along the Erosion prone areas of Canili Road Network.

Specific Objectives

- a. Determine the vegetation that grow on the different mesh size as to common names, scientific names, and family names ;
- b. Determine the vegetation composition along the erosion prone areas of Canili-Pantabangan Road Network, Maria Aurora, Philippines; and
- c. Determine what vegetation is more diverse in the study site.

Significance

This research study would provide vital information about the Three Year Vegetational Succession along the erosion prone areas of Canili-Pantabanagan Road Network. Thus, the result would serve as basis for upcoming researchers who wish to conduct further studies about the Three Year Vegetational Succession along the erosion prone areas of Canili-Pantabanagan Road Network. Moreover, the result will help policy-makers LGU's, NGO's and the DENR to formulate new strategies on how further enhance the mesh sizes on the development of vegetation of erosion prone areas in Canili-Pantabangan Road.

Scope and Limitations

This research was limited only in gathering information about Three Year Vegetational Succession along the erosion prone areas of Canili-Pantabanagan Road Network. It focuses only on the vegetational composition and identification of different species that grows along the areas. Three sites where selected; Site 1 and 2 are located at Sitio Calao, Brgy. Wenceslao Maria Aurora while Site 3 is located at Sitio Masantol, Canili Area, Maria Aurora.

2. REVIEW OF LITERATURE

Erosion Control

According to PCARRD, (1992) the soil erosion problem in the Philippines is quite pronounced with more than half of the country's land area having a slope exceeding 8 percent (defined as the Philippine uplands). The problem is aggravated by heavy rainfall, improper land use and management, excessive and improper logging, shifting cultivation and road

construction. Eroded areas are estimated to cover more than half of the land area in the following 13 provinces: Batangas, Cebu, Ilocos Sur, La Union, Batanes, Bohol, Masbate, Abra, Ilo-Ilo, Cavite, Rizal, Capiz, and Marinduque.

Agricultural activities occur largely at the expense of natural vegetation and are responsible for much of soil loss taking place everywhere, particularly in areas that are vulnerable to soil erosion. Under natural conditions, the topsoil that is lost is largely replenished from the subsoil. The topsoil is defined as a renewable resource with a threshold level below which resource use renders it non-renewable. Yield losses from soil erosion can come not only from soil nutrient losses but also from the reduction in the soil's water holding capacity, infiltration rates and loss of other beneficial top soil characteristics. The loss in crop productivity caused from nutrient loss can be offset by increased use of fertilizers. Because of the above considerations, the valuing soil depreciation in terms of fertilizer equivalent of the nutrients contained in the eroded materials has been largely criticized as an inadequate measure. Due to the absence of basic data, however, this approach has been used extensively in the country as an indicator of the on-site costs of soil erosion (Anderson and Thampapillai, 1990).

Primary Succession along an Elevation Gradient 15 Years after the Eruption of Mount Pinatubo, Luzon, Philippines

According to Marler (2011), vegetation structure and environmental variables in the Pasig-Potrero and Sacobia River systems on the east flank of Mount Pinatubo, Luzon, Philippines, to define growth form and taxonomic groups that have influenced primary succession during the 15 yr since the eruption. We selected 8 sites within east-west range of 11.5km, a north-south range of 7km, and an elevation gradient of ca. 500m. The 58 plants taxa we encountered among 63 sampled plots belonged to 21 families. Cover was dominated by *Parasponiarugosa* (tree) and *Saccharumspontaneum* (large grass). Cover of these two species was inversely related at the plot level. Exotic species represented nearly 60% of this flora but only 32% of the vegetation cover. Family richness was high for Asteraceae, Fabaceae, and Poaceae. Elevation, distance to the caldera, the distance to human settlement exhibited the most control over the vegetation. The influence of elevation on cover, species composition, and structure differed in these adjacent canyons. Plot species richness, cover, and diversity indices were greatest at the highest elevation of the Pasig-Potrero River. On a small scale, current dominant species may control progression of species assemblages as mediated by geophysical, chemical, facilitative, and competitive changes. Our findings indicate that ongoing anthropogenic disturbances and the prevalence of exotic species may prevent the vegetation from returning to its pre-eruption state. The invasive *Pennisetumsetaceum* and *chromolaenaodorata* were widespread in this landscape, and their negative influence on vegetation recovery is probable. Ours is the first detailed survey of vegetation on newly created volcanic surfaces in the region and provides a baseline for understanding the landscape-level processes determining continuing succession, coir or coconut fibre belongs to the group of hard structural fibres. It is important commercial product obtained from the husk of the coconut. Industries based on coir have developed in many coconut producing countries especially India, Tanzania, Kenya, Bangladesh, Burma, Thailand, Sri Langka, Nigeria, Ghana etc. In India, coir manufacture is a traditional industry, which has taken deep roots in the economic structure of the rural areas in the coastal states. The industry sustains over half a million people and contributes substantial foreign exchange to the national exchequer. India was ranked first among the coconut producing countries of the world until 1921, since then, the position has change. Indonesia and Philippines have increased their production and India now occupies third place. These countries together account nearly 65% of the world production (4.5MT) out of which India's share is about 25%.

Coconet

Individual fibres are 0.3-1.0mm long and 0.01-0.02mm in diameter; the ratio of length to diameter being 35. The lumen is medium to large, polygonal-rounded, or elliptic. The vascular bundle is collateral and is surrounded by thick sclerenchymatous sheath. Lignin and hemicelluloses, which form the cementing materials of fibre cells, increase with age of the fibre and the pectin decreases. As lignin content increases, the fibre becomes stiffer and tougher. Length of the fibre determines its spinnability and commercial utility. Spinnability may be defined as the ease with which textile may be twisted into continuous uniform yarns, having commercially acceptable properties. Fineness of the fibre is usually expressed by its diameter in microns or in by weight of the fibre per unit length- dinier. The compactness and strength of a yarn or cord depends on the cohesion between individual fibre.

Elongation at rupture is a criterion of practical value and is an index of the work that could be performed by the fibre within the limits of its breaking load. Torsional rigidity, stresses in the fibre due to twisting or bending or important factors which affect the diameter of the yarn, its ability to snarl, its pliability and elastic recovery from small strains and internal pressures.

The History of the Study of Succession

According to Henry Cowles's (1899) dissertation work on sand dunes along Lake Michigan was inspired by earlier European studies describing succession coastal dunes. While not the first to describe succession, Cowles's work influenced generations of ecologists by defining laws underlying the patterns of community change. Henry Cowles recognized plant communities as being dynamic, both on species composition and the underlying physical environment, a view that still holds to this day. The basic idea that plant communities of different ages in sand dunes reflected how the communities changed over time. Cowles and others have used the chronosequence approach to better understand the successional process. Since it would be difficult to follow a successional sequence that lasted decades or centuries, this method replaces a time period by spatial differences (locations of different ages) to infer how succession proceeds (see Johnson and Miyanishi 2008 for a criticism of this approach). The stage in a successional sequence is termed a sere. How this process worked has been a dominant question in the field of ecology, especially plant ecology. Plants are the dominant feature of the landscape, therefore, received the most attention over the past century. Ecologists have also identified parallel successional patterns in animals and have even documented animals affecting the directions and rate of succession. The study of succession is now ubiquitous, being investigated in practically all ecosystems.

Coconut Husk Can Stop Soil Erosion, Says PCA

According to Gallarde (2012), the bio-engineering technology using what was considered before as farm waste being suggested to prevent soil erosion in sloping areas in river banks in Negros Oriental by Philippine Coconut Authority provincial manager Brendan Trasmonte, the coconut husk, or "bunot" in the dialect, and a by-product of copra, can be processed into coco-nets similar to that of geotextile, Trasmonte said. He added the decorticated coco fiber can be twined and weaved into nets that can be installed in slopes or in river banks as mitigating measures. If the technology is acceptable and adopted by local government unit. Trasmonte said the PCA can assist in the training and installation of the concept.

After the coco nets are in place vegetation is allowed, like the planting of vitiber, a kind of grass whose roots can penetrate up to three meters underneath the soil. The water-holding capacity of this technology capacity of this technology can increase with the planting of trees and bamboos along banks, he added. "The process will not only generate jobs for coconut farmers, weavers and decorticators, but will also save the government more than half

the cost of constructing dikes,” Trasmonte said. Raw material is also not a problem because there are about nine million coconut trees in the province.

Field Testing of Bio- Textile and Bio- Logs to Mitigate Soil Slope Erosion in Maria Aurora National Highway

Angara E. V., et, al (2010) concluded that in terms of top soil loss, Treatments covered with geo-nets. With 4m interval of bio-logs and planted with Perennial Peanuts were the most effective in terms of minimizing top soil loss in disturbed sloping areas with more than 600 slopes. Control (T1) tend to have the highest rate of top soil loss because it has no net that will serve as barriers to slow down the velocity of run- off water.

Based on the results, the highest amount of erosion in the experimental areas was 0.88t/ha. This is far below the tolerable erosion limit in a disturbed area which is 2.0t/ha. They also found that if the soil is compact, it tends to decrease the size of pore spaces and when is the landscape is completely devegetated, the infiltration rate decreases while the run-off increases thereby increasing the erosion rate.

3. METHODOLOGY

Location

This research study was conducted along the Canile-Pantabangan Road. It was selected because of the presence of coco-net and bio-logs with the different mesh sizes and vegetation on the disturbed areas due to road network construction. Three sites were selected: Site 1 and 2 are located at Sitio Calao, Brgy Wenceslao, Maria Aurora while Site 3 is at Sitio, Masantol, Canili Area, Maria Aurora, Philippines.

Three plots measuring 2x2m were established on top, middle, and lower portion of the 3 study sites. Different species of plots present in each plots were identified, counted, and tabulated and were subjected to frequency counts.

Identification of species were done by experts and aided with Lexicon to further verify the correctness of the process.

Data Gathering Instruments

In the conduct of the study, the following were used: 1) Plastic straw – used to establish experimental plots; 2) Meter tape – to measure the area of experimental plots; 3) Paint and tag – used to identify the tree and other plant species; 4) Pencil and data book – recording of gathered data; and 5) Maps – to locate the previous research area.

Data Gathering Procedures

Generally, this research study determined the 3 year vegetational succession along the disturbed areas due to road construction, 3 plots on each site were established measuring 2m x 2m (top, middle, and lower portion). All species of trees and other plants were counted and identified. Recording was carefully executed to eliminate human errors. Later tabulated and subjected to simple frequency counts.

Data Gathered

The data gathered in this study were the following:

- I. Trees and saplings
 1. Identification as to their:
 - a. Common name
 - b. Family name
 - c. Scientific name
 2. Species count
- II. Undergrowth:
 1. Identification as (seedlings, grass, ferns, vines, etc.)
 - a. Common name

- b. Family name
- c. Scientific name
2. Species count (%cover)
3. Species diversity (species composition)

Data Analysis and Interpretation

The data gathered were tabulated, analyzed and interpreted using descriptive statistics of sum, average, and percentages. For diversity parameters, the ff formula was used.

$$\text{Percentage} = \frac{\text{Frequency of species}}{\text{Total frequency of the species}} \times 100$$

$$IS = (2C/A+B)$$

Where: IS = index of similarity

C = Number of species common to two plots

A = Total number of species in plot A

B = Total number of species in plot B

Principal Component Analysis (CPA). A two dimensional principal components analysis was applied to determine the similarity of the different plots. This includes the following steps:

1. Obtain importance values of the species (vegetative structure analysis)
2. Obtain index of similarity (IS) using Sorensens formula
3. Enter values of IS in a nxn symmetric index of similarity matrix
4. Input the matrix to the data view of SPSS software and run data reduction (using CPA as factor)

Two dimensional scatter plots of CPA scores showed inter plot spatial relationships. Two dimensional plots were plotted using Excel graphic and analyzed based on the principle that the distance between the points or plots in the scatter represents the degree of inter plot similarity based on the principal vegetative component.

4. RESULTS AND DISCUSSION

Composition and Diversity

Within the area of previous research study, 3 plots were carefully established with 4 treatments, in an erosion prone area along Canili-Pantabangan Road Network. Table 1 shows that T1 has 14 species, T2 has 16 species, T3 has 13 species, and T4 has 14 species, which belong to 11 families. In terms of number of species per family, Fabaceae was found numerous with the species and the rest with an average of 1-2 species per family. The number of species per plot ranges from 7-15 with an average of 10.

In terms of the number of individuals per species, Vetiver grass (*Vetiveria zizanioides* 'Monto') has the highest number of individuals=386, followed by Pakupak (*Pteridophyta*)=249, and Ipil-ipil (*Leucaena leucocephala*)=104. Of all numerous species, 2 of them belong to family Fabaceae, and the rest are from Mimosaceae, Graminaceae and Aspidiaceae. It further showed that Graminaceae family which has the highest number of individuals, and abundance in all mesh sizes, these can be attributed to the fact that they were planted after the installation of coco-nets and bio-logs.

Table 1. Species composition in the study area (T1).

Common name	Scientific name	Family name	No of individual/spp
Trees			
Kakauate	<i>Gliricida sepium</i>	Fabaceae	31
Ipil-Ipil	<i>Leucaena leucocephala</i>	Mimosaceae	25
Hawili	<i>Ficcus septic</i>	Moraceae	3
Is-Is	<i>Leucosyke capitellana</i>	Urticaceae	1
Tibig	<i>Ficus nota</i>	Moraceae	7
Takip-asin	<i>Makaranga grandifolia</i>	Euphorbiaceae	2
Coconut	<i>Cocos nucifera</i>	Arecaceae	2
Undergrowths			
Perennial peanuts	<i>Arachis glabrata</i>	Fabaceae	41
Makahiya	<i>Mimosa pudica</i>	Fabaceae	25
Carabao grass	<i>Paspalum conjugatum</i>	Poaceae	9
Vetiver grass	<i>Viteverizizniodes' Monto</i>	Gramenacea	89
Pakupak	Pteridophyta	Aspidiaceae	58
Hagonoi	<i>Chomolaem odorata</i>	Asteraceae	19
Bikas	<i>Mikania cordata</i>	Asteraceae	20
Hawili	<i>Ficcus septic</i>	Moraceae	4
Kakauate	<i>Gliricida sepium</i>	Fabaceae	30
Ipil-Ipil	<i>Leucaena leucocephala</i>	Mimosaceae	22
Tibig	<i>Ficus nota</i>	Moraceae	3
Is-Is	<i>Leucosyke capitellana</i>	Urticaceae	4
Binunga	<i>Macaranga tanarius</i>	Euphorbiaceae	2
Alateris	<i>Mutinga calabura</i>	Mitingiaceae	3
Takip-asin	<i>Makarangagrandifolia</i>	Euphorbiaceae	3
Coconut	<i>Cocos nucifera</i>	Arecaceae	3
Undergrowths			
Perennial peanuts	<i>Arachis glabrata</i>	Fabaceae	36
Makahiya	<i>Mimosa pudica</i>	Fabaceae	13
Carabao grass	<i>Paspalum conjugatum</i>	Poaceae	20
Vetiver grass	<i>Viteverizizniodes' Monto</i>	Gramenacea	84
Pakupak	Pteridophyta	Aspidiaceae	75
Hagonoi	<i>Chomolaem odorata</i>	Asteraceae	33
Bikas	<i>Mikania cordata</i>	Asteraceae	35
Kakauate	<i>Gliricida sepium</i>	Fabaceae	34
Ipil-Ipil	<i>Leucaena leucocephala</i>	Mimosaceae	29
Is-Is	<i>Leucosyke capitellana</i>	Urticaceae	5
Tibig	<i>Ficus nota</i>	Moraceae	6
Takip-asin	<i>Makaranga grandifolia</i>	Euphorbiaceae	4
Hawili	<i>Ficcus septic</i>	Moraceae	2
Undergrowths			
Perennial peanuts	<i>Arachis glabrata</i>	Fabaceae	38
Makahiya	<i>Mimosa pudica</i>	Fabaceae	12
Carabao grass	<i>Paspalum conjugatum</i>	Poaceae	25

Vetiver grass	Viteverizizniodes' Monto	Gramenacea	98
Pakupak	Pteridophyta	Aspidiaceae	55
Hagonoi	Chomolaem odorata	Asteraceae	37
Bikas	Mikania cordata	Asteraceae	25
Tibig	Ficus nota	Moraceae	6
Is-Is	Leucosyke capitellana	Urticaceae	7
Kakauate	Gliricida sepium	Fabaceae	23
Ipil-Ipil	Leucaena leucocephala	Mimosaceae	27
Binunga	Macaranga tanarius	Euphorbiaceae	2
Hawili	Ficcus septic	Moraceae	3
Coconut	Cocos nucifera	Arecaceae	3
Undergrowths			
Perennial peanuts	Arachis glabrata	Fabaceae	31
Makahiya	Mimosa pudica	Fabaceae	13
Carabao grass	Paspalum conjugatum	Poaceae	20
Vetiver grass	Viteverizizniodes' Monto	Gramenacea	94
Pakupak	Pteridophyta	Aspidiaceae	56
Hagonoi	Chomolaem odorata	Asteraceae	16
Bikas	Mikania cordata	Asteraceae	28

Principal components analysis determines the similarity of vegetation composition of the sample plots. This similarity is graphed with sample plot as points. The distance of the points reflects the degree of similarity. His points that are close together are similar in vegetation composition and those that are far apart are dissimilar. Their differences are based on a community coefficient derived from important values. A two dimensional scatter graph was constructed to graphically illustrate the inter relationship of 12 plots. Appendix 1 shows the index similarity among all possible pairs of 12 plots. The result of a 2-dimensional graph shows that there is no factor in mesh size to vegetation but to the area, because the mesh size where closely similar to each other results shows that the index mixing of plots describes no distinct grouping of species function of treatment. It reveals that the area is almost heterogeneous in character that each species are widely scattered at all points in the study area.

Result showed that there were 11 plants in site 1 namely Carabao grass(*Paspalum conjugatum*), Hagonoi(*Chomolaem odorata*), Hawili(*Ficcus septic*), Ipil-ipil(*Leucaena leucocephala*), Is-is(*Leucosyke capitellana*), Kakauate(*Gliricida sepium*), Makahiya(*Mimosa pudica*), Pakupak(*Pteridophyta*), Perennial peanuts(*Arachis glabrata*), Tibig(*Ficus nota*), and Vetiver grass (*Viteverizizniodes' Monto*), while 15 plants were found in Site 2 namely Alateris(*Mutinga calabura*), Binunga(*Macaranga tanarius*), Carabao grass(*Paspalum conjugatum*), Hagonoi(*Chomolaem odorata*), Hawili(*Ficcus septic*), Ipil-ipil(*Leucaena leucocephala*), Is-is(*Leucosyke capitellana*), Kakauate(*Gliricida sepium*), Makahiya(*Mimosa pudica*), Pakupak(*Pteridophyta*), Perennial peanut(*Arachis glabrata*) Takip-asin(*Makaranga grandifolia*), Tibig(*Ficus nota*), and Vetiver grass(*Viteverizizniodes' Monto*). On the other hand Site 3 had 8 plants namely Carabao grass (*Paspalum conjugatum*), Hagonoi(*Chomolaem odorata*), Ipil-ipil(*Leucaena leucocephala*), Kakauate(*Gliricida sepium*), Pakupak(*Pteridophyta*), Perennial peanut(*Arachis glabrata*), Tibig(*Ficus nota*), and Vetiver grass(*Viteverizizniodes' Monto*).

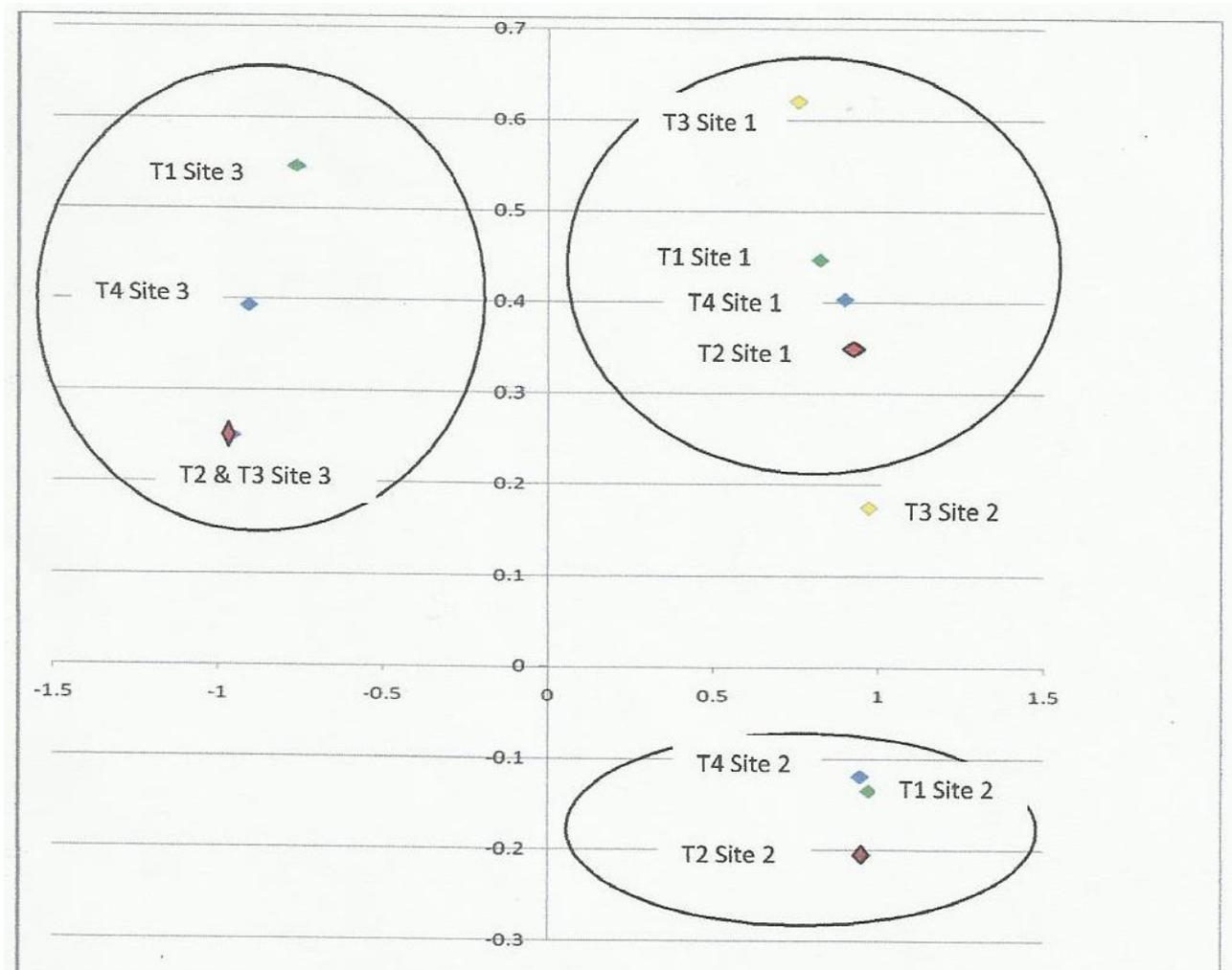


Figure 1. Similarity distribution of plot in relation to vegetation.

Generally, the 3 study sites contained the following: Alateris(*Muntinga calabura*) =3(0.2%), Binunga(*Macaranga tanarius*)=4(0.3%), Carabao grass(*Paspalum conjugatum*) =74(5.1%), Coconut(*Cocos nucifera*)=8(0.6%), Bikas(*Mikania cordata*)=91(6.3%), Hagonoy(*Chomolaem odorata*)=16(8.0%), Makahiya(*Mimosa pudica*)=63(4.4%), Pakupak(*Pteridophyta*)=249(17.3%), Perennial peanuts(*Arachis glabrata*)=146(10.1%), Takip-asin(*Makaranga grandifolia*)=9(0.6%), Tibig(*Ficus nota*)=22(1.5%), and Perennial peanut(*Arachis glabrata*)=386(26.7%).

It was also found out that the 8 species present in all study sites namely Carabao grass (*Paspalum conjugatum*), Hagonoi(*Chomolaem odorata*), Ipil-ipil(*Leucaena leucocephala*), Kakauate(*Gliricida sepium*), Pakupak(*Pteridophyta*), Perennial peanut(*Arachis glabrata*), Tibig(*Ficus nota*), and Vetiver grass(*Viteverizniodes' Monto*).

Table 2. Vegetation found in the study site.

Common name	Site 1	Site 2	Site 3	Frequency	Percentage
Alateris	-	3	-	3	0.2
Binunga	-	4	-	4	0.3
Carabao grass	29	15	30	74	5.1
Coconut	-	8	-	8	0.6
Bikas	-	-	91	91	6.3
Hagonoi	58	51	7	116	8.0
Hawili	6	8	-	14	1.0
Ipil-Ipil	44	37	23	104	7.2
Is-Is	9	10	-	19	1.3
Kakauate	59	51	25	135	9.4
Makahiya	39	24	-	63	4.4
Pakupak	86	97	66	249	17.3
Perennial peanut	48	54	44	146	10.1
Takipasin	-	9	-	9	0.6
Tibig	11	7	4	22	1.5
Vetiver grass	91	114	181	386	26.7
Total				1443	100.0

It showed that the 3 sites were covered mostly by Vetiver grass (*Viteveriziniodes' Monto*), Pakupak (*Pteridophyta*), Perennial peanut (*Arachis glabrata*), Hagonoi (*Chomoleomodorata*), Ipil-ipil (*Leucana leucocephala*), Bikas (*Mikania cordata*), Carabao grass (*Paspalum conjugatum*), Makahiya (*Mimosa pudica*), Kakauate (*Gliricida sepium*), and Hawili (*Ficcus septic*). It was also found out that the most diverse species in the study sites was Vetiver grass (*Viteveriziniodes' Monto*) which belongs to Family Graminaceae. It further showed that undergrowth have the highest number of species (7), which have the greater value to reduce the erosion in the study sites. Soil erosion has been a major issue in the past and will be even greater issue in the future.

Top 5 species found on the study areas were: Vetiver grass (*Viteverizianiodes' Monto*), Pakupak (*Pteridophyta*), Ipil-ipil (*Leucana leucocephala*), Perennial peanuts (*Arachis glabrata*), and Hagonoi (*Chomoleomodorata*).

5. SUMMARY AND CONCLUSIONS

The study was conducted to determine the vegetation successions found in the disturbed areas of Canili-Pantabangan Road Network in Aurora Province, Philippines to determine the vegetation composition and also the vegetation diversity of the study sites. Simple inventory assessment was used to attain the above mentioned objectives. Field work consists of inventory, identification, measurement, and tree markings.

Twelve quadrants plots in the study area were established for data collection. Composition and diversity showed that there were different numbers of species in every treatments, which all belongs to 11 families. Fabaceae was found to be numerous within 3 species and the rest with an average of 1 to 2 species per family. The number of species per plot ranges from 7-15 with an average of 10.

In terms of the number of individual, the area is dominated with Vetiver grass (*Viteverizianiodes' Monto*), followed by Pakupak (*Pteridophyta*), then by Perennial peanuts (*Arachis glabrata*), then by Kakauate (*Gliricida sepium*), and the least was Ipil-ipil (*Leucana leucocephala*). It further revealed that Graminaceae, Aspidiaceae, Fabaceae, and Mimosaneae

are the top 4 families which have the greater importance value. Graminacea species are more diverse in the area and it could be an important tool to reduce erosion and other environmental factor. In fact according to Kidd (2010), Vetiver grasses could be reduce erosion by up to 90%, reduce and conserve rainfall runoff by as much as 70%, improve ground water recharge, remove pollutants from water, reduce the risk of flooding, and improve economic benefits to communities.

6. RECOMMENDATIONS

The following were highly recommended:

1. The Philippine government should adopt the use of coco-net and bio-logs to control erosion on disturbed areas due to construction of road network and similar conditions.
2. Protection, conservation, and management of similar areas must be undertaken to ensure vegetation growth for the next generation; and
3. Information dissemination must be undertaken to promote the use of coco-net and bio-logs.

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8. REFERENCES

- AGBAYANI, E. A. 2003. Vegetational analysis of ASCOT reservation area. Unpublished undergraduate thesis. Aurora State College of Technology, Baler, Aurora. Philippines.
- ANDERSON, JR., THAMPAPILLAI, J. 1990. Soil conservation in developing countries. Published by World Bank. Washington D.C.
- ANGARA, E.V., ESCUETA, S.C., ROTAQUIO, E.D., BARROGO, L.H., GALLEGO, R.J., RESUENO, M.A., AGBAYANIE.A., TENOSO, K.D. AND SAGABAIN, KJ.L. 2010. Field testing of bio engineering techniques using geo-textile and bio-logs to mitigate soil slope erosion in Maria Aurora national highway. ASCOT Research International Journal Vol. 3.
- COWLES, H. 1999. The history of study of succession retrieved from <http://www.nature.com/scitable/knowledge/successional-change-in-communities>. 1326149.
- GALLARDE, J. 2012. Coconut husk can stop soil erosion, says PCA Philippine Star article. March 9, 2012.
- KIDD, R. 2009. Agroforestry database: a tree reference and selection guide version 4.0 (<http://www.worldagroforestry.org/af/treedb/>).
- MARLER, T.E. 2011. Primary succession along an eleven gradient 15 years after the eruption of Mount Pinatubo, Luzon. Philippines. Published by: University of Hawaii.
- PCARRD. 1992. Accounting for the depreciation of soil in the upland. Retrieved from (www.fao.org/docrep/006/ab604e/AB604E03.htm)

DEVELOPMENT OF TAGALOG SPEECH CORPUS

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ABSTRACT

This paper presents the design, development and contents of a tagalog speech corpus. The corpus contains 88.56 minutes of records from news articles that were in Tagalog downloaded from the internet and read by a native speaker. The recorded material is segmented into sentence length records that are divided into training sets. Speech recordings are accompanied by word level transcription and word-to-phone lexicon. The corpus is designed for the development of a text-to-speech (TTS) system, and may also be used for linguistic research.

Keywords: Phoneme Set, Speech Database, Speech Segmentation, Speech Annotation, Speech Corpus.

1. INTRODUCTION

Tagalog is one of the major languages in the Philippines. It is the mother tongue of most people residing in Central and Southern part of Luzon. Over the past, noticeable efforts have been spent on investigating the inherent acoustic properties as well as developing efficient and effective speech processing techniques for this language (Guevarra, 2002). However, in order to achieve further advancement in this field of studies, a carefully designed set of spoken language corpora is desperately in need. Therefore, we have made initial efforts to construct such kind of corpus for research and development purposes. This work can be regarded as a basic infrastructure building and also a starting point for further contributions in speech processing and implementation research.

Therefore, in this paper we would like to give a general overview on the phonology and phonetics of the Tagalog language, corpus structure and corpus analysis.

2. REVIEW OF RELATED LITERATURE

Tagalog Language Phonetics

Phonemes are linguistically defined units of speech. They are essentially labels given to each group of vocal tract articulator targets which considered being functionally equivalent by speakers of a given language. A working definition involves the use of minimal-pairs. For example, /upa/ and /apa/ differ only in their initial vocal tract configurations, but are different words, and therefore contain different phonemes. The number of phonemes in a language varies between 20 and 60, with Tagalog having 26 (Ramos, 1971).

Corresponding acoustic realization of phoneme is called a phone. A phone is thus the sound human perceive and which can be categorized into the class of corresponding phoneme. Different sounding phones belonging to the same class of a phoneme are called allophones (Ramos, 1971).

As phoneme is an atomic unit of spoken language, an atomic unit of written language is called grapheme. In principle, graphemes are the letters of a language extended with other symbols like punctuation marks and numerals. Orthography is the set of symbols used when writing a language. For example in Tagalog orthography, a

letter corresponds to a grapheme, and in phonological orthography, a phoneme corresponds to a grapheme (Wika).

Acoustic Phonetics of the Tagalog Language

Most languages, including Tagalog, can be described in terms of a set of distinct sounds, or phonemes (Ramos, 1971). In this study, about 26 phonemes including vowels, diphthongs and consonants were considered.

Table 1, 2 and 3 shows how the sounds of Tagalog are broken into phoneme classes. The three broad classes of Tagalog sounds are vowels, diphthongs and consonants. Each of these classes may be further broken down into sub-classes which are related to the manner, and place of articulation of the sound within the vocal tract.

Vowels

All vowel sounds are voiced and hence have the same sound source (the glottis) (Wika). What distinguishes one vowel from another is the shape of the oral cavity and to a lesser extent the shape of the lips and duration with which the sound is spoken (Guevarra et al 2002). The position of the tongue during the phonation of five Tagalog vowels [a, e, i, o u] is shown in Table 1.

Table 1. Articulatory Properties of Tagalog Vowels

Tongue Position	Front	Central	Back
High	I		u
Mid	E		o
Low		a	

- The mid vowels e and o are relatively new additions assimilated from Spanish.

As depicted in Table 1, vowels can be classified in different ways. Whether they are front, central, or back, vowels is decided by the location of the constriction caused by the tongue. Two other ways to classify them is by the narrowness of the strait and the roundness of the vowels.

Diphthongs

Some vowels are characterized by a movement from one vocal tract position to another. Such vowels are termed diphthongs (Ramos, 1971).

The Tagalog Diphthongs (Table 2) are /iw/, /ay/, /aw/, /oy/, and /uy/. These are complex sounds which are combinations of vowels and semi-vowels.

Table 2. Articulatory Properties of Tagalog Diphthongs

Sound/ Position	Front	Central	Back
High	Iw		uy
Mid			oy
Low		aw, ay	

Consonants

Consonant sounds are more heterogeneous than vowels in that they are produced by a wider variety of sound sources. While consonants share some inherent characteristics, it is inappropriate to define consonants as the set of speech sounds that are not vowel.

Consonants can be classified in terms of voicing, manner and place of articulation as shown in Table 3. Voicing describes whether the sound source is

produced by the vibration of the glottis or by another means. Consonants such as [p] and [m] are unvoiced while [d] and [b] are voiced. In this subsection, the production of the Tagalog consonants /b/, /d/, /k/, /g/, /h/, /l/, /m/, /n/, /ng/, /p/, (‘), /r/, /s/, /t/, /w/, and /y/ are considered. The table below shows the articulatory description of the consonant sounds (Ramos, 1971).

Table 3. Articulatory Description of the Consonant Sounds

Sounds/Position	Labial	Dental	Palatal	Velar	Glottal
Stops, voiceless	p	T		k	‘
Stops, voiced	b	D		g	
Fricatives, Voiceless			s		h
Nasals, voiced	m	N		ng	
Lateral, voiced		L			
Flap, voiced		R			
Semi-vowels, voiced	w		y		

Morphology

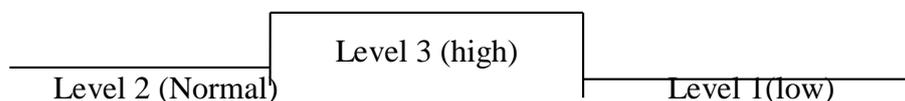
Morphology is the study of the meaning of individual units or morphemes of language and is concerned with the structure of words.

Tagalog exhibits such morphological phenomena as affixation, stress shifting, consonant alternation, and reduplication for determining parts of speech, aspect, and voice. This includes the use of various particles, prefixes, infixes, suffixes, and circumfixes (Waka). This makes Tagalog much more morphosyntactically complex than a language like English which makes less use of markers and morphemes for determining parts of speech and focus as it does syntactic arrangements.

Prosody

Stress is phonemic in Tagalog. Primary stress occurs on either the last or the next-to-the-last (penultimate) syllable of a word. Vowel lengthening accompanies primary or secondary stress except when stress occurs at the end of a word. Stress on words is very important, they differentiate words with the same spellings, but with different meanings (Waka), e.g. tayo(to stand) and tayo(us; we).

There are three kinds of pitches in Tagalog. The three levels may be indicated as follows:



Tagalog sentences have very slight variations in pitch. The sentences usually start off with level 2, the normal pitch, going up slightly over stressed syllables, reaching level 3 when the sentence is a question or ending in level 2 or 1 at the end of statements (Wika).

There are three kinds of intonation contours for the Tagalog sentences. They are rising for questions and request; falling or level for statements, commands, and responses; and suspended for series and non-final phrases. Interrogative questions, tag

questions, and requests often end with a rise rather than a fall. Non- final phrases too, often end in a slight rise.

Other Linguistic Concepts

Syntax of the language is the rules how the words can be combined. It concerns how different words, such as verbs, nouns and adjectives are aligned to form the sentences in a language. Semantics refers to the meaning of the sentence, whether the sentence is reasonable. It is an abstract concept for human interpretation of the language. The difference between syntactic and semantic concepts can be seen from a sentence that is syntactically correct, but semantically incorrect.

Tagalog is close to a “phonetic language”(Guevarra et al, 2002). The Tagalog writing system follows the phonemic principle: there exists a different grapheme corresponding to each phoneme that is not used for any other purpose (Ramos, 1971). This fact makes many aspects easier in speech and in language research. For example, the conversion of written text to phoneme strings in speech is straight forward.

Quantity of Phonemes. Phoneme duration, is a distinctive feature in Tagalog – the meaning of a word can be changed by varying the temporal durations of the phonemes.

3. RESEARCH METHODS

Script Design and Phonetic Coverage

We have used text gathered from the news articles that were in Tagalog from the internet. News articles were selected because, although the grammar and structure of the Tagalog language utilized here were not the same as the spoken language, it had informal content, and included everyday as well as non-grammatical expressions, thus approximating the natural language better. Also, there was a relative abundance of these data in the web, compared to other documents that are in Tagalog.

Sentences were selected based on the criteria that it should elicit the phones and prosodic cues that characterize Tagalog speech. Each news clip contains 5 to 47 sentences. Each sentence contained 2-13 words and had either of the following themes: (1) relating a news event, (2) describing a scene (3) relating an emotional event and (4) story telling.

The speaker read 28 questions, 10 exclamations and 558 declarative sentences. The speaker read a total of 6047 words in the recording session. These data were collected for about two weeks. For readability we put several limits on the sentence length:

For readability we put several limits on the sentence length:

- Maximum word length : 20 characters
- Maximum number of words in a sentence: 13

Syllabification

The normalized read texts were syllabified. The syllabification process cut up words into syllables. Not only words in the sentences are segmented into syllables but we also labeled the position of the syllables in the particular words. For the onset syllable (syllable that located at the beginning of the word), numeric label 1 will be put before the syllable. Then for the coda syllable (syllable that located at the end of the word), will have numeric label 2 at the end.

For example:

SENTENCE	TEXT FILE (ORTHOGRAPHY)	PRONUNCIATION (SYLLABLE)	BREAK INDEX
sent00001			
	Isa	Ee1. Sä2	1
	sa	Sä	1
	mga	Mä1.ngä2	1
	paboritong	Pä1.boh.ree1.tohng2	1
	isahog	Ee1.sä1.hohg2	2
	sa	Sä	1
	mga	Mä1.ngä2	1
	pagkaing	Päg1.kä.eeng2	1
	tsino	Tsee1.noh2	3
	ang	Äng	1
	pipinong	Pee1.pee.nohng2	1
	dagat	Dä1.gät2	1
	.		4

Middle syllables will not have any numeric label. The reason for this is we are assuming that the duration at the middle syllable is fixed.

Speaker Selection

Speaker selection is an essential and critical step in the development of all speech corpora. The quality of original utterances that are recorded by native and professional speaker directly determines the final performance or success of a speech engine. Quality may include recording condition, timbre and speaking style of speaker etc.

The main criterion used for speaker selection for this study was the ability to read out the whole text script at normal speaking rate and pronunciation. As a result, a female Tagalog native speaker was chosen.

Recording

The recording is carried out in an isolation booth that has heavily padded walls, ceiling and floor. All signals are sampled synchronously through a mixture and a soundcard and stored directly to hard disc. The speech is recorded in 44.1 kHz, and the data is stored as a mono 16 bit wav file.

In the recording session, the speaker is given a copy of the text that she will read and instructed to read the text at normal speaking rate and pronunciation. The speech is organized in 607 spoken utterances containing 6047 words, 5714 were native words and 333 loan words.

For each sentence, the speakers can utter it repeatedly until they are satisfied with their pronunciation; however all the mispronounced or unsatisfied utterances are backed up at the same time.

Many factors affecting the recorded speech quality have to be controlled such as speech rate, SNR, the stability of the voice and even the speaker's emotion. After recording, the speakers are asked to check all their own utterances carefully and try to select those defective ones. Then the speakers have to re-record these sentences.

Annotation

For the speech data annotation, we used two kinds of sound editor software and both are freely available via internet. We do a preprocessing to the sound file using Speech Filing System (SFS) software (Phon) prior to the actual annotation. The preprocessing is to clean the data speech by subtracting 16 bit spectral.

Then we standardize the energy of the sound by selecting 16 bit automatic gain. Using the same software, we automatically segmented the speech data into sentences and manually saved them into separate sound files.

The clean and preprocessed sound files are annotated into words, syllables and intonation layers using Praat software (Fon). The words are labeled orthographically and the syllables are transcribed. All annotations are done manually.

Transcription Correction

Despite the care taken to record the speech with minimal background noise and mistakes in pronunciation, some errors have crept in while recording. These errors had to be identified manually by listening to the speech. If felt unsuitable, some of the utterances have been discarded.

In the case of the data collected, the transcriptions were manually edited and ranked based on the goodness of the speech recorded. The utterances were classified as Good, With Channel distortion, with Background Noise and Useless whichever is appropriate. The pronunciation mistakes were carefully identified and if possible the corresponding changes were made in the transcriptions so that the utterance and the transcription correspond to each other. The idea behind the classification was to make the utmost utilization of the data and to serve as a corpus for further related research work.

4. DISCUSSION & CONCLUSION

Corpus Analysis

In parallel with corpus compilation a constant process of analysis was going on to diagnose its possible weak points. First we had to find out if all Tagalog diphones, existing as well as theoretical, were presented in the speech corpus and with what frequency.

As our corpus was meant to be as rich as possible phonetically and phonologically we had to include many sound combinations that were less frequent, yet vital to speech processing.

5. CONCLUSION

The aim of the speech corpus described was to develop an acoustic basis for relatively naturally sounding synthetic speech. The article provides specifics on the material included in the 607-sentence corpus. Corpus development being the first step towards natural like synthetic speech.

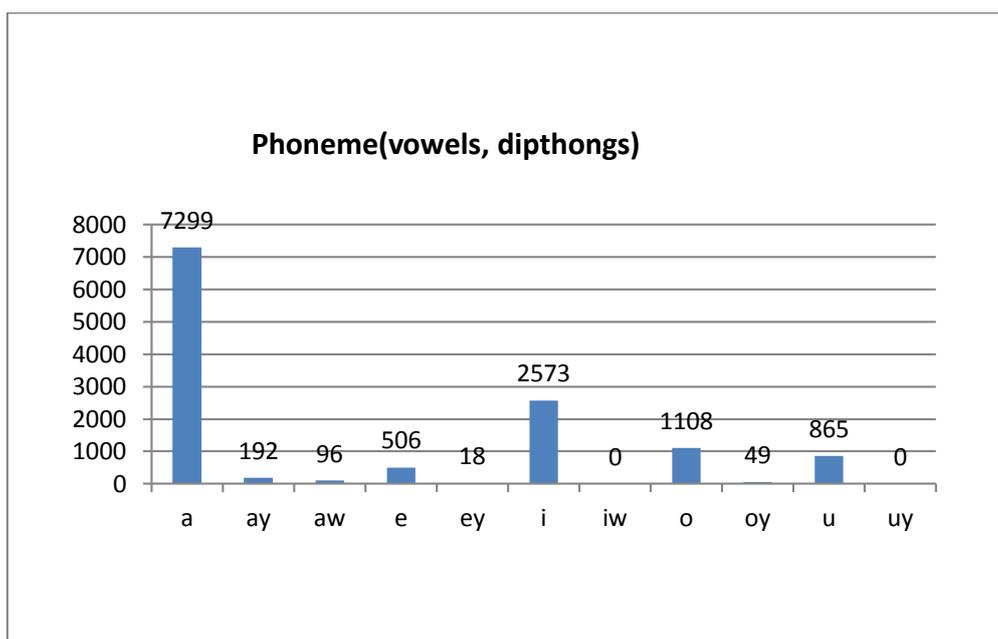


Fig. 2. Frequency of occurrences of vowels and diphthongs in the speech corpus.

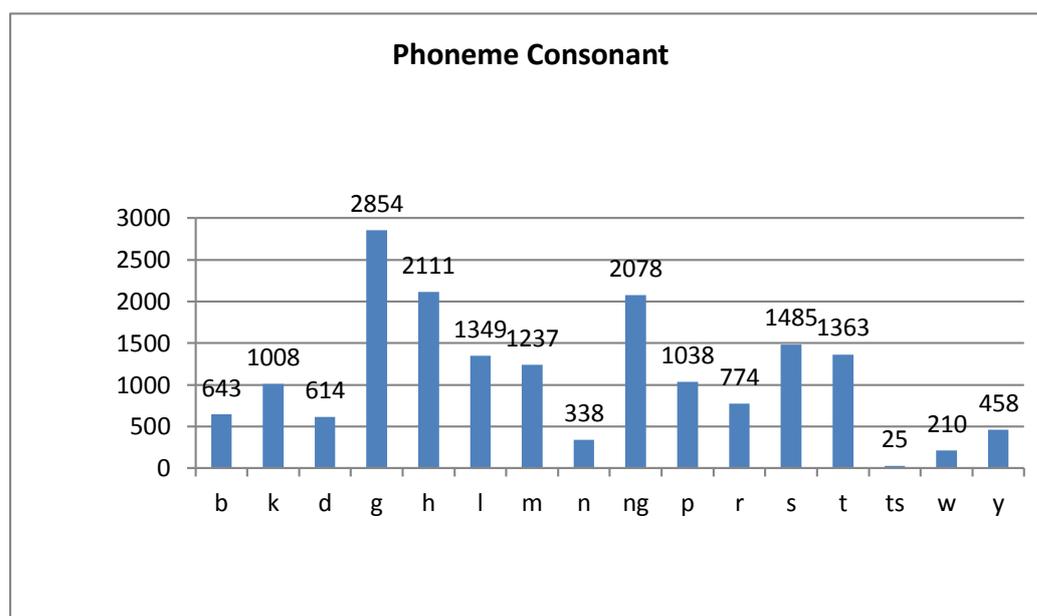


Fig. 3. Frequency of occurrences of consonants in the speech corpus.

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7. REFERENCES

- Chorkin, CHAN, “Design considerations of a putonghua database for speech recognition”, *Proc. Of the Conference on Phonetics of the Lang. in China*, pp. 13-16, Hong Kong, 1998.
- Corpus, M. J. Liampo, M. Co, R. Guevarra, “Development of a Filipino TTS system using Concatenative Speech Synthesis”, *Proc 2nd National ECE Conference*, 2001
- Databases for the Creation of Voice Driven Teleservices, <http://www.phonetik.unimuenchen.de/SpeechDat.html/> by joint efforts in European Union.
- Fon, <http://www.fon.hum.uva.>
- Guevarra R., M. Co, E. Espina, I. Garcia, E. Tan, R. Ensomo, R. Sagun, “Development of a Filipino Speech Corpus”, *Proc. 3rd National ECE Conference*, 2002.
- H.S. WANG, “Design and implementation of Mandarin speech database in Taiwan”, *Proc. Of EUROSPEECH95*, Vol.1, pp.875-7, Madrid, 1995.
- Phon, <http://www.phon.ucl.ac.uk/resource/sfs>
- Ramos, T. Tagalog Structures, University of Hawaii Press, 1971
- Various resources distributed by Linguistic Data Consortium, <http://www ldc.upenn.edu>
- Wika, <http://wika.pbwiki.com/ORTOPDF.pdf>

EXTENT OF IMPLEMENTATION OF POLICIES AND PROGRAMS OF HIGHER EDUCATION INSTITUTE: A CASE OF ISABELA STATE UNIVERSITY, ECHAGUE, PHILIPPINES

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ABSTRACT

Among SUC's that is committed to share in the national and global arena in the attainment of development goals is the Isabela State University. The Isabela State University (ISU) is committed and tasked to carry out its four-fold functions: Instruction, Research, Extension and Production. In addition, ISU is tasked to provide effective advance education and training of the needed resources in the arts, agriculture, natural sciences, as well as technological and professional fields. In the pursuit of the university's vision, mission, goals and objectives, this study attempted to assess, analyze, and evaluate the extent of implementation of policies in the different services of the Isabela State University like student services, administrative services, fiscal services, research services, extension and training and production services. A total of five hundred fourteen (514) respondents, comprising of administrators, faculty and non-teaching staff in the nine campus of the university with a sample size of 24 administrators, 164 faculty, 101 non-teaching staff and 225 supreme student council officers at the different campuses were taken. The extent of implementation of policies in the different services of the university like student services, administrative services, fiscal services, research services, extension and training and production services are perceived to be all implemented and also on the efficiency of the implementation of fiscal management policies, the three groups of respondents perceived that all policies are efficiently implemented which indicates that the level of implementation of all the four-fold functions realized the attainment of the vision, mission, goals and objectives of the university serving as the university for people and nature.

Keywords: Student Services, Administrative Services, Fiscal Services, Research and Extension.

1. INTRODUCTION

As we enter the Third Millennium, State Universities and Colleges (SUCs) made significant moves to address the challenges of policies implementation by optimizing resources through economies of scale and forceful collaboration with other agencies, human resource capability building, sustaining technology researches and improving instructional programs to make their graduates and research outputs globally competitive and to make the Philippines economically, socially and politically stable.

In the pursuit of the SUCs vision, the Philippine educational system must be modernized. This involves not only educational transformation, but also changes in economic, political, social and cultural life. This modernization must be extended to all sectors of the economy such as: education, agriculture, industry, services, as well as the Civil Service System.

Likewise, SUC's must fruitfully attain their mandated mission to promote advance instruction, through sustained training and programs in accordance to professionals and to efficiently provide, maintain and implement policies and programs in accordance with moral and ethical principles through optimum use of financial, human and physical resources responsive to the needs and priorities of their clienteles and stakeholders.

For the last 32 years, ISU is determined to be a repository of knowledge and a catalyst of change and development towards the attainment of economic, social, political, and cultural transformation, hence a study was conducted to assess the extent of implementation of policies and programs towards efficiency of fiscal policies of Isabela State University.

2. METHODOLOGY

The descriptive and inferential methods of research were applied. The respondents of the study were taken from nine (9) campuses of the Isabela State University. The total number of respondents categorized as follows: twenty four (24) administrators, one hundred sixty four (164) faculty members, one hundred one (101) non-teaching staff and twenty five (25) officers of each campus student supreme council. The data were analyzed and processed in the computer using the Statistical Package for Social Sciences (SPSS) software. The quantitative and qualitative descriptions using the Denis Likert Scale System of management were used in finding the extent of implementation of policies and efficiency of implementation of fiscal policies in the university. (4.50 – 5.00, fully implemented and very efficient), (3.50 – 4.49, implemented and efficient), (2.50 – 3.49, moderately implemented and moderately efficient), (1.50 – 2.49, partially implemented and partially efficient) and (1.00 – 1.49, not implemented and not efficient).

3. RESULTS AND DISCUSSION

It can be gleaned from Table 1, that the perception of the administrators, faculty and non-teaching staff as to extent of implementation of policies on student housing is moderately implemented. This implies that management should provide more attractive dormitories inside the university where students are to stay. Other services are implemented, which implies that the administration is really concerned about students' needs by providing all the necessary equipment and facilities even as the university is experiencing insufficient funding specially on infrastructure or capital outlay as provided in the Annual Reports.

Table 1. Perception of administrators, faculty and non-teaching staff on the extent of implementation of policies in student services, Isabela State University.

Students Services	Mean	Descriptive Equivalent
1. Admission and Registration	3.96	Implemented
2. Medical – Dental/ Health Services	3.71	Implemented
3. Library	3.86	Implemented
4. Testing	3.82	Implemented
5. Placement	3.53	Implemented
6. Guidance and Counseling	3.74	Implemented
7. Student Discipline	3.69	Implemented
8. Scholarship	4.01	Implemented
9. Retention Policy	3.78	Implemented
10. Student organization	3.84	Implemented
11. Student Housing	3.45	Moderately Implemented
12. Alumni Affairs	3.52	Implemented
13. Cashiering	3.91	Implemented
14. Accounting	3.89	Implemented
15. Sports Services	3.84	Implemented
16. NSTP	3.93	Implemented

17. Socio-Cultural Services	3.84	Implemented
18. Student Publication	3.65	Implemented
19. Research	3.74	Implemented
20. Extension	3.85	Implemented
21. Student Training	3.65	Implemented
Overall Rating	3.77	Implemented

Table 2 presents the overall perception of student leaders in ISU on the extent of implementation of policies in student services were rated moderately implemented. The respondents revealed that needs of students were not fully satisfied. Furthermore, students availed or qualified to various institutional, local, provincial and as well as private scholarships in the university. Also, computerized enrolment system should be adopted to facilitate enrolment processes, construction of dormitories should be prioritized, enrichment of knowledge and values through training and socio-cultural activities, student publication and improved placement and guidance counselling in the university should be adopted. Moreover, student organizations must be fully recognized and the alumni affairs office should be strengthened as partner in the development of the university.

Table 2. Perception of supreme student council officers in the different campuses on the extent of implementation of policies in student services, Isabela State University.

Students Services	Mean	Descriptive Equivalent
1. Admission and Registration	2.95	Moderately Implemented
2. Medical – Dental/ Health Services	2.99	Moderately Implemented
3. Library	3.65	Implemented
4. Testing	3.03	Moderately Implemented
5. Placement	3.01	Moderately Implemented
6. Guidance and Counseling	3.35	Moderately Implemented
7. Student Discipline	3.00	Moderately Implemented
8. Scholarship	3.56	Implemented
9. Retention Policy	3.10	Moderately Implemented
10. Student organization	3.36	Moderately Implemented
11. Student Housing	2.95	Moderately Implemented
12. Alumni Affairs	2.84	Moderately Implemented
13. Cashiering	2.71	Moderately Implemented
14. Accounting	2.85	Moderately Implemented
15. Sports Services	3.15	Moderately Implemented
16. NSTP	3.48	Moderately Implemented
17. Socio-Cultural Services	3.39	Moderately Implemented
18. Student Publication	3.23	Moderately Implemented
19. Research	3.19	Moderately Implemented
20. Extension	3.12	Moderately Implemented
21. Student Training	3.04	Moderately Implemented
Overall Rating	3.14	Moderately Implemented

As shown on Table 3, the respondents are agreeable that management is really implementing policies formulated and approved by the Board of Regents as manifested in the result of their responses. The Isabela State University has a well-supported staff development program, degree and non-degree, for faculty and support staff. A five year program has been laid out and designed to provide direction and monitoring system of staff development based

on the present needs and development priorities of the university. Linkages and collaborations of campuses and the university as a whole with other organizations continued to enliven the research thrusts of the university during the year. Research studies were presented during the in-house reviews as regular evaluation and monitoring tool for R & D outputs and activities. A strong research and development program in the university was further noted in the recently concluded evaluation on SUC levelling wherein research and development was given the highest points in the university. Also, the university extension and training policies were implemented as manifested in the Annual Report that extension trust of the university continued to figure as the university's main link to farm families and various communities. Major programs focused on the promotion and commercialization of technologies through sundry modalities, for self-sufficiency and sustainable development. Furthermore, the respondents observed that all policies stipulated in the UBAO manual were carried out and implemented.

Table 3. Perception of administrators, faculty and non-teaching staff on the extent of Implementation of policies in Administrative, Research, Extension and Production Services in Isabela State University.

Services	Mean	Descriptive Equivalent
1. Administrative Services	3.59	Implemented
2. Research Services	3.56	Implemented
3. Extension and Training Services	3.60	Implemented
4. Production/IGE Services	3.52	Implemented

The respondents agreed that fiscal management were fully implemented. The university is implementing policies efficiently to promote accountability and to make the university personnel involved in fiscal management and to be more responsible in the discharge of their duties and responsibilities in the principles of transparency and accountability. The findings also noted that the university management is properly disposing budget based on the provision of General Appropriation Act and income coming from tuition fee and other fiduciary funds also follows the rules and regulations on disbursement of funds as stipulated in the accounting and auditing manual of the government.

Table 4. Perception of administrators, faculty and non-teaching staff on the efficiency of Implementation of policies on fiscal operation and management, Isabela State University.

Fiscal Operations	Mean	Descriptive Equivalent
1. Segregation of accounting functions to cashier office	3.77	Efficient
2. Receipts/collection safekeeping and disposition of funds	3.90	Efficient
3. Government budgeting	3.79	Efficient
4. Expenditures and disbursements	3.84	Efficient
5. Government accounting	4.00	Efficient
6. Government auditing	3.96	Efficient
7. Accountability	3.99	Efficient
Overall Rating	3.89	Efficient

4. CONCLUSION

Policies on administrative services, student services, research services, extension and training services, production services and fiscal services are efficiently implemented which indicate

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that the level of implementation of the four functions realize the attainment of the university's vision, mission, goals and objectives as the university for people and nature.

5. RECOMMENDATION

Based on the result of the study, fiscal services, financial, human and physical resources management of the university must be improved where policies, rules and guidelines should be strictly followed. Prioritization on fund allocation and release should be given the highest consideration. In doing this, the university can be more efficient and effective to implement policies to meet the needs of the clientele.

6. REFERENCES

- Assessment Policy and Practices. The Handbook of University Policies and Procedures (HUPP). The University of Queensland Australia. Retrieved June 16, 2006 from <http://www.edu.au/hupp/index.html?page=25109>.
- Makinde, Taiwo. 2005. "Problems of Policy Implementation in Developing Nations: The Nigerian Experience. Retrieved June 16, 2006 from <http://www.usaid.gov>.
- Administrative Manual 2005. The University for People and Nature. Isabela State University.
- Cureg, Marilyn Z. "Fiscal Management of the Isabela State University". (Unpublished Master's Thesis, Isabela State University, 2003), pp 69-72.

A MEDIATING ROLE AND INFLUENCE OF THE RELATIONSHIP MARKETING SUCCESS TOWARD CLUSTER PRODUCTIVITY IN THAILAND

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ABSTRACT

Global industry trends in a new dimension have an important for each group of industries collaborative networks. In each industry, this not only encourages the development of effective joint production of enterprises only but also to stimulate competition for optimization the performance of individual enterprises to be competitive both within the network and they are able to compete on an international level. The prior researches have demonstrated the operation in the form of a cluster and the growth rate of the global economy is driven by the integration in the form of a cluster. However, the factor of success of the cluster as the result of building relationships of members within the cluster is not consistent and continuous based on the resources of existing organizations and overall picture of the cluster. Furthermore, the role of marketing to build a successful relationship with the productivity of the cluster in Thailand is not much. Thus, this research purposes studying a conceptual framework about the relationship factors that influence the success of the cluster. Factor in relationship building, information technology, resources, benefits and characteristics of entrepreneurs are influence, build successful relationship marketing and effect to productivity cluster. The results of this study will to lead to balance knowledge of marketing relationships and increasing the benefits of cluster development in Thailand.

Keywords: Cluster, Role of Marketing, Influence, Productivity.

1. INTRODUCTION

New marketing theories has put much emphasis on the overall plans by balancing between the production-centric principle and the customer-centric one (Kind and Kocker 2012). So, it needs to create an awareness on the relationship between businesses and customers; building interaction is the main factor in making the balance. At present, enterprises have to change their marketing paradigm. The ultimate goal is not to obtain the highest sale volume, but to maximize the satisfaction of the customers, as a result of relationship management between the enterprises and customers (Brito, 2011). It is generally seen that every enterprise has given much importance on building the relationship among enterprises such as the relationship with suppliers, distributors, government sectors, and even competitive businesses. Besides, good relationship will lead to collaboration between businesses to be able to share and exchange resources (Khuong, 2013). Practically, new marketing trends tend to follow the relationship marketing concept by integrating the relationship of all sectors concerned with corporate development and marketing activities (Brito, 2011; Axelsson and Easton, 1992; Ford et al., 1998; Hakansson et al., 2004; Naud and Turnbull, 1998; Sheth and Parvatiyar, 1995).

Other studies indicated that the role of relationship marketing affected organization competency. For example, the relationship marketing can increase benefits and create value for customers in the long run (Brito, 2011; Fiol et al.; 2011, Luigi and Mihai, 2011; East et al., 2006; Wagner, 2005; Hakanson, 2005; Ulaga and Eggert, 2006a). In other words, the relationship marketing is an effective mechanism in offering values to customers (Barry and Terry, 2008). Lusche (Lusch et al., 2010) pointed out that relationship marketing also helps building business networks and is a tool for supply chain management (Malshe and Sohi

2009; Mentzer and Gundlach 2010; Stock et al. 2010), leading to increase organizational competency (Ghosh, 2011) and sustainably competitive advantages. Moreover, a balance of the relationship throughout the supply chain enables enterprises to meet the needs of customers when needed (Hult, 2011; Scheer et al., 2010) which subsequently decrease the uncertainty risk of market demand. (Kanagal, 2005; Alam, 2012)

In the dynamic global world and new industrial trends, it was found that international enterprises have placed much importance to collaborative networks among industrial groups (Jungwirth and Muller, 2010), aiming to enhance collaboration, assistance and development of each industrial enterprise. Networking not only promotes efficiency development of joint production of entrepreneurs, but also stimulates competition to upgrade the potential level of each enterprise and align it with other enterprises within the network to be able to compete at the international level (Anderson and Bollingtoft, 2011).

The past research indicates about the basic factor within a cluster that, often times, the cluster consolidation is affected by the internal structure especially in terms of different rules and regulations in various groups of interdisciplinary cooperation. (Welter and Vosson, 2010). Emphasis is also placed on creating the relationship between stakeholders and business partners (Gummesson, 2008; Payne et al., 2005) to make the enterprise sustainable and increase economic value in the form of voluntary exchange to the stakeholders (Hui, K. C., 2006) which is in accordance with a research study which specified that one significant success factor of cluster is due to the harmonious and continuous relationship of members within cluster based on corporate existing resources for overall productivity (Hult, 2011; Sweeny et al., 2011) Consequently, the researcher aims to get the answers to the following questions: 1) What are influential factors on the relationship market success and how are they influential? ; 2) Does the relationship market success affect the productivity of the cluster in Thailand? This research is distinguished from other previous ones in that most studies have investigated the success factors of the operation of enterprises or entrepreneurs, not of the clusters. So far, there have been few research papers with similar purposes and there has been no research that aims to relate the influential factors to the cluster success with respect to the influence of the relationship marketing success on the cluster productivity in Thailand.

2. CONCEPTUAL FRAMEWORK AND HYPOTHESIS

Relational Factor

The model of Hunt and Arnett (2006) on the relationship marketing success is based on Commitment-Trust Theory. The research points out six influential relational factors on the relationship marketing success including trust, commitment, cooperation, keeping promises, creating shared values and communication. According to most research studies, the influential factors on the relationship marketing that affect the formulation of shared values are trust and commitment factors as they are the main influential factors on relationship marketing. (Handfield and Bechtel, 2002; Zabkar and Rrencic, 2004) Similarly, Amett and Badrinarayanan (2005) pointed out that the influential factors on the relationship marketing success comprised the factors on trust, commitment, and communications (Adobor, 2002; Anderson and Narus, 1990; Czepiel, 1990; Dwyer et al., 1987; Ganesan, 1994; Garbarino and Johnson, 1999; Mohr and Spekan, 1994; Simpson and Mayo, 1997; Verhoef et al., 2002; Wilson, 1995; Morgan and Hunt, 1994, 2006; Heffernan et al., 2008), which complied with Vieira et al., (2011) who said that those factors were basic supportive factors for the relationship marketing success and would lead to honesty and loyalty, and customer satisfaction (Alrubaiee, 2012; Alrubaiee and Al-Nazer, 2010; Bahri et al., 2013). Another research finding suggested that there was a clear evidence pointing out that the three influential factors on relationship marketing had a direct effect on organization competency.

According to Amine et al, (2012), the influential factors that affected businesses directly were communication, trust and commitment. Likewise, Bahri et al., (2013) said that the factors on trust, commitment and communication had a direct effect on organization competency in terms of customers' satisfaction aspect in service industries. In this study, the researcher proposes the following hypothesis:

Hypothesis 1: H1: The relational factor has a positive influence on the relationship marketing success.

Hypothesis 2: H2: The relational factor has a direct influence on the cluster productivity.

Resource Factor

In this research, the researcher has studied the resource-based view theory which influences corporate competency. Most research works have presented similar findings that resource use within the whole organization and among allied organizations can create competitive advantages for the cluster ((Hunt & Arnett 2006; cited in Penrose 1959; Wernerfelt, 1984; Hunt and Arnett, 2006; Hunt, 2012; Sweeney et al., 2011 cited in Hooley et al., 1998; Chicksand et al., 2012; Tooksoon et al., 2012)). Besides, Hunt & Arnett (2006) specified that relationship marketing theory gave much importance on the influential factor on the relationship marketing –based strategies which is supported by Penrose (1959). Furthermore, Lippman and Rumelt (1982) and Wernerfelt (1984) cited that resource-based view can be used as an input process to enhance competitive advantages (Paladino, 2007, 2008; Hunt, 2000; Hunt and Morgan, 1995), which is in line with McCafferty (2013) who pointed out that dependence on resource within and between businesses is a basic method in creating relationship. According to Das and Teng (2000), enterprises may have inadequate or excess resources for operations; sharing resources with business partners can complement to success and create competitive advantages (Hult, 2011; Achrol and Kotler, 1999; Das and Teng, 2000; Sarkar et al, 2001). Besides, business partners and stakeholders can also help increase values to customers with respect to resources within the cluster. (Johanson and Vahlne, 2011). Likewise, Sweeney et al., (2011) supportively indicated that the consolidation of the business clusters to make use of the resources of the allies makes an operation more efficient than doing business alone. The study of Carlson et al (2011) indicated that sharing resources within organization and among businesses can lead to successful production of new merchandise. Therefore, the researcher proposes the following hypothesis.

Hypothesis 3: H3: The resource factor has a positive influence on the relationship marketing success

Hypothesis 4: H4: The resource factor has a direct influence on the cluster productivity.

Information Technology Factor

Information technology (IT) system is a very important component in businesses because it is a tool used for practicing and solving problems as well as reminding organizations of creating shared values among organizations and business partners (Hammervoll and Toften, 2010; Zablah, Johnston, and Bellenger, 2005; Ng, 2011). Shin (2006b) pointed out that SMEs operation would gain more benefits through IT facilitation by strengthening the relationship between organizations (Sandulli et al., 2012). Michael (2007) also found that the expenditure on hardware investment has a negative effect on businesses and return on assets (ROA). Other research studies proposed considerations in consolidating production power with various organizations to gain more benefits by using IT system (Ravichandran et al., 2009). In SMEs' export businesses, IT is also essential in marketing management to increase performance efficiency (Lucchetti and Sterlacchini, 2004, Sandulli et al., 2012). According to the surveys of export businesses, IT resources have increased the efficiency of exporters (Zhang et al., 2008b). It was also found that there is a positive correlation between IT resource and financial abilities of SMEs export businesses in China. In addition, Liu and

Ravichandran (2008) revealed that the service industries that were consolidated geographically and supported the use of IT and the relation with various organizations have increased organization competency. The finding was in congruence with Chari et al., (2008) who gave a remark that an increase in financial management was closely related to the use of IT. The researcher therefore proposes the hypothesis as follows:

Hypothesis 5: H5: The information technology factor has a positive influence on the relationship marketing success.

Hypothesis 6: H6: The information technology factor has a direct influence on the productivity of the cluster.

Relationship Benefits Factor

True relationship requires a balance of exchanged items and returns gained (O'Toole and Donaldson, 2000; Wagner and Lindemann, 2008; McGinn, Thompson, and Bazerman, 2003). Mburu (2012) analyzed the benefits incurred from the relation between buyers and suppliers and used it to measure the performance of the buyers. This research showed the relationship success and its direct and positive influence on the buyers' efficiency as well as the development of other infrastructures which supports the successful relation between buyers and suppliers. The benefits gained from the strong relation strengthens the relationship between organizations and results in improvement of organization competency (Luo et al., 2006). Besides, Ghosh (2011) also stated about the increased competency of organization, namely, reduced capital, value-added innovation and tacit relation in organizations (Wathne, Biong and Heide, 2001; Uzzi, 1997). Based on the findings mentioned, the researcher proposes the following hypothesis:

Hypothesis 7: H7: The relationship benefits factor has a positive influence on the relationship marketing success.

Hypothesis 8: H8: The relationship benefits factor has a direct influence on the cluster productivity.

Entrepreneurs' Characteristics Factor

A cluster takes place from the relations by means of consolidating various business organizations into groups to complement and support one another based on competitiveness which will lead to the an increased efficiency of the business group members. The previous research pointed out in harmonious voice that the influential entrepreneurs' characteristics are those who determine the relationship marketing which affects the organization competency (Rody and Stearns, 2013; Salder-Smith, Hampson, Chaston, & Badger, 2003; Inmyxai & Takahashi, 2009; Sam, Tahir, & Bakar, 2012; Covin & Slevin, 1986; Naman & Slevin, 1993; Wiklund, 1999; Inmyxai & Takahashi, 2009; Chandrakumara et al., 2011; Sam et al., 2012). Moreover, Daft (2002) specified that job responsibilities of managers and entrepreneurs are complicated and require a variety of skills for organization management including business conceptualization, human relations and technical skills whereas Alessandri (2008) verified that the influence of risks would lead to decision – making process. Consequently, decision-making process has an influence on the decision of entrepreneurs (Nooraie, 2008). Ramo (2009) mentioned about the abilities of entrepreneurs in terms of emotional socialization skill and organization productivity. To conclude, managerial skills have a significant effect on risk management and product development (Surachman, 2007). Besides, organization innovation and learning organization factors support and complement entrepreneurs to have competitive advantages (Garcia, 2006). The entrepreneurs' managerial abilities have a significant positive influence on the operation of SMEs (Dani et al., 2013. cited in Suci, 2009). Based on the above findings, the researcher proposes the following hypothesis:

Hypothesis 9: H9: The entrepreneurs' characteristics factor has a positive influence on the relationship marketing success

Hypothesis 10: H 10: The entrepreneurs' characteristics factor has a direct influence on the cluster productivity.

Relationship Marketing Success Factor

According to Xavier et al., (2010), the influence of social interaction, trust, shared values and related local institutions can lead to new innovation, which is a means in increasing organization productivity (Chiu, 2009). The study of Kotler (2010) revealed that organization competency can be measured by value creation in customers' perspectives; forwarding information between customers and value recognition obtained from the relationship between organizations and customers reflects the result of organizing pattern determined by the members in the relation process by means of inside process (Ruey-Gwo and Ling, 2007).

The relationship between organizations can lead to overall productivity (Svetina and Prodan, 2008). The relationship marketing is a basic factor in running business and developing organizations by building relations with relevant people (Brito, 2011). Besides, supply chain management to increase the sale volume and gain updated data can meet customers' needs (Maturamaytha, 2011; Scheer et al., 2010). Therefore, an organization needs to make a balance between value creation and overall plans to customers; also business should be aware of building relation with both production and customer's services divisions. (Laequddin et al, 2012) as mentioned in the studies of Mburu (2012) that the relationship marketing success between purchasers, salespersons, production factors, benefits express organization competency. Thus paradigm shift on the relationship pays much attention to developing relationship activities, improving marketing styles to increase benefits and create values for customers in the long run (Fiol et al., 2011; Luige and Mihai, 2011). Additionally, vertical grouping of business groups resulted in skilled labour due to the strength within group, resource sharing, exchange of knowledge and mutual decision –making, competitive stimulation and upgrading the potentials of group entrepreneurs and competitive advantages (Hult, 2011; Felzenztein et al., 2012; Jungwirth and Muller, 2010; Anderson and Bollingtoft, 2011). Smedlund and Toivonen (2007) suggested that knowledge-based production networking, knowledge transfer between organizations can lead to innovation and learning organization (Mei and Nie, 2007; Svetina and Prodan, 2008). Thus, the relationship marketing success will reflect the productivity of the cluster which is innovation, financial competency and the creation of value for customers. Based on the findings, the researcher proposes the following hypothesis.

Hypothesis 11: H11: The relationship marketing success has a positive influence on the cluster productivity.

3. PROPOSED FRAMEWORK

Based on the studies and review of related literature, the researchers has set the research conceptual framework by applying the influential factors, namely, relational factor, resource factor, information technology factor, relationship benefits factor and entrepreneurs' characteristics. As shown in Figure 1.

4. CONCLUSION

Based on the review of related literature, the conceptual framework assumes that relational factor, resource factor, information technology factor, relationship benefit factor and entrepreneur's characteristics factor have an influence on the relationship marketing success and the cluster productivity, and this assumption needs to be verified.

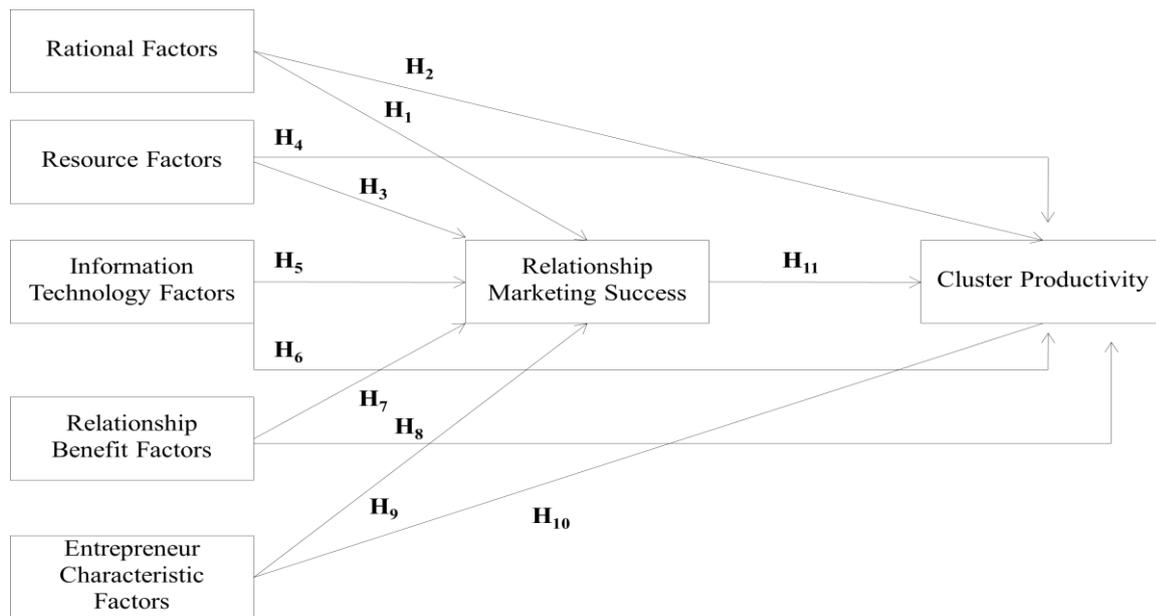


Figure 1: Conceptual Framework

5. REFERENCE

- Achrol, R. S., & Kotler, P. (1999). Marketing in the network economy. *Journal of Marketing*, 63(Special Issue), 146–163.
- Adobor, H. (2002). Competitive success in an age of alliance capitalism: how do firm-specific factors affect behavior in strategic alliance. *Advance in Competitiveness Research*. Vol. 10, No. 1, pp. 71-100.
- Alam, M. Rizwan. (2012). Relationship marketing : Perspectives and Implecations. *ZENITH International Journal of Business Economics & Management Research* Vol.2 Issue 3, March 2012, ISSN 2249 8826.
- Allessandri, Todd M. (2008). Risk and Procedural rationality, A Behavioral Theory Perspective, *Journal Of Strategy and management*, 1(2), 196-217.
- Alrubaiee, L. (2012). Exploring the Relationship between Ethical Sales Behavior, Relationship Quality, and Customer Loyalty. *International Journal of Marketing Studies*. Vol. 4, No. 1; February 2012.
- Alrubaiee, L., & Al-Nazer, N. (2010). Investigate the Impact of Relationship Marketing Orientation on Customer Loyalty: The Customer's Perspective. *International Journal of Marketing Studies*, Vol. 2, No. 1; May, 155-174.
- Amine Meryem EI Alaoue, Chakor Abdellatif & Alaoui Anass Mdaghri. (2012). Ethics, Relationship Marketing and Corporate Performance: Theoretical Analysis through the Mediating Variables. *International Business Research*; Vol. 5, No. 8; 2012. ISSN 1913-9004 E-ISSN 1913-9012.
- Anderson, P. and Bollingtoft, A. (2011). Cluster-based global firms use of local capabilities, *Management Research Review*. Vol. 34. No. 10 pp. 1087-1106.
- Anderson, J. and Narus, J. (1990). “A Model of Distributor Firm and Manufacturer Firm Working Partnerships”, *Journal of Marketing*, Vol. 54, No. 1, pp. 42-58.
- Arnett, Dennis B., & Badrinarayanan, Vishag. (2005). Enhancing Customer – needs –

International Conference on Multidisciplinary Trends in Academic Research, September 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- driven CRM strategies: core selling teams, knowledge management competence, and relationship marketing competence. *Journal of Personal Selling & Sales Management*, 25(4), 329-343.
- Axelsson, B and Easton, G. (editors) (1992). *Industrial Networks: a New View of Reality*, Routledge, London.
- Bahri, A. B., Sabahi, E., Taheri, S., Hatami, B. (2013). The Effect of Relationship Marketing on Bank's Customer Satisfaction. *International Journal of Business and Behavioral Science*. Vol. 3, No. 6; June 2013.
- Barry, J. and Terry, T.S. (2008). Empirical study of relationship value in industrial services. *Journal of Business & Industrial Marketing*, Vol. 23 No. 4, pp. 228-41.
- Brito, C. (2011). Relationship marketing: old wine in a new bottle?. *Innovative Marketing*, Volume 7, Issue 1, 2011.
- Carlson Brad D., Frankwick Gary L. and Cumiskey Kevin J. (2011). A Framework for Understanding New Product Alliance Success. *Journal of Marketing Theory and Practice*, vol. 19, no. 1 (winter 2011), pp. 7–25. © 2011 M.E. Sharpe, Inc. All rights reserved. ISSN 1069-6679/2011.
- Chandrakumara, A., De Zousa, A., & Manawaduge, A. (2011). Effects of the entrepreneurial and managerial orientations of owner-managers on company performance: An empirical test in Sri Lanka. *International Journal of Management*, 28(1), 139-158.
- Chicksand Daniel, Watson Glyn, Walker Helen, Radnor Zoe and Johnston Robert, (2012). Theoretical perspectives in purchasing and supply chain management: an analysis of the literature. *Supply Chain Management: An International Journal*, 17/4 (2012) 454–472.
- Chiu Yen Ting Helena (2009). How network competence and network location influence innovation Performance. *Journal of Business & Industrial Marketing*, 24/1 (2009) 46–55.
- Covin, J. G., & Slevin, D. P. (1988). The influence of organization structure on the utility of an entrepreneurial management style. *Journal of Management Studies*, 25(3), 217-234.
- Czepiel, J. (1990). Service encounters and service relationship: implications for research. *Journal of Business Research*, Vol. 20, pp. 13-21.
- Daft, RPaul, MR.L. (2002). *Organization Theory And Design n*, 5th Ed. W West Publishing Company, St.Paul, MN.
- Dani Ibrahim, Idrus M.S., Nimran Umar and Sudiro Achmad, (2013). Business Strategy Role as Mediation Of Management Capability and Orientation of Entrepreneurship on Business Performance (A Study On Micro and Small Scale Seaweed Business in Takalar District, South Sulawesi Province). *Journal of Management Research*. ISSN 1941-899X. 2013, Vol. 5, No. 1.
- Das, T.K. and Teng, B. (2000), A resource-based theory of strategic alliances, *Journal of Management*, Vol. 26 No. 1, pp. 31-61.
- Dwyer, F., Schurr, P. and Oh, S. (1987). “Developing Buyer-Seller Relationships”, *Journal of Marketing*, Vol. 51, No. 2, pp. 11-27.
- East, R., P. Gendall, K. Hammond and W. Lomax. (2005). Consumer Loyalty: Singular Additive Of Interactive?, *Australian Marketing Journal*, Vol. 13, No. 2, pp. 10-26.
- Felzensztein, C., Gimmon, E. and Aqueveque, C. (2012). Cluster or un-clustered industries?, Where Inter-firm marketing cooperation matters,
- Fiol C. L. J., Tena, M., A.M., Garcia, J., S. (2011). Multidimensional perspective value in Industrial Cluster. *Journal of Business & Industrial Marketing*.

International Conference on Multidisciplinary Trends in Academic Research, September 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- Ford, D., Gadde, L.E., Håkansson, H., Lundgren, A., Snehota, I. Turnbull, P. and Wilson, D. (1998). *Managing Business Relationships*, John Wiley & Sons, Chichester.
- Ganesan, S. (1994, April). Determinants of long-term orientation in buyer–seller relationships. *Journal of Marketing*, 58, 1–19. <http://dx.doi.org/10.2307/1252265>
- Garbarino, E., & Johnson, M. (1999). The different roles of satisfaction, trust and commitment in Customer relationships. *Journal of Marketing*, 63(2), 70–87. <http://dx.doi.org/10.2307/1251946>
- Garcia, Victor. J. (2006). Antecedent and Consequences of organizational innovation and Organizational Learning in Entrepreneurship, *Journal management & Data Systems*, 106(1), 21-42.
- Ghosh, S. (2011). *The weakness of strong ties: Do Relationship Roles affect innovation in embedded market?* Dissertation Proquest UMI 3461520, Binghamton University State University of New York.
- Gummesson, E. (2002). *Total Relationship Marketing*, 2nd edition, Butterworth-Heinemann, Oxford.
- Gummesson, E., (2008). *Total Relationship Marketing*. 3rd ed, Oxford: Butterworth-Heinemann.
- Håkanson, Lars. (2005). Epistemic Communities and Cluster Dynamics: On the Role of Knowledge in Industrial District. *Industry and Innovation*; Dec 2005; 12, 4; ABI/INFORM Complete. pg. 433.
- Håkansson, H., Harrison, D. and Waluszewski, A. (2004). *Rethinking Marketing – Developing a New Understanding of Markets*, John Wiley & Sons, Chichester.
- Hammervoll, T. and Toften, K. (2010). Value-Creation Initiatives in Buyer-Seller Relationships. *European Business Review*, 22(5), 539-555.
- Handfield, R.B. and Bechtel, C. (2002). The role of trust and relationship structure in Improving Supply chain responsiveness. *Industrial Marketing Management*, Vol. 31, No. 4, pp. 367-82.
- Heffernan, T., O’Neil, G., Travaglione, T., Droulers, M. (2008). Relationship marketing: The Impact Of emotional intelligence and trust on bank performance. *International Journal of Bank*. Vol. 26, No. 3, pp. 183-199.
- Hui, K. C. (2006). Relationship Marketing: Is It a Paradigm Shift? Retrieved [the date you retrieved this document], from http://kchui.com/articles/Relationship_Marketing_Paradigm_Shift.pdf.
- Hult, G. T. M. (2011). Toward a theory of the boundary-spanning marketing organization and insights from 31 organization theories. *J. of the Acad. Mark. Sci.* (2011) 39:509–536 DOI 10.1007/s11747-011-0253-6.
- Hunt, S.D. (2000), *A General Theory of Competition*, Sage Publications, Inc., Thousand Oaks, CA.
- Hunt Shelby D. and Arnett Dennis B. (2006). The explanatory foundations of relationship marketing theory. *Journal of Business & Industrial Marketing*. Vol. 21- November 2-2006-72-87.
- Hunt, S., Morgan, R., 1995. The competitive advantage theory of competition. *Journal of Marketing* 59 (2), 1–15.
- Hunt, S. D. (2012). Trust, Personal Moral Codes, and the Resource-Advantage Theory of Competition: Explaining Productivity, Economic Growth, and Wealth Creation. *Contemporary Economic*. Vol. 6, Issue 2, pp. 4-19.
- Hunt, S., Arnett, D. and Madhavaram, S. (2006). “The Explanatory Foundations of Relationship Marketing Theory”, *Journal of Business & Industrial Marketing*, Vol. 21, No.2, pp. 72-87.

International Conference on Multidisciplinary Trends in Academic Research, September 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- Inmyxai, S., & Takahashi, Y. (2009). Entrepreneurs as decisive human resources and business performance for the Lao SMEs. *Chinese Business Review*, 8(7), 29-47.
- Johanson, J., & Vahlne, J-E. (2011). Markets and Networks: Implications for Strategy Making. *Journal of the Academy of Marketing Science*, 39(4), doi:10.1007/s11747-010-0235-0.
- Jungwirth, C. and Muller, E. (2010), The sustainability of clusters – consequences of different Governance regimes of top-down and bottom-up cluster initiatives, paper presented at the 2010 Babson College Entrepreneurship Research Conference, Lausanne, June 10-12.
- Kanagal, N. (2005). Role of Relationship Marketing in competitive marketing strategy. *Journal of Management and Marketing Research*, p. 2.
- Khuong, M., N. (2013). Successful Relationship Marketing between International Travel companies. 3rd, (3rd ICM 2013) Proceeding 10-11 June 2013. Hydro Hotel, Penang, Malaysia ISBN: 978-967-S705-11-3. www.internationalconference.com.my
- Kind, S., Kocker, G. Meier Z. (2012). Developing Successful Creative & Cultural Cluster: Measuring their outcomes and impacts with new framework tools. www.projektzukunft.berlin.de.
- Kotler, P. (2010). *Principles Of Marketing: A South Asian Perspective*, 13/E: Pearson Education India.
- Laequuddin M., B.S. Sahary, Vinita Sahay, Kareem Abdul Waheed. (2012). Trust building in supply chain partners relationship: an integrated conceptual model. *Journal of Management Development*, Vol. 31 Iss: 6 pp. 550-564.
- Lippman, S.A. and Rumelt, R.P. (1982), "Uncertain Imitability", *Bell Journal of Economics*, Vol. 13, pp. 418-38.
- Liu, Y., & Ravichandran, T. (2008). A comprehensive investigation on the relationship between information technology investments and firm diversification. *Information Technology and Management*, 9(3), 169–180.
- Lucchetti, R., & Sterlacchini, A. (2004). The adoption of ICT among SMEs: Evidence from an Italian Survey. *Small Business Economics*, 23(2), 151–168.
- Luigi, D., Mihai, I. (2011). Value Chain and Customer Relationship Cycle: Two Concepts of Relationship Marketing. *International Journal of Trade, Economic and Finance*, Vol. 2, No. 2, April 2011.
- Luo, Xueming, Rebecca, J. Slotegraaf, and Xing Pan. (2006). Cross-Functional Competition: The Simultaneous Role of Cooperation and Competition Within Firms. *Journal of Marketing*, 70 (April), 67-80.
- Lusch, R. F., Vargo, S. L., & Tanniru, M. (2010). Service, value networks, and learning. *Journal of the Academy of Marketing Science*, 38(1), 19–31.
- Malshe, A., & Sohi, R. S. (2009). What makes strategy making across the sales-marketing interface more successful? *Journal of the Academy of Marketing Science*, 37(4), 400–421.
- MacCafferty Des, Egeerat Chris van, Gleeson Justin and Bartley Brendan, (2013). Urban specialization, Complementarity and spatial development strategies on the Island of Ireland. *Administration*, Vol. 60, no. 3 (2013), pp. 115-140.
- Mathuramaytha. C. (2011). Supply Chain Collaboration – What's an outcome? : A Theoretical Model. 2011 International Conference on Financial Management and Economics IPEDR vol.11 (2011) © (2011) IACSIT Press, Singapore.
- Mburu David Kiarie. (2012). Analyzing the Buyer Supplier Relationship Engagement on

International Conference on Multidisciplinary Trends in Academic Research, September 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- the Performance Benefits and Its Impact on Business Performance. *International Journal of Contemporary Business Studies*, Vol: 3, No: 12. December 2012 ISSN 2156-7506.
- McGinn, K. L., Thompson, L. and Bazerman, M. H. (2003). Dyadic Processes of Disclosure and Reciprocity in Bargaining with Communication. *Journal of Behavioral Decision Making*, 16, 17-34.
- Mei Shu-en and Nie Ming, (2007). Relationship between Knowledge Sharing, Knowledge Characteristics, Absorbive Capacity and Innovation: An Empirical Study of Wuhan Optoelectronic Cluster. *The Business Review*, Cambridge, Vol. 7 Num.2 Summer. 2007; 7, 2, ABI/INFORM Complete.
- Mentzer, J. T., & Gundlach, G. (2010). Exploring the relationship between marketing and supply chain management: introduction to the special issue. *Journal of the Academy of Marketing Science*, 38,1-4.
- Michael, S. C. (2007). Can information technology enable profitable diversification? An empirical examination. *Journal of Engineering and Technology Management*, 24(3), 167-185.
- Mohr, J. and Spekman, R. (1994). Characteristic of partnership success: partnership attributes, Communication behavior and conflict resolution techniques. *Strategic Management Journal*, Vol. 15, pp. 135-52.
- Morgan, R. and Hunt, S. (1994). "The Commitment-Trust Theory of Relationship Marketing", *Journal of Marketing*, Vol. 58, No. 3, pp. 20-38.
- Naman, J. L., & Slevin, D. P. (1993). Entrepreneurship and the concept of fit: A model and empirical tests. *Strategic Management Journal*, 14(2), 137-153.
- Naudé, P. and Turnbull, P. (1998). *Network Dynamics in International Marketing*, Pergamon, Oxford.
- Ng, E. (2011). Sustainable Supplier-Distributor Relationships: Insights from Australian Agribusinesses. *Proceedings of the International Conference on Marketing Studies*, September 9-11, Kuala Lumpur, Malaysia, 1-15.
- Nooraie, Mahmood. (2008). Decision Magnitude of Impact Decision and Strategic Decision Making Process Output, *Journal Management Decision*, 46(4), 640-655.
- O'Toole, T. and Donaldson, B. (2000). Managing Buyer-Supplier Relationship Archetypes. *Irish Marketing Review*, 13(1), 12-20.
- Paladino, A. (2007). Investigating the Drivers of Innovation and New Product Success: A Comparison of Strategic Orientations. *Journal of Product Innovation Management*, 24(6), 534-553.
- Paladino, A. (2008). Financial Champions and Masters of Innovation: Analyzing the Effects of Balancing Strategic Orientations. *Journal of Product Innovation Management*, 26(6), 616-626.
- Payne, A., Ballantyne, D., Christopher, M., (2005). A stakeholder approach to Relationship marketing strategy: the development and use of the "six markets model", *European Journal of Marketing* 39, No. 7/8: 855-871.
- Penrose, E.T. (1959), *The Theory of the Growth of the Firm*, Basil Blackwell and Mott, London.
- Ramo, Laura Guillen. (2009). The Impact of Social And Emotional Competencies On Effectiveness Of Spanish Executives. *Journal of Management Development*, 28(9), 771-793.
- Ravichandran, T., Liu, Y., Han, S., & Hasan, I. (2009). Diversification and firm performance: Exploring the moderating effects of information technology spending. *Journal of Management Information Systems*, 25(4), 205-240.

International Conference on Multidisciplinary Trends in Academic Research, September 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- Rody Raymond C. and Stearns Timothy M.,(2013). Impact of Entrepreneurial Style and Managerial Characteristics on SME Performance in Macao S.A.R., China. *Journal of Multidisciplinary Research*, Vol. 5, No. 1, Spring 2013, 27-44. ISSN 1947-2900 (print) • ISSN 1947-2919 (online).
- Ruey-Gwo, C., & Chieh-Ling, L. (2007). The relationship between leadership behavior and organizational performance in non-profit organizations, using social welfare charity foundations as an example. *Journal of American Academy of Business*, 12(1), 83-88.
- Sandulli, F. D., Fernandez-Menendez, J., Rodriguez-Duarte, A. and Lopez-Sanchez, J. I. (2012). The Productivity payoff of information technology in multimarket SMEs. *Small Bus Econ* (2012) 39:99–117 DOI 10.1007/s11187-010-9297-0.
- Sam, M., Tahir, M., & Bakar, K. (2012). Owner-managers of SMEs in its sector: Leadership company performance. *International Journal of Business & Social Science*, 3(14), 195-205.
- Sarkar, M.B., Echambadi, R., Cavusgil, S.T. and Aulakh, P.S. (2001), “The influence of complementarity, compatibility, and relationship capital on alliance performance”, *Journal of the Academy of Marketing Science*, Vol. 29 No. 4, pp. 358-73.
- Salder-Smith, E., Hampson, Y., Chaston, I., & Badger, B. (2003). Managerial behavior, entrepreneurial style, and small firm performance. *Journal of Small Business Management*, 41(1), 47-67.
- Scheer, L. K., Miao, C. F., & Garrett, J. (2010). The effects of supplier capabilities on industrial customers’ loyalty: the role of dependence. *Journal of the Academy of Marketing Science*, 38(1), 90–104.
- Sheth, J. and Parvatiyar, A. (1995). “The Evolution of Relationship Marketing”, *International Business Review*, Vol. 4, No. 4, pp. 397-418.
- Shin, N. (2006a). The impact of information technology on the financial performance of diversified firms. *Decision Support Systems*, 41(4), 698–707.
- Simpson, J.T. and Mayo, D.T. (1997), Relationship management: a call for fewer influence attempts, *Journal of Business Research*, Vol. 39, pp. 209-18.
- Smedlund Anssi and Toivonen Marja, (2007). The role of KIBS in the IC development of regional clusters. *Journal of Intellectual Capital*, Vol. 8, No. 1. 2007, pp. 159-170.
- Stock, J. R., Boyer, S. L., & Harmon, T. (2010). Research opportunities in supply chain management. *Journal of the Academy of Marketing Science*, 38,32–41.
- Surachman. (2007). Influence Skill Management and Business Orientation Against Acceptance Rate Risk and Its Impact on Small Industries Product Development In Java Tinmur, *Journal of Management Application*.
- Svetina Anja Cotic and Prodan Igor, (2008). Does Collective Learning Contribute to Innovative Performance of Cluster Firms?. Pp. 343-357.
- Sweeney, Jillian, C., Soutar, G. N. and McColl-Kennedy, J. R. (2011). The Marketing practices-Performance relationship in professional service firms. *Journal of Service Management*, Vol. 22, No. 3, pp. 292-316.
- Tooksoon Phadett, Sukitniyakorn Supee and Thammajit Jakkarat, (2012). The Exploratory Study of Marketing Capabilities and Export Success: an Investigation of Thai’s SMEs. 2012 International Conference on Economics Marketing and Management IPEDR Vol.28 (2012) © (2012) IACSIT Press, Singapore.
- Uлага, W., Eggert. A. (2006). Relationship Value and Relationship quality : Broadening the nomological network of business-to-business relationship. *European Journal of Marketing*, Vol. 40 Iss: 3 pp. 311-327.
- Uzzi, B. (1997). Social Structure and Competition in Interfirm networks: the paradox of

International Conference on Multidisciplinary Trends in Academic Research, September 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- embeddedness. *Administrative Science Quarterly*, Vol. 42. No. 1, 35-67.
- Verhoef, P.C., Franses, P.H. and Hoekstra, J.C. (2002). The effect of relational construct on Customer Referrals and number of services purchased from a multiservice provider: does age of relationship Matter, *Journal of the Academy of Marketing Science*, Vol. 30, No. 3, pp. 202-16.
- Vieira, V. A., Plinio R.R. Monteiro, Veiga, R. T. (2011). Relationship marketing in supply chain: an empirical analysis in the Brazillian service sector., *Journal of Business & Industrial Marketing*, Vol. 26 Iss: 7 pp. 524-531.
- Wagner, R. (2005). Conterporary marketing practices in Russia. *European Journal of Marketing*, Vol. 39, pp. 199-215.
- Wagner, S. M. and Lindemann, E. (2008). Determinants of Value Sharing in Channel Relationships. *Journal of Business & Industrial Marketing*, 23(8), 544-553.
- Wathne, Kenneth H., Harald Biong, and Jan B. Heide (2001), Choice of Supplier in Embedded Markets: Relationship and Marketing Program Effects,” *Journal of Marketing*, 65 (April), 54–66.
- Wernerfelt, B. (1984), A resource-based view of the firm. *Strategic Management Journal*, Vol. 5, pp. 171-80.
- Welter Florian, Vossen Rene, Richert Anja and Isenhardt Ingrid, (2010). Network Management for Clusters of Excellence: A Balance-Scorecard Approach as a Performance Measurement Tool. *The Business Review*, Cambridge, Vol. 15. Num.1, Summer. 2010.
- Wiklund, J. (1999). The sustainability of the entrepreneurial orientation-performance relationship. *Entrepreneurship Theory and Practice*, 24(1), 37-48.
- Williams Kaylene C. (2011). Core qualities of successful marketing relationships. *Journal of Management and Marketing Research*.
- Wilson, D.T. (1995). An integrated model of buyer – seller relationships. *Journal of the Academy of Marketing Science*, Vol. 23, No. 4, pp. 335-45.
- Xavier Francesc, Morales Molina and Teresa Marfa, (2010). Social Networks: Effects of Social Capital on Firm Innovation. *Journal of Small Business Management: Apr.* 2010; 48, 2; ABI/INFORM Global. Pg. 258.
- Zabkar, V. & Brencic, M. (2004). Value, trust and commitment in business-to-business relationship: a Comparison of two former Yugoslav markets. *International Marketing Review*, 21(2), 202-215.
- Zablah, A. R., Johnston, W. F. and Bellenger, D. N. (2005). Transforming Partner Relationships through Technological Innovation. *Journal of Business & Industrial Marketing*, 20(7), 355-363.
- Zhang, M., Sarker, S., & Sarker, S. (2008b). Unpacking the effect of IT capability on the performance of export-focused SMEs: A report from China. *Information Systems Journal*, 18(4), 357–380.

PARACETAMOL VERSUS PLACEBO FOR MANAGEMENT OF ACUTE POSTOPERATIVE PAIN AFTER TONSILLECTOMY IN CHILDREN

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ABSTRACT

The analgesic efficacy and safety of propacetamol, an injectable prodrug of acetaminophen, was assessed versus placebo after tonsillectomy operation in children. using double-blind randomized parallel group design, 70 children aged 6-12 years were included to evaluate the effect of a single iv infusion of 40 mg/kg propacetamol versus a single infusion of 100 ml normal saline (placebo) given at the recovery room.

Analgesic efficacy was assessed on pain scores rated on a four-points verbal scale, a five-points visual scale (faces) and a four-points pain relief verbal scale; before administration (To) and 0.25, 0.5, 1, 2, 3, 4, 5 and 6 hours after infusion. The global efficacy was rated on a five-point scale at the end of the study. Rescue medication was allowed freely and the time for re-medication as well as the occurrence of any side effect was recorded.

Propacetamol was statistically superior to placebo on all assessment criteria. The global final efficacy evaluation demonstrated 12 patients in the propacetamol group with good and very good scores compared to only one patient in the placebo group. Rescue medication was used in 40% of patients in the propacetamol group versus 83% in the placebo group. No serious side effects were recorded in both groups and pain at the infusion arm was noticed in 4 patients with Propacetamol and 2 patients in the placebo group

We concluded that, although propacetamol 40 mg/kg infusion may provide greater pain relief than placebo in children after tonsillectomy operation without any significant adverse effects, it is better to be used as a complementary drug to other analgesics in the treatment of moderate to severe postoperative pain.

Keywords: Propacetamol, Postoperative Pain, Acetaminophine, Tonsillectomy.

1. INTRODUCTION

Tonsillectomy is a common procedure (especially in children) in ear-nose throat (ENT) Surgery, causing considerable postoperative pain. Analgesia with non-opioids is often Insufficient while the use of opioids is associated with side effects such as nausea Sedation and respiratory depression. Propacetamol, N-acetylparaminophenol diethyl amino acetic ester, is the first form ofParacetamol that can be injected parentally. It is a water – soluble prodrug which is rapidly metabolized to acetaminophen (paracetamol) and diethylglycine in a 1: 1 ratioBy nonspecific plasma esterases; as a result intravenous administration of one gramPropacetamol yields only 0.5 gram of paracetamol. The present study was designed to evaluate the analgesic efficacy as well as safety ofPropacetamol versus placebo after tonsillectomy operation in children.

2. METHODS

Seventy children aged 6 – 12 years, ASA class 1 and 2 scheduled for elective tonsillectomy were included in this study after obtaining an informed parental written consent. Children with a history of paracetamol allergy were excluded. All Patients were premedicated with midazolam 0.3 mg/kg orally one hour before surgery. Anesthesia was induced with thiopentone sodium 5mg/kg IV and fentanyl 1.5 micogram/kgIV. Endotracheal intubation was facilitated with the use of atracurium 0.5mg/kg IV. Children were mechanically ventilated and anesthesia was maintained with 50% N2O inO2 plus isoflurane 1 – 2%. Bolus doses of fentanyl and/or atracurium were injected accordingly. At the end of surgery the neuromuscular block was reversed with Neostigmine 0.025 mg/kg and atropine 0.015 mg/kg IV. ECG, end tidal CO2, Pulse oximetry and blood pressure were monitored during anesthesia. In the recovery room, the children were rated on a five point visual scale (faces) as well as a four-point verbal scale (0 = non, 1 = mild, 2 = moderate, and 3 = severe) by an observer who is blind for treatment group. Children with a score of 3 – 5 on visual scale and/or 2 – 3 on the verbal scale were included in this study (i.e. moderate to severe pain). Children included in the study were randomly allocated into 2 main groups: Group I [propacetamol group], received 40 mg/kg propacetamol (mixed in 100 ml of normal saline) as an IV infusion; and Group II [placebo group], received an IV infusion of normal saline. Infusion was done over 15 minutes in both groups. Pain intensity was re-assessed by the same observer at 0.25, 0.5, 1, 2, 3, 4, 5, and 6 hours after the infusion. At the same times, pain relief was measured using a 4 point-verbal rating scale (0 = complete pain relief, 1 = good, 2 = slight, and 3 = non) At the end of 6 hours study period, a global rating of the treatment efficacy was made by both a physician observer as well as by a nurse observer using the following scale (0 = non, 1 = weak, 2 = moderate, 3 = good, and 4 = very good).

The occurrence of any side – effects was recorded. Withdrawal of the children from the study for insufficient pain relief on evaluation of the observer was allowed from the beginning of the study, but considered valid for the study only if it occurred at least 30 minute. The physician was free to choose whether additional medication should be given and the time for re-medication was recorded. For the primary analgesic efficacy data, the following variables were derived or computed to assess the analgesic efficacy of the study drug: Pain Intensity Difference. (PID) for both visual and verbal scores, PID was Calculated as the difference between the base line pain intensity and the pain Intensity at each evaluation time point. Sum of pain intensity Difference (SPID): calculated by adding the PID score over the 6 hours of the study. Total Pain Relief (TOTPAR): calculated as sum of PID and the pain relief score over the 6 hours period. To allow calculation of SPID and TOTPAR, missing data were replaced by the assessment at the time of withdrawal when patient was withdrawn for insufficient analgesia and by the previous assessment when the patient was asleep. The number of patients withdrawn from this study for insufficient analgesia was Significantly less in the propacetamol group than in the placebo group[14 Vs 29, equivalent for 40% Vs 83%]. Also the time of occurrence of treatment Failure, withdrawal, was significantly different between both groups. Both Observations indicate a better survival curve in the propacetamol group. but still, the overall final efficacy evaluation demonstrated 10 patients with good and 2 patients with very good scores in the propacetamol group (a total of 35%), versus only one patient with good assessment in the placebo group (3%).

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3. CONCLUSION

Although the infusion of propacetamol 40mg/kg may provide a significantly greater pain relief than placebo following tonsillectomy in children without any significant adverse effects, it is better to be used as a complementary drug to other analgesics for the treatment of moderate to severe postoperative pain.

THE MODEL OF ETHICAL CULTURE AND CAPABILITIES INFLUENCING REPUTATION OF BANKS IN THAILAND

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ABSTRACT

The current study aims further to examining the effect of ethical culture to corporate reputation. It is therefore, this research focuses on ethical culture, corporate capabilities and corporate reputation of banks in Thailand. The main investigation is to examine 1) the effect of ethical culture to corporate capabilities, 2) the effect of corporate capabilities to corporate reputation and 3) the effect of ethical culture through corporate capabilities to corporate reputation. The samples are 385 managers of banks in Thailand by systematic random sampling. The questionnaires are distributed and explained to the respondents by author for better understanding to respond. The structural equation model was used to analyze data. The findings reveal that ethical culture has direct affects to capabilities and reputation of an organization. The corporate capabilities has direct effects on corporate reputation. Moreover, ethical culture affects to corporate reputation both directly and indirectly through corporate capabilities. As a result, it is necessary for sustainable business to build an ethical culture and capabilities integrated all part of an organization.

Keywords: Ethical culture, Capabilities, Reputation, Banks.

1. INTRODUCTION

Corporate reputation has attracted attention from a wide range of both academic and business. Corporate reputation management is heartily and continuously considered on multi-dimension of perceptions that are crucial keys to business performance. Banking can consider by which any strategic decision plays important role to standard of living of people, organization and holistic view of national economic. Bank responds mainly in any requirement as financial products and services; however, it has to concern with multi-dimension of perception about corporate performance. It is therefore necessary to investigate in benefit from corporate ethical culture and corporate capabilities that can create corporate reputation and supporting on strategic decision in order to provide future sustainability.

2. REVIEW OF LITERATURE AND HYPOTHESIS DEVELOPMENT

Ethical Culture and Corporate Capabilities

Corporate culture consists of values, both implicit and explicit, of the firm. The explicit values are captured by the concept of corporate ideology (Husted & Allen, 2001). Basically, ethical behavior involves “doing the right thing”. It is considered essentially for corporate sustainability (Avery & Bergsteiner, 2011). Ethical culture and capability within organization as related with knowledge resource base are intangible asset. Both factors would be critical to the reputation of the organization rather than tangible asset. The assessment of corporate reputation perceptions, feelings, beliefs, and referent information about the organization is taken from the past to the present. Corporate ability and ethical culture affect to the assessment of corporate reputation (Brown & Dacin, 1997). Resource-based view research has been criticized to give elaboration of how firms build capability (Cavusgil et al., 2007).

Ethical Culture, Corporate Capabilities and Corporate Reputation

It has been suggested recently that perception of firm's ethics plays a significant role attractiveness for stakeholder of organizations (Greening and Turban, 2000). Corporate ethical

virtues are the organizational conditions for ethical conduct. They reflect the capacity of an organization to stimulate ethical conduct of employees (Kaptein, 2007). Corporate reputation and corporate capability are abstract and intangible asset. All organizations purpose mainly to reach into 2 aspects namely sustainable competitive advantages and organization performance (Barney, 1991; Kaplan & Norton, 2004). There is potential of good and sustainable performances of an organization (Roberts & Dowling, 2002) and to generate competitive advantages and high organizations' performance outcomes (Sabate & Puente, 2003). In addition, it could decrease operation costs and attractiveness of a good skill person to join the organization (Fombrun, 1997).

Ethical culture is a form of risk management and can enhance firm's reputation (Avery, 2011). Reputation is received by increasing interest in strategic management because it can create intangible resource leading to sustained competitive advantage (Barney, 1991; Dierickx & Cool, 1989). The linking between capability and ethical culture of the organization found that the capability of the organization and ethical culture affect to the assessment of a sense of corporate stakeholders to the organization (Berens, Riel & Bruggen, 2005).

Corporate which could run transparently, ethical ways can retain stakeholder confidence and maintain their reputations. At the enterprise level, ethics start with instilling desired values and behaviors into employees. Corporate leaders perceive as having high ethics that will be have greater success in obtaining employee understanding and commitment to realizing a strategy. The hypotheses can be developed on the basis of previous theoretical discussion.

H1: Corporate with a large degree of ethical culture could have better corporate capability

H2: Corporate with a large degree of capability could have better corporate reputation

H3: Corporate with a large degree of ethical culture could have better corporate reputation

3. RESEARCH METHODS

The purpose of this study was to examine the construct of corporate ethical culture, corporate capability and corporate reputation of banks in Thailand with exploratory factor analysis. The researcher examined the effect of corporate ethical culture and corporate capability to corporate reputation. Path analysis and structural equation model by AMOS software program were employed. The systematic random sampling was taken on 385 managers of banks in Thailand. The questionnaires were distributed and explained to the respondents by author for better understanding to respond.

The measurements composed of ethical culture follow by Kaptein (2007). In the parts of corporate capability, it was used following Sharma & Verdenberg, 1998; Wang & Ahmed, 2004; Panayides, 2006; Zhou & Li, 2009; and corporate reputation was used following Fombrun, Gardberg & Server (2000). The questionnaire was adapted from academicians to comply with context of a bank in Thailand. Respondents were encouraged to rate each item on a 5 point scale ranging from strongly disagree to strongly agree.

A pilot test was carried out to assess the validity and reliability of the questionnaire by thirty respondents of bank's managers. The items of ethical culture reveal 0.845 and corporate capability reveal 0.926, corporate reputation reveal 0.975 and all of indicators have total reveal 0.972 of Cronbach's alpha. The validity of the questionnaires were determined by the use of exploratory factor analysis to determine component of ethical culture, corporate capability and corporate reputation.

The data collected was initially fed into SPSS for descriptive analysis and exploratory factor analysis. Variables were transformed to make them usable for Analysis of Moment Structures (AMOS). Structural equation modeling technique was used to analyze the data and to test hypotheses. The structural equation model technique is an important tool which involves

identification of variable and development of theoretical model. Hypotheses are then framed based on theoretical model. Primary data was collected through survey questionnaires and hypotheses are tested on the bases of collected data.

4. RESULTS

An exploratory factor analysis of ethical culture, corporate capability and corporate reputation can explain below.

Ethical Culture (EC) has explained 60.02% of the variance. We also assessed the internal reliability of ethical culture by calculating Cronbach's alpha for each dimensions by using 5 items scale of manager's perception. All values were satisfactory; the 5 competences items = 0.833. After rotation of a clean factor structure for employee's perception, the components were displayed in Table 1.

Table1 An exploratory factor analysis of Ethical Culture (EC)

Indicator	Component	Factor Loading
EC1	In our company, everyone is totally committed to the norms and values of the organization.	.742
EC2	In our company, there is atmosphere of mutual trust prevails.	.751
EC3	In our company, everyone plays the highest interests.	.759
EC4	In our company, a mutual relationship of trust prevails between employees and management.	.817
EC5	In our company, everyone treats one another with respect	.802
	Cronbach's Alpha	.833
Total Variance Explained = 60.024, KMO = .837		
Bartlett's test of sphericity Approx. Chi-square = 671.575, df = 10, p-value = 0.000		

Corporate Capability (CAP) has explained 60.02% of the variance. We also assessed the internal reliability of corporate capability by calculating Cronbach's alpha values was satisfactory at 0.833. After rotation of a clean factor structure for corporate capability, the components were displayed in Table 2.

Table2 An exploratory factor analysis of Corporate Capability (CAP)

Indicator	Component	Factor Loading
CAP1	The objectives of our company are driven primarily by customer satisfaction.	.750
CAP2	Our existing competency can withstand any changes in the industry.	.830
CAP3	Our existing competency can withstand business environment.	.821
CAP4	In new product and service introductions, our company is often firstly come to the market.	.823
CAP5	Senior executives constantly seek unusual, novel solutions to solve any problems.	.825
	Cronbach's Alpha	.867
Total Variance Explained = 65.638 , KMO = .827		
Bartlett's test of sphericity Approx. Chi-square = 925.740 , df = 10 , p-value = 0.000		

Corporate Reputation (REP) has explained 70.24% of the variance. We also assessed the internal reliability of the two dimensions of corporate reputation dimension by calculating Cronbach's alpha for each dimension by using 16 items scale of employee's perception. All values were satisfactory; the 11 competences items = 0.948, the 5 workplace environment items = 0.934 and all of items = 0.960. After rotation of a clean factor structure for employee's perception, the components were displayed in Table 3.

Table3 An exploratory factor analysis of Corporate Reputation (REP)

Indicator	Descriptive	Factor Loading	
		Factor1	Factor2
REP_O1	Our company has a strong record of profitability.	.727	
REP_O2	Our company seems a company with strong prospect for future growth.	.715	
REP_O3	Our company has trends to outperform over competitions.	.792	
REP_P1	Our company stands behind its products and services.	.744	
REP_P2	Our company develops innovative product and services.	.719	
REP_P3	Our company offers product and service that are good for income.	.735	
REP_P4	Our company offers high product and services.	.746	
REP_L1	Our company has excellent leadership.	.640	
REP_L2	Our company has clear vision for our future.	.676	
REP_S1	Our company supports good reason.	.716	
REP_S2	Our company has been recognized by international organizations.	.749	.842
REP_W1	I have a good feeling about our company.		.843
REP_W2	Our company seems a good company to work for.		.768
REP_W3	I admire and respect our company.		
REP_W4	Our company is well managed for success.		.753
REP_W5	Our company seems a workplace that would have good employees.		.934
	Cronbach's Alpha	.948	
Total Variance Explained = 70.242, KMO = .949			
Bartlett's test of sphericity Approx. Chi-square = 5598.035 , df = 120 , p-value = 0.000			

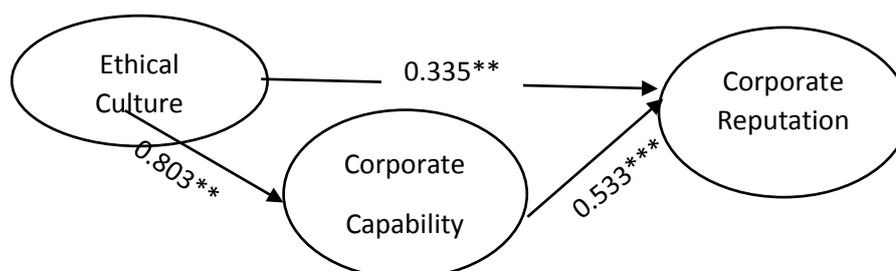


Figure 1. The Model of Ethical Culture and Capabilities Influencing reputation

The estimate model fits the data reasonably well. It was assessed by examining several Goodness of fit (GFI) = 0.950, Adjusted Goodness of fit (AGFI) = 0.924, Comparative Fit Index (CFI) = 0.995, Root Mean Square error of approximation (RMSEA) = 0.020, Chi-

square= 266.602, df = 231, p-value = 0.054, and ratio between chi-square and number of degree of freedom = 1.154.

Hypothesis	Direct effect	Indirect effect	Total effect	Hypothesis test
H1: EC->CAP	0.803***	0.000	0.803***	Accepted
H1: CAP->REP	0.533***	0.000	0.533***	Accepted
H1: EC->REP	0.335***	0.428***	0.763***	Accepted

The corporate ethic had high effect towards the corporate capabilities likewise corporate capabilities had effect to corporate reputation. While the corporate ethic took role in effect to corporate reputation in both direct effect and indirect effect. This research confirms the necessity for businesses to establish an ethical corporate culture with stronger awareness on ethical. Businesses could no longer move on without having ethical culture. Evidently, this research finds that corporate has higher expectation towards firms to be ethical corporate culture. They are willing to exercise their power to support companies with positive reputation.

5. DISCUSSION & CONCLUSION

This study contributes to the literature in several ways. First, by identifying ethical culture as an important driver of corporate capability. The integration of ethical culture and corporate capability for creating corporate reputation particularly in the corporate reputation in dimension of workplace environment and dimension of corporate performance. The results of the present study indicate that the level of corporate reputation depends on ethical corporate culture and corporate capability which is in line with the study of Robert and Dowling (2002). Ethical culture had both direct and indirect effect passed through the corporate capability by which rather low direct effect but high indirect effect.

6. FUTURE RESEARCH

This research has studied the effect of ethical corporate culture to corporate reputation, it found that corporate capability is mediator. In fact, corporate reputation may come from the reasons more than ethical culture and corporate capability of the organization. Corporate reputation has affected by numerous factors. Researcher should examine other factors that related to the reputation of an organization. The corporate reputation may come from corporate strategy or devotion caused by social responsibility of the organization.

7. REFERENCES

- Avery, G.C., Bergsteiner, H. (2011). Sustainable leadership: practices for enhancing business resilience and performance. *Strategy & Leadership*, Vol. 39 No.3, pp.5-15.
- Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17, 99-120.
- Berens, G., van Riel, C. B. M. and van Bruggen, G. H. (2005). Corporate Associations and Consumer Product Responses: The Moderating Role of Corporate Brand Dominance. *Journal of Marketing*, 69 (July), 35-48.
- Brown, T. J. and Dacin, A. P. (1997). The Company and the Product: Corporate Associations and Consumer Product Responses, *Journal of Marketing*, 61 (January), 68-84.
- Cavusgil, E., Seggie, S.H. & Talay, M.B. (2007). Dynamic capabilities view: foundations and research agenda, *Journal of Marketing Theory and Practice*, vol. 15(2), spring, pp. 159-166.
- Dierickx, I. and Cool, K. (1989). Asset stock accumulation and sustainable competitive

International Conference on Multidisciplinary Trends in Academic Research, September 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- advantage. *Management Science*, 35, 1504–1511.
- Fombrun, C., Gardberg, N. A. and Sever, J. M. (2000). The Reputation Quotient: A multi-Stakeholder measure of corporate reputation. *The Journal of Brand Management*. 7(4), 241-255.
- Fombrun, C. and Van Riel, C. (1997). The reputational landscape. *Corporate Reputation Review*, 1(1/2), 5–13.
- Greening, D.W. and Turban, D.B. (2000). Corporate social performance as a competitive advantage in attracting a quality workforce. *Business and Society*, 39, 254-280.
- Husted, B. W. and Allen, D. B. (2001). Toward a model of corporate social strategy formulation. *Proceedings of the Social Issues in Management Division at Academy of Management Conference*, Washington D.C., Washington, Estados Unidos, 61.
- Kaplan, R. S. and Norton, D. P. (2004). The strategy map: guide to aligning intangible assets, *Strategy & Leadership*, Vol. 32(5)5, 10 - 17
- Kaptein, S.P. (2008). Developing and testing a measure for the ethical culture of organizations: the corporate ethical virtues model. *Journal of Organizational Behavior*, 29(7), 923-947.
- Roberts, P. W. and Dowling, G. R. (2002). Corporate Reputation and Sustained Superior Financial Performance. *Strategic Management Review*, 23, 1077-1093.
- Sabate, J. M. & Puente, E. Q. (2003). Empirical analysis of the relationship between corporate reputation and financial performance: a survey of the literature. *Corporate Reputation Review*, 6 (2), 161-178.
- Sharma, S. and Verdenberg, H. (1998). Proactive corporate environmental strategy and the development of competitively valuable organizational capabilities. *Strategic Management Journal*, 19, 729-753.

HOW DO BEVERAGE MANUFACTURING FIRMS IN THAILAND ADJUST THEMSELVES IF FREE FLOW OF 11 LOGISTICS SERVICES PROVIDER NOT POSITIVE IMPACT TO OVERALL EQUIPMENT EFFICIENCY?

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ABSTRACT

Initially, Associate of Southeast Asian Nation: ASEAN sponsor free flow of 11 logistics services provider to boost up the production in ASEAN region. This paper investigates in “If free flow of 11 logistics services provider not positive impact to Overall Equipment Efficiency: OEE of beverage manufacturing firm in Thailand, how do beverage manufacturing firms adjust themselves”. Then, this study had been taking an inductive approach method; also, registered mail with open-end question had been delivered to 293 manufacturing firms in Thailand while the completed questionnaires were 78 firms, and an expert in logistics and industrial sectors had been explored the opinion by semi-structured question with in-depth interview. Next, the results show that expert and almost of beverage manufacturing firms trust that free flow of 11 logistics services provider not negative to OEE in Beverage Manufacturing firm, but they differ in solution in solution if beverage manufacturing firms may be not gain positive impact from free flow of 11 logistics services provider; expert suggest to learning in holistic information of logistics provider before taking a logistics services while large beverage manufacturing firms select to close or open some business; small beverage manufacturing firms select to improve their machine capacity and development information with supplier; medium enterprise have a variety in adjustment themselves.

Keywords: Free Flow of 11 Logistics Services Provider, Overall Equipment Efficiency, Beverage Manufacturing Firms.

1. INTRODUCTION

Initially, ASEAN Economic Community: AEC has lunched Roadmap for the Integration of Logistics Services: RILS which ease the logistics services provider 11 sectors can liquidity their goods transfer or goods freely movement. Then, Free flow of 11 logistics services provider has been trusted as a strategic of economic grouting which might promote a coordinate, an effectively in traffic and a movement goods from supplier to point of production and consumption (Department of Trade Negotiation, 2012; Chandra and Kinasih, 2012). Next, a movement of material and resource from point of origin to point of manufacturing site is inbound logistics as logistics for production (Gonzalez, 2002). Mainly, AEC has passage “free movement of goods and establish a single production base” (The ASEAN Secretariat, 2008) which can be implied to “AEC promote free flow of 11 logistics services provider to enhance conversion process in manufacturing firms”.

In Thailand, beverage manufacturing sector is an important role for nation economic. In exactly, beverage and food industrial sector had constructed the highest GDP 5.86% in 2012 (Office of Small and Medium Enterprise Enterprises Promotion, 2013). The interesting, beverage manufacture in Thailand usually concentrate in Overall Equipment Efficiency: OEE which had been taken to control the effective of manufacturing such as carbonated soft drink manufacturer, alcoholic drink producer

and milk manufacturer (Department of Industrial Work, 2012; Dairy Farming Promotion Organization of Thailand, 2007). Logically, OEE has defined as a cross product of Machine Ability: MA, Performance Efficiency: PE, and Quality Rate: QR. (Bamber, Castka, Sharp and Motara, 2003); moreover, OEE is often used for manufacturing improvement to reduce non value added activity. So that, the research study shore up OEE in the beverage manufacturing firm in Thailand is an important.

To come to the point, AEC direct supporting to free flow of 11 logistics services provider which is a trusted strategic to enhance efficacy of manufacturing firms. Then, the raised question is “If free flow of 11 logistics services provider not positive impact to OEE of beverage manufacturing firms, how do beverage manufacturing firms in Thailand adjust themselves?”; which have not investigated as well. This study objects to explore “How do beverage manufacturing firms in Thailand adjust themselves if free flow of 11 logistics services provider not positive impact to OEE? The statement of investigation may contribute a significantly to both of beverage industrial sector and logistics services provider in future.

2. LITERATURE REVIEW

Free Flow of 11 Logistics Services Provider

Associate of Southeast Asian Nation: ASEAN has been forcing logistics services as the urgent business to free trade. The opening in the free trade of logistics services sector was a trusted strategic which might promote coordinate, effectively in traffic, and which facilitate the movement goods from supplier to the point of production or consumption. The policy has been promoted the logistics services provider in ASEAN is Roadmap for the Integration of Logistics Services: RILS (Department of Trade Negotiation, 2012; Chandra and Kinasih, 2012)

RILS aims to un-bound of cross border supply and cross border consumption in logistics services, and almost unbound of business representative; however, foreign equity participation not exceeds 49%. RILS might help logistics services provider whom is logistics driver for better liquidity to supply, enhance logistics operation, and which can be implied as free flow of logistics services provider. Then, RILS purposes to free flow of logistic 11 sectors as (1) Maritime Cargo Handling Services, (2) Storage and Warehousing Services, (3) Freight Transport Agency Services, (4) Other auxiliary services, (5) Courier Services, (6) Packaging Services, (7) Customs clearance services, (8) International Maritime Freight Transportation, (9) Air Freight Services, (10) International rail freight transports, (11) International road freight transports (Department of Trade Negotiation, 2012; The ASEAN Secretariat, 2011).

Free flow of 11 logistics services provider are significantly for manufacturing firms; it's removing the obstacle regulation in cross border investment such as increasing an investment share 49% in 2008 and reach to 70% in 2013 (Office of trade services and investment, 2013; Department of Trade Negotiation, 2011; Office of trade services and investment, 2011). The result of logistics services open trade might be facilitated in liquidity in logistic services and logistics cost reduction.

Overall Equipment Efficiency: OEE

OEE has defined as a cross product of Machine Ability: MA, Performance Efficiency: PE, and Quality Rate: QR. (Bamber, Castka, Sharp and Motara, 2003). OEE measures on how about efficiency of manufacturing firm which convert time into output; OEE factor is often used to improvement as indicator on quality, delivery and utilization within manufacturing setting as well (Garza-Reyes, Eldridge, Barber and Soriano-Meier, 2010; Gibbons and Burgess, 2010).

OEE measuring ensure the best utilization of operational because it related losses in operation; in addition, OEE is often used as a driver for improving in quality, productivity and machine utilization; consequently, OEE aims to reduce non value added activity in industrial processes (Koli and Rawat, 2011; Idhammar, 1997). Generally, every firm requires a high level of operating equipment efficiency, since OEE reflect the ability to maintain the convergent system to make maximum equipment utilization. The main part of OEE can be explained as follow.

Machine ability has defined as ability efficiency. The machine ability measures downtime or equipment failure that results in unscheduled of requirement (Mathur, Dangayach, Mittal and Sharma, 2011; Nachiappan and Anantharaman, 2006). The ability rate measure total time which systems can not operating cause from breakdown, adjustment and other stop (Yam, Tse, Ling and Fung, 2000; De Groote, 1995). Preventive maintenance is the tool to decrease the losses in the availability losses (Dal, Tugwell and Greatbanks, 2000) which are breakdown losses and bring up to production losses. Breakdown losses is included equipment failure and quantity losses (Muchiri and Pintelon, 2008; Tsarouhas, 2007) while bring up to production losses is included set up and adjustment (Anvari and Edwards, 2011).

Performance efficiency has defined as speed efficiency (Mathur, Dangayach, Mittal and Sharma, 2011; Nachiappan and Anantharaman, 2006), and performance efficiency is cross product of operating speed rate and net operating rate (Zandieh, Tabatabaei and Ghandehary, 2012; Kwon and Lee, 2004; Prickett, 1999; Blanchard, 1997; De Groote, 1995). The performance efficiency measures the ratio of equipment operating speed and ideal speed (Bamber, Castka, Sharp and Motara, 2003); it's equipment capacity as well (Dal, Tugwell and Greatbanks, 2000). The losses of performance efficiency include temporary stopping and reduced speed; besides, temporary stopping include minor stoppage and idling (Nachiappan and Anantharaman, 2006; Jeong and Philips 2001).

Quality Rate has defined as quality efficiency which is ratio of amount of good product per processed amount (Mathur, Dangayach, Mittal and Sharma, 2011; Nachiappan and Anantharaman, 2006; Kwon and Lee, 2004; Prickett, 1999; Blanchard, 1997; De Groote, 1995). The important of quality efficiency indicate the proportion of defect products per total production volume (Dal, Tugwell and Greatbanks, 2000). Quality efficiency calculation represents the good part from total production. The losses in quality efficiency include defect, reworking, and material losses during making (Nachiappan and Anantharaman, 2006; Jeong and Philips 2001).

OEE measurements ensure the best utilization of practice, for it related losses in operation. The ten losses of OEE are included (1) failure losses, (2) quantity losses, (3) setup and (4) adjustment. The losses of performance efficiency include (5) minor stoppage, (6) idling and (7) speed losses. The losses in quality efficiency mode include (8) defective product, (9) reworking and (10) material losses during production. If firms can reduce ten losses in OEE, it means OEE increasing.

Situation of Beverage Manufacturing Firms in Thailand

Beverage industrial sector play a vital role for nation economic of Thailand. Beverage and food industry in Thailand had growth 3.81% in 2011 which had included non alcoholic beverage 1.52% and alcoholic beverage 0.07% (Econnews, 2012). Expressly, the population demographic of Thailand has been changed which has affected to the consumer behavior changing; also, Thai consumers gradually drink in the ready to drink and the healthy beverage (low fat, vegetarian beverage and natural beverage

ingredient. The forecasting of beverage markets in Thailand will grow to 7.6% in 2014 (Thailand Board of Investment, 2012).

Importantly, the beverage manufactures have to concentrate in production and logistic cost in lower price because almost of Thai people is middle class income, need to convenience in consumption and low price product (Bank of Thailand, 2012). The beverage industries have to improve manufacturing efficiency, develop the productivity in production system and improve logistic system (Thailand Board of Investment, 2012); accordingly, they can sustain the business growth.

Mostly, beverage industry is convergent process. Certainly, any changes in material input relative price factors and industry capital structure. Commonly, the beverage manufacturer almost fix process technology, yet the production formula has been fixed such as beer, wine and etc; as a result, it can be inferred as convergent process (Bootdachi and Khochaimaha, 2011; Xia and Buccola, 2003). Precisely, Thai beverage manufacturing firms usually attention in OEE which has been use to control the effective of manufacturing for example; carbonated soft drink producer (Faculty of Engineering, Chulalongkorn University, 2006), alcoholic drink producer (Department of Industrial Work, 2012), brewery producer and milk producers (Dairy Farming Promotion Organization of Thailand, 2007).

The material consumptions are hardly to changing because there effect on beverage ingredient; also, it's seem to be a fixed cost per unit. Industrial firms should improve the needless cost in the production and the product transfer process; industrial firms have to effort to produce an output with minimum unit cost for sustains the profit for business survival which is the production efficiency improving concept. So that, Thai beverage manufacturing firms should maximize the equipment to make equipment efficiency; the factor impact to OEE has been highly need to study.

3. RESEARCH METHOD

Firstly, the population in this research were chief executive, top management or company representative of beverage manufacturing firms that had registered in Department of Industrial work of Thailand and operating until year 2013 totally 293 factory (Department of Industrial Work of Thailand,2013). Next, the first parts of survey questions were 4 items which collected the demographic data; which included beverage product type (carbonate or non carbonate), year of entry in their market as well. Then, the second part of instrument was the open ended inquiry which had been used to answer the research inquiry as “If free flow of 11 logistics services provider not positive impact to OEE of beverage manufacturing firms, how do beverage manufacturing firms adjust themselves?” After that, the answer back from beverage manufacturing firms had been categorized in group of adjust themselves.

Secondly, the expert opinion interview had been taken to explore the specific issue to fill in specific information gap (Elliott and Fankel-Elliott, 2003). In-dept interview had been taken to get the information from potential participation or specialist thought interview to find their perspective (Boyce and Neale, 2006). This information had been gathered by specialist of Department of Trade Negotiation of Thailand whom familiar with free flow of 11 logistics services provider, and it had been used to refining for survey result. The expert had been asked by semi-structure with open-ended question which is “If free flow of 11 logistics services provider not positive impact to Overall Equipment Efficiency of beverage manufacturing firm, how do beverage manufacturing firm adjust themselves?” After that, the transcribed data will be interpreted by researcher and research advisor.

Finally, the results from the approaching both of beverage manufacturer and expert opinion had been initially taken to interpret by researcher and dissertation advisor reviews. After reviewing and interpretation of research result analysis, this information had been summarized to conclusion.

4. RESULTS

Invitations to this survey participation were lettered to a full amount of 293 firms of Thai beverage industrial sector. From the provocation launched, 35 (11.94%) were undeliverable, for they went out of business and had an unfounded address. A total of 84 participants responses which had been calculated a comeback with rate of 28.66 percent; even so, the responses 6 (2.04%) were uncompleted and removed. Lastly, the completed responses resulted a total of 78 (26.62%) which were used in this study's data analysis. Normally, the studies in manufacturing firms have a low responses rate; for example, the reply back 24.24% which is acceptable (Biloslavo, Bagnoli and Figelj, 2013; Chow and Frazer, 2003; Burki and Terrell, 1998).

Table 1 Respondent and Firms Characteristics

Description	N	Percent
Sample	78	
Position level		
Production Manager	48	61.5
Plant Manager	17	21.8
Assistant Factory Manager	6	7.7
Assistant Director	3	3.8
Managing Director	2	2.6
Associate Director	2	2.6
Beverage Type		
Non-Carbonated Beverage Production	68	87.2
Carbonated Beverage production	5	6.4
Carbonated Beverage and Non Carbonated Beverage	5	6.4
Industrial Size		
Medium Enterprises	52	66.7
Small Enterprises	19	24.4
Large Enterprises	7	9.0
Year of Manufacturing		
Equal and Less than 10 years	37	47.4
11 years - 20 years	23	29.5
More than 20 years	18	23.1

The largest groups of respondent were production manager 61.5% followed by plant manager 21.8%, assistant factory manager 7.7%, assistant director 3.8%, managing director 2.6% and associate director 2.6%. The results of the respondent characteristics are presented. The largest groups of beverage production type were Non-Carbonated Beverage Production 87.1%, Carbonated Beverage production 6.4% and Carbonated Beverage and Non-Carbonated Beverage 6.4%. The largest groups of industrial size were Medium Enterprises 66.6%, Small Enterprises 24.3% and Large Enterprises 8.9%. The largest groups of years of manufacturing were equal and Less than 10 years 47.4%, 11 years - 20 years 29.4% and more than 20 years 23%. The results of the firm characteristics are presented follow Table 1.

Results of the Open Ended Question in Survey Instrument

The open ended question had taken to capture the opinion of company representative in “If free flow of 11 logistics services provider not positive impact to Overall Equipment Efficiency of beverage manufacturing firm, how do beverage manufacturing firm adjust themselves?”. The research question had been answered in this section. Then, the answers can be categorized as below.

Table 2 Firm opinion in "If free flow of 11 logistics services provider not positive impact to OEE, how do they adjustment themselves"

Description	Size of Enterprise			Totally
	Small	Medium	Large	
1. Free flow of 11 logistics services providers does not negative impact to OEE	14	34	2	50
2. Upgrade the machine for higher of production quality	3	3		6
3. Decreased the operation procedure in manufacturing process		6		6
4. Construct a network for improve inbound logistics system		3		3
5. Develop an information technology with supplier to accurate stock	2	3		5
6. Find new raw material sourcing		3		3
7. Set up new business to operation or Cut down old business			5	5
Total	19	52	7	78

The researcher had asked the production manager in a reposed group totally 78 manager by survey instrument; as a result, 60 (76.9 %) managers though that free flow of 11 logistics services providers does not negative impact to overall equipment efficiency while 28 (23.1%) managers allowed to answers this question. To begin with the beverage manufacturing firms opinioned in variety of solution; however, when concentrated only in 28 managers and categorized with size of enterprise that result as follow Table 2.

Almost of beverage manufacturing firms opinion that free flow of 11 logistics services provider will not have negative to their business while had only 1 in 4 part of respondent in solution if it don't positive to their firms. When concentrate to beverage manufacturing firms though in countermeasure If free flow of 11 logistics services provider not positive impact to Overall Equipment Efficiency of beverage manufacturing firm; as a result, all of large enterprise selected to cut down old business or set up new business, small enterprise selected to upgrade their machine and information technology with supplier, almost of medium enterprise selected to decrease an operation procedure in their process but they had still a variety of choice.

Result of Expert Opinion Interview

Initially, Department of Trade of Negotiation of Thailand: DTN is a representative organizer of ASEAN Economics Community: AEC; also, they have an in charge to communicate the policy of free flow of 11 logistics services providers. Next, the researcher had contacted DTN to suggest the expert in logistics and manufacturing

firms, but they have not the specialist in their organization; however, DTN had suggested the external specialize in logistics and industrial sectors follow the data base of The Federation of Thai Industries.

The qualification of expert had been a former Deputy Secretary General of Executive Board of The Federation of Thai Industries who was charged in Economics and logistics from 2007 to 2014; also, he had been a board of director of Thailand logistics from 2008 to 2010. Presently, he is a member of National Economics and Social Advisory Council which base in Economics and Production Industrial sector. Then, the researcher had requested the specialize for in-dept interview; as a result, he had appreciated to answers the research question, and the interview results of expert opinion as follow this.

Interviewer: If free flow of 11 logistics services provider not positive impact to Overall Equipment Efficiency of beverage manufacturing firm, how do beverage manufacturing firm adjust themselves?

Expert: Free flow of 11 logistics services providers is an advantage of beverage manufacturing industrial sector as services user; also, I trust that is positive to their production efficiency, since the competition of logistics providers construct an opportunity for beverage manufacturing sector such as competitive between domestic providers and multinational providers, price bargain increasing, inventory cost reduction, risk management and etc.

I trust it not harmful to production efficiency; however, the beverage manufacturing firm can not take a benefit from free flow of 11 logistics services providers if they don't understand in role of each logistics services providers and how to use logistics services providers. So that before logistics services providers selection, beverage manufacturing firms should learn information of logistics services providers such as company profile, business policy, business performance, reputation and low compliance, network and status, core specialize, management team and information technology.

It can be implied that the expert inform free flow of 11 logistics services provider does not negative impact to OEE of beverage manufacturing firm. However, the beverage manufacturing firm will have to take delivery of an advantage of free flow of 11 logistics services provider unless they learn information of logistics services provider before using. So that, beverage manufacturing firms has to adjust themselves by learning in holistic information about logistics services provider before capture services.

In summing up, the expert recommends that free flow of 11 logistics services provider positive impact to OEE in Beverage Manufacturing firm, but some logistics services provider might not be taken such as freight transport agency services, packaging services and international rail freight service. Free flow of 11 logistics services provider not negative impact to OEE in beverage manufacturing firm; however, they should adjustment themselves by learn in holistic view info of logistic provider before take a services, if they may be not gain positive impact to OEE.

5. DISCUSSION AND CONCLUSION

Expert and almost of beverage manufacturing firms trust that free flow of 11 logistics services provider not negative to Overall Equipment Efficiency in Beverage Manufacturing firm, but they differ in solution if beverage manufacturing firms may be not gain positive impact from free flow of 11 logistics services provider; for example, expert suggest to learning in holistic information of logistics provider before

taking a logistics services while large beverage manufacturing firms select to close or open some business; small beverage manufacturing firms select to improve their machine capacity and development information with supplier; medium enterprise have a variety in use.

Beverage manufacturing firms should learn holistic information before take a logistics service which couple with an idea of their adjustment themselves if free flow of logistics services provider does not positive impact to their overall equipment efficiency: which may facilitate to reduce an item of their adjustment themselves. This study was focused on beverage manufacturing firms of Thailand; however, manufacturing firms in another industrial sector may be difference opinion such as logistics providers using, adjustment themselves for the impact of free flow of 11 logistics services provider and the impact to their overall equipment efficiency.

6. REFERENCE

- Anvari, F. and Edwards, R.(2011), *Performance measurement based on a total quality approach*. International Journal of Productivity and Performance Management, 60(5), 512-528.
- Bamber, C.J., Castka, P., Sharp, J.M. and Motara, Y.(2003), *Cross-functional team working for overall equipment effectiveness (OEE)*. Journal of Quality in Maintenance Engineering, 9(3), 223-238.
- Bamber, C.J., Castka, P., Sharp, J.M. and Motara, Y.(2003), *Cross-functional team working for overall equipment effectiveness (OEE)*. Journal of Quality in Maintenance Engineering, 9(3), 223-238.
- Biloslavo, R., Bagnoli, C. and Figelj, R.R.(2013), *Managing dualities for efficiency and effectiveness of organizations*. Industrial Management & Data Systems, 113 (3), 423-442.
- Blanchard, B.S.(1997), *An enhanced approach for implementing total productive maintenance in the manufacturing environment*. Journal of Quality in Maintenance Engineering, 3(2), 69-80.
- Bootdachi, J. and Khochaimaha, S.(2011), *Thai Alcoholic Beverage and ASEAN Economics Community*. GMSARN International Conference on Social-Energy-Environmental Development: SEED towards Sustainability 28-30 Mar. 2012.
- Boyce, C. and Neale, P.(2006), *Conducting In-Depth Interviews: A Guide for Designing and Conducting In-Depth Interviews for Evaluation Input*. Pathfinder International Tool Series: Monitoring and Evaluation-2
- Burki, A.A. and Terrell, D.(1998), *Measuring Production Efficiency of Small Firm in Pakistan*. World Development. 26 (1), 155-169.
- Chandra, A.C. and Kinasih, H.N.(2012), *Services Trade Liberalization and Food Security: Exploring the links in the Association of Southeast Asian Nations (ASEAN)*. The International Institute for Sustainable Development, [Online] Available: <http://www.iisd.org> (March 23, 2013)
- Chow, L. and Frazer, L.(2003), *Servicing customers directly: Mobile franchising arrangements in Australia*. European Journal of Marketing, 37(3/4), 594-613.
- Dairy Farming Promotion Organization of Thailand (2007), *Annual Report 2007*. Ministry of Agriculture and Cooperatives of Thailand, [Online] Available: <http://www.dpo.go.th/download/pdf/2550.pdf> (March 23, 2013)
- Dal, B., Tugwell, P. and Greatbanks, R.(2000), *Overall equipment effectiveness as a*

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Global Illuminators, Kuala Lumpur, Malaysia.

- measure of operational improvement: A practical analysis*. International Journal of Operations & Production Management, 20(12), 1488-1502.
- De Groote, P. (1995), *Maintenance performance analysis: a practical approach*. Journal of Quality in Maintenance Engineering, 1(2), 4-24.
- Department of Industrial Work of Thailand (2012), *The Succession of Factory attend the latency development project of Waste Utilization*. [Online] Available: <http://www.diw.go.th/iwmb> (Feb 15, 2013)
- Department of Industrial Work of Thailand (2013), *Factory data*. [Online] Available: <http://userdb.diw.go.th/results1.asp>. (Feb 15, 2013)
- Department of Trade Negotiation(2011), *Integrate of Logistics Services under AEC*. Ministry of Commerce of Thailand, [Online] Available: http://dtm.go.th/images/stories/Services_and_Investment/6_2_1_5_1_2.pdf (Feb 15, 2013)
- Department of Trade Negotiation(2012), *Logistics Services. Ministry of Commerce of Thailand*, [Online] Available: <http://www.dtm.go.th>. (March 23, 2013)
- Econnews (2012), *Econnews of January, 2012 volume no. 535*, Econnews press, [Online] Available: <http://www.econnews.org>. (March 23, 2013)
- Elliott, R. and Fankel-Elliott, N.(2003), *Using ethnography in strategic consumer research*. Qualitative Marketing Research: An International Journal, 6(4), 215-223.
- Faculty of Engineering, Chulalongkorn University(2006), *The project of Maintenance Technology Training*, Department of Industrial Work, Ministry of Industry of Thailand, [Online] Available: http://www2.diw.go.th/mac/PC_5/form_pc5/job_2548.pdf. (March 23, 2013)
- Garza-Reyes, J.D., Eldridge, S., Barber, K.D. and Soriano-Meier, S.(2010), *Overall equipment effectiveness (OEE) and process capability (PC) measures: A relationship analysis*. International Journal of Quality & Reliability Management, 27(1), 48-62.
- Gibbons, P.M. and Burgess, S.C.(2010), *Introducing OEE as a measure of lean Six Sigma capability*. International Journal of Lean Six Sigma, 1(2), 134-156.
- Gonzalez, A.(2002), *Inbound logistics drives strong demand for transportation systems*. Warehousing Management, 9(8), 1-3.
- Heilala, J., Helin, K. and Montonen, J.(2006), *Total cost of ownership analysis for modular final assembly systems*. International Journal of Production Research, 44(18-19), 3967-3988.
- Idhammar, C.(1997), *Do the right thing: Measuring overall equipment efficiency*. Pulp & Paper, 71(4), 53.
- Jeong, K. and Phillip, D.T.(2001), *Operation Efficiency and Effectiveness measurement*. International Journal of Operation & Production Management, 21(11), 1404-1416.
- Koli, L.N. and Rawat, B.(2011), *Measuring of Operational Efficiency and its Impact on Overall Profitability- A Case Study of BPCL*. BVIMR Management Egde, 4(2), 105-114.
- Kwon, O. and Lee, H.(2004), *Calculation methodology for contributive managerial effect by OEE as a result of TPM activities*. Journal of Quality in Maintenance Engineering, 10(4), 263-272.
- Mathur, A., Dangayach, G.S., Mittal, M.L. and Sharma, K.(2011), *Performance measurement in automated manufacturing*. Measuring Business Excellence, 15(1), 77-91.

International Conference on Multidisciplinary Trends in Academic Research, September 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- Muchiri, P. and Pintelon, L.(2008), *Performance measurement using overall equipment effectiveness (OEE): literature review and practical application discussion*. International Journal of Production Research, 46(13), 3517-3535.
- Nachiappan, R.M. and Anantharaman, N.(2006), *Evaluation of overall line effectiveness (OLE) in a continuous product line manufacturing system*. Journal of Manufacturing Technology Management, 17(7), 987-1008.
- Office of Small and Medium Enterprise Enterprises Promotion(2013), *Annual report of Small and Medium Enterprise Enterprises: 2011-2012*. Office of Small and Medium Enterprise Enterprises Promotion of Thailand, [Online] Available: <http://www.sme.go.th>. (March 23, 2013)
- Office of trade services and investment (2011), *Logistics Services*. Department of Trade Negotiation of Thailand, [Online] Available: http://dtn.go.th/images/stories/Services_and_Investment/6_2_1_1_1.pdf (March 23, 2013)
- Office of trade services and investment (2013), *Storage and Warehousing services*. Department of Trade Negotiation of Thailand, [Online] Available: http://dtn.go.th/images/stories/Services_and_Investment/6_2_1_1_1.pdf (March 23, 2013)
- Prickett, P.W.(1999), *An integrated approach to autonomous maintenance management*. Integrated Manufacturing Systems, (10/4), 233-242.
- Thailand Board of Investment (2012), *Food Industry in Thailand*.Office of The Board of Investment, Chatuchak, Bangkok, Thailand
- The ASEAN Secretariat(2008), *ASEAN Economic Community Blueprint*. [Online] Available: <http://www.asean.org> (October 10, 2011)
- The ASEAN Secretariat(2011), *ASEAN Economic Community Factbook*. Public Outreach and Civil Society Division, The ASEAN Secretariat, Jakarta, Indonesia.
- Tsarouhas, P.(2007), *Reviews and Case Studies: Implementation of total productive maintenance in food industry: a case study*. Journal of Quality in Maintenance Engineering, 13(1), 5-18.
- Xia, Y. and Buccola, S.(2003), *Factor Use and Productivity Change in the Alcoholic Beverage Industries*. Southern Economic Journal, 70(1), 93-109.
- Yam, R.C.M., Tse, P., Ling, L. and Fung, F.(2000), *Enhancement of maintenance management through benchmarking*. Journal of Quality in Maintenance Engineering, 6(4), 224-240.
- Zandieh, S., Tabatabaei, S.A.N. and Ghandehary, M.(2012), *Evaluation of Overall Equipment Effectiveness in a Continuous Process Production System of Condensate Stabilization Plant in Assalooyeh*. Interdisciplinary Journal of Contemporary Research in Business, 3(10), 590-598.

EFFECT OF PERCEIVED QUALITY, PERCEIVED VALUE AND CUSTOMER EXPECTATION ON CUSTOMER SATISFACTION OF PROFESSIONAL SERVICES COMPANY: EMPIRICAL STUDY ON INDEPENDENT SURVEYOR SERVICES INDUSTRY IN INDONESIA

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ABSTRACT

The competition in the independent surveyor service industry in Indonesia in the future is very challenging. The service industry currently protected by the government with the implementation of restrictions on the activities of foreign surveyor service companies to operate in Indonesia as stated in the Negative List of Investment, but in the near future the inspection services will be open to foreign companies. This study aimed to develop a model of Customer Satisfaction in professional services firms, especially in the coal independent surveyor service industries in Indonesia by using the perspective of Relationship Marketing. Developing of customer satisfaction will ensure a long-term competitive advantage. Scope of service activities are independent surveyor on inspection and testing of coal are traded between sellers and buyers for export purposes. Research conducted on independent surveyor service users in particular coal mining companies as producers, exporters and traders. Testing the hypothesis made on the relationship between 7 variables to customer satisfaction. Data compiled from 200 questionnaires completed by corporate decision-makers from 51 exporters and coal trading company in Indonesia and analyzed using the Structural Equation Model (SEM). The results of the study showed that the main factor to build a Customer Satisfaction are Perceived Quality, Perceived Value and Customer Expectation. Furthermore. Research on the perceived quality suggests that perceived quality influenced by reliability, assurance, responsiveness and empathy. Suggestions for future studies is that empathy needs to be studied more in depth to determine its influence in building Perceived Quality in professional service firms. Managerial implications of this research is that an independent surveyor company should focus on the building customer satisfaction through the integration of perceived quality, perceived value and customer satisfaction. The company also needs to provide the quality of service with emphasis on reliability and assurance for the customer.

Keywords: Reliability, Responsiveness, Assurance, Empathy, Perceived Quality, Perceived Value, Customer Expectation, Customer Satisfaction.

1. INTRODUCTION

The independent surveyor industry is included in the government protection scope by implementing the limitation for foreign investments in Indonesia. Therefore, the government still has not given permission for the foreign independent surveyor industry as stated in *Negative List Investment*. However, it has been considered by the authority to open the market for the foreign surveyor companies as a response to the emergence of globalization which seems to have led to a

stronger competition in the independent surveyor markets, including those which deal with coal mining.

The export value of mining product in Indonesia is the highest as recorded in 2011 for US\$ 34.7 billions, with US\$ 27.77 billions is contributed from coal export (Performance Report of Minister of Trade, Republic of Indonesia, 2011). It is predicted that the production of Indonesia's coal in the future will increase as the coal consumption is expected to increase to 33% in 2025 out of the total consumption of energy sources. This eventually leads to the increase in the demand for independent surveyors for coal export. In the relation to the issue, it is important that there is a point of view of customers in selecting the companies providing such service. Kilpady (2005) states that adopting relationship marketing strategy (RM) can play a role in the success of the business in the future.

This research focuses on the test of factors influencing customer satisfaction to the independent surveyor industry in order to build a long-term relationship. It aims to identify and verify the role of reliability, assurance, responsiveness, empathy, perceived quality, perceived value, and customer expectation on customer satisfaction, as well as to build or develop a model of customer satisfaction based on the relationship marketing perspective which describes the relation between those variables and customer satisfaction.

2. LITERATURE REVIEW

Zeithaml *et al.* (2009) in their book, *Service Marketing: Integrating Customer Focus Across the Firm*, state that the concept of relationship marketing basically represents a marketing paradigm shift from focusing on the acquisition/transaction to focusing on retention/relation. The philosophy of relationship marketing is conducting business and strategic orientation by focusing on managing and improving relationship with the existing customers instead of only acquiring new ones. Based on the concept, it is less costly to maintain the old customers than prospecting new ones, and it is believed that a successful marketer is the one who works with an effective strategy to maintain customers. Maxim (2009) in his research on the position of RM confirms that relationship marketing is a new paradigm on the concept of marketing thinking where it represents a new dimension as an addition to the previous marketing paradigms which are only based on transaction activities.

Gounaris (2005) states that there have been very little empirical documentations of Relationship Marketing on professional service, particularly for business-to-business (B2B) marketing. The market in professional service is dominated by the amount of knowledge representation and the rapid increase on economic sectors. Professional service focuses on resources in specific areas of expertise and gain experiences by dealing with the various ranges of clients and being innovative in the engagement process. Knowledge based relationship can be strengthened through mutual trust (Bagdoniene and Jakstaite, 2009). Professional service as an intensive with knowledge business (Doloreux and Muller, 2007) is designed for institutional clients, mostly business but not restricted for non-profit organizations. Jaakkola and Halinen (2006) underline that the characteristics of professional service include having expertise or specialist, having autonomy in making decision, altruism, self management, client participation, and customization in high level.

In service marketing, satisfaction may be defined as a condition when the customer perceive the results from the evaluation of the whole aspects of building a relationship (Savert, 2002 in Casalo *et al.* 2011) and it has been considered as the key antecedent of trust (Bauer *et al.*

2002). Several authors conclude that satisfaction is determined by customer value as the comparison between the perceived attributes and the exchanging processes in marketing or the comparison between the perceived benefits and the spent cost. Customer satisfaction is as well influenced by service quality and expectation, which is a comprehensive subjective evaluation on the service based on the company's level of perception on the service provided which can fulfill the requirement of desires and goals from the customers (Farn and Huang, 2008). Conceptually, the service quality is defined as the difference between customer satisfaction on the service and perceived service (Gronroos, 2000; Parasuraman, Zeithaml and Berry, 1988). Garvin (1998) says that the perceived quality is an image and reputation represented by a product which comes along with the company's responsibility, as well as one of the service quality dimensions used as an outline of planning and strategic analysis.

3. CONCEPTUAL FRAMEWORK

Parasuraman, Zeithaml and Berry (1988), in their researches on various kinds of service industries, identify five major dimensions of service quality which include reliability, responsiveness, assurance, empathy, and tangibles. In professional service industry, tangibles is the least discussed that it is not included in this research. Therefore, the hypotheses are in the following:

H1: Reliability has positive impact on Perceived Service Quality

H2: Responsiveness has positive impact on Perceived Service Quality

H3: Assurance has positive impact on Perceived Service Quality

H4: Empathy has positive impact on Perceived Service Quality

The retention strategy will not achieve a long-term success if the company lacks of a strong basis on service quality as it is the key element of customer satisfaction. All the strategy is built upon the assumption of the competition quality and provided value. Therefore, it is clear that company is expected to initiate the process of relationship development by providing a good major service presentation, or at least fulfilling customer expectation (Zeithaml *et al*, 2009). Zeithaml *et al*. (2009) continue by saying that satisfaction is the key factors in building a strong customer relationship or customer loyalty. Therefore, the hypotheses are in the following:

H5: Perceived Service Quality has positive impact on Customer Satisfaction.

H6: Perceived Service Quality has positive impact on Perceived Value.

H7: Perceived Value has positive impact on Customer Satisfaction.

H8: Expectation has positive impact on Perceived Value

H9: Expectation has positive impact on Customer Satisfaction

Based on the elaboration, the conceptual framework is depicted in Figure 1:

4. RESEARCH METHOD

This research is conducted on coal mining exporting companies and coal trading companies as the customers for independent surveyor providers in Indonesia. Data from the respondents were collected in April to August 2013. The population for the purpose of this research consists of coal mining companies operating as exporter and producers, both being a member of Indonesia's Coal Mining Association (ICMA) and nonmembers, as well as national and international trader. The analysis unit is that every company is selected and in the analysis they are represented by the decision maker for employing surveyor service in the company. The interview process is conducted for respondents in 51 companies.

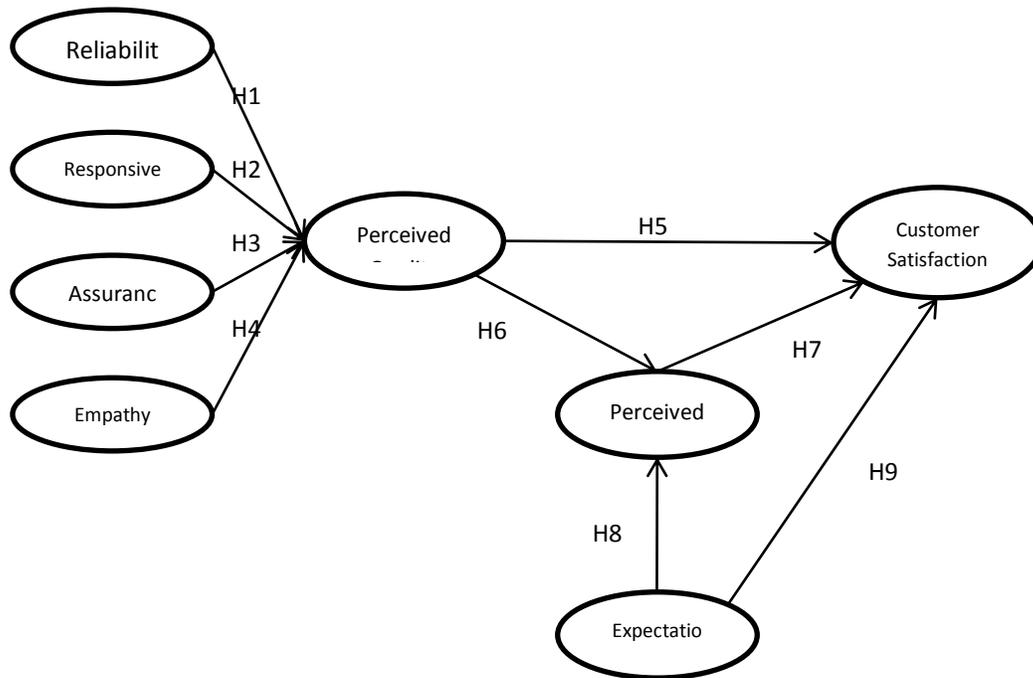


Figure 1. Conceptual Model of Company-Customer Relationship

The purposive sampling method is used for the research. Data are collected by filling the questionnaires for targeted respondents, and then analyzed with descriptive statistic method in structural equation model (SEM) to confirm the structured model. All data are processed with computer software LISREL 8.5.1. The variables for the research consists of independent and dependent variables. Those variables, both exogenous (x1-x17) and endogenous latent variables (y1-y6), are measured with a series of questions where every one of them is composed in accordance with responded indicators using the Likert scale between 1 to 5, in which 1 = strongly disagree and 5 = strongly agree. The cross diagram and tested hypotheses show the relationship among the variables as depicted in Figure 2.

5. RESULTS AND ANALYSIS

Respondents Profile and Market Structure

This research includes 93 respondents representing 51 companies as the users for independent surveyor service where each one of them fill 1 to 3 questionnaires. In total, the number of filled questionnaires reaches 200 questionnaires. Those companies appoint the independent surveyor service for the purpose of coal exporting activities, and they include 43 companies (88.2% of total population) as both exporter and producers (operating coal mining activities) and 8 companies (11.8%) doing their business as trader (buying and exporting) for coal industry.

The characteristic of independent surveyor service market for coal industry in Indonesia influences by the competition character and company's selection for independent surveyor. The selection of users is based on the performance shown by the surveyors consisting of various factors. For the purpose of this research, 4 independent surveyor service companies are appointed by the

coal companies, there are: Sucofindo (46%), Geoservices (30.50%), IOL Indonesia (12.50%) and Carsurin (8.50%), and by percentage of the companies employment is 97.5%.

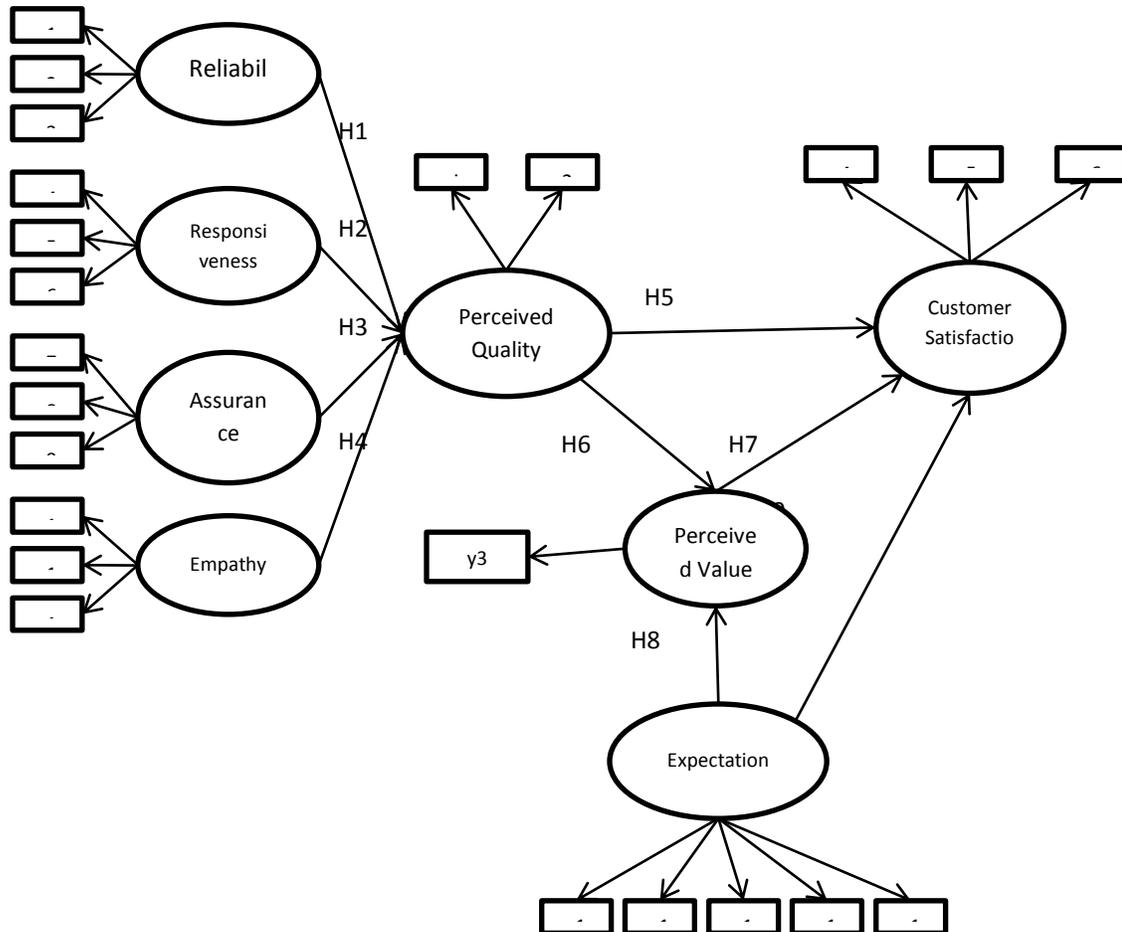


Figure 2. Cross Diagram

Data Analysis

The initial phase for this research starts with an analysis on each sub-model of Relationship Marketing to test the reliability of the measurement model in order to identify the ability of every indicator in explaining the latent variables. The reliability and validity of the measurement construct is chosen to ensure whether a group of indicators is able to explain the latent variables. Hair *et al.* (2006) state that a construct is considered reliable when the value of its construct reliability (CR) is not less than 0.7 or the value of the construct validity (CV) is not less than 0.5. On the other hand, Joreskog and Sorbom (1996) in a more simpler way require the standardized value of indicator variable coefisien (lambda) is at least 0.5. The Lisrel software is capable of explaining the results of test on construct reliability and construct validity for each relationship marketing sub-model in this research as shown in Table 1.

Table1. Latent Variables, Indicator Variables and Result of Reliability and Validity Test

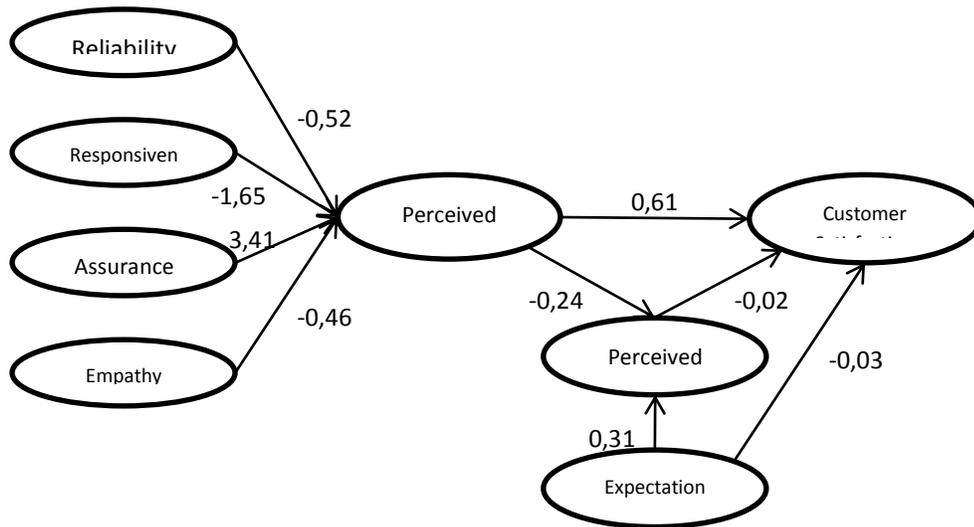
No.	Latent Variables	Indicator Variables	Code	Lambda	Error	t-Value	CR	CV	Reference
1.	Reliability	Accuracy	x1	0.80	0.35	14.58	0.74	0.49	Zeithaml, Berry and Parasuraman (1988)
		Expertise	x2	0.67	0.55	19.90			
		Delivery	x3	0.61	0.63	14.08			
2.	Responsiveness	Informativeness	x4	0.71	0.50	15.87	0.77	0.52	
		Speed	x5	0.69	0.53	16.66			
		Supportive	x6	0.77	0.40	17.07			
3.	Assurance	Reputation	x7	0.72	0.48	15.90	0.70	0.43	
		Security	x8	0.61	0.63	17.78			
		Competency	x9	0.64	0.59	15.43			
4.	Empathy	Individual Attention	x10	0.70	0.51	12.01	0.66	0.39	
		Understanding	x11	0.63	0.60	12.33			
		Flexibility	x12	0.54	0.71	12.20			
5.	Perceived Quality	Customer's Feeling	y1	0.79	0.37	0.73	0.65	0.48	Parasuraman, Zeithaml & Berry (1988)
		Actual Experience	y2	0.58	0.66	0.59			
6.	Perceived Value	Price-Quality Ratio (Value for money)	y3	2.94	5.15	0	0.63	0.63	Fornel <i>et al.</i> (1996), Wang (2009), Zeithaml <i>et al.</i> (2009)
7.	Customer Expectation	Customer Philosophies	x13	0.62	0.64	16.03	0.86	0.55	Zeithaml <i>et al.</i> (2009)
		Customer Needs	x14	0.82	0.33	15.54			
		Perceived Service Alternatives	x15	0.89	0.20	15.29			
		Service Promises	x16	0.69	0.52	13.69			
		Past Experience	x17	0.64	0.58	12.00			
8.	Customer Satisfaction	Service Features	y4	0.78	0.39	0	0.77	0.52	Zeithaml <i>et al.</i> (2009)
		Customer Emotion	y5	0.68	0.54	0			
		Perception of Equity	y6	0.71	0.50	0			

The results from the analysis on the eight latent variable constructs show that the affirmations explaining the indicators are able to explain the latent variables. They prove that all variables are crucial as the basis to get description on the latent variables in different coefficient units.

Structural Model of Relationship Marketing

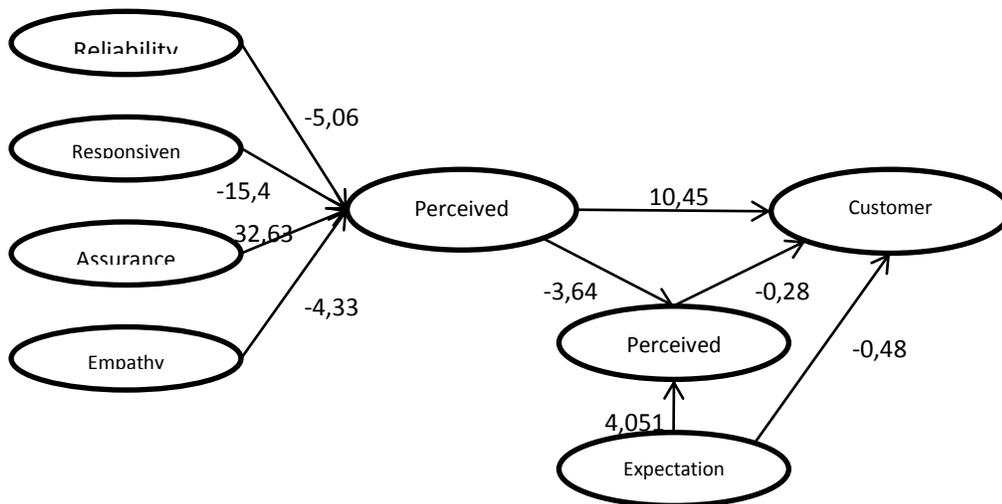
The structural model explained in the framework section indicates that to identify the coefficient value of the model or the contribution of each exogenous latent variables to the endogenous latent ones, it is important to make a coefficient assumption by applying the concept of un-weighted least square (ULS). The results from the assumption along with the coefficient test are explained in the Figure 3. The hypotheses are tested by using two statistic tests (Joreskog,

1998), statistic Khi-kuadrat (χ^2) and RMSEA. H_0 is acceptable if the P-Value (χ^2 test) is more than 0.05 or the RMSEA value is less than 0.08. The results show that the P-Value = 0.53909 and RMSEA=0.000, which mean that in general, the empirical model is acceptable in accordance with the required criteria by Joreskog *et al.* (1996). Meanwhile, the t-value shows the significance of relationship between latent variables as shown in Figure 4.



Chi-Square=153.34, df=165, P-value=0.73258, RMSEA=0.000

Figure 3. Coefficient of Customer Satisfaction Model



Chi-Square=153.34, df=165, P-value=0.73258, RMSEA=0.000

Figure 4. t-value of Customer Satisfaction Model

Table 2 shows the relationship pattern among latent variables.

Table2. Relationship Among Variables

ENDOGEN VARIABLES	EXOGEN VARIABLES	Coefficient Model	t-value	EXPLANATION
CUSTOMER SATISFACTION	Perceived Quality	0.61	10.45	Customer Satisfaction is influenced respectively based on the greatest contribution by Perceived Quality, Customer Expectation and Perceived Value. Perceived Quality significantly influences customer satisfaction with t value = 10.45
	Expectation	-0.03	-0.48	
	Customer Expectation	-0.02	-0.28	
PERCEIVED VALUE	Customer Expectation	0.31	4.05	Perceived Value is influenced respectively based on the greatest contribution by Customer Expectation and Perceived Quality. Both significantly influence customer satisfaction with t value = 4.05 for Customer Expectation and -3.64 for perceived quality.
	Perceived Quality	0.24	-3.64	
PERCEIVED QUALITY	Assurance	3.41	32.63	Perceived Quality is influenced respectively based on the greatest contribution by Assurance, Responsiveness, Reliability and Empathy. The four variables significantly influence customer satisfaction with t value for Assurance, t = 32.63, responsiveness, t= -15.40, reliability, t=-5.06 and empathy t=-4.33. The four variables positively influence Perceived Quality.
	Responsiveness	-1.65	-15.40	
	Reliability	-0.52	-5.06	
	Empathy	-0.46	-4.33	

6. CONCLUSION AND SUGGESTION

Conclusion

Customer satisfaction is influenced by perceived quality, perceived value and customer expectation. The perceived quality and customer expectation variables also influence customer satisfaction through perceived value. Perceived quality is significantly influenced by reliability, responsiveness, assurance and empathy.

Suggestion

It is important to study the perceived value aspect more comprehensively considering that it is the determinant for the construction of customer satisfaction.

Managerial Implication

To ensure customer satisfaction, it is worth noted for the managers of independent surveyor companies in coal industry to improve:

1. Perceived quality through the improvement of customer's feeling/memory. The customers for the service are known to demand for high quality service performance considering that their expectation is equally high.
2. Accuracy, because company's capability in providing service, which includes accurate survey results, is the sole foundation of the independent surveyor company to achieve reliability from the customers.
3. Assurance, which is the ability of the staff members to build the company's reputation before the customers and to guarantee security for them.

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4. Supportive attitude from the staff members by responding customer expectation

7. REFERENCES

- Bagdonieni, L. and R. Jakstaite. 2009. Trust as Basis for Development of Relationships Between Professional Service Providers and Their Clients. *Economics and Management*: 2009, 14.
- Bauer, H., M. Grether and M. Leach. 2002. Building Customer Relations over the internet. *Industrial Marketing Management*, Vol. 31, 155-163.
- Casalo, L.V., C. Flavian, and M. Guinaliu. 2011. The Generation of Trust in the online services and product distribution: The case of Spanish E-commerce. *Journal of Electronic Commerce Research*, Vol. 12(3), 199-213.
- Doloreux, C. and Muller, F. (2007). The key Dimensions of Knowledge-intensive Business Services (KIBS) analysis: a decade of evolution. Working papers Firms and Region, U1/2007.
- Farn, C.K. and Huang, L.T. 2008. Exploring Determinants of Industrial Customers Loyalty on Service Providers in the E-Business Environment- The Perspective of Relationship Marketing. 7th WSEAS International Conference on E-ACTIVITIES (PP.60-67). Cairo.
- Fornel C, Johnson MD, Anderson EW, Cha-Jaesung, Bryant BE. 1996. The American Customer Satisfaction Index: Nature, purpose and findings. *Journal of Marketing*. 60(4):7.
- Garvin, D.A. 1988. *Managing Quality*. New York: The Free Press.
- Gounaris, S.P. 2005. Trust and Commitment influence on Customer Retention: Insights from Business-to-Business Services. *Journal of Business Research*, Vol. 58(2): 126-140.
- Gronroos C. 2000. *Service management and marketing: a customer relationship management approach*. Ed ke-2. Chichester (GB): Wiley.
- Hair Jr, Black WC, Babin BJ, Anderson RE, Tatham RL. 2006. *Multivariate data analysis*. Upper Saddle River (US): Pearson, Prentice Hall.
- Jaakkola, E. and Halinen, A. 2006. Problem Solving within Professional Services: evidence from medical field, *International Journal of Service Industry Management*, 5, 409-429.
- Joreskog Karl, Sorborn. 1996. *LISREL & user's reference guide*. Chicago (US): Scientific Software International
- Kilpady, N. 2005. *Relationship Marketing in Professional Services: A Case Study of Archetectural Practice*. University of Nottingham.
- Laporan Kinerja Kementerian Perdagangan 2011 [internet]. Tersedia pada: www.kemendag.go.id/files/pdf/2012/12/06/lakip.2011-id0-1354804791.pdf
- Maxim, A. 2009. Relationship Marketing – A New Paradigm in Marketing Theory and Practice.”Al I. Cuza” University of Iasi, Faculty of Economics and Business Administration. Rumania.
- Parasuraman, A., Zeithaml, V.A. and Berry, L.L. 1988. Service Quality: a multiple-item scale for measuring customer perception. *Journal of Retailing* , Vol. 64(1): 12.
- Wang, Jau-Shyong. 2009. Trust and Relationship Commitment between direct selling distributors and Customers. *African Journal of Business Management* Vo.3 (12), pp. 862-870.
- Zeithaml, V.A, Mary Jo, B., and Dwayne, D.G. 2009. *Services Marketing: Integrating Customer Focus Across the Firm*. Mc. Graw Hill.

**CATFISH (CLARIAS GARIEPINUS) FRY GROWTH AT REDUCED FEEDING LEVEL
IN THE BIOFLOC CULTURE SYSTEM IN BANDUNG REGENCY, WEST JAVA,
INDONESIA**

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ABSTRACT

The aim of the research was to observe catfish (*Clarias gariepinus*) growth at reduced feeding level in the biofloc culture system. Feed residues and metabolites from catfish farms contain toxic ammonia that can affect water quality and organism growth. However, the existing organisms involved in the biofloc system can change ammonia into a non-toxic nitrite. Biofloc can also be used as catfish feed.

The research was carried out at the hatchery Fish Breeding Centers Ciparay Bandung Regency from April 2014 until June 2014. The research employed the Completely Randomized Design (CRD) design of experiment, which involved six different feeding level reduction treatments, each of which having a different amount of feed but the same amount of biofloc. The research administered the following treatments: (A) 0% feeding level reduction (positive control), (B) 5% feeding level reduction, (C) 10% feeding level reduction, (D) 15% feeding level reduction, (E) 20 % feeding level reduction, (F) 25% feeding level reduction. Each treatment was repeated three times.

The parameter observed was Average Daily Gain (gram/day). Treatments A through F yielded the following results respectively: 0.32; 0.30; 0.29; 0.26; 0.29 and 0.30. Statistically, the results indicated no significant difference. In other words, reduction of feeding level for catfish fry had no effect on Average Daily Gain, and a 25% reduction even yielded the highest result. The water quality parameters observed, namely temperature, pH level, and dissolved oxygen (DO), indicated optimum figures for catfish fry rearing.

Keywords: Catfish, Biofloc, Reduced Feed, Average Daily Gain.

1. INTRODUCTION

Waste from fish farms is dominated by biodegradable organic matter such as proteins, carbohydrates, and fats from unconsumed feed and its faeces. Such waste materials are organic matter which may be used by heterotrophic bacteria as a potential source of nutrition for biofloc supporting organisms, both as fish feed and water quality control. Biofloc is a combination of macro-and microorganisms including bacteria, microalgae, fungi, protozoa, metazoan, and nematodes (Tacon et al., 2002 in Kurniasari, 2010). Floc biomass formed in bodies of water may be consumed by fish as additional sources of feed and as water purifier (Aiyushirota, 2009).

In the biofloc technology, heterotroph bacteria are the organisms quickly converting NH_3 into bacteria biomass. NH_3 is a toxin, yet on the other hand provides the energy required to sustain the bacteria's life. The bacteria then combine with algae and other organisms to create aggregates as natural fish feed. Algae provide the necessary elements essential for the bacteria, which are then rearranged into the required compounds. Both bacteria and algae are naturally occurring and developing organisms. Biofloc technology is environmentally-friendly since it

minimises water pollution and reduces the need for expensive commercial feed – biofloc is healthy and natural (Anonymous, 2013).

2. REVIEW OF LITERATURE

Several studies have shown that the application of biofloc technology plays a role to improve water quality, biosecurity, productivity, feed efficiency, and reduce production costs through lowered feed expenses. Theoretically and practically, the application of biofloc technology improves water quality by controlling ammonia concentrations and improving nutrient consumption as it is consumed by the organism cultured (Ekasari, 2009).

Azim and Little (2008) found that the Feed Conversion Ratio value of the fish farmed using biofloc technology to be better compared to conventional methods. This is consistent with Widanarni et al. (2010), stating that the increased feed efficiency of biofloc technology is due to the presence of additional nutrition sources for the fish in the form of increased biofloc microbe biomass. In Riani (2012), the reduction of commercial feed by 25% for white leg shrimps increases its daily growth rate by 3.1679 %, improved its longevity by 92% with a feed conversion ratio of 0.73. Rostika (2014) found that shrimps whose feed are reduced by 25% experience similar weight increase to those fed at default level.

The findings of Rachmiwati (2008) concluded that tilapia fry using zero water exchange system may benefit from waste produced by catfish farms by developing heterotroph bacteria. Tilapia fry at a density of 125 fish per square metre are capable of growth exceeding 100% every 40 days and improves feed efficiency by 12.07 % through the conversion of waste by heterotroph bacteria from a 100 fish per square meter catfish farm. Adding Carbon element (molasses) in catfish farms increases the fish's survivability by 94.625 % kept over 46 days. The highest specific growth rate is 7.16 % with a feed efficiency value of 85.8 % (Gunadi, 2009).

The advantage of biofloc technology is that both waste management to control water quality and production of feed are conducted on site. Studies on heterotrophic culture making use of biofloc found that at a density of 100 fish per square meter each, the growth rates of catfish and tilapia are 2.51 % and 2.58 %, respectively, with a total production of 80.6 kg and a catfish survival rate of 94.4% and tilapia at 84.1 %. At the start of the study, the average weight of individual catfish is between 41.01 to 45.94 grams whereas by the end the average weight of individuals has risen to 113.73 to 125.51 grams (Kurniasari, 2010).

3. RESEARCH METHODS

This study is conducted at Hatchery UPTD Pembenuhan Ikan Ciparay, Bandung from April 2014 to June 2014.

Apparatuses and Materials

Water gallon, fibre basin, blower, heater, aeration hose and stone, pH meter, DO meter, thermometer, scale, fish net, plastic containers, measuring cylinders, plankton net, plankton identification instruments such as microscopes, counting chambers, cover glass, hand counter, pipette, plankton identification classification, Sangkuriang catfish stock measuring 9 to 10 cm weighing 6 to 7 grams, commercial probiotic, commercial fish feed, and molasses.

Research Method

The research method used is experimental with completely randomized design consisting of six treatments and three repetitions.

Treatment A: feed given at default level (control). Treatment B: feed reduced by 5% of default level. Treatment C: feed reduced by 10% of default level. Treatment D: feed reduced by 15% of default level. Treatment E: feed reduced by 20% of default level. Treatment F: feed reduced by 25% of default level.

The parameters observed are Average Daily Gain and Feed Conversion Ratio (Djajasewaka, 1995).

4. RESULT AND DISCUSSION

Average Daily Gain

Average Daily Gain (ADG) shows the percentage of daily weight gain where higher values equate to increased growth. The observed ADG range of catfish treated with less feed to the control is between 0.26% and 0.32%. Treatment A as control and Treatment F with 25 % less feed does not demonstrate any significant difference in their ADG values. Such lack of difference is due to supplemental nutrition from the biofloc in addition to commercial feed. Biofloc consists of several microorganisms, such as bacteria, fungi, microalgae, and zooplanktons such as rotifer (Figure 1).The microorganisms are natural fish feed containing enough nutrition to meet the dietary needs of the catfish.

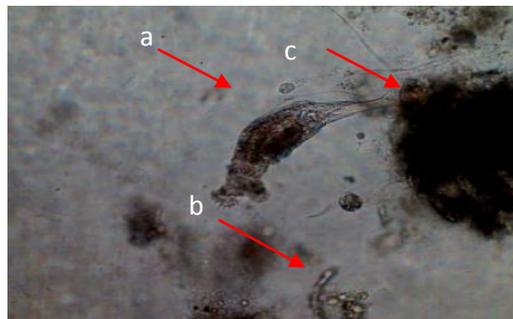


Figure 1. Bioflock (a:Rotifer, b:Alga, c:Flock)

Suprpto and Samtafsir (2013) state that in a fishery environment, biofloc serves as additional source of feed for fish and suppress the growth of pathogens. Biofloc contains polyhydroxy alkananoate (PHA), which when consumed is decomposed by digestive enzymes and forms alkananoic acid capable of reducing the growth of harmful gut bacteria and promotes digestion of consumed feed.

Table 1.Sangkuriang Catfish Average Daily Gain

Treatment	Feeding Level	Average Daily Gain (%)
A	Default level	0,32
B	Feed reduced by 5%	0,30
C	Feed reduced by 10%	0,29
D	Feed reduced by 15%	0,26
E	Feed reduced by 20%	0,29
F	Feed reduced by 25%	0,30

Note: Values followed by similar letters shows no significant difference tested using Duncan's Multiple Range Test at 5%.

Feed conversion ratio

Treatment A as control and Treatment F with 25% less feed shows significant difference in its feed conversion ratio. The lowest feed conversion ratio during the period of this study is 0.795 in Treatment F (feed reduced by 25%) whereas the highest is 1.037 in Treatment A (feed at default value).

The feed conversion ratio of each treatment is in order of treatment (Figure 2). Higher feed level equates to higher feed conversion ratio. The reason is because catfish breed using biofloc experiences similar growth rates between treatments and does not show significant difference in weight increase when tested using Duncan's multiple range test. Thus, the lowest feed conversion ratio obtained in Treatment F (0.795) shows the prospect of producing a one kilogram catfish using only 0.795 kilogram of feed.

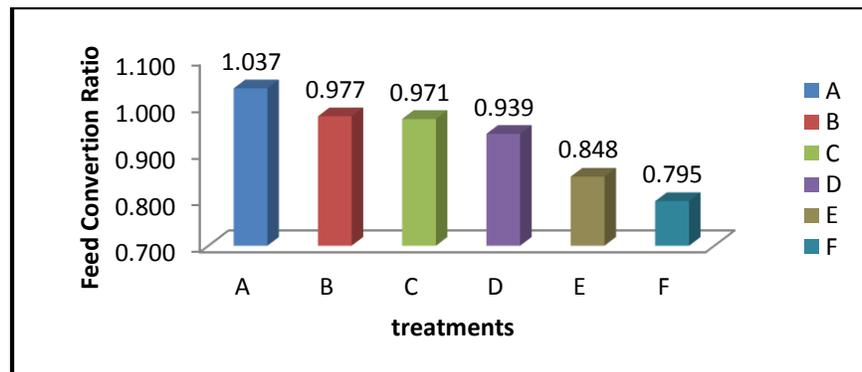


Figure 2. Feed Conversion Value

At the start of this study, the initial feed conversion ratio is deemed satisfactory with values ranging from 1.037 to 0.795 which is in agreement with the findings of Mudjiman (2008), where the feed conversion ratio of fish and shrimp range between 2 to 2.5. It should be noted that lower feed conversion ratio demonstrates efficient feed consumption. Such low conversion value also shows the fish's own ability to efficiently digest and convert the given feed into lean mass.

5. CONCLUSION

This study concludes that:

- Catfish with reduced and default feed levels shows similar Average Daily Gain (ADG) values.
- Catfish breed using the biofloc system and with reduced feed level shows significant difference in its feed conversion ratio.
- Reducing catfish feed by 25% is a viable option to reach 0.30% ADG, 0.795 feed conversion ratio, and 90% survivability.

6. REFERENCES

- Aiyushirota, I. 2009. *Konsep Budidaya Udang Sistem Bakteri Heterotrop dengan Bioflocs*. Aiyushirotabiota. Indonesia.
- Anonim. 2013. *Teknologi Bioflock Hemat Pakan Ikan*. <http://budidaya-ikan.com/teknologi-bioflock-hemat-pakan-ikan/>. Accessed on 22 September 2013.
- Azim, M.E. and Little. 2008. *The Biofloc Technology (BFT) In Indoor Tanks: Water Quality, Biofloc Composition an Growth and Welfare of Nile Tilapia (Oreochromis niloticus)*. o, 283: 29-35.
- Djajasewaka, H. 1995. *Penggunaan Silase Ikan sebagai Pengganti Tepung Ikan dalam Pakan Ikan Mas (Cyprinus carpio L)*. Buletin Penelitian Perikanan Darat.
- Gunandi, B., et al. 2009. *KASK: Rasio C/N dan Akumulasi Limbah pada Budidaya Ikan Lele Secara Intensif*. Loka Riset Pemulihan dan Teknologi Budidaya Perikanan Air Tawar. Sukamandi-Subang.
- Kurniasari, A. 2010. *Pengaruh Pemanfaatan Bioflock Terhadap Produksi Total Lele dan Nila pada Sistem Budidaya Heterotrofik*. Thesis at the Faculty of Fisheries and Marine Sciences, Universitas Padjadjaran.
- Rachmiwati, L. M. 2008. *Pemanfaatan Limbah Budidaya Ikan Lele (Clarias sp.) oleh Ikan Nila (Oreochromis niloticus) Melalui Pengembangan Bakteri Heterotrof*. Skripsi Fakultas Perikanan Dan Ilmu Kelautan. Institut Pertanian Bogor.
- Riani, H., et al. 2012. *Efek Pengurangan Pakan Terhadap Pertumbuhan Udang Vaname (Litopenaeus vannamei) PL-21 yang Diberi Bioflock*. Jurnal Perikanan dan Kelautan. 3(3): 207-211 (2012).
- Rostika, R. 2014. *The Reduction Feed on Shrimp Vaname (Litopenaeus vannamei) Replaced by The Addition Biofloc in Ciamis District*. Research Journal of Biotechnology. 9(2): February (2014).
- Suprpto and Samtafsir, L. S. 2013. *Biofloc-165*. Depok. Penerbit AGRO 165.

**CONCEPTUAL FRAMEWORK FOR EMPLOYMENT PARADOX:
BUSINESSPEOPLE ATTITUDE IN THAILAND**

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ABSTRACT

The employment paradox is one of perplexing problems that governments in many countries do not know how to deal with. This study delved into this conundrum through an internet interview of voluntary participants who are micro, small, and medium business owners and workers from different companies. Quotes from the interview were analyzed and filtered to deduce factors which influence the employment paradox. In the resulting accumulation of data, there are three groups of attributes which are, employee attributes, business attributes, and national attributes. Employee attributes are composed of job satisfaction, life satisfaction, capability, personal image, trend influence, business etiquette, industriousness, and level of education. The business attributes consist of business ethics, fringe benefits, workplace climate, payment, management skill, leadership, and the entry barrier. National or country attributes carry the number of foreign workers and the quality of the education system. All attributes are assembled into a conceptual framework to explain the employment paradox.

Keywords: Employment, Paradox, Thailand, Business, Attitude, Conceptual, Framework.

1. INTRODUCTION

Generally speaking, when someone asks a manager how and why problems occur due to the unemployment phenomenon, they will invariably answer that it is because the available manpower in the country exceeds the requirements of the job market. If somebody asks managers about the cause of the vacant job problem, surely they are going to say that it is due to an insufficiency of workforce in the country. Perhaps, these two problems, which are unemployment and job vacancies, cannot take place in the same period of time. Unfortunately, these two problems can occur simultaneously. Just how, why and when can the unemployment problem and the job vacancy problem occur in the same period of time? This is a question that has plagued many entrepreneurs around the world. In concordance, Thai entrepreneurs, especially in micro and small enterprise, want to know this answer as well. This strange phenomenon is called the 'Employment Paradox'.

To put the Employment Paradox in perspective, imagine a person that cannot find what he/she wants to eat even though there are more than fifty restaurants along the street. Similarly, there is a mass amount of unemployed people looking for work, while organizations are unable to find enough workers to meet their requirements. Although there are a hundred jobless adolescents in the local village, the manager cannot find four or five people to work in his or her factory, regardless of the fact that the job requirements are very basic, such as rudimentary assembly, for example.

Yes, it may sound strange but it is the reality in Thailand. Despite a high number of unemployed, which was estimated 370 thousand people in January of 2011,

and about 360 thousand people in January of 2014 (Department of Employment, 2014), many Thai entrepreneurs in small and micro businesses and some medium enterprises still post job recruitment posters on their manufactory walls and in newspapers, concurrently, many Thai young villagers remain out of work. Why and how? The question still remains and some researchers and many practitioners are in a quandary because of it.

In this regard, this study explored into the elusive gap between the two problems, unemployment and vacant jobs, to search for the factor or factors that lead to this conundrum, the employment paradox. The main goal of this study is to generate a conceptual framework for the employment paradox through interviews. The next section of this paper is literature review. Reports, research, news, and so forth that relate to the employment paradox are discussed. Consulting and interviewing Thai business people essential to this study for the gathering of information. Information meta-analysis will take place following the interviews, and summarized in the conclusion section.

2. LITERATURE REVIEW

Employment Paradox

Unfortunately, it is a probability that no one has offered to define the employment paradox academically, although most researchers and practitioners know that what it is. To reiterate, 'Employment Paradox' is a phenomenon with two facets, which are unemployment and vacant jobs, occurring in the same period of time and in the same country. Numerous studies describe the many attributes that lead to unemployment and job vacancies.

Disability

Kaye (2003) pointed out that disabilities cause a loss of opportunities for employment. With this in mind, Kaye's (2003) research concerns the improvement of employment opportunities for people who are disabled. The rate of employment opportunities of the handicapped is steadily increases because managers are beginning to change their attitude in a positive way. Broadly speaking, however, many business owners still have a negative attitude toward employees with disabilities. 'Why do not employers hire and retain workers with disabilities?' Kaye and colleges (2011) gathered information from their respondents and extrapolated that "the principal barriers to employing workers with disabilities are lack of awareness of disability and accommodation issues, concern over costs, and fear of legal liability." Consequently, the helping and supporting by the government is really important, "policy changes or public programs that could increase labor force engagement among working-age grownups that have disabilities" (Kaye *et al.*, 2011).

The term 'disability' can be separated into two major categories, which are physical disabilities and mental disabilities. According to Scheid (1998), industries that had followed the ADA (Americans with Disabilities Act) had policies in place for hiring men or women with physical disabilities. On the other hand, mentally handicapped people are likely to have less advantage vis-à-vis physically handicapped people do to managerial belief that the employment of someone with mental disabilities is not one of the company responsibilities. Perhaps, Scheid (1998) was right. It can be risky to have a workforce with mental disabilities in the assembly line while not so much so with physical disabilities. Nevertheless, not all types of mental disability have a negative effect on employees' overall performance. It depends on what kind of work they do. Summarily, disabilities can be one of the barricades of

employment opportunity for those affected, and managers are more open to hiring handicapped employees for their firms than they were in the past.

Educational Background

Formal education can increase the employment opportunity for the workforce. In the study of Helgesson *et al.* (2014), Swedish high school dropouts were found to have a higher risk of unemployment in a follow-up study after five years (Hammarstrom and Janlert, 2000 cited by Helgesson *et al.*, 2014). In addition, for immigrants to Sweden, one of the potential reasons that cause unemployment is a lack of higher education. Their study showed a negative relation between education and the risk of future unemployment meaning that the higher the educational level, the lower the risk of unemployment in the future. Weber (2002) offered the same idea about the benefits of higher educational. "There is strong empirical evidence that unemployment rates decrease as the educational level rises," stated in the first line of Weber's (2002) abstract. Likewise, Núñez and Livanos (2010) concluded that an academic degree is more helpful in reducing the likelihood of short-term joblessness. In China, the tendency of unemployment for people who have graduated from primary education and secondary education is higher. Bai (2006) stressed that a tertiary degree is needed, thus the government should develop higher education if funding is sufficient or the unemployment rate will increase.

In contrast, DePrince and Morris (2008) implied that a higher educational degree cannot guarantee a lower risk of unemployment in some cases. Today, bachelor's degrees are a dime a dozen, only those individuals that have a special skills that match employers' needs get the job. Nevertheless, the higher the level of education relates directly to a higher probability of a person getting hired.

Some studies define the term 'skill' as 'education', case in point Decreuse (2001), who wrote that 'skill' stands for 'education' and categorized skill into two types, schooling and learning-by-doing. Decreuse (2001) cited Sicherman (1991) to emphasize the phenomenon called 'overeducation', where the individual feels overeducated for the job he or she occupies. Naturally, a person with a master's degree would not want to get a job that requires only a bachelor's degree.

Workforce Skill

Rappaport (2012) figured out why unemployment differs persistently across metro areas. One observation involved the skills of workers. "A possible explanation for large and persistent differences in metro unemployment is that they reflect differences in the skills of metro workers," hypothesized Rappaport (2012). That could mean most jobless people have a lack of working skills. For managers, if they hire people with low skills, business owners will be forced to pay for additional training. Gatta (2008) explained that low-skill working adults need education and training. The use of technology and online learning provide workers the greatest advantage of opportunity. Many adult students have reported enthusiastically that they could not have completed their education or skills training program if they had not been available online (Gatta, 2005 cited by Gatta, 2008).

Some jobs require more a higher skill level than others, for instance, a nurse. McHugh *et al.* (2011) discovered that California's government has no plan to reduce the nursing skill level requirement as people had feared. Hospitals in the state followed the trend of medical institutions nationally by increasing a nursing skill mix, and employed more highly skilled nurses as a primary staff. Working in a hospital is about a matter of life and death, highly skill medical and experienced workforces are very significant.

Culture, Religion, and Stereotypes

There are many things that are prohibited in different cultures or religions, and that can cause unemployment. Culture and religion do not impact employment directly. Read and Oselin (2008) found in their case study that Arab American women with higher educational attainments had lower employment rates vis-à-vis other groups of American women. “Why?” They answered that because most Arab Americans universally support female education as a personal resource rather than one of economic mobility, more to assure the future of their children, family solidarity, and the maintenance of ethnic and religious mores.

People who were born in non-English-speaking nations are more likely to have difficulty with languages and culture. In Australia, Carroll (2006) explicated that being born in a non-English-speaking country is related with very lower transition rates from unemployment to employment. In Nepal, Banerjee *et al.* (2014) summarized that culturally based differences results in differences in unemployment rates and other attributes as well. Thus, culture and religion can be a barrier to employment to some degree.

Age, Gender and Population

Not only disability, education, skill, culture, religion, and stereotypes are some examples of obstacles that do not let people escape from their unemployed status; age and gender are obstacles as well. Rudawska (2010) wrote about people who remain active in the workplace and its impact on the labor market and implied that “if increased numbers of healthy older people were to extend their participation in the work force, their contribution to public revenues would continuously increase.” Not all elderly are unable to work; some are still healthy and want to find ways to augment their lives financially and to keep busy. An example that many Thai people can see every day is many old English native speakers come to Thailand to look for schools where they can teach English and receive their pension.

On the flip side, however, globally, the unemployment rate among youth is steadily increasing likewise with elders. One of the most severe implications of rapid population growth is that demand for jobs exceeds the availability of work. As Barwell (2000) offered, UK unemployment rate has steadily decreased from 1984 to 1998 due to a drop in the birth rate in the 1970s, the ‘baby bust’. Not far from that period of time, in Israel, there are differences in job finding intensity for the differences ages in Israelis women. Kulik (2000) studied in this topic and discovered that post-adolescents, up to age 21, spent most time seeking employment, about one a week. Israelis women in the young adult group, age 22-35, were least likely to reject job offers owing to financial considerations. The adult and mid-life groups, age within 36 and 49, tended to refuse job offers due to family obligations or work conditions. The last group, late adulthood, age 50-62, unemployment does not matter, they have less financial worry than did the rest of the women’s groups. Kulik (2000) drew a big clear picture of the breakdown among women, age, and employment in Israel.

Every detail discussed in this section concerns the matters of employment and unemployment. In summary, a younger person has the higher chance of getting the job than an older person when both have equal education and same level of special skills. Do Men or women have the better opportunity to get a job? No one really seems to know. It depends on other factors, such as local tradition, personal attitude (of employee and employer), personal image, nationality, connection, and so forth. For business owners, they often make sure that workers they hire are qualified and worthy of their pay. For some firms acquiring sufficient manpower is a never ending

battle. Although thousands of applicants might apply for the job, the vast majority do not meet the job requirements. As a result, the employment paradox is like a parallel path that never meets, employers are seeking employees, and employees are seeking employers.

3. MODEL DEVELOPMENT

Interview Businesspeople in Thailand

The main goal of this section is to sift the factors that probably involve the employment paradox via an internet interview method. This study has various types of the respondents; a small business owner, a medium business manager, and a staff member. There are twelve voluntary respondents in this study as follows: four small business owners, one medium business manager, and seven employees. The result is variety of information is collected and analyzed for key words in their speech. There are three categories of attributes, which are (1) employee's attributes, (2) business's attributes, and (3) country's attributes. With many researches and theories, the conceptual framework for the employment paradox is established.

The employment paradox may not be a major problem for large scale enterprises in Thailand. Most businesses here with large economy of scale usually have plans for various contingencies. Conglomerates are attractive for people to work for, due to their good image, which gives them more access to human resources. Once, Porter (2004) explained that "although Ford and GM have relatively similar strategies and could be classified in the same strategic group, GM's greater scale allows it to reap some of the economies inherent in the strategy that Ford cannot" (p. 143). Thus, the large scale of the firm provides advantages and protects it from a whole myriad of problems. In contrast, micro and small firms have to search for workers because managers feel that there is an insufficient workforce for their business. As mentioned earlier, about 331,000 is the number of unemployed Thai people in first quarter of 2014 (Department of Employment, 2014). Although this is a relatively small number when compared with the total Thai population, many teenagers who live near small factories are unemployed, and those factories have many empty positions.

Micro and small firms are in a big red ocean, they have to pay more and offer some benefits that are better than the others if they want to hire someone in this day and age. The minimum wage in Thailand is 300 baht but micro and small businesses have to pay at least 500 baht to keep their workers. This is a battle for wage leadership.

Owner and Manager Interview

Interviewed two managers of a micro industry, construction material producer and supplier of large Thai business, they explained that:

"Here, you can see many jobless people walking on a road and living in their home with a bottle of liquor in their hands, meanwhile, we, small businesses never stop seeking for workers. I used to be confused by such a situation, a lot of unemployed people are available in the labor market, but we cannot get any of them to work. Three of our employees quit. Two said that they would rather sit in the back of a pickup and hit on young women on the foot path in country side than work. The other one did not want to work on an assembly line because it was messy due to lubricants involved in production. Although we pay more than other companies, they still wanted to leave.

The population of available employees is decreasing, but the number of micro business owner is shapely increasing as former workers want to be rich and start their own micro businesses. They do not want to be an employee forever, so they have only two choices either start their own business or become unemployed. Many are under the illusion that starting a micro business is such an easy thing, for example, opening an air conditioning installation service or opening a metal works facility.”

There are three key words form these two managers as follows: ‘job satisfaction’, ‘life satisfaction’, and ‘entry barrier’. From what managers said, many Thai workers do not enjoy tedious jobs, even though they might pay more money. They want a more challenging job with a business owner who likes to drink alcohol with them. According to the theory of work adjustment, it is probable for an employee to change his or her job if individual satisfaction and workplace atmosphere are not coordinated (Dawis *et al.*, 1968). This theory tells us that in some cases, the employee meets one-hundred percent of the employer’s requirement, but the employer does not reciprocate with the employee’s wants. Surprisingly, money and job duties are not deciding factors for some people.

In the second paragraph of the interview with the same managers, they pointed out more about employee’s attitudes. In sum, two managers explained that some workers want a better quality of life and think that the business does not provide to the level they expect. As a result, they left.

Besides the theory of work adjustment, job satisfaction and employee attitudes can explain this case. Saari and Judge (2004) stressed that job satisfaction is linked to an employee’s attitude toward a job. Satisfied staff is a productive resource of the firm. It is not an easy task to maintain an employees’ satisfaction level for a long period of time, but it is not an impossible goal to achieve. Job satisfaction is related to the outcomes of the organization. For job performance, the link between it and job satisfaction depends on the complexity of the job. The link will get stronger when job complexity is higher (Judge *et al.*, 2001 cited by Saari and Judge, 2004). However, life satisfaction is one of the significant factors to maintain job satisfaction. The best thing that the organization could do is maintain job satisfaction, but job satisfaction is one part of employee’s life satisfaction and that is difficult to control (Saari and Judge, 2004). High job satisfaction and high salary do not translate into high life satisfaction and that why some employees decide to quit their jobs even though their wage is high. Likewise, Herzberg (2011) explained that ‘personal life’ is one of the hygiene factors (dissatisfaction-avoidance factor) that cause the decrease of the worker’s job satisfaction (pp. 37-40).

Porter (2004) implied that the height of the entry barrier is reliant on the scale economic, product & service differentiation, capital requirements, switching cost, access to distribution channels, and government policy (pp. 7-13). In reality, Thai small and micro firms really have a very low entry barrier. Their economy of scale is low, less differentiation among the same strategic group, low capital requirements, various paths to access to distribution channels, and lax government policies. That why some Thai workers quit their jobs to start a new business. For example, opening an air conditioner installation service only requires four or five workers, and when necessary, neighbors who live in the same neighborhood can work part time.

P1: Employee's job satisfaction has a negative impact on unemployment and job vacancies.

P2: Employee's life satisfaction has a positive effect on Employee job satisfaction and vice versa.

P3: Business entry barrier has a negative relationship with unemployment and job vacancies.

Another respondent, who is a micro manufacturer, pointed out that leadership is significant to maintain the employee's satisfaction. He explained as follows:

"I have my micro business. I require one pickup driver, three workers for the assembly line, and one clerk. Every day, I have to do everything alone, starting my work day at 2:00 am and working until 4:00 pm. It is extremely hard work. In spite of a very high return, I have no time to organize my business. Thus, it is difficult to seek for new customer groups. Previously, I had five people working for me. Due to my lack of leadership skill, my most experienced and best workers left me for new jobs. The rest of my men are unskilled, inexperienced, and disrespectful. My lack of leadership made caused a lot of anxiety. It is not easy to find new employees these days. Many prospective employees would rather drive a taxi as it is much less complex work. If I want to hire a new clerk, I have to be concern myself with employee theft. Most Thai people want comfortable jobs, high benefits, good social status, easy promotion, many days off, and so on.

Compared to foreign laborers that come to work in Thailand, they really are dedicated workers, they are dedicated to their job, and their only goal is to send much money as they can from Thailand to their family back home. However, some of them are unfriendly, and we don't trust some of them."

The interesting key words in his messages are 'leadership' and 'foreign laborers'. The respondent stressed that the leadership ability of the business owner is integral as it is the heart of business. For leadership, Goleman (2011) suggested that previous studies have shown that successful managers must have strengths in self-awareness, self-regulation, motivation, empathy, and social skill (p. 3). This five attributes together can allow the manager to foster his/her employees' job satisfaction, and to some degree employees' life satisfaction.

Moreover, Goleman (2011, pp. 4-5) wrote that there are six styles (modes) of leadership that businesspeople should know how and when to use or to switch.

1. The coercive – order subordinates to do as the manager says, especially in a grave situation.
2. The authoritative – persuade subordinates to associate with the leader notion.
3. The affiliative – good to generate harmony and morale, but care must be taken to avoid poor performance.
4. The democratic – by giving people a voice in decisions that help draw new ideas.
5. The pacesetter – the leader is a very good example to the subordinates to follow.
6. The coaching – teach foot soldiers how to be a good knights.

Imagine the elite military forces, they use a sniper rifle for a long range target, and when they are in the building, stun grenades and submachine guns to help them to secure a room quickly. In the same regard, for businesspeople, some situations are suitable for some leadership styles, it depends on many factors; workplace climate, for

example. Prioritizing the right styles for the right situation is the art of employee maintenance.

About foreign laborers, they are one of the underpinnings that foment the employment paradox in Thailand. How? They say they can work hard for a wage which is lower than national minimum wage. According to Porter's (2004) generic strategies, customers want to buy bulk products from the firm that offers the lowest price to them (p. 39). Likewise, manufacturers want to cut costs by employing workers who are willing to accept a lower wage. Naturally, foreign workers are very attractive to Thai small business owners which make Thai workers less desired. Thai workers are becoming notorious for their lack of sedulousness. In this regard, management leadership and employee productivity is very important.

P4: There is a positive connection from a business owner's leadership to employee's job satisfaction.

P5: Number of foreign workers has a direct impact on the level of Thai worker unemployment as it decreases the number of job vacancies.

The forth participant is a medium business owner who volunteered his response to the employment paradox. His organization has many share holders and a hundred plus employees. His opinion is as follows:

"Small or big, whatever scale your business is, this problem (the employment paradox) can occur anytime. In my view, I must focus on skill and morale when I choose someone. When I listen to other business operators they often complain a lot about job vacancy, I think that is owing to a lack of managerial skill rather than the number of employees. Owners have to learn how to allocate their people properly and train employees so that they can be multifunctional when necessary.

From conversation with few experienced CEOs, I can make a conclusion into three subtopics:

- 1) New generation workers like less job complexity, high pay, good fringe benefits but are unworthy.*
- 2) Strategy and direction of the business must be defined. Management must hire only people with attributes that match core business requirements.*
- 3) Media and social trends have an impact on the mindset of college graduates. We are living in an age of materialism; young people long for quick money to buy frivolous items they want now rather than concern themselves with saving for their future."*

New influence factors were ascertained from his comments, which are 'employee's industriousness' and 'business's management skill'. Employee's industriousness is linked to employee job satisfaction positively. Herzberg (2011) wrote that 'a six-day week is inhuman' and 'a ten-hour day is exploitation' to imply the fringe benefits that an employee should receive (p. 34). In this standpoint, Herzberg (2011) tries to tell us that amount of work time relates to an employee's job satisfaction. Each person has a different limit. As an example, Ms. A can work over ten hours a day without complaint, Mr. B works six hours a day while protesting the 'long' hours. In this respondent's view, many Thai employees lack industriousness meaning that their limit is low which results in low job satisfaction.

Business's management skill looks and sounds like 'leadership' from the previous respondent, but that is not the case at all. According to Buckingham (2011), there are three tactics that a good manager should implement, as follows:

- (1) 'Capitalize on employees' strengths' – by observing a worker's reactions to events, listen to find out what he/she expects, watch for their weaknesses, and offer them training or job assistance if required.
- (2) 'Activate employees' strengths' – If a person values recognition from his/her peers, laud him/her publicly. If a person values recognition from a superior, just praise him/her privately. If a person values admiration from others, give him an award. Last, if a person values recognition from customers, post a photo of him/her and his/her best customer in the workplace.
- (3) 'Tailor coaching to learning style' – If an employee does not want to make any mistakes, give him/her time to learn. If an employee is always learning by trial and error, assign him/her easy jobs first. But, if a worker is a watcher, let him/her see how the professionals perform (pp. 93-95).

These three tactics help a manager to know how to design his/her workforce and assign a person for tasks that he/she will be good at. Hence, when managers know how to organize their manpower in ways that accomplish the work, job vacancies will be reduced. In addition, for managers, management skill helps them to improve their leadership ability as well.

P6: Employee's industriousness has positive link to employee's job satisfaction.

P7: Business's management skill has negative relation on job vacancies.

P8: Business's management skill has positive impact on business's owner leadership.

Next, this study respondent is American who founded a successful fancy costume company in Thailand for seven years. He pointed out about Thai employee's characteristics which are different from workforces in other countries.

"Having worked in upper management with many major Korean firms, such as Samsung and LG, it was an unspoken company policy that staff in any department would not leave the office before their manager, if the boss stayed late, you did, too. There were many unspoken rules. On the other hand, there were numerous and generous benefits such as bonuses, vacations and other perks.

In contrast, businesses in Thailand seem to have their rules written in stone. People are told what to do and how to do it and no deviation is allowed. The expectations of management are very high, while the expectations of staff are not much taken into consideration.

Having run a business for a number of years in Thailand, in the beginning I found that a good salary was sufficient in keeping employees happy, but over time they became dissatisfied and wanted more, until it came to the point that profitability was suffering and productivity was lacking. I had to reassess everything and change to piecework over an hourly wage. Once I changed to piecework, the change was profound. I no longer had to concern myself with staffing problems because as soon as I had my people working from home the job became a family affair so suddenly it was much easier to increase productivity and improve quality. Since they were working at home, the whole family got involved."

From his statements, two significant factors, 'job payment' and 'management skill', are visible. About management skill, they are already discussed in the interviews with the fourth participant. In this case study, the fifth answerer pointed out that he was changed a style of payment in order to maintain employees' job satisfaction. Flexibility is one of management skills that business owners should keep in mind.

For payment, it is common sense that everybody understand how it links to satisfaction in job. For example, number of studies (Oshagbemi, 2000; Tepeci and Bartlett, 2002; Pelit *et al.*, 2011) explained that the employees in service businesses are not satisfied if they determine that the amount of work they performed was not compensated fairly, consequently, low job satisfaction is the only result.

P9: Job payment has positive connection with employee's job satisfaction.

Employee Interview

For variety in perspective, some of the respondents are not business owners. Some are experienced staff members from different companies. First is a key person in charge of HR recruitment. He told a story that directly relates to the employment paradox conundrum in Thai, as follows:

"I had a chance to interview a number of young female graduates who were candidates for a job. But, often something strange occurred during the interview. Why do so many of them have to bring their boyfriend (or husband) to the interview? I understand that the nature of a boyfriend is cherishing his girlfriend, or driving his girlfriend to the interview, but that doesn't mean he has to follow her around like a lost puppy, especially to a job interview.

In fact, the head of human resource division gives everybody an opportunity to apply for the job but he/she can easily cross a name off the list, especially if a boyfriend or husband feels the need to get involved in the employment process. For some companies, the interview takes place in a reception hall and applicants should respect to the institution. Just think about appropriateness."

The important concepts from both paragraphs are 'business etiquette' and 'personal image'. Perhaps, no researcher explains about properness and employment. Nevertheless, some previous studies can be utilized to review the connection between etiquette and its impact on employment. For instance, talking about an organization's culture, Ravasi and Schultz (2006) broadly defined the term 'organizational culture' as "a set of shared mental assumptions that guide interpretation and action in organizations by defining appropriate behavior for various situations." In other words, organizational culture is the common path for all actors in the firm. In this study, properness can be generally defined as a set of behaviors that match the inherent patterns of the organization. Many of the job candidates' boyfriends are discourteous and do not show respect to the company and staff members in the interview room, doing such things as sitting with their legs crossed and speaking loudly into a mobile phone during the interview.

It is not just about properness, it is also about personal image. When a job candidate comes with her boyfriend, it implies that she cannot do an interview without a guardian. In the interviewer's perspective, this job candidate is immature which

translates to a lack of job compatibility because this job candidate cannot achieve her tasks on her own. It is a very bad personal indicator which causes many young women to miss out on a job. Hence, suitability and personal image provide an opportunity for the individual to get employed. Lack of properness and personal image are some more factors that cause the employment paradox.

P10: Awareness of business etiquette has negative relationship to unemployment and job vacancies.

P11: Personal image has negative relationship to unemployment and job vacancies.

The next respondent was a job interviewer and the writer of an examination paper for a programming position. Mainly in this interview, he said that personal capability is required.

"I was given the task interviewing and ascertaining the ability of applicants for an IT division at a previous company. I saw a lot of topics in internet forums talking about the low salary for a computer programmer. Some said that this was because programmers are not much different from laborers in that they can use a computer keyboard. But, they never acknowledge their own lack of programming skills. I always focused on reasoning and problem solving logic rather than command recitation when I designed a test. Some companies like candidates to physically write source code on paper as a test method. I do not understand the purpose of this kind of test because anyone can find code in an API Doc (help) or search Google. In this regard, I allow candidates to open their books and surf the internet during the test.

Unfortunately, less than 10 percent of all candidates passed the test. The company owner asked me how difficult my examination was. I told him that it was no more difficult than any of the basic duties the staff in his IT division was performing on a daily basis. They thought that the test is hard because they did not understand what algorithms were. This is due to the fact that the Thai education system requires students to memorize rather than causality and learning by doing. In short, those candidates lacked capability."

From his vantage point, the key words are 'capability' and 'education system'. Earlier in this study, workforce skill is discussed in the literature review section. Many studies (Rappaport, 2012; Gatta, 2005; Gatta, 2008; McHugh *et al.*, 2011) explained that the high workforce skill or employee's capability translates into a higher potential for the individual to get hired. In reality, all business owners want skillful people to work for them although skillful workers are a rare resource on this planet. Therefore, a large unskilled workforce has resulted, and the employment paradox comes into play.

The quote of DePrince and Morris (2008) was earlier reviewed. In some cases, a higher level of education does not provide a lot of benefit to a person. Only skill and experience can bring an advantage to him/her. If his/her skill and experience match the business owner's requirements, he/she has better chance to get the job. Nevertheless, many studies (Helgesson *et al.*, 2014; Hammarstrom and Janlert, 2000; Weber, 2002; Núñez and Livanos, 2010; Bai, 2006) still support that level of education impacts employment.

However, the education system is involved in developing human resources. If the major teaching method of the education system is verbatim memorization; the

more a student remembers, the better the chance to get an 'A grade'. So long as this is the case, students will never start to think outside of the box.

P12: Individual capability has negative relationship to unemployment and job vacancies.

P13: Quality of the education system has negative relationship to unemployment and job vacancies.

P14: Level of education has negative relationship to unemployment and job vacancies.

One of the respondents is interesting because he is a micro business owner but he commented from the standpoint of an employee. His previous job involved life insurance. His thoughts:

"I just left a fifty thousand Baht salary job. I have long-term debt for a house and a car. I have to support my wife and my little dog. Why would I decide to quit, right? There are a few reasons.

The first was the company's propensity for defrauding customers; fourteen years of deception and exploitation of customers. I saw the ways they cheated customers. I kept asking myself what I was doing working in this insurance company, and finally couldn't live with myself. I remember when the company sent me to convince a customer to accept a payment which was lower than that stipulated in the contract.

The second reason is that I'm getting older. I surmised that when I reach fifty-five, and the time has come to retire, that company had no policy to benefit or support its retired employees. For those two reasons, I decided to quit and started a small business. The return is acceptable. I just plan for my future. About job vacancy, many micro businesses are simply self-employment, one person; the owner does everything and gets 100% of the return. If a micro business gets bigger, it requires more manpower, making things difficult to control."

Two key words are revealed here are 'business ethics' and 'fringe benefits'. For business ethics, Byrne (2011) figured out that business ethics are essential these days. Many businesses ignore laws concerning human rights and business ethicists went unheeded. In this perspective, if the firm without ethics ignores human rights or cheats customers, surely the employees would want to leave the firm at the earliest opportunity. It is a good thing to apply human rights and improve business ethics. Branco, Rodrigues (2006), and Kotler *et al.* (2012, pp. 12-16) explained that CSR (Corporate Social Responsibility) helps increase ability to retain employees of the firm. Between business ethics and CSR, a positive relationship exists, or they can be the same. Thus, if the business cannot keep its ethics, it's hard to maintain the employee's job satisfaction. For employee retirement support, it is absolutely related to the employee's job satisfaction. One of the CSR practices is to fulfill the basic requirements of the employee because they are one of the stakeholder groups of the firm as Freeman (2010, p. 25) suggested.

P15: Business ethics has a positive link to employee's job satisfaction.

P16: Business fringe benefit has a positive impact to employee's job satisfaction.

After interviewing IT workers from various companies, many factors that relate to employee's job satisfaction were revealed. Their comments had four attributes in common, which are as follows:

“I am one of staff member in an IT division, and there are four things that cause a struggle my mind. Number one is wage and advancement opportunity. For young graduated people, it is easier to get promoted than older workers. When his/her passes 30 years of age, everything becomes harder. Number two, is workplace climate. You have unpleasant supervisors and coworkers and the job is simply boring, you really have no choice but find another job. Three, there are plenty of job opportunities. Some are easy with less pay, some are hard with good pay. Most Thai workers want an easy job with good pay. That is why many business owners hire foreign workers who do not complain about less pay and hard work. Finally, job trends, when a mobile application is a hit, for example, many people decide to become mobile app developers. That causes job vacancies in other job positions.”

These are ‘payment’, ‘workplace climate’, and ‘trend influence’, which relate positively to employee job satisfaction. The factor named ‘payment’ is already suggested in the interview with the fifth respondent.

Workplace climate can affect an employee’s job satisfaction. Basford and Offermann (2012) presented research on the impact of coworker relationships on employee motivation and intent to stay. They indicated that “coworkers may greatly affect the workplace.” Furthermore, “coworkers can greatly affect organizational climate; helping to build energized, productive workplaces or to destroy them.” Steere (1988, p. 22) cited Maslow’s (1970) pyramidal model of needs to illustrate the five human needs. Applied to this study, employees are human beings and they absolutely have these five ‘needs’. The 1st need of the pyramid is basic fringe benefits that an employer can offer employees, such as free lodging and free toiletries. The 2nd need is employees’ safety and confidentiality; surely they do not want to work with worry or fear. In the 3rd need, employees want peace and happiness, thus camaraderie in the workplace is good. The 4th need is employee desire to receive admiration from coworkers. And the 5th need is the potential for promotion and advancement and is highly dependent on the employer’s ability to provide such. Hence, the employee is able to survive in the workplace so long as their needs have been satisfied and the workplace environment is conducive.

Perhaps, trend influence is best discussed by using the theory of work adjustment, which was discussed earlier. Dawis *et al.* (1968) stressed that it is probable for an employee to change his/her job if individual satisfaction and workplace atmosphere are not in tandem.

Naturally, when new job trends come along and they deviate from the current kind of job, if an employee is leaning toward following the new trend, his/her job’s satisfaction will decrease. Porter (2004) wrote about exit and entry barrier many times, but it was from the perspective of business rather than employee and work adjustment. Comparatively, when a double-panel door is open, everybody can easy walk in and out. If someone closes the left panel of this door it will make it difficult for people to walk in and out. In the end, if the double-panel door is locked, it no longer serves as a door. In this standpoint, the lower the job exit and entry barrier, the easier it is to quit and find an alternate place to work.

P17: Workplace climate can affect an employee’s job satisfaction in a negative way.

P18: Trend influence can affect an employee’s job satisfaction in a negative way.

The other three respondents who are employees stated that employee job satisfaction and life satisfaction have a relationship with unemployment and job vacancies.

- (1) *“Thai people are waiting for easy jobs with high pay and that keeps them jobless. Some of them wait for money from government programs, or borrow money from financial institutions. When they are unable to pay back, they tend to violate the law, become a drug dealer or gambler, for example. Otherwise, they become a short-term taxi driver without experience. Even though factories around urban and country areas announce they need more truck drivers, people still prefer to be taxi drivers.”*
- (2) *“One of the reasons for the unemployment problem is the minimum wage increase. In fact, minimum wage in Thailand is 300 THB, but no one feels it is a living wage, especially employees. They can start with 300 THB only for one or two weeks and after that they will want 400 THB because they think they have some skills. If a person can do many kinds of work, they expect, at minimum, 700 Baht a day.”*
- (3) *“Don’t forget that age is one of keys to get hired. Mostly, young people (up to 30) often change their job. Likewise, I watched TV last night and figured out that young Vietnamese often change their job, once or twice a year, the same goes for Thai teenagers. In the company that I am working for, the term ‘basic human want’ is defined. There are five human’s wants these are participation, comprehension, supervision, esteem, and achievement.”*

These three quotes show that there are no other ways to explain the occurrence of unemployment and job vacancies other than job payment, job complexity, and basic want of human that suggested by Maslow (1970). If the interview had continued with other respondents, the replies would have continued in the same vein.

Last, the employment paradox occurs due to the convergence of mass unemployment and the high job vacancies. Thus, the final proposal in this study is as follows:

P19: Unemployment rate has a positive connection to the employment paradox.

P20: Level of job vacancies has a positive connection to the employment paradox.

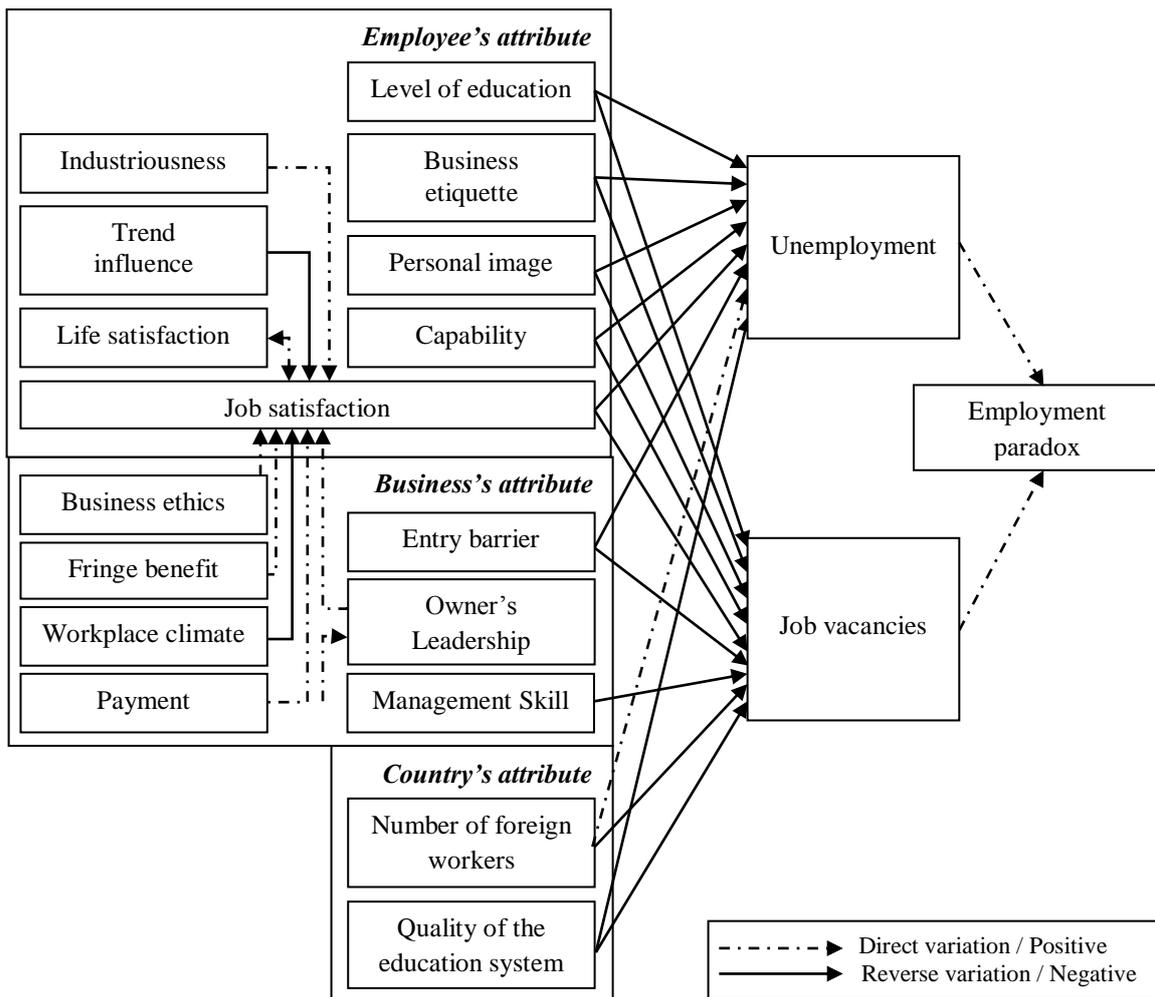


Figure 1. Conceptual framework of the employment paradox

4. CONCLUSION

This study delved deeply into part of the employment paradox, perhaps, that part is its core. Imagine that if the employment paradox were a living thing, it would have two giant arms, unemployment is its right arm and job vacancies is its left arm with fingers that can separate into three major groups: (1) employee attributes, (2) business attributes, and (3) national attributes. This overall perspective resulted in the giant conceptual framework (Figure 1).

The problem began when a large number of Thai employees left their positions because of a lack of individual job satisfaction, and that resulted in lose-lose situation, employees became jobless, while businesses faced job vacancies, and both suffered (P1). Job satisfaction is one of the critical factors relating to the matter of unemployed and employed. If we examine 'job satisfaction', we will see that there are sub-dimensions inside and Life satisfaction is one of them. When employees have problems with their finances, family, health, and so forth that certainly has negative impact on their attitude toward the job. Their satisfaction with life will decrease if employees feel that their job is not as good as they expected. Life satisfaction and job satisfaction are always go hand in hand (P2).

One thing that produces unemployment and job vacancies in many micro, small, and some medium sized enterprises is a low entry barrier. To start a micro business, an owner needs minimal capital, and maybe a few part-time employees. The micro-business owner has to deal with less government regulation, and experience is less crucial; everything seems to be easy in the view of the employees. Employees of micro businesses are more likely to quit their job and start to walk on their own path (P3). On the other hand, appearances are very deceiving. Opening a works facility is easy but winning customers is difficult, and that is what those former employees failed to think about.

However, the leadership ability of the owner is an important integer in the success formula. Pay and fringe benefits can raise employee's job satisfaction only to some degree, therefore leadership is needed. Without leadership, a business owner is no different from an automated teller machine in the eyes of the employee (P4). Some employers feel that the quantity and quality of domestic employee output is incommensurate with wages forcing employers to look to foreign workers. Foreign workers are shining stars to owners because most of them do not complain about low wages, low fringe benefits, and/or hard work. With this in mind, some business owners choose foreign workers over Thai workers even though the owners do not completely trust foreign workers (P5).

Some business owners commented that the new generation of Thai workers entering the workforce lacks industriousness. Without industriousness, difficult tasks become boring. When such workers enter the workplace it is almost certain that they will never sense job satisfaction. Inevitably, the only option for such employees is to quit their jobs (P6). In order to maintain the happiness of employees, key business people must learn management skills. For example, pay by month is often fruitless because some employees are lazy, involving themselves in such things as horseplay, or chatting on a mobile phone during the assembly process. When a superior appears they suddenly get back to work and act like nothing happened. Skillful management, for example, might change 'pay by month' to 'pay by piece', allowing a business to improve its performance and prevent job vacancies (P7). After managers acquire a certain level of management skills, their leadership will improve with the 'learning by doing' method (P8).

Level of job payment has a direct correlation to employee's job satisfaction. This is common sense, as most people on this planet will agree. Often, if an owner wants to maximize Thai employee job satisfaction, the owner has to increase wages or bonuses for the employees although they are unworthy (P9). Why is it that they are not worthy? Let's see why. Number one is they lack an awareness of properness. In other words, they have no business etiquette. From the Thai entrepreneur's standpoint, many Thai employees have no idea when and where the right time and right place is for some behavior. For example, many female applicants who have recently graduated from college bring their boyfriends to the job interview, and don't intervene when their boyfriends sit at the back of the room slouching and speaking loudly into a phone. She has an extremely high chance to lose out on the job. This study suggests that the higher the awareness of business etiquette, the lower the rates of unemployment and job vacancies (P10). Number two is personal image. According to number one, lack of business etiquette creates a very negative personal image in employers' and colleagues' eyes. It can make everybody judge you in a negative way and you can lose your job to a more suitable candidate (P11). Number three, employee's capability is significant. When the employee's capability does not reach

an employer's expectations, that employee is expendable in the business owner's view (P12).

It is not just between employees and employers, characteristics of a country can make the employment paradox happen as well. Quality of the education system of a country plays a significant role in this conundrum. As discussed earlier, what will happen if the major teaching method of the education system is verbatim memorization? The more a student remembers, the better the chance to get a good grade. As a result, as students advance in such a system they become nervous to start thinking outside of the box. Nevertheless, a good grade is not an absolutely indicator of the abilities, skills, creativity, and so on that some companies want. That is why a good memory does not necessarily provide advantages in the working environment, in many cases (P13). However, many managers look first at an employee's educational background because they think that a higher level of education represents better performance and a stronger sense of responsibility (P14).

Business ethics is one of the many keys to maintaining an employee's job satisfaction. Human rights, environmental impact, cheating propensity, laws, etc., such things are important for business people to be mindful of and concerned about. Thai workers are only human and if they become unhappy with their job sooner or later they will leave that job for other opportunities. That is to say, the lower a firm's business ethics the lower the job satisfaction (P15). When a business owner is concerned about ethics, he/she will be unable to ignore fringe benefits for an employee. For example, lodging, free utilities (e.g., laundry detergent, dish soap, toothpaste, etc.), and a free fridge, these are perks for employees. These fringe benefits allow managers to give their employees a sense of job satisfaction to some extent (P16). On the other end of the spectrum, fringe benefits are meaningless when climate in the workplace are very hot or very cold. Workplace climate is not about room temperature but it is about conflict among workers, demanding bosses and selfish co-workers, such conditions make the workplace climate fluctuate, suddenly hot and suddenly cold. Workers who cannot tolerate these repeated changes will say 'farewell' to their job (P17).

As we practitioners and researchers know, climate change in the workplace affects an employee's job satisfaction. Job trend changes in society can affect an employee's job satisfaction as well. When a new trend hits a marketplace, many people begin to contemplate leaving their jobs for the new one. In this regard, work positions that are not relevant to the new trend will experience more vacancies and many employees become jobless. In other words, the easier an employee becomes attracted to new trends, the higher the job vacancy and unemployment rate (P18). Ultimately, those employee's attributes, business's attributes, and the country's attribute have effects on the unemployment rate and the level of job vacancies in Thailand. When both unemployment and job vacancies increase, whether sharply or incrementally, the employment paradox becomes apparent (P19 & P20).

For practitioners, this study provides the academic answers for some of the many questions that arise, such as how the employment paradox occurs in this country, why employees want to quit their job, what employees are thinking regarding their jobs, and so on. Understanding employees and the business allow the proprietor to instill job satisfaction in his/her workers, as illustrated in Sun-Tzu's quote "know your enemies and know yourself, in a hundred battles you will never lose". Thus, business owners have to analyze characteristics of his/her business, employees, and country in order to avoid job vacancies. Moreover, employees should analyze their

situation and circumstances carefully to prevent themselves from becoming unemployed.

For academics, the conceptual framework is huge and carries many attributes in itself but it spotlights some areas of the employment paradox. Researchers can follow the suggestions in this study as a guideline to venture into the employment paradox in various countries. Difference in culture, geographic, etc. may bring various factors and answers to researchers. Due to the limitations of this study, the focus of this study is narrow and targets only Thailand and probably would have presented more factors had there been more respondents. However, the authors hope that this study can be a map for exploration into the employment paradox in other lands to whatever extent.

5. REFERENCES

- Bai, L. (2006). Graduate Unemployment: Dilemmas and Challenges in China's Move to Mass Higher Education. *The China Quarterly* 185, 128-144.
- Barwell, R. (2000). Age structure and the UK unemployment rate. *Bank of England Quarterly Bulletin* 40(3), 257-265.
- Banerjee, I., Roy, R., Sathian, B., Khadka, S., Chakraborty, P. K., Saha, A. & Pugazhandhi, B. (2014). Impact of Ethnicity, Unemployment and Economy on Mental Disorders: A Study from Western Nepal. *Nepal Journal of Epidemiology* 4(1), 306-315.
- Basford, T. E. & Offermann, L. R. (2012). Beyond leadership: The impact of coworker relationships on employee motivation and intent to stay. *Journal of Management & Organization* 18(6), 807-817.
- Branco, M. C. & Rodrigues, L. L. (2006). Corporate social responsibility and resource-based perspective, *Journal of Business Ethics* 69(2), 111-132.
- Buckingham, M. (2011). What Great Managers do. In *HBR's 10 must reads on managing people*. Massachusetts: Harvard Business School Publishing.
- Byrne, E. F. (2011). Business Ethics Should Study Illicit Businesses: To Advance Respect for Human Rights. *Journal of Business Ethics* 103, 497-509.
- Carroll, N. (2006). Explaining Unemployment Duration in Australia. *Economic Record* 82(258), 298-314.
- Dawis, R. V., Lofquist, L. H. & Weiss, D. J. (1968). *Minnesota studies in vocational rehabilitation: xxiii, A theory of Work Adjustment (A revision)*. Minnesota: University of Minnesota.
- Decreuse, B. (2001). Can skill-biased technological change compress unemployment rate differentials across education groups?. *Journal of Population Economics* 14(4), 651-667.
- DePrince, A. E. Jr. & Morris, P. D. (2008). The Effects of Education on the Natural Rate of Unemployment. *Business Economics* 43(2), 45-54.
- Department of Employment (2014, March). Unemployment Status, Layoff and Vacant Job. Retrieved June 10, 2014, from http://www.ftijob.com/datafiles/สถานการณ์การว่างงาน_ม.ค.57.pdf
- Freeman, R. E. (2010). *Strategic Management: A Stakeholder Approach*. New York: Cambridge University Press.
- Gatta, M. (2005). *Not Just Getting By: The New Era of Flexible Workforce Development*, Maryland: Lexington Books.

International Conference on Multidisciplinary Trends in Academic Research, 29-30 September 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- Gatta, M. (2008). Low-Skill Workers, Technology, and Education: A New Vision for Workforce Development Policy. *The Economic and Labour Relations Review* 19(1), 109–128.
- Goleman, D. (2011). Leadership That Gets Results. In *HBR's 10 must reads on managing people*. Massachusetts: Harvard Business School Publishing.
- Hammarstrom, A. & Janlert, U. (2000). Do Early Unemployment and Health Status among Young Men and Women Affect Their Chances of Later Employment?. *Scandinavia Journal of Public Health* 28(1), 10-15.
- Helgesson, M., Johansson, B., Nordqvist, T., Lundberg, I. & Vingård, E. (2014). Unemployment at a Young Age and Later Unemployment in Native Swedish and Immigrant Young Adults. *Modern Economy* 5, 24-31.
- Herzberg, F. (2011). One More Time: How Do You Motivate Employee?. In *HBR's 10 must reads on managing people*. Massachusetts: Harvard Business School Publishing.
- Judge, T. A., Thoresen, C. J., Bono, J. E., & Patton, G. K. (2001). The job satisfaction job performance relationship: A qualitative and quantitative review. *Psychological Bulletin* 127, 376-407.
- Kaye, H. S. (2003). *Improved Employment Opportunities For People with Disabilities*. Virginia: Department's Education Publications Center.
- Kaye, H. S., Jans, L. H. & Jones, E. C. (2011). Why Don't Employers Hire and Retain Workers with Disabilities?. *Journal of Occupational Rehabilitation* 21, 526-536.
- Kotler, P., Hessekiel, D. & Lee, N. R. (2012). *Good Works!: Marketing and Corporate Initiatives that Build a Better World... and the Bottom Line*. New Jersey: Wiley.
- Kulik, L. (2000). Women Face Unemployment: A Comparative Analysis of Age Groups. *Journal of Career Development* 27(1), 15-33.
- Maslow, A. H. (1970). *Motivation and Personality (Reprint)*. New York: Harper & Row.
- McHugh, M. D., Kelly, L. A., Sloane, D. M. & Aiken, L. H. (2011). Contradicting Fears, California's Nurse-To-Patient Mandate Did Not Reduce The Skill Level Of The Nursing Workforce In Hospitals. *Health Affairs* 30(7), 1299-1306.
- Núñez, I. & Livanos, L. (2010). Higher education and unemployment in Europe: an analysis of the academic subject and national effects. *Higher Education* 59(4), 475-487.
- Oshagbemi, T. (2000). Is Length of Service Related to the Level of Job Satisfaction?. *International Journal of Social Economics* 27(3), 205-217.
- Pelit, E., Öztürk, Y. & Arslantürk, Y. (2011). The Effects of Employee Empowerment on Employee Job Satisfaction. *International Journal of Contemporary Hospitality Management* 23(6), 784-802.
- Porter, M. E. (2004). *Competitive Strategy*. New York: Free Press.
- Rappaport, J. (2012). Why Does Unemployment Differ Persistently Across Metro Areas?. *Economic Review - Federal Reserve Bank of Kansas City 2nd Quarter*, 1-31.
- Ravasi, D. & Schultz, M. (2006). Responding To Organizational Identity Threats: Exploring the Role of Organizational Culture. *Academy of Management Journal* 49(3), 433–458.

International Conference on Multidisciplinary Trends in Academic Research, 29-30 September 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- Read, J. G. & Oselin, S. (2008). Gender and the Education-Employment Paradox in Ethnic and Religious Contexts: The Case of Arab Americans. *American Sociological Review* 73(2), 296-313.
- Saari, L. M. & Judge, T. A. (2004). Employee Attitudes and Job Satisfaction. *Human Resource Management* 43(4), 395-407.
- Scheid, T. L. (1998). The Americans with Disabilities Act, mental disability, and employment practices. *The Journal of Behavioral Health Services & Research* 25(3), 312-324.
- Sicherman, N. (1991). Overeducation in the Labor Market. *Journal of Labor Economics* 9(2), 101-122.
- Steere, B. F. (1988). *Becoming an Effective Classroom Manager*. New York: SUNY Press.
- Tepeci, M. & Bartlett, A. L. B. (2002). The hospitality industry culture profile: a measure of individual values, organizational culture and person organization fit as predictors of job satisfaction and behavioral intentions. *The International Journal of Hospitality Management* 21(2), 151-171.
- Weber, B. A. (2002). The link between unemployment and returns to education: Evidence from 14 European countries. *Education & Training* 44(4/5), 171-178.

ROOT GROWTH AND GOSSYPOL CONTENT IN GOSSYPIUM HIRSUTUM L. ROOT AND HAIRY ROOT CULTURES.

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ABSTRACT

Experiment was conducted to optimize gossypol production as well as root and hairy root growth based on the concentration of LS medium. Hairy root was induced by *Agrobacterium rhizogenes* strain ATCC-15834. There were four treatment applied 1) Full-strength LS medium for normal roots culture (LNT), 2) Full-strength LS for hairy roots culture (LT), 3) Half-strength LS for normal roots culture (1/2NT), 4) Half-strength LS for hairy roots culture (1/2T). All treatment produced the highest root growth on days 20th, but the highest dry weight of roots was obtained at 1/2T treatment. The highest gossypol content in roots was obtained on days 16th for all treatments and all were growth associated, while the amount of gossypol that was secreted into culture medium were obtained on days 20th for all treatments. Highest gossypol content was also achieved in 1/2T, both in hairy roots and medium. According to these results, it could be concluded that 1/2T represented the best treatment combination for growth as well as gossypol production in root and medium.

Keywords: *Gossypium Hirsutum* L., Root Growth, Gossypol, Hairy Root, LS Concentration.

1. INTRODUCTION

Gossypol is a di-sesquiterpene yellowish pigments, present in various parts of cotton plants (Marchlewski, 1899). It exhibits multiple biological properties, including male anti fertility activity (Endress, 1994), anti tumor activity (Duke, 1987) and insecticidal activity (Rogers, 1995). Gossypol in the cottonseed can also be used as dietary supplement in broilers to increase their weight (Bailey *et al.*, 2000). In the past few decades, effort have been made to produce valuable plant metabolites using different biotechnological tools, among them is the application of *in vitro* culture techniques, i.e. by growing plant tissues, organs or undifferentiated cells, which will then be used to induce secondary metabolite synthesis and accumulation, by not using the plant *in vivo* (Zarate, 1999).

The synthetic capacity of dedifferentiated tissues often differs substantially from that of fully differentiated tissue, both quantitatively and qualitatively (Suzuki *et al.*, 1987). A number of attempts have been made to produce gossypol by callus culture, however its production ability was not satisfactory. Yulia (1999) even found low gossypol content in callus culture of *Gossypium hirsutum* L. which was elicited by *Rhizoctonia solani*.

Many important plant secondary metabolites are synthesized in root tissues which can then be stored *in situ* or transported to other plant organs (Waller and Nowacki, 1978). Gossypol is abundance in the roots of *G. hirsutum* L. (Nomeir and Abou-donia, 1982). Recently, the roots of several species transformed by *Agrobacterium rhizogenes* were capable of quite rapid growth in *in vitro* defined nutrient medium without the requirement for exogenous phytohormones (Tepfer and Tempe, 1981; Wilmitzer *et al.*, 1982). Therefore, increasing of gossypol content in plant

organ culture could be conducted by using hairy roots culture technique transformed by *A. rhizogenes* (Drewes and Staden, 1995). Several studies on the biosynthesis of the secondary metabolite using hairy root cultures showed that tropane alkaloid was produced in the *Hyoscyamus muticus* culture (Flores and Filner, 1985), tropane alkaloid in the *Atropa baetica* culture (Zarate, 1999) and puerarin in the *Pueraria phaseoloides* culture (Shi and Kintzios, 2003).

Changes in hairy root metabolite formation and morphology were influenced by physical and chemical stimuli, including nutrient limitation, illumination, and hormone concentration (Tone *et al.*, 1994a, 1994b). Some researches on the influence of medium to the production of secondary metabolite in the hairy root culture have been conducted. In the culture of red beet (*Beta vulgaris*) hairy roots, phosphate is the key nutrient for increasing the accumulation of betanin pigment in the roots. Normal root growth, which was parallel with enhanced pigment formation, was achieved even in medium without phosphate (Taya *et al.*, 1994b). Flota *et al.* (1994) found high biomass of root *Catharanthus roseus* with specific nitrate/ammonium ratio. Higher tropane alkaloids was achieved in hairy roots of *A. baetica* transformed by *A. rhizogenes* strain ATCC-15834 cultivated in half Murashige-Skoog medium (Zarate, 1999). Pramudiyanti and Rizkita (2004) reported that there were parallel relationship between root growth and gossypol content in the root culture of *G. hirsutum* L. cv. tamcot. Therefore, this research will study the effect of a half and full-strength nutrition concentration of Linsmaier-Skoog (LS) medium in order to get optimal root growth and gossypol content in *Gossypium hirsutum* untransformed and hairy root culture.

2. Research Methods

Hairy root induction

Agrobacterium rhizogenes strain ATCC-15834 (48 h, old) was used to initiate hairy root on *G. hirsutum* L. cv. kanesia 7 culture, cultured on LS full-strength solid medium. Cultures were decontaminated with cefotaxime followed by culturing in the dark for 30 days in LS agar medium supplemented with cefotaxime. The hairy roots emerged and confirmed 7-10 days after infection (Rizkita and Wardani, 2003). Hairy roots were excised from the explants and transferred to flasks containing either half or full-strength concentration of LS liquid medium. The culture flasks were then placed on an orbital shaker at 120 rpm in dark condition and temperature of $26\pm 2^{\circ}\text{C}$ (Kusumadewi, 2004). The established hairy root culture was sub-cultured every 10 days. Three replicate flasks from each nutrient medium were harvested every 4 days over a culture period of 36 days to determine the root growth (dry weight) and gossypol content from both hairy roots and liquid medium

Root (nontransformed) culture

Non-transformed roots were obtained from 3 days old sterile seedlings of *G. hirsutum* L. cv. kanesia 7. Roots were cut $\pm 2\text{cm}$ from the tip and cultured in two different liquid media (LS medium with half and full-strength concentration). The culture conditions were the same as the hairy roots culture conditions. (Nurchayati and Rizkita, 2006).

Roots growth parameter

Time course of growth was observed by sampling roots every 4 days during the culture cycle of 36 days, and dry weight was evaluated as parameter of root growth

Extraction and determination of gossypol

The quantification of gossypol in hairy roots and non-transformed roots was conducted by tissue extraction using modified Nemeir and Abou-donia (1982) method. The extract was separated by reversed phase high-performance liquid chromatography (HPLC from

Shimadzu Ltd., Japan) using a Shimpack VP-ODS C-18 (4.6 mmx150 mm) column in a solvent system of CH₃OH:H₂O (9:1) isocratic, by adding 0.1% phosphoric acid, at λ 230 nm. Standard gossypol was purchased as gossypol-acetic acid from sigma, its purity was determined by HPLC to be 99.5%. Data processor was a chromatopac CR-7A plus (Shimadzu Ltd., Japan). The data processor was used to measure the retention time, peak areas, and the percentage of each peak in the chromatogram.

3. RESULTS AND DISCUSSION

Root Growth

Hairy roots were successfully initiated in solid and liquid LS medium (Figure 1a and b), while nontransformed (normal) root was in LS liquid medium (Figure 2). The result showed that nutrition concentrations influenced the root growth pattern (Figure 3a and b). Roots entered the growth phase immediately and achieved highest dry weight on days 20th (late logarithmic phase) for all treatment combinations. Highest dry weight of roots was obtained on 1/2T treatment combination (0.1740 ± 0.0036 gDW). Taya *et al.* (1994) found a normal root growth and formation of betanin in medium without phosphate.



Figure 1(a). Hairy roots (30 days), cultured in solid LS medium.

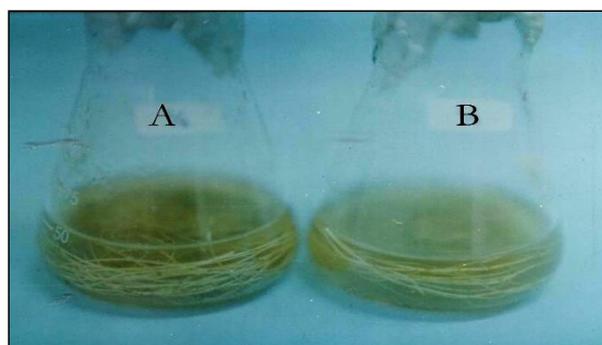


Figure 1(b) Hairy roots in liquid LS medium.

A half-strength nutrition concentration (A), Full-strength nutrition concentration (B).



Figure 2. Normal roots culture.

A half-strength nutrition concentration (A), Full-strength nutrition concentration (B).

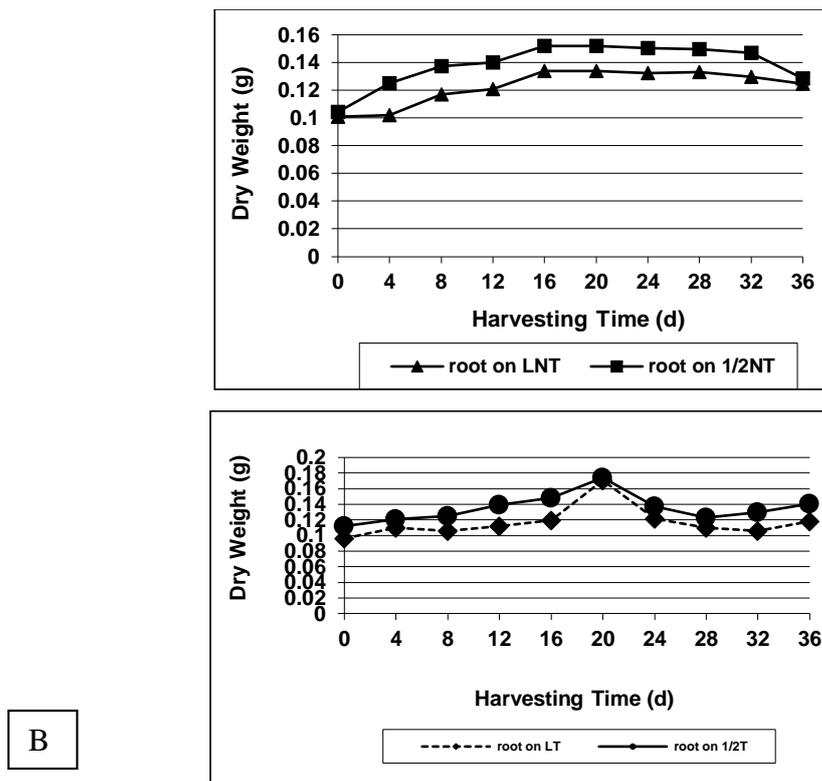


Figure 3. Root growth pattern in normal root cultures (a) and hairy root cultures (b).

Results of this experiment showed that dry weight of roots on treatment combinations of a full-strength nutrition concentration (LT, LNT) was lower than that on a half-strength nutrition concentration (1/2NT, 1/2T), data was presented in Table 1. Muranaka *et al.* (1992) reported that high nitrate (NO_3^-) concentration in KNO_3 caused several toxic effects in the root cultures physiological conditions. Franklin and Dixon (1994) also reported that concentration of KNO_3 more than 15 mM in MS medium could reduce rapid growth in the culture. It was indicated that low ammonium (NH_4^+) and nitrate (NO_3^-) ratio was favorable to roots growth.

Nutrition concentration caused a significant effect on root growth, while the type of root factor and interaction between the two factors did not reveal significant

effects. These results indicated that root growth patterns in normal roots culture and hairy roots culture were similar.

Table 1. The effect of nutrition concentration and root type on root dry weight for all treatment combinations.

Treatment	Dry Weight (g)
(LNT)	0.1224±0.0137 a
(1/2NT)	0.1382±0.0187 b
(LT)	0.1171±0.0203 a
(1/2T)	0.1351±0.0175 b

Bulgakov *et al.* (2002) investigated carbohydrase enzyme activity that caused *rolC* gene insertion in *Panax ginseng* culture, and found obvious result from his research, that *rolC* gene could affect carbohydrase enzymes activity such as 1,3- β -D-glucanase. However, authors suggested that 1,4- β -D-glucanase enzyme expression was suppressed, therefore root growth (hairy roots) was delayed.

Gossypol content in roots

The highest gossypol content in roots was obtained on days 16th for all treatment combinations (Figure 4). Based on statistical analysis, it was found that nutrition concentration caused a significant effect on gossypol content in roots, while type of root factor did not show a significant effect. Interaction between the two factors revealed a significant effects. These results indicated that the two factors could be applied together, so that treatment with type of root factor could be elevated by nutrition concentration factor. 1/2T treatment combination represented the best treatment combination and significantly different to other treatment combinations (12.6479±0.2992 mg/gDW) (Table 2).

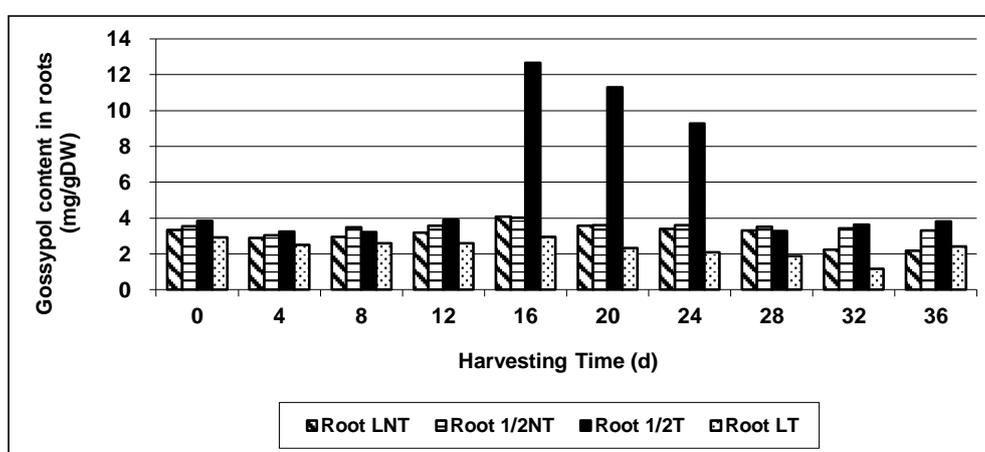


Figure 4. Gossypol content in roots for all treatment combinations. L: Nutrition concentration (Full-strength), 1/2: (Half-strength), T: Transformant roots, NT: Non transformant roots.

Table 2. The effect of nutrition concentration and root types on gossypol content in roots for all treatment combinations. Data were transformed to logarithmic ($^{10}\log$).

Treatment	Gossypol content in roots (mg/gDW)
(LNT)	0.4854±0.0862 b
(1/2NT)	0.5421±0.0467 b
(LT)	0.3552±0.1161 a
(1/2T)	0.6963±0.2334 c

This result was similar to Zarate (1999) which found high accumulation of atropine and scopolamine in hairy roots culture of *Atropa baetica* that were cultured in a half nutrition concentration of MS medium. Baiza *et al.* (1998) investigated hyoscyamine content in normal roots culture of *Datura stramonium* which found high hyoscyamine content on days 16th (logarithmic phase) using half nutrition concentration of MS medium. Khan and Harborne (1990) reported that low concentration of potassium (K) could increase alkaloid tropane synthesis in *Atropa acuminata* hairy roots culture. Higher alkaloid accumulation also occurred when nitrogen supply was lowered. According to Hammond-Kosack and Jones (1996), synthesis of phytoalexins secondary metabolite such as terpenoid (gossypol) and flavonoid was a consequence from plant-pathogen interaction. Bulgakov *et al.* (2003) investigated key processes of defense reactions in *Rubia cordifolia* callus culture which was transformed by *Agrobacterium rhizogenes* contained rolB and rolC genes. That result indicated a higher increment of anthraquinone synthesis in transformed culture compare to that of non transformed culture.

Significant positive correlation ($r=0.725$) between means of gossypol content in roots and dry weight at 1/2T treatment combination indicated parallel relationship i.e gossypol content in roots increased when dry weight of roots was also increase, and conversely. According to Endress (1994), Pramudiyanti and Rizkita (2004), Rizkita and Wardhani (2003), and Nurchayati and Rizkita (2006), gossypol accumulation in roots culture was parallel to dry weight.

Gossypol secretion into culture medium

The highest gossypol production into culture medium were obtained on days 20th for all treatment combinations (Figure 5). Statistical analysis showed a significant effect of nutrition concentration factor, type of root and interaction between the two factors to the gossypol secretion into culture medium. 1/2T treatment combination represented the best treatment combination, gossypol was secreted more into culture medium (11.4740 ± 0.3304 mg/L) (Table 3).

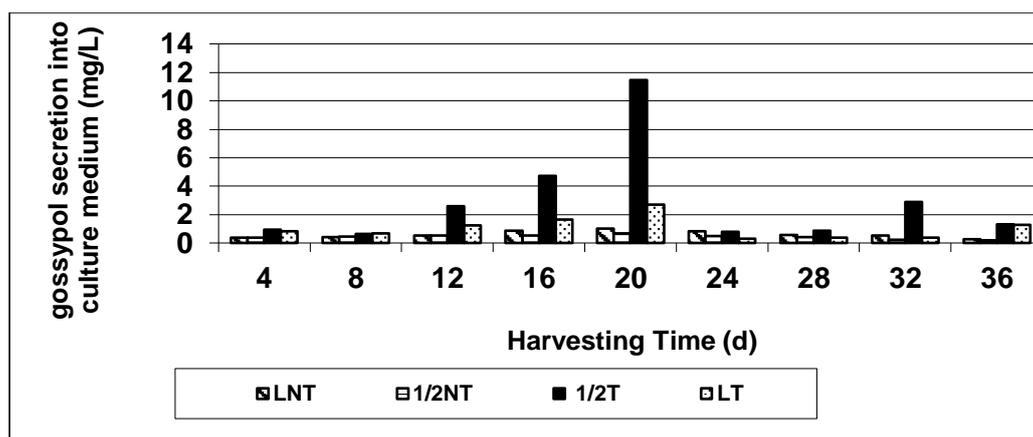


Figure 5. Gossypol secretion into culture medium for all treatment combinations. L: Nutrition concentration (Full-strength), 1/2: (Half-strength), T: Transformant roots, NT: Non transformant roots.

Nussbaumer *et al.* (1998) reported that hairy roots culture of *Datura candida* X *Datura aurea* cultured in a half-strength nutrition concentration of B5 (normal ratio of nitrate/ammonium: 25/2) medium secreted higher tropane alkaloid into culture medium compare to the medium with nitrate/ammonium ratio such as 25/5; 37/2; 50/2; 75/2; 40/2. So nitrate/ammonium optimal ratio influenced secondary metabolite production. The highest secretion of gossypol into culture medium was achieved on 1/2T treatment combination at pH of medium 4.57 (11.4740 ± 0.3304 mg/L) (Figure 6). At the lowest pH of medium (3.45) secretion of gossypol was c.a 2.8764 ± 0.0591 mg/L. However, Alvarez and Giuletti (2000) found that the highest alkaloid secretion into culture medium of the root culture of *Brugmansia candida* was at 4.5 pH of medium, not at the lowest pH of a medium (3.5). Therefore they concluded that there was other mechanism which influenced the secretion of metabolite beside of pH in medium and cell necrosis

Table 3. The effect of nutrition concentration and root types on gossypol secretion into culture medium. Data were transformed to logarithmic ($^{10}\log$).

Treatment	Gossypol in medium (mg/L)
(LNT)	0.7282 ± 0.1988 a
(1/2NT)	0.6026 ± 0.1720 a
(LT)	0.9034 ± 0.3257 b
(1/2T)	1.2511 ± 0.4123 c

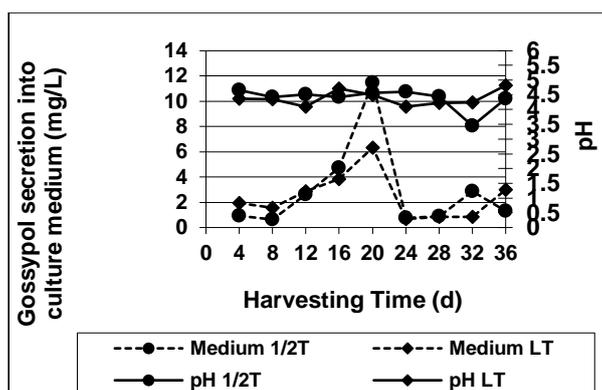


Figure 6. (a) Gossypol secretion into culture medium and pH of medium pattern in the hairy roots culture (1/2T, LT). L: Nutrition concentration (Full-strength), 1/2: (Half-strength), T: Transformant roots.

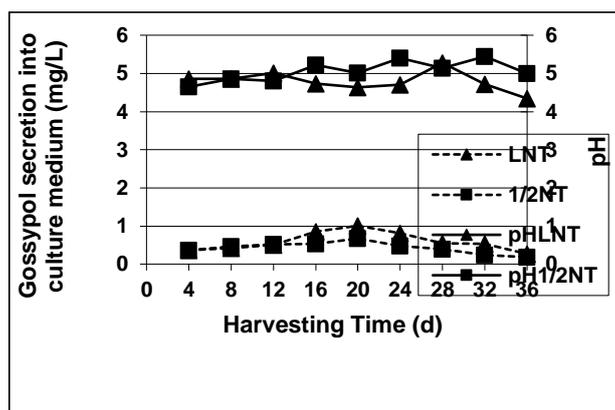


Figure 6. (b). Gossypol secretion into culture medium and pH of medium pattern in the normal roots culture (1/2NT, LNT). L: Nutrition concentration (Full-strength), 1/2: (Half-strength), NT: Non transformant roots.

4. CONCLUSION

1/2T treatment combination represented the best treatment combination. The highest Gossypol content in all roots type was achieved on days 16th. There was a parallel relationship between gossypol content in roots to growth of roots (dry weight). The highest dry weight of roots occurred on days 20th. Roots growth was affected by nutrition concentration. Gossypol was secreted into culture medium in the largest amount on days 20th. Hairy roots culture released more gossypol into culture medium compare to that in normal untransformed roots culture.

5. ACKNOWLEDGMENT

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6. REFERENCES

Bailey, C.A., Stipanovic R.D., Ziehr M.S., Haq A.U., Sattar M., Kubena L.F., Kim H.L, and Vieira R. (2000), *Cottonseed with a high (+)- to (-)-Gossypol*

- Enantiomer Ratio Favorable to Broiler Production*, Texas A&M University, Texas.
- Bulgakov, V.P., Kusaykin, M., Tchernoded, T.N., Zvyagintseva, T.N. dan Zhuravlev, Yu.N. (2002), Carbohyrase activities of the rolC-gene transformed and non-transformed ginseng cultures, *Fitoterapia*, **73**: 638-643.
- Bulgakov, V.P., G.K., Tchernoded, Mischenko, N.P., Yu.N., Shkryl, S.A., Fedoreyev, Yu.N. dan Zhuravlev. (2003), The rolB and rolC genes activate synthesis of anthraquinones in *Rubia cordifolia* cells by mechanism independent of octadecanoid signaling pathway, *Plant Science*, **166**: 1069-1075.
- Drewes F.E. and J van Staden. (1995), Attempts to produce solasodine in callus and suspension cultures of *Solanum mauritianum* Scop., *Plant Growth Regul* 17: 21-25.
- Duke, J.A. (1987), *Handbook of medicinal herbs*, CRC Press, Florida p.217-219.
- Endress, R. (1994), *Plant Cell Biotechnology*, Springer-Verlag, Berlin.
- Flores H.E. and P. Filner. (1985), Metabolic relationships of putrescine, GABA and alkaloids in cell and root cultures of Solanaceae. In primary and Secondary Metabolism of Plant Cell Cultures, edited by K.H. Newmann, W.Barz and E. Reinhard, pp.174-186. Springer-Verlag, Heidelberg. Dalam:
- Doran, M.P. (1997), *Hairy Roots Culture and Applications*. Harwood academic publishers, University of New South Wales, Australia. pp. 3.
- Flota, V., Valanzuela, M., Ham, m., Coello-coello, J., Vargas, V.M. (1994), Catharanthine and ajmalicine synthesis in *Catharanthus roseus* hairy roots cultures. *Plant Cell Tiss. Organ Cult.* 38:273-279. Dalam:
- Badra R., Shanks J.V. (1996), *Transient Studies of Nutrient Uptake, Growth, and Indole Alkaloid Accumulation in Heterotrophic Cultures of Hairy Roots of Catharanthus roseus*, John Willey&Sons, Inc. New York. 1997.
- Franklin, C.L., Dixon, R.A. (1994), Initiation and maintenance of callus and cell suspension cultures. In Dixon, R.A., Gonzales, R.A. (eds), *Plant cell culture- a practical approach* (2nd edn.). pp.1-25. IRL Press, Oxford.
- H.P., Shi, S.Kintzios. (2003), Genetic transformation of *Pueraria phaseoloides* with *Agrobacterium rhizogenes* and puerarin production in hairy roots. *Plant Cell Rep* 21:1103-1107.
- Khan, M.B. Harborne, J.B. (1990), Effect of nitrogen on alkaloid production in *Atropa acuminata*, *Planta Med* 56: 605-606. Dalam: Zarate, R. (1999), Tropane alkaloid production by *Agrobacterium rhizogenes* transformed hairy root cultures of *Atropa baetica* Willk. *Plant Cell Reports* 18: 418-423.
- Kusumadewi, B.A.,(2004), Pengaruh faktor lingkungan (suhu dan kelembaban) terhadap pertumbuhan dan produksi kultur akar berambut *Gossypium hirsutum* L. kultivar kanesia-7 yang ditransformasi dengan *Agrobacterium rhizogenes* strain ATCC 15834. Skripsi S1 Departemen Biologi, Institut Teknologi Bandung.
- Marchlewski, L., J. Prakt. Chem. 60:84 (1899). Dalam: Nomier, A.A. and Abou-Donia, M.B. (1982), Gossypol: high performance liquid chromatography, analysis and stability in various solvent, *JAOCs*. 59:546-549.
- Muranaka, T., Ohkawa, H., Yamada, Y. (1992), Scopolamine release into media by *Duboisia leichardtii* hairy root clones, *Appl. Microbiol Biotechnol* 37: 554-559. Dalam: Nussbaumer, I. and Christen, K.P. (1998), Hairy roots of *Datura*

International Conference on Multidisciplinary Trends in Academic Research, September 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- candida x Datura aurea*: effect of culture medium composition on growth and alkaloid biosynthesis, *Plant Cell Reports* 17: 405-409, Springer-Verlag.
- Nomier, A.A. and Abou-Donia, M.B. (1982), Gossypol: high performance liquid chromatography, analysis and stability in various solvent, *JAOCS*. 59:546-549.
- Nurchayati, Y. and Rizkita RE (2006), Produksi Gosipol Menggunakan Kultur Akar Berambut *Gossypium hirsutum* cv Kanesia. Berkala Ilmiah Biologi, (5):1, 51-56
- Nussbaumer, I. and Christen, K.P. (1998), Hairy roots of *Datura candida x Datura aurea*: effect of culture medium composition on growth and alkaloid biosynthesis, *Plant Cell Reports* 17: 405-409, Springer-Verlag.
- Pitta-Alvarez, I., and Giulietti, A.M. (2000), Influence of chitosan, acetic acid and citric acid on growth and tropane alkaloid production in transformed roots of *Brugmansia candida* Effect of medium pH and growth phase, *Plant Cell, Tissue and Organ Culture* 59: 31-38, Kluwer Academic Publishers, Netherlands.
- Pramudiyanti and Rizkita RE. (2004), Evaluasi Pola Produksi Ajmalisin Kultur Agregat Sel *Catharanthus roseus* (L.) G. Don pada Tiga Tingkatan Subkultur dalam Bioreaktor Tipe AIRLIFT. Seminar MIPA IV
- Rogers, G.M. (1995), Poitencial for gossypol toxicity when feeding whole cotton seed. *Animal Husbandry Newsletter*, June/July:1-2.
- Suzuki, M., Kakagawa K., Fukui H, Tabata, M. (1987), Relationship of berberine-producing capability between *Thalictrum* plants and their tissue cultures. *Plant Cell Rep* 6:260/.
- Taiz, L., and Zeiger, E. (2002), *Plant Physiology*, 3rd edition, Sinauer Associates, Inc., Sunderland, MA 01375 U.S.A.
- Taya, M., K Yakura, M Kino-oka and S Tone. (1994 b), Influence of medium constituents on enhancement of pigment production by batch culture of red beet hairy roots. *J. Ferment Bioeng* 77:215-217. Dalam: Doran, M.P. (1997), *Hairy Roots Culture and Applications*. Harwood academic publishers, University of New South Wales, Australia. pp.65.
- Tepfer, D.A. and J. Tempe. (1981), Production d,agropine par des racines formes sous l'action d, *Agrobacterium rhizogenes* souche A4. *CR Acad Sci Paris Ser III* 292:153-156. Dalam: Doran, M.P. (1997), *Hairy Roots Culture and Applications*. Harwood academic publishers, University of New South Wales, Australia.
- Waller, G.R., Nowacki, E.K. (1978), Alkaloid biology and metabolism in plants. Plenum, New York. Dalam: Zarate, R. (1999), Tropane alkaloid production by *Agrobacterium rhizogenes* transformed hairy root cultures of *Atropa baetica* Willk., *Plant Cell Reports* (1999) 18: 418-423.
- Rizkita RE and Wardani W, 2003, Evaluation of Gossypol Production in Hairy Root Culture of *Gossypium hirsutum* L. cv Kanesia 7 Transformed by *Agrobacterium rhizogenes*. International Seminars in Biotechnology, SEAMEO BIOTROP.
- Wilmitzer L., J. Sanchez-Serrano, E. Buschfeld and J. Sche. (1982), DNA from *Agrobacterium rhizogenes* is transferred to and expressed in axenic hairy root tissue *Mol Gen Genet* 186:16-22. Dalam: Doran, M.P. (1997), *Hairy Roots Culture and Applications*, Harwood academic publishers, University of New South Wales, Australia.

International Conference on Multidisciplinary Trends in Academic Research,
September 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

Yulia,D.(1999), *Perbandingan Kandungan Gosipol Pada Kalus G.hirsutum L. Dan G. herbaceum L. yang dielisitasi dengan homogenat jamur R. solani Kuhn.* Tesis Pascasarjana ITB, Bandung.

Zarate,R.(1999), Tropane alkaloid production by *Agrobacterium rhizogenes* transformed hairy root cultures of *Atropa baetica* Willk., *Plant Cell Reporsts* (1999)

FIRST LANGUAGE USE IN ARABIC LANGUAGE CLASSROOMS: TEACHER PERSPECTIVE

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ABSTRACT

The use of the target language has long been considered an important principle of second language (L2) instruction. Previous research has attempted to quantify the amount of the first language (L1) used in the classroom and has explored the purposes or functions of teachers' 'lapses' into their students' L1. The purpose of this qualitative study is to explore the teachers' attitudes towards the use of Bahasa Indonesia in Arabic language classroom. Data was collected based on the interviews of the teachers. The respondents of this study were two experienced teachers who have more than 15 years of teaching experience. The findings indicated that teachers prefer using Arabic language itself in Arabic language classroom. The Direct Method was applied as teaching strategies. The use of student's first language is prohibited in or outside the classroom. As a result, students are able to speak Arabic without any sense of shame and fear. Because of the prohibition of using L1 in the school campus, the institution is able to educate its students to master Arabic language.

Keywords: First Language, Target Language, Arabic Classroom, Qualitative.

1. INTRODUCTION

The issues on whether to use or not to use students' first language (L1) in second language (L2) classroom have generated increasingly debates among researchers and language teachers for many years. Some teachers feel that L1 can be used in certain circumstances. For instance, it can be used to increase students' comprehension and learning of L2 (Cook, 2001; Tang, 2002), present new vocabularies, explain difficult grammar and give instructions as well as suggestions (Mirza, Mahmus, and Jabbar, 2012). According to Cole (1998), L1 is most useful for novices since students at this level have little or no knowledge about L2. It also can be used to introduce the major differences between L1 and L2, to save a lot of guessing, to motivate students and to reduce their anxiety. On the other hand, Mahadeo (2006) asserts that the use of L1 is a barrier to learning L2 and it also prevents the student from acquiring the valuable input in the L2 (Krashen and Terrell, 1983). Although there are a number of studies discussed the use of L1 in EFL classroom, but the use of *Bahasa* as a students' L1 in Arabic as a foreign language (AFL) classroom has not been studied enough to inform AFL pedagogies. This study is a contribution to filling the existing knowledge gap. It investigates the attitudes of AFL teachers and seeks to determine the role of *Bahasa* in AFL classes.

2. LITERATURE REVIEW

The Use of L1 in Major L2 Methodologies

Language teachers have been debating whether or not to use the L1 in the L2 teaching. Some teachers opine that L1 may be used under certain limitations and appropriate (Cole, 1998) while others feel that L1 should not be allowed at all because it prevents students to learn L2 (Krashen and Terrell, 1983). Nazary (2008) asserts that in the field of L2, there are several common classifications of methods which deal with the role of L1 in the L2 classroom: Traditional

methods or Grammar Translation Method (GTM), Direct Method (DM), Audio-lingual Method and Communicative Methods (CM).

The GTM is usually conducted in the students' L1 to help them understand their L1 better through translation and analysis of the L2 grammar (Hadley, 2001). Grammar rules are learned deductively; students learn grammar rules by rote, and then practice the rules by doing grammar drills and translating sentences to and from the targeted language. There is little use of L2 and the instruction is given in the students' L1 (Celce-Murcia, 1991). More attention is paid to the form of the sentences being translated than to their content. There are two main goals of grammar-translation classes. One is to develop students' reading ability to a level where they can read literature in the targeted language (Richards and Rodgers, 2001). The other is to develop students' general mental discipline. According to Hamdallah (1999), this method depends heavily on translating to the students' L1.

The DM of teaching is not limited to but often used in teaching L2. This method refrains from using the learners' L1 and uses only the L2. The aim of this method is to emphasize language use by providing a direct contact with the L2 in meaningful situations. It represents critical reaction to the teaching methods of the ancient Grammar Translation Method which produced knowledge about language rather than knowledge of the language. The general goal of the direct method is to provide learners with a practically useful knowledge of the language. They should learn to speak and understand the targeted language in everyday situations.

The audio-lingual method is a style of teaching used in teaching foreign languages. It was developed in an attempt to address some of the perceived weaknesses of the direct method. It is based on behaviourist theory, which professes that certain traits of living things, and in this case, humans could be trained through a system of reinforcement—correct use of a trait would receive positive feedback while incorrect use of that trait would receive negative feedback. This approach to language learning is almost similar to the direct method. Like the direct method, the audio-lingual method advises students to be taught a language directly, without using the students' native language to explain new words or grammar in the target language. However, unlike the direct method, the audio-lingual method does not focus on teaching vocabulary. Rather, it is common for teachers to drill students in teaching grammar.

The communicative method is an approach to the teaching of foreign languages that emphasizes interaction as both the means and the ultimate goal of learning a language. According to Hamdallah (1999) and Hadley (2001), the communicative approach is one of the most popular language teaching approach today. This approach has raised the ban on using L1 in the L2 learning, however limited L1 use is allowed in the L2 classroom (Celce-Murcia, 1991; Hamdallah, 1999; Richards and Rodgers, 2001). The use of L2 in the foreign language classroom needs to be maximized in order to develop their language skills. According to Medgyes (1999), the use of mother tongue in classrooms has been one of the greatest dilemmas in the foreign language class for nearly a century. Although learners should be exposed to the second language as much as possible, but Nation (2001) argued that the L1 plays an essential role in communicating meaning in L2 teaching.

Reasons for using L1 in the L2 classroom

The bilingual approach has been accepted by researchers who believe that specific use of L1 is a helpful technique in the L2 classroom. Thus, many researchers have figured ways out to use L1 into the L2 teaching efficiently. For instance, Tang (2002) often use L1 for low and medium proficiency level students in English classes to give instructions, explain meanings of words, explain complex ideas and explain complex grammar points. Students may understand better when the explanations of the subject matters are given in their own language. Alshammari (2011) and Machaal (2012) argued that the use of L1 can save teachers' time of explaining, increase students' understanding and make the learning process becomes more effective. The

use of L1 with novices has verified to be a very useful and valuable device in enhancing students' understanding. Another significant reason for teachers' use of the L1 in the L2 classroom is to build natural relationship between teachers and their students. There is no obstacle between teachers and their students (Turgut and İrgin, 2009). The communication between teachers and students becomes easier (Nation, 2003). Accordingly, students feel free to ask their teachers for any difficulties they encounter.

The proponents of the code-switching theory argued that when teachers use code-switching to put their message across, their behaviour is similar to naturally occurring code-switching activities that take place in various real-life situations (Macaro, 2009). This optimal use of L1 was defined as one "where code-switching in broadly communicative classrooms can enhance second language acquisition and/or proficiency better than second language exclusivity" (Macaro, 2009, p.38). A number of scholars who seemed to share this view are Atkinson (1987), Auerbach (1993) and Cook (2001). Furthermore, the usefulness of L1 as a cognitive and mediating learning tool has been significant for a quite some time (Macaro, 2009).

Harbord (1992) concluded that there are three reasons for using L1 in the classrooms. They are facilitating communication, facilitating teacher-student relationships, and facilitating the learning of L2. Cook (2001) elaborated further by stating teachers should use L1 to convey meaning and organize classrooms. Students can use L1 for scaffolding (i.e building up the basics, from which further learning can be processed) and for cooperative learning with fellow classmates. Perhaps the biggest reason for using L1 in the classroom though, is that it can save a lot of time and confusion (Harbord, 1992).

Teachers' attitudes towards the use of L1 in the L2 classroom

There have been a number of researches on the use of L1 in L2 classes. Harbord (1992) for example, indicates that many second language teachers have attempted to create English-only classrooms but unfortunately, it leads to students misunderstanding. Therefore, he draws the conclusion to use translation method to make student understand better. This view is in line with Cameron (2001) and McCann (2005) who proposed that translation can be used positively in explaining the structures of language and giving feedback. Turnbull (2001) stressed that teachers may use L1 in appropriate ways to help students understand unfamiliar words.

Al-Nofaie (2010) carried out a study to examine the attitudes of three teachers and 30 students in Saudi school towards the use of L1 in English classes. The results showed that the participants' use of L1 seems to be systematic. Teachers preferred using L1 with novices and low achieving students to assist them in order to comprehend new language, and for specific reasons. For instance, L1 was used to explain grammatical terms, introduce new vocabulary and give exam instructions. A study conducted by Alshammari (2011) investigated the opinions of teachers and students about the use of mother tongue in foreign language classroom. The findings revealed that the proper use of L1 in L2 classrooms seems not to affect students' exposure to the L2. It may be necessary in order to increase students' comprehension.

These views were supported by Machaal (2012) and Salah and Farrah (2012). Machaal (2012) verified the attitudes and beliefs of the students, foreign language teachers and policy makers towards the use of the L1 in foreign language classrooms. The findings showed that most participants agreed and supported the use of L1 in L2 classroom. They accepted that L1 should be used whenever is necessary and it could be useful in explaining vocabularies and facilitating comprehension. In addition, the study also aimed to investigate teachers' perceptions toward using mother tongue in the targeted language classroom. The study found that L1 should be occasionally used to simplify the teaching and learning processes.

Arguments against using L1

Some researchers argue that using L1 in the L2 classroom might affect students' learning process negatively since it reduces the learners' exposure to the L2 and reduces their opportunities for using the targeted language (Deller and Rinvoluceri, 2002; Polio and Duff, 1994). According to Krashen and Terrell (1983), L1 should not be used in the L2 classrooms to enhance students' exposure to the L2, since students acquire the L2 through the same way they acquire their L1.

Another argument is the interference from the mother tongue. Interference can lead to difficulty in the L2 learning and to avoid that, L1 should be separated in L2 learning (Cook, 2001; Richards and Rodgers, 2001). According to Harbord (1992), learners may assume that word by word translation is a meaningful techniques if teachers overuse L1 in their teaching, therefore they will work towards transferring meaning in L2 learning. Phillipson (1992) asserted that the more L2 is taught the better the results will be. In line with his study, Auerbach (1993) indicated that students will learn more quickly if they are exposed more to L2; as they hear and use L2, they will internalize it and begin to think in L2. Similarly, Polio and Duff (1994, p. 322) insists that using L1 "prevent students from receiving input they might be exposed to in social situations outside the classroom".

3. RESEARCH QUESTION

The current study attempts at answering the following questions:

Central Research Question

What is the teaching Arabic as a foreign language to non-native Arabic teachers in Higher learning Institution in Indonesia?

Sub Research Questions

1. What are the attitudes of the teachers towards the use of first language in Arabic language classroom?
2. How do the teachers conduct the AFL classes?
3. What resources and teaching methodologies used by the teachers?
4. What are the teachers' suggestions to enhance the teaching of AFL to the non-native learners in the Institution?

4. METHODOLOGY

Participants

The study was carried out in a higher learning institution in Indonesia. For selecting the institution and the participants, a purposive sampling was applied. Two experienced lecturers who have more than 15 years of teaching experiences were interviewed. The opinion of the experienced teachers are helpful and it should be taken into consideration (Nunan, 1992). The participants were also chosen based on their positions in the institution. In administrative position, the informant 1 is a deputy rector and the informant 2 is a head of Arabic department.

Research Instrument and Procedures for Data Collection

Interviews method was applied for the data collection. Teachers' attitudes were investigated qualitatively through semi-structured interviews only due to their small number. The interview sessions were conducted during 30-45 minutes. The interviewees' responses were recorded during the interviews. The audio-recorded interviews were transcribed, summarized and coded. All transcripts were read several times to obtain a thorough understanding.

Inter-rater Reliabilities

Inter-rater reliability was used in this study to assess the degree to which two or more evaluators that use the same rating scale give the same rating to an identical observable situation. The inter-raters were given the full transcript to state the agreement with the themes developed by

the researcher. The raters were Associate Professors from Malaysia Public Higher Education Institution. They were experts in Arabic as a second language and were knowledgeable in developing themes. The inter-raters reliability was calculated using a formula as follow:

$$\text{Reliability} = \frac{\text{Number of agreement}}{\text{Total number of agreement} + \text{disagreement}} \times 100$$

The first rater produced 88.24 percent of rating, and the second rater generated 100 percent. The average of the two raters is 94.12 percent which indicate a good reliability.

Pilot study

A pilot study is designed to test logistics and gather information prior to a real study, in order to establish the issues to be addressed in the real study. A good research strategy requires careful planning and a pilot study will often be a part of this strategy. According to Wiersma (2000), a pilot study should be done to detect some unclear statements, poorly understood sentences, repeated question or unneeded questions. Therefore, the pilot study was carried by interviewing an Associate Professor from a Malaysia Public University who has more than 15 years of experience in teaching Islamic studies and Arabic language.

5. FINDINGS AND DISCUSSION

What are the attitudes of the teachers towards the use of Bahasa Indonesia in Arabic language classroom?

Theme 1: Prohibition of using Bahasa

The study revealed that the participants are very strict about using L1. In this study, the teachers are reluctant in allowing students to use L1 in or outside the classroom. Students must use Arabic when they want to interact among them or with teachers. They are forced to use Arabic in their daily activities. They will be punished when using L1 in the school area. Teachers prohibit students from using L1 to increase students' exposure to the L2 and provide them with sufficient opportunities to practise Arabic. Students will learn more quickly when they are exposed to the L2, because they hear and use Arabic, they try to think in Arabic. This finding supports the belief that L2 is best learned through the exposure to the language itself (Polio and Duff, 1994).

Theme 2: Language of Religion

Arabic language is the Quranic language. It is a language of religion. All Islamic studies subjects are taught in Arabic. Arabic language and Islamic studies cannot be separated. Students need to learn the Arabic language before understanding Islamic knowledge. For example, Informant 1 stated:

...Arabic language is more important because it is a language of religion. (I1, DU 102)

... Islamic jurisprudence use Arabic, Exegesis, Tajweed also use Arabic, Hadith use Arabic. .. All Islamic studies subjects are in Arabic (I1, DU 103)

How do the teachers conduct the AFL classes?

Theme 1: Obligation of using Arabic language

The use of Arabic language is compulsory either in classroom or outside classroom. Students are required to write, read and speak Arabic. The reason of this obligation is to provide students with sufficient opportunities to practice Arabic language. Monolingual approach results in increasing confidence in speaking and listening skills, creating more realistic environment for the students.

Theme 2: Habituate

The frequently use of Arabic language in Arabic classroom whether in writing, reading or speaking, will lead the students familiar with Arabic language and they can get accustomed to the Arabic language. The focus on target language can increase students' communication and stimulate both conscious and unconscious learning.

Theme 3: Minimum translation

Arabic must be used as much as possible in the Arabic language classroom to expose students to sufficient Arabic. But in a few cases, if students did not understand the meaning of a word, and it cannot be explained by a body language, pictures, drawing or other techniques, teacher were allowed to use L1 sometimes and for specific reasons. For example, Informant 2 stated:

... They can translate it into Bahasa Indonesia, but should be one time only. For instance, the word "jauhar" (diamond), it is difficult to explain in Arabic, and there is no object can be used to explain it... so, they translate it into Bahasa Indonesia... and it could not be written in the whiteboard. (I2, DU 53)

Theme 4: Drill and practices

Drills are usually repetitive and are used as a reinforcement tool. Effective use of drill and practice depends on the recognition of the type of skill being developed, and the use of appropriate strategies to develop these competencies. Teachers use drill and practice activities to help their students master the materials at their own pace. The drill and practice activities mainly for the beginning learner or for students who are experiencing learning problems. In this institution, after every Morning Prayer, students will be provided with the drills and tests to help improve their Arabic language efficiency. They are usually assisted by senior students who are more experts and more knowledgeable.

What resources and teaching methodologies used by the teachers?

Theme 1: Direct Method

Teachers use direct method when teaching Arabic language. Meaning that, L1 is inhibited in teaching L2. The purpose of using direct method is to make the learning of Arabic more interesting and lively by establishing direct bond between a word and its meaning. Informant 1 stated:

... by means of direct method, so, see and speak, or see and imitate, that's all, no translation. So, translation in our method is prohibited (I1, DU 40)

The central of Direct Method is the association of words and sentences with their meaning through demonstration, dramatizing, painting, etc. Direct Method involves all discussion in the target language. The teacher uses examples of language in order to inductively teach grammar; students are to try to guess the rules of the language by the examples provided. Teachers interact with the students a lot, asking them questions about relevant topics and trying to use the grammatical structure of the day in the conversation. Accuracy is sought and errors are corrected.

Theme 2: Role play

In order to let students speak Arabic, teachers have to conduct some events such as Arabic drama or Arabic series. The reason behind this event is not only to let students speak, but also to let them see and hear what are showed in Arabic drama or series. The more they hear, the more they get familiar with Arabic language.

Theme 3: Text books

Teaching language must be in the real context. This institution uses non-classical books as students' textbook, such as *kitab an-nahw al-wadih* for teaching Arabic syntax. Some students' textbooks are written by teachers such as morphology books and rhetoric book. The self-written textbooks are based on the real context so that students may understand better.

Today, curriculum in most subjects is built around themes. For example, a teacher might teach a unit on “What Does That Symbol Mean?” involving the use of symbols in Arabic and are based on the local culture. Language teachers can tie instruction to these themes to make language instruction more meaningful and seamlessly integrated into the school day. Students not only learn the language, but also content and culture. Thematic planning makes instruction more comprehensible because the theme creates a meaningful context. When students are studying a thematic unit, they are using their new language skills in context—and not simply learning vocabulary in isolation.

Theme 4: Environment

The findings showed that teachers in this institution never used language technology in teaching Arabic language. They built an Arabic environment within the campus. Students acquire Arabic language through that environment. Informant 2 stated:

... In term of teaching Arabic, we do not use language technology... We use this existing environment, like living laboratory, large laboratory (I2, DU 76)

The environment affects second language acquisition. An environment which encourages the greatest amount of use of the language is beneficial. People use an 'affective filter' that regulates how much input is received by a language processing mechanism. If the affective filter is over-used, a person tries to compose grammatically perfect sentences every times he/she speaks, and if it is underused he/she speaks without regard to the 'rules' he/she is aware of. The optimal user of the affective filter speaks naturally and often and eventually incorporates more rules into his/her speech. In this way, the brain is provided with more experience and input while also progressing toward more fluent speech

What are the teachers' suggestions to enhance the teaching of AFL to the non-native learners in the Institution?

Theme 1: Commitment

Teachers' commitment in using Arabic language with the students will help improve student language acquisition. When teachers always use Arabic in their daily activities, they show positive attitude to their students. Consequently, students will be accustomed to using Arabic when they hear the teachers speak Arabic exclusively. Informant 1 stated:

...the more important, the lecturers also speak Arabic in front of students, of course, there must have students who want to talk just like their teachers (I1, DU. 122).

Informant 2 stated:

...require teachers' commitment, as long as the teachers do not speak Malay or Indonesian with their students, the students will become committed (I2, DU 101)

Theme 2: Continuous Practice

Practice make perfect. Second language acquisition requires continuous practice. Everyone knows the importance of language practice for language learners. Repetition seems to be a one of the common tools that people use to practice. Limited repetition may have a limited role, especially with regards to some aspects of pronunciation. However the thing to remember is that language is fluid and creative. So learning language by repetition is counter intuitive. Respecting this fluidity and creativity is important and should not be under-rated.

Language is so connected to who we are that it is difficult to separate ourselves from the language we use. We speak what we think or feel and the connection between words and our experience (including actions at times) is instantaneous. So we need to be mindful that wherever possible the practice that we do needs to honour this connection. If it does not, then we are practicing in a way that does not call on the faculties that we use when we are actually using the language in real life.

6. CONCLUSION

Arabic learning is increasingly gaining a place in Muslim society. Many people felt that Arabic is the language need to be learned because of its privileges as well as its importance in our daily life. Arabic language classes are also open in many schools and higher learning institutions. Many parents are aware of the importance of the Arabic language and they are racing to send their children to learn Arabic. But to what extent the teaching of Arabic language classes that have an impact on the students? Will they be able to speak well and use the right language and fluent Arabic?

The result showed that the percentage of using *Bahasa* in the teaching of Arabic is very small and almost nil. Teachers only use bahasa in a desperate situation and they are allowed only one word in a class session. They prefer using Arabic language itself to teach Arabic. They inhibit students from using L1 and focus on L2 to enhance communication and also to create confidence learners and challenge them to communicate with others through their limited language. Because of the prohibition of using L1 in the school campus, this institution is able to educate its students to master Arabic language.

Language teaching requires a continuous process and language itself should always be practiced in teaching and learning. This is to ensure that students fully master all the required skills such as reading, listening, writing and speaking skills. Learning the language would be better if teachers are able to organize lesson plans effectively, use appropriately and effectively techniques and methods of teaching and ensure lessons run properly.

7. REFERENCES

- Al-Nofaie, H. (2010). The Attitudes of Teachers and Students Towards Using Arabic in EFL Classrooms in Saudi Public Schools: A Case Study. *Novitas-ROYAL (Research on Youth and Language)*, 4(1), 64–95.
- Alshammari, M. M. (2011). The use of the mother tongue in Saudi EFL classrooms. *Journal of International Education Research*, 7(4), 95–101.
- Atkinson, D. (1987). classroom : a neglected resource ?, *41*(October), 241–247.
- Auerbach, E. R. (1993). Reexamining English Only in the ESL Classroom. *TESOL Quarterly*, 27(1), 9. doi:10.2307/3586949
- Cameron, L. (2001). *Teaching languages to young learners*. Cambridge: Cambridge University Press.
- Celce-Murcia, M. (1991). *Teaching English as a second or foreign language* (3rd ed.). Boston: Heinle & Heinle.
- Cole, S. (1998). The Use of L1 in Communicative English Classrooms. *The Language Teacher*, 22, 11–14.
- Cook, V. (2001). Using the First Language in the Classroom. *Canadian Modern Language Review*, 57(3), 402.

- International Conference on Multidisciplinary Trends in Academic Research, September 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.
- Deller, S., and Rinvolutri, M. (2002). Using the mother tongue: Making the most of the learner's language. *Humanising Language Teaching*, 5(1), 10–12.
- Hadley, A. O. (2001). *Teaching Language in Context*. Boston: Heinle & Heinle.
- Hamdallah, R. (1999). To Use or Not To Use Arabic in English Language Teaching. *An-Najah University Journal Research*, 13(1), 285–295.
- Harbord, J. (1992). The use of the mother tongue in the classroom. *ELT Journal*, 46, 350–355.
- Krashen, S. D., and Terrell, T. D. (1983). *The Natural Approach: Language Acquisition in the Classroom*. Englewood Cliffs, New Jersey: Prentice Hall.
- Macaro, E. (2009). Teacher use of codeswitching in the second language classroom. In Turnbull & Dailey-O'cain (Eds.), *First language use in second and foreign language learning*. Clevedon: Multilingual Matters.
- Machaal, B. (2012). The Use of Arabic in English Classes: A teaching Support or a Learning Hindrance? *Arab World English Journal*, 3(2), 194–232.
- Mahadeo, S. K. (2006). Issue 18 - 2006 English Language Teaching in Mauritius : A Need for clarity of vision regarding English Language Policy, (19).
- McCann. (2005). Not lost in translation. *IATEFL Issues*, 186, 8.
- Medgyes, P. (1999). *The Non-native Teacher*. Ismaning, Germany: Hueber Verlag.
- Mirza, M. G. H., Mahmud, K., and Jabbar, J. (2012). Use of Other Languages in English Language Teaching at Tertiary Level: A Case Study on Bangladesh. *English Language Teaching*, 5(9), 71–77. doi:10.5539/elt.v5n9p71
- Nation, P. (2003). The role of the first language in foreign language learning. *Asian EFL Journal*, 5(2), 1–8. Retrieved from http://asian-efl-journal.com/june_2003_pn.pdf
- Nazary, M. (2008). The Role of L1 in L2 Acquisition : Attitudes of Iranian University Students. *Novitas-ROYAL (Research on Youth and Language)*, 2(2), 138–153.
- Nunan, D. (1992). *Research Methods in Language Learning*. Cambridge: Cambridge University Press.
- Phillipson, R. (1992). *Linguistic Imperialism*. Oxford: Oxford University Press.
- Polio, C. G., and Duff, P. A. (1994). Teachers' language use in university foreign Language Classrooms : A qualitative analysis of English and target language alternation. *The Modern Language Journal*, 78(3), 313–326. Retrieved from [http://faculty.educ.ubc.ca/pduff/personal_website/Publications/Polio & Duff \(1994\).pdf](http://faculty.educ.ubc.ca/pduff/personal_website/Publications/Polio & Duff (1994).pdf)

International Conference on Multidisciplinary Trends in Academic Research, September 29-30, 2014. MTAR © 2014 Bangkok, Thailand.

Global Illuminators, Kuala Lumpur, Malaysia.

Richards, J. C., and Rodgers, T. S. (2001). *Approaches and Methods in Language Teaching* (2nd ed.). Cambridge, New York: Cambridge University Press.

Salah, N. M. H., and Farrah, M. A. H. (2012). A quarterly international peer reviewed journal issn: 2229-9327. *Arab World English Journal*, 3(2), 400–436.

Tang, J. (2002). Using L1 in the English Classroom. *English Teaching Forum*, 40(1), 36–43.

Turgut, Y., and İrgin, P. (2009). Young learners' language learning via computer games. *Procedia - Social and Behavioral Sciences*, 1(1), 760–764. doi:10.1016/j.sbspro.2009.01.135

Turnbull, M. (2001). There is a role for the L1 in second and foreign language teaching, but... *Canadian Modern Language Review/La Revue Canadienne Des Langues Vivantes*, 57(4), 531–540.

Wiersma, W. (2000). *Research Methods in Education*. Boston: Allyn and Bacon.

SELF-REGULATED LEARNING AND MOTIVATION OF ISLAMIC STUDIES AND NON-ISLAMIC STUDIES STREAM STUDENTS

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ABSTRACT

Self-regulated learning and motivation is important aspects of students' learning and academic performance in a classroom context. This study aims at 1) investigating the differences in self-regulated learning and motivation between the Islamic studies and non-Islamic studies stream students; 2) examining relationships between self-regulated learning, motivation and academic performance. Eight hundred and twenty five universities students were involved in this study. A self-report measure of students metacognitive self-regulation, help seeking, organization, effort regulation, self-efficacy, intrinsic and extrinsic goal orientation, task value and test anxiety was administered, and academic performance data were obtained from students' cumulative grade point average (CGPA). The study uses a questionnaire as the information-gathering instrument. The questionnaire was based on the Motivated Strategies for Learning Questionnaire (MSLQ). T-test results indicated that students from Islamic studies background prefer using more strategies to score extrinsic goal orientation than non-Islamic studies students, and conversely, non-Islamic studies students practice metacognitive self-regulation strategies and organization strategies more than Islamic studies students did. Correlation analysis revealed that self-efficacy, intrinsic and extrinsic goal orientation, task value and test anxiety were positively related to metacognitive self-regulation, help seeking and organization. Regression analyses showed that test anxiety and intrinsic goal orientation appeared as the best predictors of academic performance.

Keywords: Self-Regulated Learning, Motivation, Islamic Studies, Non-Islamic Studies.

1. INTRODUCTION

Approaches to learning are among the factors that may influence students' academic achievement and previous studies have found the variation in the ways in which students approach their learning. This study focuses mainly on self-regulated learning (SRL) and motivation strategy. Self-regulated students participate proactively in the learning process emotionally, motivationally and cognitively. These students have their self-activated intentions and self-directed efforts in order to gain knowledge and skills by using specific strategies (Nota, Soresi, and Zimmerman, 2004).

Pintrich, Smith, Garcia and McKeachie (1991) have come up with a manual on the use of the Motivated Strategies for Learning Questionnaire (MSLQ) which categorised self-regulated learning into two main strategies. The first one is cognitive and metacognitive strategies which include rehearsal, elaboration, organisation, critical thinking and metacognitive self-regulation. The second strategy is resource management strategies which include time and study environment, effort regulation, and peer learning and help seeking.

On the other hand, Zimmerman and Martinez-Pons (1986) identified 14 commonly used academic self-regulated learning strategies. The strategies include: self-evaluation, organising and transforming, goal setting and planning, seeking information, keeping record and monitoring, environmental structuring, self-consequences, rehearsing and memorising,

seeking peer assistance, seeking teacher assistance, seeking adult assistance, reviewing tests, reviewing notes and reviewing texts. They used a structured interview called self-regulated learning interview schedule (SRLIS) in order to assess how these strategies are implemented.

Previous studies have shown that students who adopted a positive approach to learning and used effective learning strategies tended to have excellent learning experiences. This outcome suggests that students tend to develop their own potential and learn at their own pace, not to mention their positive lifelong learning skills and knowledge (Artlet, Baumert, Julius-McElvany and Peschar, 2003). According to Stipek (1996) and Brophy (1998), learning becomes more meaningful if students become aware of the learning processes and actions. Therefore, they will be more responsible, more effective, and more independent in performing their tasks.

Learning strategy solely is not enough to improve student achievement. Students should be motivated to use strategies, and organize cognitions and their efforts (Paris, Lipson and Wixson, 1983). Motivation is the internal power that drives individuals to act in order to satisfy their desire (Amstrong, 1995). The internal power can be triggered either by the individual himself or by the environment. In the context of learning and academic achievement, students must have a view about the capabilities, skills, and knowledge needed to complete the task of learning. As such, individuals with high motivation and high self-efficacies will develop high goals (Rohaty Mohd Majzub, 1998).

It is important for educators to facilitate and provide an effective teaching as well as learning environment that will support future learning and eventually a successful career. Previous researches have utilized different research methods to identify variation in students' learning strategies. A study on self-regulated learning by Mohamad Azrien Mohamed Adnan and Shukeri Mohamad (2008) discussed the theoretical framework of self-regulated learning for Arabic language students. Meanwhile, Mohamad Azrien Mohamed Adnan and Mohd Alwee Yusoff (2009) examined the relationship between motivation and self-regulated learning strategies among Islamic studies students. On the contrary, Sharifah Buniamin (2012) analysed non-Islamic students' approaches to learning. Thus, this study aims at filling the gap by comparing the learning strategies and motivation adopted by Islamic studies and non-Islamic studies students. The motivation of this study is to support students and educators in developing a good learning strategy. Hence, the study attempts to answer the following questions:

1. Are there any differences in SRL practices between Islamic and non-Islamic stream students?
2. Are there any differences in motivation factors between Islamic and non-Islamic stream students?
3. Is there any relationship between SRL practices and motivation for Islamic and non-Islamic stream students' academic performance?

2. THEORETICAL FRAMEWORK

Learning strategies

According to self-regulated learning theory, self-regulated learning is an integrated learning process, which occurs when individuals attempt to adjust the characteristics of their own behaviour, motivation, and cognition to best suit their own learning. Pintrich (1999) describes self-regulated learning as an active, constructive process whereby learners set goals for their learning plan actions and monitor, regulate and control their cognition, motivation and behaviour.

An important aspect of self-regulated learning theory is that students' learning and motivation are interdependent. Their learning strategy enables them to be self-aware,

knowledgeable, and decisive in implementing their learning strategy. While in terms of motivation, they possess high self-efficacy, self-attribution and intrinsic task interest. Their self-motivation is also evident in their continuing tendency to set higher learning goals for themselves when they achieve the earlier goals (Zimmerman, 1990). In that level, self-regulated learners are not only self-directed but are also self-motivated.

According to Pintrich et al.(1991), learning strategies can be classified into cognitive, metacognitive, and resource management strategies. The cognitive and metacognitive strategies can be further classified into metacognitive self-regulation, organization and peer learning. Paris et al. (1983) resolved that using self-regulated learning strategies promotes students' motivational beliefs.

Researchers define learning strategies in various ways. According to Weinstein and Mayer (1986), learning strategies are the involvement of students' behaviour and thought during learning activities which, in turn, affect the process of encoding information or skills into the memory. They cluster learning strategies according to their functions, such as cognitive strategies (rehearsal, description, and organising), metacognitive strategies (comprehension monitoring), and affective strategies (motivation). Zimmerman and Martinez-Pons (1990) stressed that learning strategies as an appropriate plan to achieve individual learning goals. The ability to plan requires the skill to control one's own learning which ultimately leads to the attainment of one's goals. O'Malley and Chamot (1990) viewed learning strategies as the special thoughts or behaviours that individuals use to help them comprehend, learn, or retain new information. Accordingly, Byrnes (1996) stated that learning strategies are a set of actions undertaken to achieve the target. In this case, Byrnes divides learning strategies into cognitive and cognitive-control strategies. A cognitive strategy involves cognitive information skills that will help students remember facts systematically; organise the facts or concepts into a clear, easy-to-understand structure; and integrate new knowledge on the basis of prior knowledge and daily experience. A cognitive-control strategy (metacognitive strategies) is a decision making process that determines which strategies should be used to achieve the goals; monitors the extent to which the implementation of the strategies towards the objectives are to be achieved; and reviews what steps have been applied, once the goals have been achieved.

Motivation

The objectives of education are to help students to acquire knowledge and skills; and to encourage them to have a desire to succeed. Both of these objectives are related to motivation theory (Klausmeier and Ripple, 1971).

Motivation to learn is the tendency of individuals to perform academic activities meaningfully. Students who have high motivation to learn will make appropriate efforts to achieve their learning goals, and students who are motivated to learn will seek to understand a topic if they find the topic is interesting and fun. Motivation can be distinguished in value components (intrinsic goal orientation and extrinsic goal orientation), control belief (self-efficacy for learning and performance) and affective component (test anxiety).

Value components consist of goal orientation and task value. Identification of learning goals is an important element for students' success. Goal orientation is important in moving effort, increasing persistence and influencing efficacy through commitment. Goal orientation refers to the student's perception of the reasons why he or she is participating in a learning task. There are two types of orientation; intrinsic goal orientation and extrinsic goal orientation. Intrinsic goal orientation is students' inspiration to participate in a task from primarily internal reasons such as being curious, wanting to challenge, wanting to master the content. Whereas extrinsic goal orientation complements intrinsic goal orientation, and is caused by primarily external reasons such as getting good grade, competing with others, and seeking approval or rewards. Although these two categories of motivation have different goals, but learning based

on the integration of intrinsic and extrinsic motivation will lead students to effective learning (Eggen & Kauchak, 2004).

Task value focuses on the student assessment on the importance of the task. It refers to the student's evaluation of how interesting, how important, and how useful the task is. According to Pintrich (1999), high task value leads to better learning involvement. Pintrich, Roeser and De Groot (1994) proposed three key aspects of the task value, namely interest, utility and importance. Interest refers to the personal interests of students and their desire to study the materials. Utility aspect refers to the students' perception of how useful the learning materials are to them. Importance refers to the perception of students about the suitability of the course material to them. Higher task will produce motivated behaviour and the task was found to correlate with academic performance.

Self-efficacy beliefs determine how people feel, think, motivate themselves and behave. Bandura (1997) states that 'perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the course of action required to manage prospective situations' (p. 2). Bandura (1994) pointed out four primary factors influencing students' self-efficacy. The first is the positive impact of the learning experience and the self-efficacy enhancement when students attain success. In contrast, the negative experience of frequent failure in a subject lowers their self-efficacy. The second factor that influences students' self-efficacy is when the students are the role models of their peers; they become more '*efficacious*' and try to do their best in any given task (Bandura, 1986; Kitsantas, Zimmerman, and Clearly, 2000). Third, praise and words of encouragement from teachers will positively stimulate students to continue studying, despite challenging tasks. Finally, psychological factors such as fatigue or a poor diet will reduce efficacy, and negative emotional states such as anxiety may also lessen efficacy. Eggen and Kauchak (2004) listed the influences of self-efficacy on student behaviours and cognitive development when the students are more confident in their ability to succeed and can anticipate their success: which expectations positively affect their motivation. Students who have high self-efficacy are more willing to accept a challenging task, work harder, have a calmer disposition despite experiencing failure in the beginning, practice effective learning strategies, and generally generate better performance than students who have low self-efficacy, even if they have the same abilities and skills.

Affective behaviour refers to the emotional response of a particular task. A common measure to see the emotional reaction is a measure of test anxiety. Test anxiety is a combination of physiological over-arousal, tension and somatic symptoms, along with worry, dread and fear of failure, that occurs before or during test situations (Zeidner, 1998). It is a physiological condition in which people experience extreme stress, anxiety, and discomfort during and or before taking a test. These responses can drastically hinder an individual's ability to perform well and negatively affects their social emotional and behavioural development and feelings about themselves and school (Salend, 2012). Pintrich and de Groot (1990) found that test anxiety has a negative relationship with academic achievement. Students who have lower level of performance might have higher levels of test anxiety.

3. METHODOLOGY

Sample

Data were collected from the selected Malaysia Higher Learning Institution. The participants in this study were university students who enrolled in undergraduate bachelor programmes in Islamic studies and non-Islamic studies programmes. The study used a convenience sampling of 825 students from universities in Malaysia. This sampling technique is preferable because it is fast, inexpensive and the subjects are readily available.

Procedure

A questionnaire was administered in order to collect information on the students' motivation, learning strategies, and individual backgrounds. The questionnaires were pilot tested, and modified for the current study. A total of 60 students were involved in the pilot test. The questionnaire was adopted and adapted from the Motivated Strategies for Learning Questionnaires (MSLQ) originally developed by Pintrich et al. (1991). This instrument was one of the most frequently used (see for example (Easton and McColl, 1997; Gay, Mills, and Airasian, 2006). Each item was measured on a seven-point Likert scale, ranging from not at all true of me (= 1) to very true of me (= 7).

The questionnaire is divided into three parts. The first part involves the background of the respondents. This part of the questionnaire uses a nominal scale. Respondents are needed to specify their gender, ethnicity, home town, income of family, place of study, year of study, and latest result (Cumulative Grade Point Average = CGPA). The second part concerns with students' motivation and contained 23 statements of motivational items, representing five dimensions, namely intrinsic goal orientation, extrinsic goal orientation, task value, self-efficacy and test anxiety.

The last section concerns the students learning strategies, and it contains 23 statements of learning strategies items representing four dimensions, namely metacognitive self-regulation, help seeking, organization and effort regulation.

Data Collection and Analysis

The questionnaire was administered to university students by the lecturers during a regular class period. Subjects were provided with full instruction regarding the procedures of administration. The students were informed that there were no right or wrong answers to any question, that their confidentiality was secured, and that their response would be used solely for research purposes. The subjects were also informed that their participation was on voluntary basis and it would not affect their grades.

Quantitative data analysis was used in this study. Quantitative analysis involved both descriptive, as well as inferential statistics. Descriptive statistics (frequency) were used to analyse the background of the respondents, whereas inferential statistics, including t-test, Pearson's correlation and multiple regression analysis were used to determine any variation in variables. T-test was conducted to investigate the differences in motivation and learning strategies between Islamic studies and non-Islamic studies students, whereas Pearson's correlation was conducted to examine the relationships between students' motivation and learning strategies. Regression analysis was conducted to test the effects of the strategy employed and motivation on students' grades.

Initial Factorial Analysis

This study used Principle Component Analysis with varimax rotation to identify the elements or factors which may exist in the study that may affect students' performance. Principle Component Analysis is a data reduction technique used to identify the major dimensions underlying a number of variations in the participants' responses. Two statistical methods were used to test the appropriateness of the factor model; Barlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO). If the Barlett's test of sphericity was significant and KMO provide great value, which is greater than 0.5, then the factor analysis is appropriate to be used in this study (Malhotra, 1996). The result is shown in Table 1.

The results from the Bartless's test of Sphericity shows statistically significant correlation among items, where $\chi^2 (253) = 7703$, $p < .001$ for motivation and $\chi^2 (253) = 6563$, $p < .001$ for self-regulated learning. Kaiser-Meyer-Olkin Measure of Sampling Adequacy also shows a great value, (0.890 for motivation and 0.920 for self-regulated learning) which is

greater than 0.7. These results suggest that a factor analysis is appropriate and the sample size is sufficient for meaningful factorability (Pett, Lackey, & Sullivan, 2003).

Table 1 KMO and Bartlett's Test for Motivation and Self-Regulated Learning (SRL)

	Motivation	SRL
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.890	.920
Approx. Chi-Square	7702.911	6562.809
Bartlett's Test of df	253	253
Sphericity Sig.	.00	.000
	0	

Factor Structure of Motivation and SRL

Five factors are obtained from motivation dimension and four factors are from SRL dimension. Each of the nine factors had eigenvalues greater than 1. The five factors of motivation dimension accounted for 60.42 percent of the total variance explained and four factors of SRL accounted for 51.66 percent of the total variance explained. The nine factors from two dimensions and their factor loadings are detailed in Appendix. The factors were reviewed while the properties reflected were named by the loaded items. These consisted of the following:

Motivation Dimension (five factors)

Factor 1 has high coefficients with variables v13, v14, v12, v19 and v20, and represents *extrinsic goal orientation*. Factor 2 consists of variables v18, v17, v4, v8 and v16, and represents *self-efficacy strategy*. Factor 3 signifies *test anxiety* that consists of six variables (v7, v3, v23, v22, v11 and v21). Factor 4 entails variables v9, v10, v1, and represents *intrinsic goal orientation*. Factor 5 represents *task value* and consists of variables v5, v6, and v2.

Self-Regulated Learning Dimensions (four factors)

Factor 1 has high coefficients with variables v18, v12, v11, v17, v15, v, 19, v14, v13, v22, and v20, and represents *Metacognitive self-regulation*. Factor 2 contains variables v6, v4, v5, v1, and v2, and represents *help seeking*. Factor 3 represents *organization* and consists of variables v9, v10, v7 and v3. Factor 4 involves variables v23, v8, v16 and v21 and represents *effort regulation*.

Reliability

On the basis of the study sample, the coefficient alpha reliability estimates for motivation dimensions were as follows: Extrinsic goal orientation = .827, self-efficacy = .850, test anxiety = .783, Intrinsic goal orientation = .670 and task value = .772. The coefficient alpha reliability estimates for learning strategies were the following: metacognitive self-regulation = .871, help seeking = .782, organization = .728 and effort regulation = .615. According to Hair, Black, Babin and Anderson (2010), the generally agreed upon lower limit for Cronbach's alpha is 0.70, although it may decrease to 0.60 in an exploratory research. Therefore, there is a high consistency among respondents in this study in answering the questionnaires.

4. RESULTS

Demographic Information

The respondents who participated in this study consist of 263 male (31.2%) and 580 female (68.8%). Of the 825 respondents, 21.4 percent are from National University of Malaya, 32.6 percent are from Islamic University College Selangor, 19.9 percent are from University of Tenaga Nasional and 26.1 percent are from Sultan Zainal Abidin University. The respondents were from rural (43.5 %) and urban areas (56.5%). In addition, 56.4 percent of the respondents are from Islamic studies while 43.6 percent are from non-Islamic studies.

The differences between Islamic and non-Islamic stream students on Self-Regulated Learning practices

An independent sample t-test was employed to assess the difference in the mean of metacognition self-regulation strategies, help seeking strategies, organization strategies and effort regulation strategies. Table 2 shows the differences between Islamic studies and non-Islamic studies stream students in learning strategies. The t-test result indicated that there were significant differences between the non-Islamic studies students and Islamic studies students in the metacognition self-regulation, $t(df = 823) = -3.421, p < .01$ and organization, $t(df = 823) = -8.272, p < .01$. The mean values indicate that non-Islamic studies students practice metacognitive self-regulation strategies ($M = 5.3880$) and organization strategies ($M = 4.8563$) more than Islamic studies students. The results also revealed that there were no statistically differences between the non-Islamic studies students and Islamic studies students in the help seeking strategies $t(df = 823) = -1.698, p > .01$ and effort regulation strategies $t(df = 823) = -1.672, p > .01$.

Table 2 Mean and Standard Deviation (SD) across the Self-Regulated Learning Dimension

Variables	Islamic Studies (N=465)		Non-Islamic Studies (N=360)		t	sig
	Mean	SD	Mean	SD		
Metacognition	5.1847	.85991	5.3880	.82854	-3.421	.001
Help seeking	5.1849	.95486	5.2975	.93037	-1.698	.090
Organization	4.2462	1.12326	4.8563	.99055	-8.272	.000
Effort Regulation	4.3602	1.04792	4.4813	1.00961	-1.672	.095

Differences between Islamic studies and non-Islamic studies stream students on motivation

An independent sample t-test was performed to compare the difference in the mean of the task value, intrinsic goal orientation, test anxiety, self-efficacy and extrinsic goal orientation. Table 3 presents the differences in the mean score of motivation dimension between Islamic studies and non-Islamic studies stream students. The results of the independent sample t-test illustrated that out of five constructs of motivation, there was only one construct of extrinsic goal orientation that has a statistically significant difference between the Islamic studies stream students ($M=5.9329, SD=.98215$) and non-Islamic studies stream students ($M=5.7739, SD=.89286$); $t(737) = 2.399; p < .05$. The results also indicated that students from Islamic studies background prefer using more strategies to score extrinsic goal orientation than non-Islamic studies students. The other four constructs did not appear to differ significantly in their learning motivation.

Table 3 Mean and Standard Deviation (SD) across the Motivation Dimension

Variables	Islamic Studies (N=465)		Non-Islamic Studies (N=360)		t	sig
	Mean	SD	Mean	SD		
Task Value	5.7935	.97694	5.7287	.88778	.984	.326
Intrinsic Goal Orientation	4.8100	1.09597	4.8630	1.09685	-.688	.492
Test Anxiety	4.4749	1.12507	4.3644	1.17168	1.375	.170
Self-Efficacy	4.9803	.90967	4.9625	.99039	.265	.791
Extrinsic Goal Orientation	5.9329	.98215	5.7739	.89286	2.399	.017

Relationship between self-regulated learning practices, motivation and students' academic performance

Table 4 shows the correlation matrix of the nine variables: four for learning strategy subscales and five for motivation subscales. As shown in the table, metacognitive self-regulation strategy was positively correlated with help seeking strategy ($r=.689$, $p<.01$), organization strategy ($r=.588$, $p<.01$), and effort regulation strategy ($r=.173$, $p<.01$), and students who had a better help seeking strategy, would have better organization ($r=.562$, $p<.01$) and effort regulation strategies ($r=.080$, $p<.05$). Organization strategy was significantly correlated with effort regulation strategy ($r = .174$, $p<.01$). Task value strategy was positively correlated with metacognitive self-regulation ($r=.512$, $p<.01$), help seeking ($r=.430$, $p<.01$) and organization strategy ($r=.207$, $p<.01$). Students who have intrinsic goal orientation seemed to have more self-regulation in metacognitive ($r=.408$, $p<.01$), help seeking ($r=.393$, $p<.01$) and organization strategy ($r = .303$, $p<.01$). The data also showed that test anxiety strategy was significantly positively correlated with metacognitive self-regulation ($r=.153$, $p<.01$), help seeking ($r=.136$, $p<.01$), organization ($r=.139$, $p<.01$), extrinsic goal orientation ($r=.140$, $p<.01$) and effort regulation ($r=.487$, $p<.01$).

Students who have a high level of self-efficacy, have a high level of metacognitive self-regulation ($r=.573$, $p<.01$), seek help from peer and expert ($r=.529$, $p<.01$), organize their study effectively ($r=.465$, $p<.01$), and have high intrinsic goal orientation ($r=.532$, $p<.01$). The data also showed that extrinsic goal orientation factor had a significant correlation with all variations except effort regulation strategy; however, the level of significant correlation was moderate. Overall, the study found that all the variables of learning strategies had a positive relationship with motivation variables. The value shown for the nine variables is between 0.080 to 0.689, $p < 0.05$. This shows that the motivation of university students in Peninsular Malaysia had a strong positive relationship with their learning strategies. The result is consistent with the findings of studies by other researchers (O'Malley and Chamot, 1990).

Table 4 Relationship between Self-Regulated Learning and Motivation

V	M	HS	O	ER	EGO	SE	TA	IGO	TV
M	1	.689**	.588**	.173**	.532**	.573**	.153**	.408**	.512**
HS	.689**	1	.562**	.080*	.453**	.529**	.136**	.393**	.430**
O	.588**	.562**	1	.174**	.190**	.465**	.139**	.303**	.207**
ER	.173**	.080*	.174**	1	.049	.045	.487**	.056	-.020
EGO	.532**	.453**	.190**	.049	1	.489**	.140**	.339**	.623**
SE	.573**	.529**	.465**	.045	.489**	1	.091**	.532**	.564**
TA	.153**	.136**	.139**	.487**	.140**	.091**	1	.107**	.023
IGO	.408**	.393**	.303**	.056	.339**	.532**	.107**	1	.422**
TV	.512**	.430**	.207**	-.020	.623**	.564**	.023	.422**	1

** . Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

V: Variable, M: Metacognitive, HS: Help Seeking, O: Organization, ER: Effort Regulation, EGO: Extrinsic Goal Orientation, SE: Self-Efficacy, TA: Test Anxiety, IGO: Intrinsic Goal Orientation, TV: Task Value

The correlation coefficient is a popular inferential statistic used by researchers to see the relationship between variables but the correlation coefficient does not show how much the independent variable can predict the dependent variables. Hence, a multiple regression analysis

was used as the second step of the analysis to further investigate the relationship between learning strategies and motivation. The learning strategies constructs and motivation constructs were used as the independent variables, and the students' performance was treated as the dependent variable. In order to explain the role of gender and hometown in affecting learning strategies and motivation on students' performance, those three variables were used as the moderator variables in the regression analysis.

Before fitting the multiple regression models, a multicollinearity test was conducted to examine the correlation between those variables. The test revealed that there is no significant correlation between them. When the predictor variables are correlated among themselves, the unique contribution of each predictor variable is difficult to assess. This is because of the overlapped or shared variance between the predictor variables, i.e., they are multicollinear. For this model, both of the "tolerance" values (greater than 0.10) and the "VIF" values (less than 10) are all quite acceptable. Thus, multicollinearity does not seem to be a problem for this model.

The results (in Table 5) show that the r value is 0.181, which is quite low. The obtained r^2 was 0.033 [$F(11,813) = 6.652, p < 0.05$], showing that 3.5 percent of the observed variability in academic performance was explained by the set of independent variables, were included in the regression model.

In order to determine which factors contribute to the prediction of academic performance, the standardised regression coefficients or beta weights (β) were examined. 'Standardised' means that the values for the different variables have been converted to the same scale so that they can be compared. It revealed that the relative predictive power of each variable independently after the contributions of all other variables in the model was controlled.

Table 5 Standardised beta coefficient of predictors of academic performance

Model	B	SE B	β	t	Sig.
(Constant)	2.149	.318		6.748	.000
Task Value	-.023	.055	-.021	-.416	.677
Test Anxiety	-.093	.040	-.097	-2.347	.019
Intrinsic Goal Orientation	.094	.037	.103	2.560	.011
Self-Efficacy	.086	.057	.077	1.505	.133
Extrinsic Goal Orientation	.039	.054	.035	.724	.469
Metacognition	-.137	.071	-.111	-1.946	.052
help seeking	.037	.057	.033	.650	.516
Organization	.046	.045	.049	1.038	.299
Effort Regulation	.036	.041	.035	.869	.385
gender	.106	.080	.047	1.327	.185
hometown	.119	.074	.056	1.611	.108

Dependent Variable: Academic Performance

$r=0.181, r^2=0.033, \Delta r^2=0.020, F(11,813) = 6.652, p<0.05$

Table 5 shows that the largest beta weight, 0.103, was recorded for intrinsic goal orientation. The predictive power for this variable was significant at the alpha value of 0.05. This means that intrinsic goal orientation had a contribution in explaining students'

academic performance, when the variance explained by all other variables in the model was controlled for.

The second strongest predictor of students' academic performance is test anxiety, where $p < 0.05$, the beta weight for learning challenges was $-.097$, after other independent variables in the regression model were statistically controlled.

Regression analysis on academic performance revealed that the significant predictors were test anxiety ($r = -.136$, $p < .005$) and intrinsic goal orientation ($r = .108$, $p < .005$).

Using the unstandardized coefficients, labelled as B in Table 5, a regression equation was produced. This equation consists of the constant, intrinsic goal orientation, test anxiety and a residual value.

$$\text{Academic performance} = 2.149 + 0.094(\text{IGO}) - 0.093(\text{TA}) + e$$

Where;

2.149 = Constants

IGO = Intrinsic Goal Orientation

TA = Test Anxiety

e = Residual

Based on the unstandardized B coefficients for each independent variable (Table 5), students' academic performance can be predicted. In detail, students' academic performance are expected to improve by 0.094 units with every one-unit increase in intrinsic goal orientation scores, $t(813) = 2.560$, $p < 0.05$. The improvement in this aspect may bring considerable positive changes to students' academic performance. The result on test anxiety was interesting. When the level of test anxiety is low, there is a predicted increase in academic performance by 0.093 units, $t(813) = -2.347$, $p < 0.05$. This findings is in line with the previous research (Chapell et al., 2005; Pintrich and De Groot, 1990). Test anxiety is a very common phenomenon among many students. They may feel a certain level of pressure due to their expectations and also their family expectations. According to Donnelly (2009), an average level of anxiety is possible and useful in helping students to be more hardworking and responsible of what they have to do.

5. DISCUSSION

The main objective of this study is to examine the differences in learning strategy and motivation between Islamic studies and non-Islamic studies stream students. The study reveals that there is a significant difference in the metacognition self-regulation and organization between Islamic studies and non-Islamic studies stream students. The findings also directed that non-Islamic students score higher than Islamic studies students in all SRL strategies especially in metacognition self-regulation and organization. The possible explanation is because of the sample selected in this study. The majority of the respondents of non-Islamic studies are from accounting and engineering students. The nature of the accounting and engineering programmes which are classified as a professional field are structured according to the professional bodies such as Malaysian Institute of Accountants (MIA), Associations of Chartered Certified Accountants (ACCA), Board of Engineers Malaysia (BEM) and Institution of Engineers Malaysia (IEM). The structure of accounting and engineering programmes are more stringent compared to the Islamic studies programme. Moreover, the strategy of organising is designed to help students and it is proven to be more effective in learning technical subjects (Nota et al., 2004). Lucas and Meyer (2005) identified several causes as being potentially important in learning non-Islamic studies programmes. For example, the nature of accounting and engineering subjects as they involve mathematic, numbers, technique and formulae. These differences in both programs might influence the students' learning strategies.

The study also found a significant difference in extrinsic goal orientation between Islamic studies and non-Islamic studies stream students. The Islamic studies students scored

higher than the non-Islamic studies students. This may be explained by the nature of the Islamic studies programmes. Generally, students from Islamic studies love to do something that will bring benefits to him and other people. For example, they usually give speech about the Islamic program to other people for the sake of reward for the hereafter.

Moreover, result of correlation shows that self-efficacy was significantly positively correlated with metacognitive self-regulation, help seeking and organization. Students who perceived they were capable were more likely to report the use of metacognitive strategies. They know how to plan, monitor and regulate the activities for their study. They are able to select appropriate information and also construct connections among the information to be learned and they are able to identify someone to provide them with some assistance.

Intrinsic and extrinsic goals were very strongly related to metacognitive self-regulation, self-efficacy and help seeking. Students who were motivated to learn, understand and master the materials, and concerned with the good grade and performance were more cognitively engaged to learn and tend to value a deeper level of understanding the materials. They try to communicate with the experts. In addition, these students were more desirable for improving their academic work.

The findings for the regression analysis reported that test anxiety and intrinsic goal orientation were the best predictors of academic performance. This means that test anxiety and intrinsic goal orientation are essential for academic performance either they are from Islamic studies or non-Islamic studies background.

There are various factor influencing students' learning strategies. However, this study only focuses on self-regulated learning strategy due to several limitations. Future study should explore other learning strategies such as deep, surface and strategic learning strategy. It is important to note that the generalizability of the results may be limited due to the sampling technique used. Future research should also consider a wider group of students in order to facilitate a reliable generalisation for the respective population.

In summary, this study has provided valuable information for educators and also the university in order to motivate students and promote effective learning to produce excellent students. In addition, the implication in teaching aspect is that instructors should engage in a supportive learning climate in order to enhance students' learning experiences and successful learning outcomes. Students need to have both the "will" and the "skill" to be successful in classrooms. Finally, this study may lead to the implementation of improved practices in training program design and stimulate further research into the areas of self-regulated learning and motivation.

6. REFERENCE

- Amstrong, M. (1995). *A Handbook ff Personnel Management Practice* (5th ed.). London: Kojan Page Limited.
- Artlet, C., Baumert, J., Julius-McElvany, N., and Peschar, J. (2003). *Learners for Life: Student Approaches to Learning*.
- Bandura, A. (1986). *Social Foundations of Thought and Action*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1994). Self-Efficacy. In V. S. Ramachaurdan (Ed.), *Encyclopedia of human behavior* (pp. 71–81). New York: Academic Press.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.
- Brophy, J. (1998). *Motivating Students to Learn*. Boston: McGraw-Hill.
- Byrnes, J. P. (1996). *Cognitive Development and Learning in Instructional Contexts*. Boston: Allyn and Bacon.

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Global Illuminators, Kuala Lumpur, Malaysia.

- Chapell, M. S., Blanding, Z. B., Silverstein, M. E., Takahashi, M., Newman, B., Gubi, A., and McCann, N. (2005). Test Anxiety and Academic Performance in Undergraduate and Graduate Students. *Journal of Educational Psychology*, 97(2), 268–274.
- Donnelly, R. (2009). Embedding interaction within a blend of learner centric pedagogy and technology. *World Journal on Educational Technology*, 1(1), 6–29.
- Easton, V. J., and McColl, J. H. (1997). Statistics glossary. Retrieved April 26, 2013, from <http://www.stats.gla.ac.uk/steps/glossary/sampling.html#clustsamp>
- Eggen, P., and Kauchak, D. (2004). *Educational psychology: Windows on classrooms* (6th ed.). New Jersey, NJ: Pearson Education Inc.
- Gay, L. R., Mills, G. E., and Airasian, P. W. (2006). *Educational research: Competencies for analysis and applications* (7th ed.). USA: Pearson Education, Inc.
- Hair, J. F., Black, W. C., Babin, B. J., and Anderson, R. E. (2010). *Multivariate Data Analysis* (7th ed.). Upper Saddle River, NJ: Prentice Hall.
- Kitsantas, A., Zimmerman, B. J., and Clearly, T. (2000). The Role of Observation and Emulation in the Development of Athletic Self Regulation. *Journal of Educational Psychology*, 92(4), 811–817.
- Klausmeier, H. J., and Ripple, R. E. (1971). *Learning and Human Abilities: Educational Psychology*. New York, NY: Harper & Row.
- Lucas, U., and Meyer, J. H. F. (2005). Towards a mapping of the student world: The identification of variation in students' conceptions of, and motivations to learn, introductory accounting. *British Accounting Review*, 37(2), 177–204.
- Malhotra, N. . (1996). *Marketing Research: The Applied Orientation*. New Jersey, NJ: Prentice-Hall International, Inc.
- Mohamad Azrien Mohamed Adnan, and Mohd Alwee Yusoff. (2009). Motivasi, Pembelajaran Pengaturan Kendiri dan Prestasi Akademik: Satu Kajian Di Kalangan Pelajar Asasi Pengajian Islam Universiti Malaya Nilam Puri. *Jurnal Al-Tamaddun*, 4, 1–16.
- Mohamad Azrien Mohamed Adnan, and Shukeri Mohamad. (2008). Pengaturan Pembelajaran Mandiri: Kerangka Konseptual. In Hamid Fahmi Zarkasyi & Mohd Fauzi Hamat (Eds.), *Metodologi Pengkajian Islam: Pengalaman Indonesi-Malaysia* (pp. 391–403). Gontor: Institut Studi Islam Darusslam.
- Nota, L., Soresi, S., and Zimmerman, B. J. (2004). Self-Regulation and Academic Achievement and Resilience: A Longitudinal Study. *International Journal of Educational Research*, 41(3), 198–215.
- O'Malley, J. M., and Chamot, A. U. (1990). *Learning Strategies in Second Language Acquisition*. *Tesol Quarterly* (Vol. 8, pp. 129–136). Cambridge: Cambridge University Press. doi:10.2307/329782
- Paris, S. G., Lipson, M. Y., and Wixson, K. (1983). Becoming a strategic reader. *Contemporary Educational Research*, 8, 293–316.
- Pintrich, P. R. (1999). The Role of Motivation in Promoting and Sustaining Self-Regulated Learning. *International Journal of Educational Research*, 31(6), 459–470.
- Pintrich, P. R., and De Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82(1), 33–40. doi:10.1037//0022-0663.82.1.33
- Pintrich, P. R., Roeser, R. W., and De Groot, E. A. M. (1994). Classroom and Individual Differences in Early Adolescent' Motivation and Self-Regulated Learning. *Journal of Early Adolescence*, 14(2), 139–161.
- Pintrich, P. R., Smith, D. A. F., Garcia, T., and McKeachie, W. J. (1991). *A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ)*. Ann Arbor, MI: National Center for Research to Improve Postsecondary Teaching and Learning.

International Conference on Multidisciplinary Trends in Academic Research, September 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- Rohaty Mohd Majzub. (1998). Atribusi, kepercayaan dan motivasi. In Omar Ibrahim, Rohaty Mohd Majzub, & R. Amir (Eds.), *Proses Pembelajaran Kepelbagaian Pelajar*. Bangi: Universiti Kebangsaan Malaysia.
- Salend, S. J. (2012). Teaching students not to sweat the test. *Phi Delta Kappan*, 93(6), 20–25.
- Sharifah Buniamin. (2012). A Comparative Study on Self Regulated Learning Strategy Between Accounting and Business Students. *Malaysian Journal of Education*, 37(1), 37–45.
- Stipek, D. (1996). Motivation and instruction. In D. Berliner & R. Calfee (Eds.), *Handbook of Educational Psychology* (pp. 85–113). New York: Macmillan.
- Weinstein, C. E., and Mayer, R. E. (1986). The teaching of learning strategies. In M. C. Wittrock (Ed.), *Handbook of Research on Teaching* (3rd ed.). New York: Mc Millan Publishing Company.
- Zeidner, M. (1998). *Test anxiety: The state of the art*. New York, NY: Plenum.
- Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational Psychologist*, 25(1), 3–17.
- Zimmerman, B. J., and Martinez-Pons, M. (1986). Development of a Structured Interview for Assessing Student Use of Self-Regulated Learning Strategies. *American Educational Research Journal*, 23, 614–628. doi:10.2307/1163093
- Zimmerman, B. J., and Martinez-Pons, M. (1990). Student Differences in Self-Regulated Learning: Relating Grade, Sex, and Giftedness to Self-Efficacy and Strategy Use. *Journal of Educational Psychology*, 82(1), 51–59. doi:10.1037//0022-0663.82.1.51

7. APPENDIX

The following items represent the Motivated Strategies for Learning Questionnaire (MSLQ) that was used in this study to measure students' motivational beliefs and self-regulated learning.

Motivational Belief

A. Extrinsic Goal Orientation

1. The most important for me right now is improving my overall grade point average, so my main concern is getting a good grade – v13
2. I want to do well because it is important to show my ability to my family, friends, employer, or others – v14
3. Getting a good grade in this class is the most satisfying thing for me right now – v12
4. If I can, I want to get better grades than most of the other students – v18
5. The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible – v19

B. Self-Efficacy

1. I am certain I can master the skills being taught – v17
2. I am confident I can understand the most complex material presented by the instructor – v16
3. I'm certain I can understand the ideas thought in this course – v4
4. I believe I will receive an excellent grade in this class – v8
5. Considering the difficulty of this course, the teacher, and my skills, I think I will do well in this class – v15

C. Test Anxiety

1. I have an uneasy, upset feeling when I take test – v7

2. I am so nervous during a test that I cannot remember facts I have learned – v3
3. I feel my heart beating fast when I take an exam – v22
4. When I take a test, I think of the consequences of failing – v21
5. When I take a test I think about I poorly I am doing compared with other students – v11
6. When I take test I think about items on other parts of the test I can't answer – v20

D. Intrinsic Goal Orientation

1. I prefer course material that arouses my curiosity, even if it is difficult to learn – v9
2. When I have the opportunity, I choose course assignment that I can learn from even if they don't guarantee a good grade – v10
3. I prefer class work that is challenging so that I can learn new things – v1

E. Task Value

1. I expect to do very well – v5
2. I am sure I can do an excellent job on the problems and tasks assigned – v6
3. Compared with other students I expect to do very well – v2

Self-Regulated Learning Strategies

A. Metacognitive Self-Regulation

1. When studying, I try to determine which concepts I don't understand well – v18
2. If course material are difficult to understand, I change the way I read the material – v12
3. When I become confused about something I'm reading, I go back and try to figure it out – v11
4. I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying – v17
5. I memorise keywords to remind me of important concepts – v15
6. When I study, I set goals for myself in order to direct my activities in each study period – v19
7. I try to change the way I study in order to fit the course requirements and instructor's teaching style – v14
8. Before I study new course material thoroughly, I often skim it to see how it is organised – v13
9. I work hard to do well in class even if I don't like what I am doing – v22
10. If I get confused taking notes in class, I make sure I sort it out afterwards – v20

B. Help Seeking

1. When studying, I often set aside time to discuss the course material with a group of students – v6
2. When studying for this course, I often try to explain the material to a classmate or a friend – v4
3. I try to work with other students to complete the course assignment – v5
4. I ask myself questions to make sure I know the material I have been studying – v1
5. I make lists of important terms for this course and memorize them – v2

C. Organization

1. When I study, I attempt questions as my own exercise – v9
2. When reading, I make up questions to help focus my reading – v10
3. When studying for this class, I read my class notes over and over again – v7
4. Even when study materials are dull and uninteresting, I keep working until I finish – v3

D. Effort Regulation

1. When course work is difficult, I give up or only study the easy parts – v23
2. During class time I often miss important points because I'm thinking of other things – v8
3. I often find that I have been reading for class but don't know what it was all about – v16
4. I often feel so lazy or bored when I study that I quit before I finish what I planned to do – v21

AN OLD FOLKTALE RECONSTRUCTED FOR BETTER GENERATION: AN INDONESIAN CASE

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ABSTRACT

A folktale must not be a dead and dormant narrative. Being a text that possesses power in the education of children, and in shaping them to approved behaviour, a folktale must develop with time. As values in society alter and shift, folktales must be adjusted and amended. This is especially true and urgent in folktales that carry values or principles that are not believed anymore or that do not carry constructive values. These tales have to be rewritten and reconstructed in order to be able to transmit constructive values to child readers, for a better generation.

This paper presents a study on the influence of a reconstructed version of a long-established Indonesian folktale to Children's Perceived Self-Efficacy in Indonesia. Children's perceived self-efficacy represents children's beliefs in their abilities to achieve certain attainments. In this study, 93 students of grades 4 – 5 Elementary School in Indonesia are surveyed on their perceived self-efficacy prior to and after being read to a traditional and a reconstructed version of the tale. Using a 4-point-response format, their perceived self-efficacy are compared and contrasted to those who read the traditional version of the tale. The result of the study shows how a reconstructed folktale can influence child readers in positive ways on their perceived self-efficacy that influence the construction of a better generation.

Keywords: Children Literature, Reconstructed Folktale, Children's Perceived Self-Efficacy, Education.

1. INTRODUCTION

Children stories have always played a double role as an 'edutainment' tool for children, that is, to entertain and to educate (Citraningtyas, 2011). In the case of folktales, however, the edification element is always much stronger than the entertaining element. Folktales are widely believed to be tales that are capable of shaping children's character (Johnston, 2001; Pantaleo, 2001; Meek 2001, Rusciano, 2003; Citraningtyas et.al., 2011, 2012) and of molding a nation (Johnston, 2000). It is therefore hardly surprising that parents, educators, and even government, greatly trust folktales for the edification of younger generation.

Despite the important function of folktales in shaping a nation and in educating young generation, Indonesian children have grown with tales that are disturbing to be used to mold a character. A number of Indonesian tales end with unconstructive endings, where the protagonists are cursed to be a lifeless, dead, and objects that are unproductive or infertile. These kinds of endings are unconstructive in shaping young generation of a nation, for such endings may promote negative impact for the young generation, and thus for the nation.

One of Indonesia's most popular tales is *Malin Kundang*, a tale of a young unfilial man who is then cursed by his own mother as he fails to acknowledge her. He is cursed to be a stone by the mother. So popular is this tale that *Malin Kundang* is widely used as a reference to establish and assert filial piety amongst Indonesian children (Citraningtyas, 2004). It is common in Indonesia to read news or articles about a child or children who face catastrophe for being unfilial. Parents and educators often use the folktale to warn young generations not to be like Malin Kundang or else they will face the consequence of being cursed.

Although there are numerous different versions of *Malin Kundang* found, there has never been a version that totally reconstructs the tale to give it a new impact to readers. It is deemed vital to reconstruct the tale in order to shape Indonesian children and society for a better future. In 2012, Citraningtyas *et.al.* has prepared a reconstructed version of the tale where Malin is freed from his curse, is forgiven and is given another opportunity. After another long struggle, Malin then lives happily ever after with his wife and mother to embrace a promising future together. The removal of the curse from Malin is believed to free Malin, and other Indonesian young generation from an everlasting curse that may hinder their progress and development. The change in the tale ending to forgive Malin and to give him another opportunity is believed to encourage a higher self-efficacy to child readers. A high self-efficacy is a quality important in shaping a better generation.

This paper presents the effect of the reconstructed version of *Malin Kundang* tale on the self-efficacy of Indonesian child readers. Children's perceived self-efficacy, developed by Bandura (1977), represents children's beliefs in their abilities to achieve certain attainments. Ninety five students aged 9 - 12 are surveyed on their perceived self-efficacy prior to and after being read to a traditional and a reconstructed version of the tale. Using 1 to 4 point Lickert Scale format, their perceived self-efficacy are compared and contrasted between those who read the traditional version of the tale to those who read the reconstructed version.

2. REVIEW OF LITERATURE

Folktales are alive, just like plants that continually grow: "Tales, just as plants, adapt to a certain environment through natural selection and thus differ somewhat from other members of the same species" (Bradkūnas 1975). Therefore, tale reconstruction has to be an essential activity in order to adapt with the ever-changing cultural and social shifts.

To reconstruct is generally understood as to build again. Something is reconstructed because there is a need to correct it. A building, for example, is reconstructed to refurbish its looks and/or strengthen its structure. A physical reconstruction is needed to correct certain defect in the body. If applied to a tale, reconstruction is to construct again an available tale with the purpose of making it better and more suitable to adapt with cultural and social changes. The parts that are old and not suitable anymore are changed with new better and stronger parts (Citraningtyas *et.al.*, 2012).

Tale reconstruction is not a new entity and has been done throughout history to a number of well-known tales. Tales such as *Cinderella* and *Little Red Riding Hood* are the popular examples of tales that have undergone numerous changes over centuries to adapt with societal need. The earliest version of *Cinderella*, for example, ended with *Cinderella* killing the stepmother. The version of *Cinderella* that we know today is a happy ending that is more constructive and more acceptable for today's audience. The ending of *Little Red Riding Hood* has also gone through a number of changes, from the girl who died, to a girl who is rescued by the huntsman (Dundes, 1989, p. 73). It is thus proven that tale reconstructions are normal and necessary.

It is believed that tale reconstruction can be beneficial for the betterment of the readers' self-efficacy. Should a reader's self-efficacy increase, the quality of human resource will be increased. Thus, the advancement of the nation can progress with better quality of human resource. Self-efficacy is a term coined by Albert Bandura (1977, 1986, 1992, 1997), to refer to a person's belief in their own ability to succeed in a given situation. Bandura affirms that if a person believes that he or she is capable of accomplishing a task, he or she will persevere longer and is more likely to succeed because of this perseverance. On the contrary, if a person does not believe that he or she is capable of performing a task, he or she will give up easily,

and thus will unlikely succeed in the task. Higher levels of perceived self-efficacy and higher performance attainments, therefore, tend to go hand in hand.

Self-efficacy has now become such an important topic among psychologists and educators as researchers (Nilsen, 2009; Loo and Choy, 2013) have confirmed that self efficacy can influence people's goals, actions, motivation, and successes in life. Nations with citizens that have higher self-efficacy will be more productive to those with lower self-efficacy. Therefore, increasing perceived self-efficacy will be advantageous for the betterment of a nation.

3. METHOD AND PROCEDURE

The subjects of this study are 95 Indonesian students aged 9 – 12 years old. These students are in their fourth grade of Elementary School. They are recruited through the schools that agree to participate in this research project. Respondents from each school are split into two groups: the control group and the experimental group. Both groups are given a pre-test, treatment, and a post-test to measure difference of their perceived self-efficacy before and after treatment.

During the pre-test, the respondents were given nine questions adapted from Muris (2001, 2002) that measure respondents' self-efficacy in three areas. Three questions are on academic self-efficacy, three on social, and three on emotional. These three areas of human quotient are generally believed to be important for the development of an individual. Prior to the pre-test, the students were given guidance that the activity was not a test and that their answers were equally correct as long as they were answered honestly, according to their own condition. They are also told that they should answer the questions according to what they think is correct for themselves, not according to what might be judged as correct by their teacher, parents or any authoritative figures they might know. This process was necessary for Indonesian context, where students are not used to express their opinion or to give answers that might be different from the generally approved answer. The questionnaire used 1 (for not at all) to 4 (for very well) point Lickert Scale. The 4-point Lickert Scale was preferred due to the absence of the neutral or undecided option, because this option can be a very well-liked option to respondents who are not used to give their opinion.

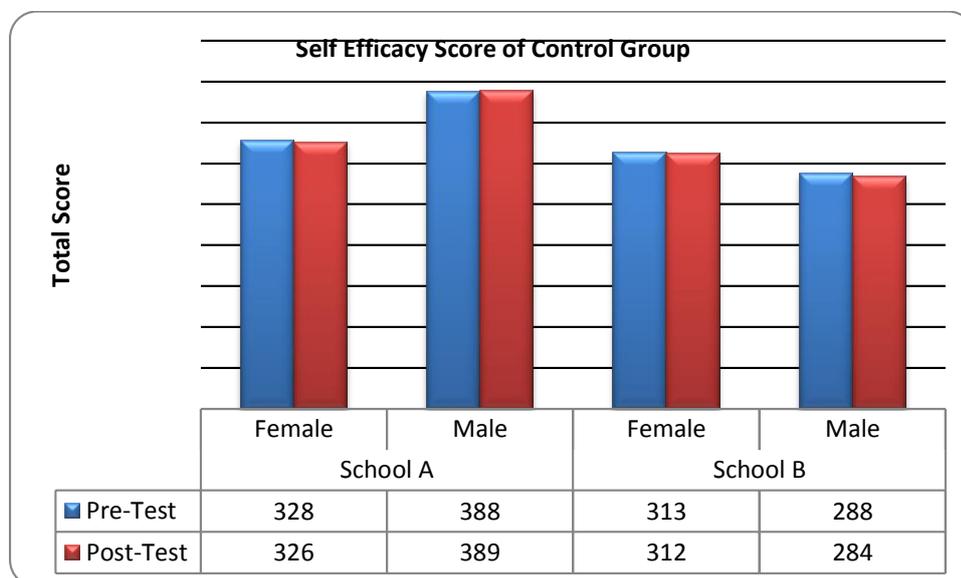
After the pre-test, both groups listened to *Malin Kundang* tale told by a professional story-teller. The control group listened to the traditional version of the tale, while the experimental group listened to the reconstructed version of the tale. The reason why professional story-tellers were used was to eliminate any bias that might be present if the tale was told by their teacher or by the researcher. Based on a general observation, most children in Indonesia first heard the *Malin Kundang* tale through parents, educators, or other authoritative figures in their lives. In this research, the respondents listen to the tale through a professional story teller so that they are not bound by the same feeling and experience that they acquire through the introduction of the tale by an authoritative figure. The respondents did not listen to the tale through the researcher either so that the respondents do not feel any obliged connections between the tale and the questionnaires they answer.

During the post-test, the respondents were again given a set of nine questions adapted from Muris (2001, 2002), to measure their perceived self-efficacy in three areas: academic, social and emotional. The responses were then summed up to produce a total score. Higher scores indicate higher self-efficacy.

4. FINDINGS AND DISCUSSION

It is found that both control and experimental groups achieved an average score of 2.75 in the pre-test. This can be understood as the general starting score for the respondents: that Indonesian child readers who have all been familiar with the traditional version of *Malin*

Kundang tale, have average self-efficacy of 2.75 or 68.7%. It will be observed whether the self-efficacy will increase with exposure to the reconstructed version of the tale.



1 : Self Efficacy Score of control group during pre-test and post-test.

Figure 1 shows the comparison of self-efficacy score in the control group at pre-test and post-test. It is evident that there hardly any changes in the respondents' self-efficacy between the pre-test and post-test in both schools. It means that the respondents who are already very familiar with the traditional version of the tale have unchanged self-efficacy after listening to the same traditional tale. This is regardless that the tale was told by a professional story teller rather than an authoritative figure in the respondents' lives.

In the experimental group, on the other hand, shows an increase in the post-test score. Figure 2 demonstrates that all male and female respondents from both schools experience an increase of score from pre-test to post-test. These respondents experience positive increase after listening to the reconstructed version of *Malin Kundang* tale. As higher score indicates higher self-efficacy, it can be said that the reconstructed version of the tale increase respondents' self-efficacy. It is interesting to note that in both schools, the increase is more apparent among male students. In school A, the increase experienced by male respondents double the amount of increase experienced by female respondents. A similar situation also happens in school B, where the increase among male students are 59 points, if compared to 34 point increase among female students.

It is also found that the average score for the post-test of the experimental group is 2.97 or 74%. It is therefore apparent that the reconstructed version of the tale had increased respondent's self-efficacy.

Although in average there appears to be no change between the score of pre-test and post test in the control group, when examined more closely it is apparent that there are dynamics of results in the three areas of self-efficacy researched. There were some increase and decrease in scores recorded there. In the control groups, the most affected self-efficacy on repeated exposure of the traditional version of *Malin Kundang*, is self-efficacy in social area. As shown in Figure 3, the post-test score of control group decreased by 29% in social self-efficacy area. In addition to the decline in the field of social self-efficacy, the self-efficacy in the emotional area also decreased. However, interestingly, the traditional version of this tale

does not only decrease the self-efficacy of the control group, but also gives an increase on the self-efficacy in the academic area. It may be due to the top-down style of educational and parental approach in Indonesia where an authoritative figure remains to be a very influential figure for Indonesian children. Thus the teachings of a top-down authoritative figure, as affirmed in the traditional story of *Malin Kundang*, could well be accepted by the respondents. It is more so in a society with a belief that respect to parents is a key for success. This element can increase a child's self-efficacy in the academic field.

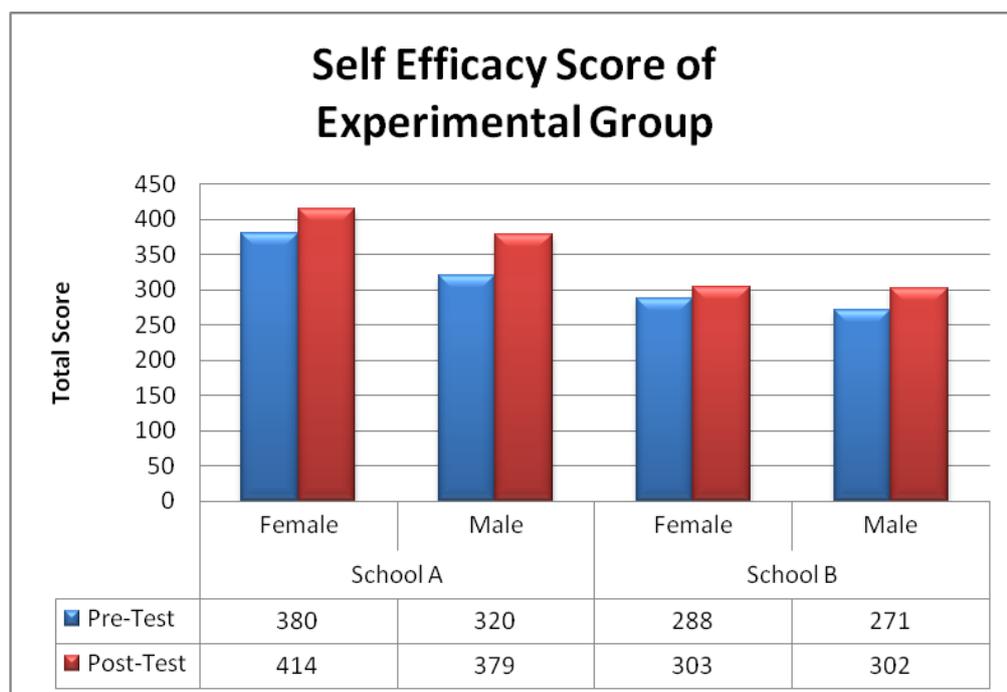


Figure 2 : Self Efficacy Score of experimental group during pre-test and post-test.

The experimental group, on the other hand, generally experienced more improvement in the post -test score. Areas of self-efficacy that increased the most are in the academic field. Figure 3 also shows an increase in value by 68% in the educational self-efficacy. This shows that despite the fact that a top-down educational approach can indeed increase confidence in one's academic field, but liberating education, which is not merely a top-down, even further enhancing self-efficacy in the field of education.

In this experimental group, the increase in value also occurs in the emotional self-efficacy. The result of this increase can be seen in Table 3. It is apparent that emotional self-efficacy increases by 35%. The only value that decreases in this group is the value of self-efficacy in the social area. There is a decrease by 13% in social self-efficacy. However the decrease in the area of social self-efficacy in the experimental group is still much lower than (only a half of) the decrease in social self-efficacy in the control group.

From the findings of self-efficacy by gender as exposed through Figure 4, it is interesting to note that the change in score is more obvious in male respondents than female respondents in the experimental group. While in the control group, the decrease experienced by male and female respondents are the same.

At school A, score increase experienced by male respondents is twice the increase in scores experienced by female respondents. The same is seen in school B, where the male respondents scores increased by 54 points, compared to female respondents who experienced a gain of 34 points.

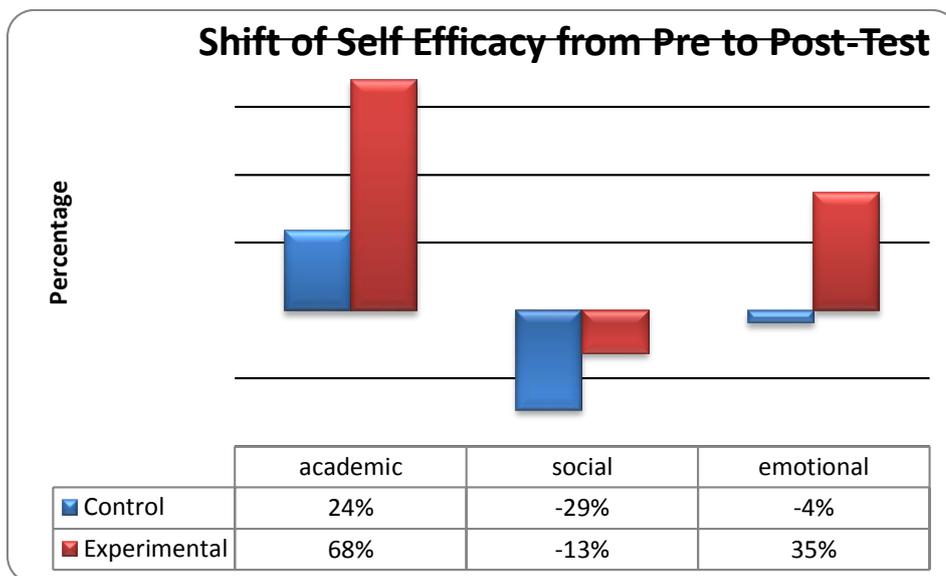


Figure 3: Self-efficacy grouped by three areas.

This phenomenon may be due to the type of story used in this study. *Malin Kundang* is a folktale that concerns the child-parent relationship experienced by a little boy. Therefore, male respondents are more likely to identify themselves with *Malin Kundang* rather than female respondents.

The findings obtained have shown that the reconstructed version of *Malin Kundang* increase the self-efficacy of Indonesian children. With the increase in self-efficacy, it increases the motivation and fighting spirit of Indonesian children for the betterment of Indonesia.

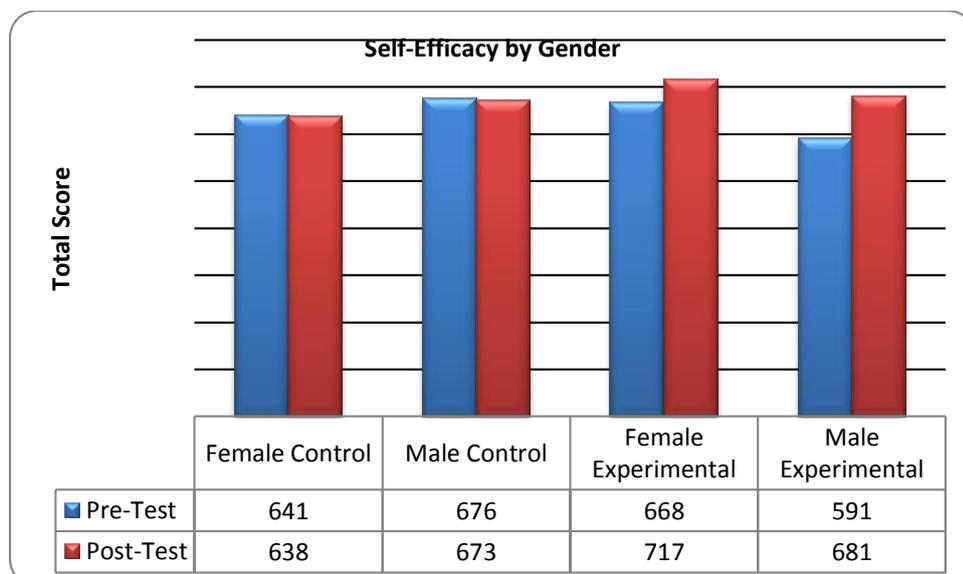


Figure 4: The comparison of pre-test and post-test score grouped by gender.

5. CONCLUSION

The research is to measure the effect of a reconstructed version of an Indonesian folktale to the self-efficacy of Indonesian readers. It is hypothesized that a tale that is reconstructed for more

positive values positively affects readers, and thus enhance a better generation. The *Malin Kundang* tale is reconstructed to liberate Malin from the curse of his mother for his unfilial conduct. Malin is forgiven and lives happily with his wife and the mother.

The subject of the study is 95 students aged 9 - 12 who are divided into control and experimental groups. Both groups receive similar treatments to measure academic, social and emotional self-efficacy: pre-test, treatment, and post-test. During the treatment, the control group is exposed to the traditional version of the *Malin Kundang* tale, while the experimental group is exposed to the reconstructed version.

The study results in four main findings. There are no apparent changes of self-efficacy score occurs in the control group. Therefore, the score of the respondents' self efficacy remains unchanged between the pre-test and post-test. On the other hand, apparent increase of self-efficacy score occurs in the experimental group. After being exposed to the reconstructed version of the tale, the respondents experienced an increase in their self-efficacy score up to 139 points all together. The respondents in the experimental group increased their academic self-efficacy the most, followed by emotional self-efficacy. These respondents did not experience an increase in the social self-efficacy. Male respondents are affected most by this reconstructed tale if compared to female respondents. In the experimental group, male students achieved higher increase in self-efficacy score if compared to female respondents.

The findings confirm the hypothesis that a tale reconstructed to be more positive will result in positive effect to the readers' self-efficacy. Respondents from the experimental group experienced increases in their self-efficacy score that is advantageous for the advancement of a nation. However, more treatments still need to be done to confirm the stability of the result if the exposure to the reconstructed tale is repeated and given to wider audience.

6. REFERENCES

- Bandura, A. (1977). "Self-efficacy: Toward a unifying theory of behavioral change". *Psychological Review*, 84, 191-215.
- Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, 28(2), 117.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Free man
- Bandura, A., Pastorelli, C., Barbaranelli, C., & Caprara, G.V. (1999) *Self-Efficacy Questionnaire for Children*.
- Bradkūnas, Elena. (1975) 'If You Kill a Snake – The Sun Will Cry.' Folktale Type 425–M A Study in Oicotype and Folk Belief. *Lituanus: Lithuanian Quarterly Journal of Arts and Sciences* Vol. 21. No. 1. http://www.lituanus.org/1975/75_1_01.htm .
- Citraningtyas, Clara Evi. (2004). Breaking a Curse Silence: Malin Kundang and Transactional Approaches to Reading in Indonesian Classrooms – an empirical study. Ph.D. thesis. Macquarie University.
- Citraningtyas, Clara Evi. (2010). "*Sastra Anak dan Restu Negara : Menegosiasikan Identitas Nasional Indonesia*". Polyglot, Fakultas Ilmu Pendidikan Universitas Pelita Harapan, Juli 2010.
- Citraningtyas, Clara Evi. (2011). "*Sastra Anak: Edutainment dengan Catatan*". Makalah disajikan dalam Seminar Nasional Sastra Anak di Universitas Negeri Yogyakarta, dalam rangka Hari Anak Nasional, Juli 2011.
- Citraningtyas, Clara Evi. (2012). "*Cintarella, Merekonstruksi Cinderella*". Makalah disajikan dalam Persidangan Kebangsaan Libatsama Universiti dan Komuniti: Hala Tuju Baharu Dalam Ilmu Kemanusiaan, Universiti Sains Malaysia, Pulau Pinang. November.
- Dundes, A. (ed). (1989). *Little Red Riding Hood*. Madison, WI: The University of Wisconsin Press.

International Conference on Multidisciplinary Trends in Academic Research, September 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- Johnston, I. (2000) "Literature and Social Studies: Exploring the Hyphenated Spaces of Canadian Identity." *Canadian Social Studies*. Vol. 35, No. 1, Fall. http://www.quasar.ualberta.ca/css/literature_and_social_studies.htm#Literature_and_Social_Studies
- Loo, C.W., and J.L.F. Choy. "Sources of Self-Efficacy Influencing Academic Performance of Engineering Students." *American Journal of Educational Research* 1.3 (2013): 86-92.
- Meek, M. ed. (2001). *Children's Literature and National Identity*. Stoke on Trent: Trentham Books.
- Muris, P. (2001). A brief questionnaire for measuring self-efficacy in youths. *Journal of Psychopathology and Behavioral Assessment*, 23, 145-149.
- Muris, P. (2002). Relationships between self-efficacy and symptoms of anxiety disorders and depression in a normal adolescent sample. *Personality and Individual Differences*, 32, 337-348.
- Nilsen, Hallgeir (2009) Influence on Student Academic Behaviour through Motivation, Self-Efficacy and Value-Expectation: An Action Research Project to Improve Learning. *Issue s in Informing Science and Information Technology*. (6), 545-556.
- Pantaleo, S. (2001). "Exploring Canadian Identity through Canadian Children's Literature." *Reading Online*. 5.2.
- Rusciano, Frank Louis. (2003). "The Construction of National Identity: A 23-Nation Study". *Political Research Quarterly*, Vol. 56, No. 3 (Sep., 2003), pp. 361-366. Published by: Sage Publications, Inc. for University of Utah. URL: <http://www.jstor.org/stable/3219795>.

TEACHERS', STUDENTS' AND PARENTS' PERSPECTIVES ON SEX EDUCATION INTEGRATED CURRICULUM FOR SIXTH GRADE STUDENTS

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ABSTRACT

Sex problems are rapidly increasing worldwide including in Thailand. The rate of Thai unplanned teenage pregnancies has been ranked in the first in Asia. Moreover, sex problems now are expanding to primary students. Sex education is expected to help prevent sex problems that should be conducted early in the primary level. This study aims to investigate the stakeholders' perspectives on sex education integrated curriculum for 6th grade students. Teachers, students and parents are regarded as important stakeholders for sex education. This study was a qualitative research. The participants were nine in-service physical education teachers (seven males, two females), 10 of 6th grade students (one male, nine females), and nine parents (two males, seven females) from Samutsakhon province, Thailand. They were asked to participate in focus group discussions. The qualitative data were analyzed by using a constant comparative method. The results revealed that all groups of participant regarded sex education as being very important for 6th grade students. The participating teachers and parents stated that sex problems tended to expand to primary students because of the easy access to internet media (e.g. YouTube) and sexual stuffs (e.g. sex movies). Teachers and parents need to communicate each other more frequently for updating about students' sexual related information and problems. All participating groups were interested in sex education integrated curriculum. The parents and students suggested integrating sex education into all subjects in schools. The students preferred to learn sex education through short movies, drama, and role play; while the parents preferred teachers to use sexual related stories and news, models, and Dhamma. The students reflected that their teachers normally taught sex education by textbook-based learning; while the teachers indicated that they normally taught sex education by using a variety of teaching methods and media as short movies, animation, video, and role play. The teachers also reflected that sex education was far from student's understanding. Finally, the main findings emerged from this study were discussed and utilized for the development of sex education integrated curriculum for sixth grade students in the next phase of the study.

Keywords: Sex Education, Integrated Curriculum, Perspective, Sixth Grade Student, Thailand.

1. INTRODUCTION

Sexual problems in teenagers e.g. AIDS, sexual transmitted infections (STIs), illegal abortion and teenage pregnancy, are widely spread and highly concerned by all stakeholders. The rates of STIs, unplanned teenage pregnancies and abortion have been rising across the world (Kirby, et al., 2007). Particularly in U.S., the rate of teen pregnancy was the highest among Western developed nations (National Campaign, 2003).

The situation of sex problems in Thailand is in crisis and potentially increasing as seen from hot news as "Found more than 2,000 corpses of infants in Wat Prayakai morgue". In addition, the rate of Thai teen mom was up to 70/1,000 people whereas Japan, Korea and China teen mom were only 4-5/ 1,000 people. One of solutions for coping with this problem is promoting sex education in the country.

“Sex education” can be defined in many aspects. Kearney (2008) defined “sex education” as a comprehensive course of action from school, socially attitudes, practices and personal conduct of children and adults. In sum, sex education is education about all prospective of sexuality, including information about reproduction (fertilization till childbirth), body image, sexual orientation, sexual values, pleasure, decision making, communication, dating, relationships, sexually transmitted infections (STIs) and birth control methods.

Sex education has been developed in many countries in many aspects such as contents and topics, teacher qualification and timing of first sex education instruction (Eisenberg et al., 1997). However, heavy work load and external evaluation are two difficulties teachers face in launching sex education (Kay, et al., 2010). In addition, Lyttleton (1994; 1996) stated that a one-size-fits-all approach is ineffective for sex education. Kay et al. (2010) suggest that focusing more on a curriculum serving students’ needs and on age-appropriate information may serve to be more effective in long run. In addition, Kirby et al. (1997) stated that sex education programs should start at an early age.

In Thailand, sex education is mandatory and explicitly mentioned in the 2001 Thai Basic Education Curriculum (B.E. 2544) particularly in the 2nd Learning Strand, namely, “Life and Family” (Thailand’s Compulsory Education Curriculum, 2001). Thai students have to learn sex education from grades 1 to 12. There are several topics and learning indicators related to sex education , including nature of human growth and development, problems and effects of sexual intercourse, contraception methods (condom and contraceptive pills), sexual transmitted infections (STIs), AIDS and unintended pregnancy, etc.

Even though sex education has been included in Thai basic curriculum, the situation about sexual problems in Thailand is not much improved. Thai teenagers have less skill in sexual-related topics and hold some misinformation and entrenched values (Vuttanont, et al., 2006). Some researchers found that peers were the preferred sourced of sexual information for students rather than their parents or teachers. Tipwareerom et al. (2011) did the research in boys and their parents about STIs knowledge and risky sexual behaviors using the model of risky sexual behavior prevention . They found that the participant’ scores of STIs knowledge and decision making skills decreased and the parents did not improve their risky sexual behavior skills.

To build effective sex education curriculum, perspectives from involved stakeholders as teachers, students and parents are very important and should be taken into account. Thus, this study aims to explore teachers’, students’ and parents’ perspectives on current situation about sexual problems and desirable characteristics of sex education curriculum for sixth grade students.

2. METHODS

This study is a focus group study. The focus group discussion (FGD) was conducted with the participants, who volunteered Samutsakhon province, Thailand. There were nine in-service primary teachers (seven males, two females), 10 of 6th grade students (one male, nine females), and nine parents (two males, seven females). The qualitative data were analyzed by using a constant comparative method. This study was ethically approved by Mahidol University Institutional Review Board (MU-IRB).

3. RESULTS AND DISCUSSION

There are three themes found from this study: current situation of sexual problems in Thailand, sex education in primary schools, and desirable characteristics of sex education curriculum.

Current situation of sexual problems in Thailand

Sexual problems in Thailand tended to be occurred with younger students. Previously sexual problems happened with 8th and 9th grade students, but now it happened with primary students. The participating teachers and parents pointed out the advancement of technology as a major source such as internet, smart phone, social network etc. For example, primary students especially 6th grade students themselves could access to sexual stuff via internet (sex webs , Facebook, Youtube, Line)

...because of the movies, smart phone, some 5th or 6th grade students imitated from the movies then wrote sexual words in Line or shot naked pictures in Facebook...(parent 04)...nowadays there are a lot of tempting medias, I was once found a 6th grade girl shot herself naked in her smart phone. Finally I found out that she had first intercourse since grade fifth...(teacher07) *Note: Teacher 07 is a code to represent the participating teacher no. 7*

Moreover, the relationship in family was one cause of sexual problems. For example, some parents may have no time to talk with their child about sexual issues or thought that sexual topics were not appropriate topic to talk with their child. Therefore children went to talk with their friends or searched from internet without any advices from parents. . In focus group, only four out of 10 students said that they regularly talked with their parents in every topic.

...talked to mom in everything, she always gave me good advices to do or not to do... (student09)...told mom about friend's stories even good or bad, she said I should concentrate about learning. It's a time for studying (student01)... I had talked sexual stuffs with my parents. (student07)

Sex education in primary schools

The participating students stated that their teachers mostly taught sex education by textbook-based teaching. However, their teachers also employed movies from Youtube, sexual-related news from newspapers, physical models or role play in teaching. The three most favorite teaching methods in sex education for the students were short movies, role play and news from newspapers.

...teacher asked us to follow her from the textbook, I understood at that time but I can't remember. (student07)...teacher showed us the pictures from the textbook, sometimes I had seen from the projector. (student05)

...teacher had real stories, news that made us know how to protect ourselves... (student04)...sometimes teacher have the models for learning human organs or the slides from PowerPoint.(student01)...teacher had cartoon or animation from YouTube in sex education class...(student06)

The participating teachers did not mention about textbook-based teaching. They said that they used various teaching methods such as short movies, Youtube, real stories from news or newspapers and role play. Importantly, every teacher realized that sex education is important but they emphasized that time for teaching sex education is very limit.

...teaching about sexual stuffs was only in physical education subject, I think it was not enough to teach our students. I need sex education subject...(teacher02)...the mandatory sex education in class was not enough to solve the sex problems in nowadays , we need to integrated the curriculum...(teacher01)...I liked to apply news or real situations to sex education class then let them discuss about the stories...(teacher06)...I need them to criticize the problems by using role play, I gave each group two weeks to work out together and students love to play...(teacher03)

Desirable characteristics of sex education curriculum

When asking the participants about desirable characteristics of sex education curriculum and their opinions in using in integrated sex education curriculum for 6th grade students, participants agreed to have sex education curriculum in primary schools. Some teachers told that they used to integrate sexual topics when teaching Thai language and Science subjects. Also the parents agreed to integrate sex topics in various subjects because it will help their child remember better than only being taught in physical education subject. They said “the more it taught, the better it was”

...I agreed to integrate with Science, Social and Thai language, we can unite the sexual stories into these subjects. It could subsidize the sex problems in nowadays...(teacher02)...it would be fine because Science has sex organ characteristics lesson, Social Sciences teach about behavior in each social environment, also in Thai language I taught Thai motto about Thai women should have properly manner and behave like women in ancient time ...(teacher03)

...I suggested applying Dhamma with sex education, it might be good to have monk taught Dhamma in school again...(parent06)...I think mixing four subjects together might be fun and interested...(student03)...it should be fine and might be more understand...(student09)

Both participating teachers and parents in this study agreed to start sex education since the primary level as Kirby et al. (1997) suggested that sex education should be started at an early age. In addition, the participating teachers realized the importance of having sex education in the curriculum and stated that the learning hours allocated for sex education was quite limited. This is similar to Kay et al. (2010) who stated that only five to eight hours per one academic year was not enough for teaching sex education. The integration of sex education in other subjects such as science, social studies, and Thai language is needed to help solve the time limitation.

The students showed that they preferred to learn sex education through short movies, role play and news rather than textbooks. Then, the teachers should employ a variety of teaching methods and materials in teaching sex education in order to serve the students' needs and preferred learning styles. Finally, helping prevent sexual problems, it needs cooperation from all stakeholders; teachers, students and parents. Teachers and parents need to communicate to each other more frequently for updating the status of students' sexual problems. Parents should be open-minded for talking with their child about sexual topics. Nolin and Peterson (1992) suggested that parents should have open conversation with their children about sexual stuffs in order to promote positive sexual behaviors and attitudes in adolescence.

4. IMPLICATIONS

This study will lead to the construction of learning unit for teaching sex education for grade 6 students in Thailand. The students' preferred learning materials and styles are taken into account in the new learning unit. In addition, sex education will be integrated with other subjects as Science, Social science and Thai language to become an integrated curriculum for sex education. The integrated curriculum is expected to cope with time limitation for teaching sex education and promote holistic learning in students. One of key factors is parents, so parents should cooperate and communicate with schools more frequently for updating their students' behaviors and problems.

5. REFERENCES

- Eisenberg, M. E., Wagenaar, A. & Neumark-Sztainer, D. (1997). Viewpoints of Minnesota students on school-based sexuality education. *Journal of School Health*, 67(8), 322-326.
- Glaser, B. & Strauss, A. L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Chicago: Aldine Publishing Company.
- Kay, N. S., Jones, M. R., Jantaraweragul, S. (2010). Teaching sex education in Thailand. *Journal of Research*, 5(2), 10-16.
- Kearney, M. S. (2008, September 18). Teen pregnancy prevention as an anti-poverty intervention: a review of the evidence. Retrieved from <http://econserv.umd.edu/kearney/Papers/Kearney....2008-nber.org>
- Kirby, D.B., Korpi, M., Barth, R.P., et al. (1997). The impact of the postponing sexual involvement curriculum among youths in California. *Family Plann Perspective*, 29, 100-108.
- Kirby, D.B., Laris, B.A. & Roller, L.A. (2007). Sex and HIV education programs: their impact on sexual behaviors of young people throughout the world. *Journal of Adolescent Health*, 40(3), 206-217.
- Lyttleton, C. (1994). Knowledge and meaning: The aids education campaign in rural northeast Thailand. *Social Science Medicine*, 38(1), 135-146.
- Lyttleton, C. (1996). Health and Development: Knowledge systems and local practice in rural Thailand. *Health Transition Review*, 6, 25-48.
- Micheal, V. (2009). Sexuality, schooling, and teacher identity formation; a critical pedagogy for teacher education. *Teaching and Teacher Education*, 25, 383-390.
- Nolin, M.J. and Peterson, K.K. (1992). Gender differences in parent-child communication about sexuality: an exploratory study. *Journal of Adolescent Research*, 7(1), 59-79.
- Noppakuntong, W. (2007, September 4). Talking about sex in the classroom. Bangkok Post, Retrieved from <http://www.bangkokpost.com/education/site2007/cvse0407.htm>
- Tipwareerom, W., Powwattana, A., Lapvongwatana, P., & Crosby, R.A. (2011). Effectiveness of a model of risky sexual behavior prevention among adolescent boys in Thailand. *Southeast Asian Journal Tropical Medical Public Health*, 42(3), 726-736.
- Tortolero, S.R., Markham, C.M., Peskin, M.F., et al. (2010). It's your game: Keep it real: Delaying sexual behavior with an effective middle school program. *Journal of Adolescent Health*, 46, 169-179.
- Van der Stege, H.A., van Staa, A., Hilberink, S.R., & Visser, A.Ph. (2010). Using the new board game SeCZ TaLK to stimulate the communication on sexual health for adolescents with chronic conditions. *Patient Education and Counseling*, 81,324-331.
- Vuttanont, U., Greenhalgh, T., Griffin, M., & Boynton, P. (2006). "Smart boys" and "sweet girls"-sex education needs in Thai teenagers: A mixed-method study. *Lancet*, 368, 2068-2080.

PATOLA CRAFT OF SURENDRANAGAR, GUJARAT: SUSTENANCE THROUGH GREEN TECHNOLOGY

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ABSTRACT

Handloom industry in India is heritage based reflecting the richness and diversity of Indian Culture. It is a typical in terms of its traditionalism, distinctive style and technology. Patola from Patan in Gujarat is a handloom saree made by a unique and time consuming process of resist dyeing technique (similar to tie and dye) on warp and weft silk yarns and then weaving it which creates a surface design that is reversible. This expensive woven wonders is an investment of life-time which has emerged strongly in the last three decades in the other regions of Gujarat namely Rajkot and Surendranagar mainly to provide a cheaper option to the celebrated Patan Patola. The main aim of the study was to document the craft details of this newly emerged low-cost variation of the traditional technique of Patola weaving which needs to be preserved as it is a symbol of our heritage and culture.

Somasar, a village in Surendranagar district of Gujarat, India was selected as the locale of the study. Case study clubbed with Focus Group Discussion and observation method was selected to gather detailed information related to Patola craft. An interview schedule was formulated following the guidelines given in the book 'Designers meet artisans – a practical guide' published by the Craft Revival Trust, Artisanfas de Columbia and UNESCO. The data collected in form of field notes and pictures were presented in a meaningful manner under various titles such as family background, Material procurement, Patola process, Design details, Market and Marketing of Patola, Peculiar craft practices, Problems and projection of craft.

The analysis of data brought to light peculiar and sustained craft practices. Modified pit loom for weaving Patola and use of harvested rain water for dyeing formed an essential part of the Patola craft. This practice of energy conservation has not just contributed to the product competence but also added more value to the craft and helped the craftsmen take pride in their learnt craft. It may be a baby step towards green technology but surely a big contribution to the Green Initiative action around the world.

Keywords: Patola, Sustained Craft Practices, Energy Conservation, Green Technology, Value Addition.

1. INTRODUCTION

The word *Patola* came from the Sanskrit word 'Patta' meaning a silken cloth. Since seventh century Patta word is used for silk cloths. *Patola* was a double ikat fabric made in silk in Patan, Gujarat. The term ikat came from the Malay expression

'*Mengikat*' which means 'to tie or to bind' (Gillow, 2005). This technique is found in the many parts of the world as well as in our country (India). The names are different in different regions but the technique is same. Patan's *Patola* has an elaborate and time consuming weaving technique which makes it an unparalleled handloom in the world. It is not just a hand-woven fabric but an intrinsic part of Gujarat. There was a time when a *Patola* was an essential item in the bridal trousseau. *Patola* still forms a part of the socio-religious paraphernalia (Patolas, 1988). Recently, the *Patola* of Patan received its

Geographical Indication Certificate, but it is still languishing as a craft. In contrast, the craft of *Patola* is thriving in other districts of Gujarat. It is during the late 1950's as part of the movement for the revival of handicrafts, the Khadi and Village Industries Commission financed a *Patola* weaving unit in Rajkot. One of the weavers working with the Salvis moved from Patan to run this training center.

At present, in villages of Surendranagar and Rajkot districts of Gujarat, replicas of intricate Patan *Patola* are woven with similar but simpler designs. They are produced faster and are cheaper than those of Patan since they are made with single ikat technique (Gulati, 1951).

The main aim of study was to document the details of *Patola* craft. The locale of the study was restricted to Somasar village of Muli Taluka and Surendranagar District, Gujarat (Fig. 1). The craft documentation was limited to making of *Patola* through weft ikat technique only.

2. METHODOLOGY

Case study method along with the observation method was used for the documentation of *Patola* craft. Focus Group Discussion method was adopted to collect relevant data to come closer to the real life requirements of craft and craftsmen. Mr. Viththalbhai Vaghela, a master craftsman of *Patola* of Somasar was selected purposively. An interview schedule was formulated following the guidelines given in the book 'Designers meet artisans – a practical guide' published by the Craft Revival Trust, Artisanfas de Columbia and UNESCO in 2005. The interview schedule for craftsman was open ended and prepared to gain the information on village, social position of the craftsman, demographic details, family composition, life history, designing, motifs, dyeing practices, weaving practices, loom setting, buying and selling practices and difficulties faced by weaver. The data was also collected from the craftsmen through focus group discussion, direct observation, participant suggestions and physical records available with the craftsmen. A set of statements were framed for Focus group discussion to gain views of the respondents on peculiar craft practices, problems and projections of craft.

The data collected in form of field notes and pictures were presented in a meaningful manner under various titles such as Family background, Material procurement, *Patola* process, Design details, Market and Marketing of *Patola*, Peculiar craft practices, Problems and projection of craft. Also the data was presented through images, flow charts and schematic diagrams.

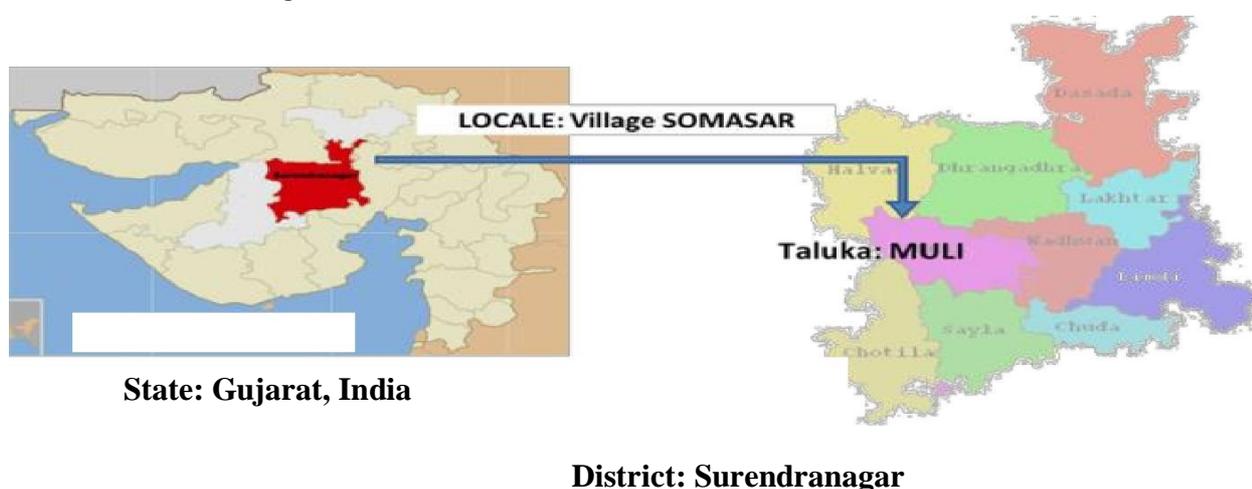


Figure 1 : Map showing the locale of the study

3. RESULTS AND DISCUSSION

Mr. Viththalbhai Vaghela a master craftsman of *Patola* craft, who was practicing single ikat technique in Somasar village of Surendranagar district of central Gujarat in western India, belonged to the *Boonker* (weaver) community. He learned *Patola* craft from *Rashtriya Shala* (National School), Rajkot in 1972, from Shri Karamchand Ghodadas Prajapati. He was instrumental in introducing this craft to the weaver's community of his village.

The analysis of data brought to light peculiar and sustained craft practices in making of *Patola*. Few significant craft practices used were modified pit looms, natural gums in charcoal slurry for marking of design on silk yarns prior to weaving and using harvested rain water for dyeing of silk yarns.

The Patola Loom -

The *Patola* loom was made up of rosewood and bamboo sticks. The loom had no fixed framework i.e. it remained hanging. It would have to be set up each time a new warp is put up however; it was easier to be rolled in a cloth and placed aside when not in use. The loom lied at a horizontal slant position. Two warp beams; one actual and the other support warp beam were held together by a string and fastened to a pole and the warps were hung to the wall. It had no treadles and it was a throw shuttle loom. The cloth beam was made of solid wood square beam.

Modified Patola Loom -

Mr. Viththalbhai Vaghela modified the pit loom (*Khadda shaal*) into *Ghoda shaal* where in instead of creating pit in the ground, the loom was fixed on the equal height cement pillars (Plate1) to match the height of a seated weaver. It appeared to be a combination of fly shuttle pit loom and hanging *Patola* loom.

Locally (Gujarati language) pit loom was known as *khaddashaal*. Pit means *khadda* and *shaal* meaning the loom. This loom was placed over a pit dug into the ground, so the weaver could sit on the edge of the pit and be on the same plane as the loom. Two pillars on either sides of the pit supported the upper frame of the loom on which healds were hung. These healds were attached to treadles with cord which was situated in the pit and it was operated by foot.

Somasar weavers used fly shuttle for insertion of wefts. The fly shuttle has all the advantages of throw shuttle. The sley carries a race board and two shuttle boxes, one on either side, with a picker propelled by means of strings. The main advantage of the fly shuttle pit loom is that despite its increased rate of production, it can produce fabrics with higher counts of superfine yarn. The fly shuttle oscillating sley works at a higher speed than the throw shuttle sley, resulting in an increase in the rate of production. It requires manual force. Electricity is not required for running this kind of looms. It conserves energy and thus, the loom used by the weavers was definitely the equipment with green technology. The other processes prior to weaving such as warp and weft preparation for weaving, marking on weft silk yarns, tying of wefts, dyeing of warp and weft, separation of warps and wefts and bobbin preparation does not require electricity and it was pollution free process.

Designing and motifs -

The designs were made on graph paper according to buyer's requirement before starting the manufacturing process. Both traditional and newly designed motifs were used and the demand for both the motifs was similar. No conscious attempt was made to modify the traditional motifs thereby contributing to its sustenance by keeping intact the characteristic features of the *Patola*. The collected motif were classified as traditional saree designs, fancy *patola* designs, border designs, motifs acquired from the other craft, designs made for

academic institutes and other designs which reflected the events of daily life. (Plate 2, 3)
The newly designed motifs were adding value in the reputation of Patola. This made them different from Patan. The craftsmen were sustaining both, their lives and craft by continuously practicing their learnt craft and were proud of their custom made designs.

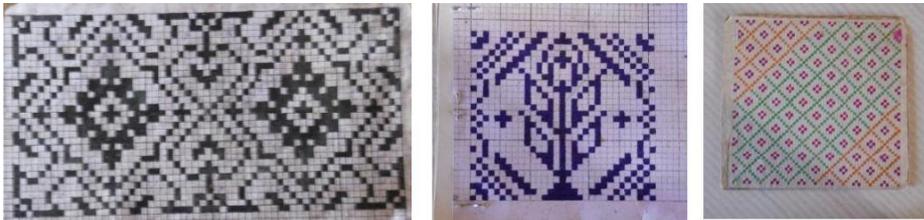


Plate 1: Designing on graph paper



Plate 2: Designing for institutes

Marking Process–

Before setting the yarns on loom, they were tied and dyed according to design. The marking of design was done with charcoal slurry and natural gums. Natural gum of *Babhal* plant (*Acacia nilotica*) was first softened by soaking it overnight in water, which turned into a thick paste by the morning. The slurry was prepared by rubbing charcoal on stone along with water. The reason stated by the weaver for the use of natural gum was, it is easily soluble in water. It provides thickness, sticky appearance to the paste; so that it did not spoil the yarns while marking the designs. (Plate 4, 5)



Plate 4: Natural gum in charcoal slurry



Plate 5: Marking of design with charcoal slurry on silk yarn

Roof Top Rain Water Harvesting System -

There was roof top rain water harvesting (RTRWH) tanks in eight to ten houses of the village. Average rainfall during the period of June to September was approximated as 597 millimeter and 28 normal rainy days (Craft, 2005). These water tanks were constructed by the Aga Khan foundation who adopted the village under their rural development plans.

The size of tank was 12'x12' and 15' deep inside the ground. A hand pump was situated at one corner of the tank. The flat roof surface area was 30'x 20' (Figure 2). The tank was covered with cement concrete slab. The window was constructed at the surface of slab to check the water level in the tank.

Craftsmen collected rain water from roof top after first two to three rainfall so that they got clean water. It was noted that, four inch diameter PVC pipe was used to transport rain water to the harvesting underground tank through funnel (Plate 6,7) and stored for a whole year

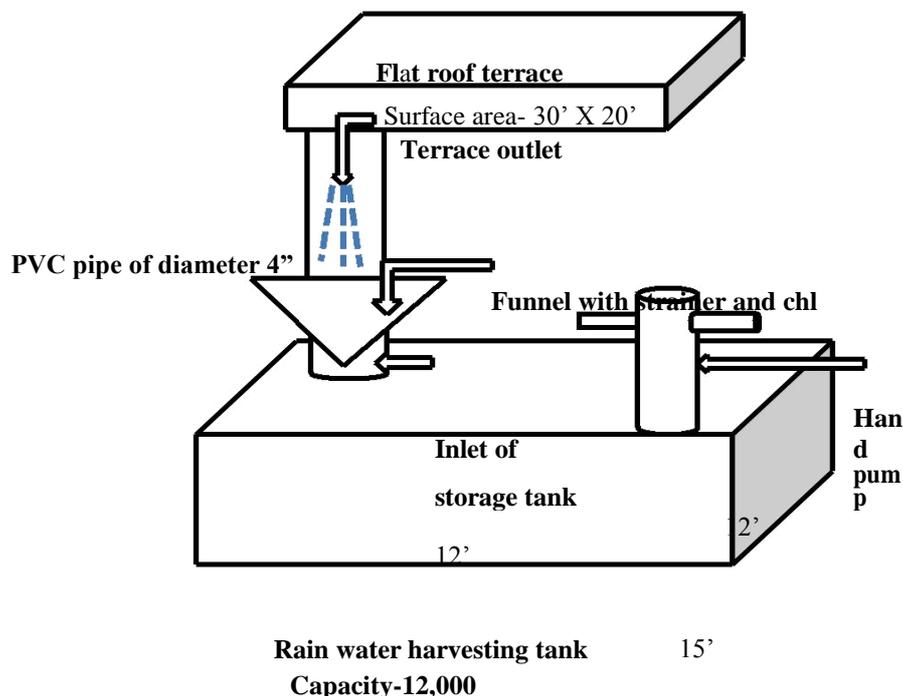


Figure 2: Schematic diagram of Roof Top Rain Water Harvesting System

Water before storage was strained through cloth and chlorine balls were added for the purification of water. One pack of eight to ten chlorine balls (small) were added at a time and this process was repeated two to three times in month. Chlorine was evaporated after some time so it did not affect in dyeing process.

In Surendranagar, water was a problem throughout the year as it is drought prone region. There were times when people of the village faced shortage of drinking water, but due to rain water harvesting programme this problem has been solved. Apart from drinking the craftsmen used this water for dyeing purpose too. A craftsman opined that red and green colours gave best results with rain water. The normal ground water was saline, it increased repulsion while dyeing.

Green technology helped in conservation of roof top rain water. Harvested rain water provided an independent supply of potable water and it was a good option to main water supply. As the rain water is free from salinity and other salts, chemical processes were not required to remove the hardness of water. Craftsmen used roof top rain water for dyeing process and provided their customers an assurance of being part of green technology.



Plate 6: Roof top rain water **Plate 7:** Underground harvested rain water harvesting tank and hand pump - November 2013

4. CONCLUSION

The oldest and largest home-based handloom industry in India still exists as artisanal activity. The knowledge and skills needed for this sector is inherent in the craftsmen. However, *Patola* craft have been learnt as apprenticeship from Government training programs instead of the usual inheritance from their forefathers. The single ikat

Patola of Surendranagar, Gujarat as a handloom fabric is no longer producer-driven; but now buyer-driven. The traditional motifs of *Patola* were contributing to its sustenance by keeping intact the characteristic features of the *Patola*. *Patola* made here is fulfilling the desires and fantasies of human to own a handloom fabric for varied reasons. This when made with low overhead costs and less complicated equipment with no use of electricity in the production equipment could be the best green technology. Modified *Patola* loom for weaving *Patola* and use of harvested rain water for dyeing which formed an essential part of the Somasar *Patola* craft is by far also contributing to the product competence. This practice of energy conservation has also added more value to the craft and helped the craftsmen take pride in their learnt craft. It may be a baby step towards green technology but surely a big contribution to the Green Initiative action around the world.

5. ACKNOWLEDGEMENT

We would like to thank Mr. Viththalbhai Vaghela for providing detail information about *Patola* craft. Also, we extend our thanks to all other craftsmen who have participated in the focus group discussion.

6. REFERENCES

- Craft (2005), Designer Meet Artisans- a practical guide. Jointly published by the Craft Revival Trust, Artesanías de Colombia S A. and UNESCO.
- Gillow, J. A. (2005) A visual guide to traditional techniques- world textiles, New York, Thomas and Hudson Inc.
- Gulati. A. (1951), The Patolas of Gujarat, Ahmedabad: Museum of textiles
- Patolas and resist dyed fabrics of India (1988), Jakarta, published in conjunction with

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Global Illuminators, Kuala Lumpur, Malaysia.

the exhibition – The voyage of a cloth held at Bank Duta

1. <http://www.onefivefive.com/india/villages/Surendranagar/Muli/Somasar>
2. <http://timesofindia.indiatimes.com/city/surat/Geographical-indication-tag-to-Patan-patola-to-end-feud-over-name/articleshow/30414891.cms>
3. <http://www.census2011.co.in/census/district/189-surendranagar.html>

ANALYSIS OF ECONOMIC VALUE OF CREATIVE TOURISM IN NAKHON SI THAMMARAT PROVINCE, THAILAND

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ABSTRACT

This paper aimed to assess on economic value of creative tourism in Nakhon Si Thammarat province based on the basis of income, income leak-out, direct revenue, indirect revenue, induced revenue and tourism multiplier, and opportunities for the employment of local labor by creative tourism entrepreneurs. Data was collected from the questionnaire survey of 100 enterprises related to tourism business such as accommodations, restaurants, entertainments, transportation companies, tour operators and souvenir shops. In addition, the key informants related creative tourism businesses were interviewed to assess the fact of economic phenomena concerning to creative tourism activities in the province. Interestingly, the results illustrated that even though the revenue of accommodation sector gained highest, this sector has highest leakage of income. In contrast, entertainments earned income lower than accommodations, they could make more tourism multiplier in the province. It found that reasons for economic leakage of accommodations were caused by usage outsider labors and materials. While, tourism multiplier was boost up in entertainment sector since domestic labors spent their earning the most in their own area. The concerns of sustaining creative tourism businesses were strengthening by local participation, local use, and the local government support in practical.

Keywords: Creative Tourism, Income Leak-Out, Tourism Multiplier, Income Distribution.

1. INTRODUCTION

Nowadays, the world economy varies and affect both directly and indirectly to the business, but the tourism can enormously makes income to the country (Jordan, 2012; Klint, 2012). The transportation and the communication technology can help the development of tourism reaching a large-sized industry which is extremely important with the development of the country being the initial rank (Cernat & Gourdon, 2012; Choi & Sirakaya 2006; Sakolnakorn, Naipinit, & Kroeksakul, 2013). The tourism is the large-sized and rapidly developing industry, creating work, income and development of many countries. (Baker, 2013; Yazdi, 2012).

According to the Department of Tourism shows that amount of foreign tourists traveling to Thailand in 2013 total 26,735,583 people increasing amount 19.60 percent from 2012. In 2013, there are total 6,715 registers that especially run the tourism businesses in Thailand (Department of Tourism, 2014). It is the strong point being charitable to the development of tourism, including the chance from the government policy, which promotes the tourism in the country. The visitors can feel various tourisms appending with the Tourism Authority of Thailand (TAT), who has defined the vision of the long-term national tourism administration. It is defined to be Thai identity in the international standard in 2012, advancing Thailand to be the World Class Destination and Asian Gateway (Svetasreni, 2012). Designated Areas for Sustainable Tourism Administration (Public Organization) (DASTA) has used creative tourism activity as a tool for tourism development. Creative tourism is community - based

tourism that development for value adds creation for tourism resources on the basis of Thainess, such as the way of life, local wisdom, art and culture, and history. (Sangsnit, 2013). Promoting and developing, the creative tourism presentation created the new way in the tourism areas, adding an alternative area and variety of tourism. Developing the new tourism, it creates the identity of that area and occurs distribution of tourist which helps to keep the same tourist destination (National Research Council of Thailand (NRCT), 2011).

Nakhon Si Thammarat province (NST) located in the central of the South. It is the big city which ranked 16th in Thailand and 2nd in the South (Provincial Administrative Organization (PAO), 2010). The province has old Buddhism civilization, unique tradition, and convenient transportation. There are also various tourism activities, attracting the tourist throughout the year. The popular creative tourism activities in the province include sailing to feel the living of fishermen at Pak Pha Nang district, sailing to see the Chinese white dolphins, to feel the history and living of a community at Khanom district, making the natural fabric dyeing of Khiriwong village, Suchart Subsin's shadow puppet, traditional parade by bringing the long robe of a Buddhist monk to a temple, etc.

In the case, the researcher has seen the creative tourism, being a choice which can make income to the tourism entrepreneurs and related industries. So, if we can know economic value which occurs in each country and organize appropriate tourism, it will be a method that can also create a sustainable to the tourism business. The researcher has selected to analysis the economic value of Nakhon Si Thammarat province, Thailand. It has organized the creative tourism, being the method of development to sustainable for the entrepreneurs and related organizations to develop the creative tourism.

2. LITERATURE REVIEW

Creative Tourism: Conceptual Framework for Economic Sustainability

The concept of the creative tourism has been developed for many years and many countries having their definitions (Tan, Kung & Luh, 2013). Richards & Raymond (2000) have defined the creative tourism that "tourism which offers visitors the opportunities to develop their creative potential through active participation in courses and learning experience which are characteristic of the holiday destination where they are undertaken." And the Creative Cities Network meeting determined the definition of the creative tourism "Creative Tourism is a tourism directed toward an engaged and authentic experience, with participative learning in the arts, heritage or special character of a place" (Wurzburge, Aageson, Pattakos, & Pratt, 2009). Richards (2005), referred to (Lindroth, Ritalahti, & Soisalon-Soininen, 2007) and UNESCO, (2008) said that keeping a balance between changing occurring tourism in the community and the community which gains benefits in the types of capitalism and sustainable of community's development, the community must be able to use the creative tourism organization to be an instrument.

The tourists want to feel local culture and living of community, and real experience among the place which is visited by them (Korez-Vide, 2013). The culture and innovation which have important role to attract investment of continuously creative tourism, having to offer different cultural, quality of life, and living (Djukic & Vukmirovic, 2012). The creative tourism shows that the difference with the former cultural tourism in the past. It also wants to participate in the culture, interacting with people who have created the culture, and helping the real experience from their learning

and tourist (Salman & Uygur, 2010). But the creative tourism has ability more than the former culture tourism, because it can easily increase the value from tourist destinations quickly presenting their new tourism products, and there are creative resources which are more sustainable and faster than the touchable cultural products (Richards & Wilson, 2006). Because of the tourists want a place that gives an experienced knowledge and presents the most impressive experience. The tourism products have to be improved with the change, being the new occurring tourist destination according to tourists' need (Fernandes, 2011). The tourism is a branch of economy which has potential as much as the sustainable of cultural investment and human resource (Djukic & Vukmirovic, 2012).

Smith, (2006), refers to Korez-Vide, (2013) saying that the creative tourism is a new tourism that aims to the tourists getting direct experience from tourist destination until they feel to bind up with that place. And they wish to go back there for many times. So, the experiences which they gained are different depending on creativity of the participated tourist destination. In the long-term, the competition of the tourism depends on the sustainability of tourism development (Vellecco & Mancino, 2010).

The chance in the developing tourism economy of Thailand is occurred from the cabinet announcing the Eleventh National Economic and Social Development Plan (11st NESDP) (2012 – 2016), it has mentioned the development of tourism economy into the strategic issue of adjustment of economic structure efficiently and sustainable development. It has emphasized the creativity as well as intelligence of locality, also aiming to restore and develop the quality of tourist destination according with demand of the marketing. The restoration and development of tourist destination has promoted tourism activities according with area's potential and the demand of the world market. It reaches a group of costumers and extends to new markets which has potential and emphasizes the development of the creative tourism and eco-friendly. It regards the balance and ability of supporting tourist destinations, also enhancing the standard of products, servicing the development of infrastructure more quality and sufficiency, and integrating the tourism with the living culture. The natural resource has created new and unique products and services reflecting area's identity which can attract the including investment of businesses in the area, also promoting the infrastructures' investment (Office of the National Economic and Social Development Plan (ONESDP 2011).

Economic Value for Sustainable Development

The development can affect both advantage and disadvantage to a tourist destination (Yazdi, 2012). The sustainable development is a development directly with the demand in the present without loss of lineage's ability in the future that satisfies your requirement, using tourism activities to keep environment, society, culture, economy and entirety of the area (DASTA; Rigall-I-Torrent, 2008; Vellecco & Mancino, 2010). The good sustainable development has to be the adapting and learning process (Farrell & Twining-Ward, 2005). But the co-learning into a tourist destination cannot be successful if the structure of organization or community that has promoted the limited learning process, it will be depended on accompany and instill the unitized concept (Schianetz Kavanagh & Lockington, 2007). According to the research of Tan, et al., (2013) said an affect that the workers and policy makers have to consider about allocation of the resources, because it is difficult to find a tourism business which really give the creativity. Addition, the experience which they are finding, because of some entrepreneurs just change their old business and claim it is a creative business without considering the content and real quality reflecting the unique of their presentation. So,

the development of changing tourism pattern has to mainly see the readiness of resources, it is the reaction of requirement, the sustainable development in the stable character and long-term aspect (Vellecco & Mancino, 2010). The tourists also are glad to pay for good and interesting products. For the one day tourism, there is a share of the tourist who has the high limited time, because there is a time for paying during the short-time visiting to visit other places (Lindroth, et al., 2007). It shows that entrepreneurs should increase the duration of tourist's checking in by presenting a new tourist destination or an extra activity being a part of tourism package, (Cernat & Gourdon, 2007). The research of Cernat & Gourdon (2007) has shown benefits of the specifying indicator method which determines the concerned policies and policy suggestions increasing the sustainable of the tourism in the developing country. It covers many aspects of the tourism consisting economic sustainable, including tourism assets, tourism activity, linkages and leakage effects that will be useful in the development of country if you know how to use appropriately.

3. METHODS

To meet the stated objectives, the researchers employed a mixed-method approach. The studied population includes stakeholders in the creative tourism including the entrepreneurs and community's leaders in Nakhon Si Thammarat. A simple group is tourism entrepreneurs who directly involves the tourism including accommodations, restaurants, entertainments, transportation companies, tour operators and souvenir shops amount 100 places, 10% sampling error with 95% confidence level (Yamane, 1973). Using the convenient sampling, the researcher collected the data during August 2013 to March 2014. The primary data is from giving the open-ended questionnaire and deeply interviewing. The secondary data is found from documents, academic articles, and concerned researches. In the study, it determines basic element for analysis the economy of the creative tourism in Nakhon Si Thammarat province as follows (Jitpakdee Dungtripop & Kayapan, 2013):

- Revenue is an income which is not deducted a profit.
- Leak-out is an out-flow of income occurring from out-provincial labors and aliens, and using out-material, calculating to be percent = $(\text{Out-labor} + \text{Out-material}) / \text{Revenue} \times 100$.
- Direct Revenue is a direct income occurring from using in-material and in-provincial labors = $\text{Revenue} - (\text{out-labor} + \text{out-material})$.
- Indirect Revenue is an indirect income occurring from productions and services of tourism, the business has to pay a type of essential-producing purchase. For example, a purchase of material and labors' wage = $\text{labor} + \text{material}$.
- Induced Revenue is the essential-producing income which labor or essential-producing owner has sold a product to the tourism industry's entrepreneur = $\text{Profit of Material} + \text{Labor}$.
- Tourism Multiplier is one Baht which a tourist destination gains from a tourist; it is going to make income to the tourist destination equaling Multiplier Baht.

Tourism Multiplier = $(\text{Direct Revenue} + \text{Indirect Revenue} + \text{Induced Effect}) / \text{Direct Revenue}$ (Pholphirul, 2007).

4. RESULTS

According to the study, the data was collected by giving questionnaires and interviewing the tourism stakeholders to analysis the economic value occurring from

the creative tourism management in Nakhon Si Thammarat province, the result of the data collected by giving questionnaires from the tourism entrepreneurs who directly relates with the tourism including accommodations, restaurants, entertainments, transportation companies, tour operators and souvenir shops. We got one hundred questionnaires. The kind of workplaces has small, middle, and big workplaces. They are the community's areas. Moreover, there are workplaces which have related with the tourist community business including Suchart Subsin's shadow puppet, souvenir shops, and silverware which is a community's product. The result of the study of economic analysis, the entrepreneurs have discussions as the follow:

According to the questionnaire answer amount one-hundred people of six types in Nakhon Si Thammarat province, have shown that the souvenir shops has the highest annual averaged income, next workplaces are accommodations, restaurants, transportation companies, tour operators, and entertainments which has a lowest annual income. Each annual income of these types is statistically different equaling .000; it is significantly different one-hundred percent, showing on the Table 1.

Table 1: Annual average revenue of Creative Tourism in Nakhon Si Thammarat Province

Category	N	Annual average revenue (Thai Baht*)	Revenue distribution (%)
Accommodations	36	2,396,100.00	21.23
Restaurants	28	2,219,000.00	19.66
Souvenir shops	13	2,828,200.00	25.06
Tour operators	11	1,312,000.00	11.62
Transportation companies	7	1,637,000.00	14.50
Entertainments	5	894,600.00	7.93
	100		100

Chi-Square Sig = .000

Source: Field Survey, 2014

*Currency exchange rate 1 Thai Baht equals 0.33 US Dollar. (Bank of Thailand, 2014)

The proportion of revenue distribution of the tourism in Nakhon Si Thammarat's areas, found that the souvenir shops has the highest proportion of revenue distribution amount 25.06%, next accommodations amount 21.23, restaurants amount 19.66%, transportation companies amount 14.50%, and tour operators amount 11.62%, the proportion of entertainments has the lowest proportion of revenue distribution only amount 7.93%.

The proportion of entrepreneurs, labors, and materials in Nakhon Si Thammarat province has affected the increasing of income of the local people and income leak-out. According to the research by using the questionnaire has shown that the restaurants and the transportation companies, their owners are the local people amount 95%, the transportation' labors are the local people amount 96%, the secondary is the souvenir shops amount 91% and the local materials have been used in the transportation amount 96%. In the accommodations, the owners are the local people amount 94% and their most labors are the local people amount 87% and using the local materials amount 85%. It is noticed that the souvenir shops have the highest revenue distribution proportion of income, but the transportation companies has the highest proportion of entrepreneurs, labors, and using materials in the local area, showing on the Table 2.

Table 2: The proportion of entrepreneurs, labors, and materials in Nakhon Si Thammarat province

	Accommodations %	Restaurants %	Souvenir shops %	Tour operators %	Transportation companies %	Entertainments %
Entrepreneurs	94	95	90	85	95	80
Labors	87	70	91	88	96	74
Materials	85	82	85	80	96	85

Source: Field Survey, 2014

The result of the study, the souvenir shops has the highest income and the entertainments has the lowest income. But, when we analyze income leak-out due to using out-materials and out-labors, we found that the restaurants has the highest income leak-out amount 13.80%, secondary is the entertainments amount 11.75%, the tour operators amount 10.00%, the souvenir shops amount 7.50%, and the transportation companies has the lowest income leak-out amount 2.40%, showing the Table 3.

Table 3 Revenue, Leak-out, direct revenue, indirect revenue, Induce revenue and Tourism multiplier

Category	n	Revenue (THB)*	Leak-out %	Direct Revenue*	Indirect Revenue*	Induce Revenue*	Tourism Multiplier
Accommodations	36	2,396,100.	8.50	2,192,431.50	1,930,425.00	611,604.53	2.16
Restaurants	28	2,219,000.	13.80	1,912,778.00	1,331,400.00	568,729.70	1.99
Souvenir shops	13	2,828,200.	7.50	2,616,085.00	1,696,920.00	721,898.05	1.92
Tour operators	11	1,312,000.	10.00	1,180,800.00	787,200.00	337,184.00	1.95
Transportation companies	7	1,637,000.	2.40	1,597,712.00	982,200.00	411,541.80	1.87
Entertainments	5	894,600.0	11.75	789,484.50	536,760.00	228,346.65	1.97

Source: Field Survey, 2014

*Currency exchange rate 1 Thai Baht equals 0.33 US Dollar. (Bank of Thailand, 2014)

When we analyze a tourism multiplier, which comes from direct and indirect incomes, and the effect of the income, we found that the accommodation's entrepreneurs in Nakhon Si Thammarat province have the highest tourism multiplier, it means when it has an income from tourist amount 1 Baht, it can make the income to the tourist destination in Nakhon Si Thammarat province equal 2.16 Baht, the secondary is the restaurant's entrepreneurs equal 1.99 Baht, the entertainment's entrepreneurs equal 1.95 Baht, the souvenir shop's entrepreneurs equal 1.92 Baht and the lowest tourism multiplier is the transportation's entrepreneurs equal 1.87 Baht, showing on the Table 3.

According to the survey and interviewing the tourism entrepreneurs in the most popular tourist destinations in Nakhon Si Thammarat province including Wat Phra Mahathat Woramahawihan, Pak Pha Nang district, Khiriwong village, Kao Luang national park, tourist destinations in Khanom district, we interviewed the entrepreneurs, community' leaders in the government and private sectors in the province. They brought the strong point each community presenting into the differently creative tourism activities though 12 months. It has motivated the economy and making a job and income throughout the year, because the economic development is going to improve equality of an income (Temel, 2014). When we considered the issue of proportion of revenue distribution, we found that the souvenir shops has the proportion of revenue distribution highly amount 25.06% and the entertainments has the proportion of revenue distribution lowly only amount 7.39%.

If we consider the leak-out and tourism multiplier, we found that the tourism multiplier of income due to use out-materials and out-labors. We found that the restaurants has the highest income leak-out average 13.80% although there are the lowest in-employment and material. Secondary is the entertainments which has the leak-out average 11.75%, the tour operator's average 10.00%, and the souvenir shops average 7.50%. As the transportation companies has the lowest income leak-out average 2.40%, because the highest average of employment and using materials in the local area. And the highest tourism multiplier is the accommodations, when it has an income from a tourist amount 1 Baht, it can make the income to a tourist destination in Nakhon Si Thammarat province equal 2.16 Baht and the lowest tourism multiplier is the transportation companies equal 1.87 Baht. It shows that an overall image of tourism multiplier of government and private sectors in Nakhon Si Thammarat province has caused the increase of payment and motivated the more ascendant province's economy.

Moreover, the economic factor which is above-mentioned, the researcher interviewed the community's leader and organizations who related with the creative tourism management.

Mr. Apinan Sutanuwong, NST Governor, commented that the tourist destination in the province should be promoted and developed to be the creative tourism including Wat Phra Mahathat Woramahawihan, Suchat's Shadow Puppets, Khiriwong Village, and Krung Ching Mist. Mrs. Napasorn Kakai, Director of TAT, NST Office, said that TAT has started to change the direction of new advertisement. Originally, it tried to introduce amazing tourist destinations through the obvious topography being the creative tourism in the concept "Nakhon Si Awesome". It presented in the type of creative tourism of Nakhon Si Thammarat province, emphasizing the cultural and natural tourism which is popular from Thai and foreign tourists.

"TAT has emphasized the approach marketing to create acknowledgment of the tourism in the province. Accompany between the tours operators managed a creative tourism program for a 3 days 2 nights. The economic revenue distribution has been well accepted during April 2014. Nakhon Si Thammarat province has the income from tourism approximately amount 120,000,000 Baht." (Mrs. Napasorn Kakai).

Mr. Duriyang Sopa, Director of NST Department of Tourism, said that each creative tourism activity is going to send trough the local knowledge and experience via the knowledgeable person including the carving Shadow Puppet or making fabric dyeing. The tourist is going to be suggested and practiced by a professional. And PAO has a policy of tourism expanding by promoting every districts in Nakhon Si Thammarat province which has the unique local tourism destinations, and organizes activities throughout a year. Mr. Manoch Sanpong, Chief Executive of the PAO, said

that a community has gained benefits from the creative activities from the sustainable of tourism occurring in a community. For example, the producing by using the specified knowledge and ability can create a famous trademark in the country and be sold a souvenir making an income to a community including the product of mangosteen, the natural color fabric dyeing etc. The professionalization maybe uses the practice and promotion of government sector. Mrs. Huwaidiyah Pitsuwan Useng, Deputy Mayor of NST City Municipality, said to the promotion as a local administrator emphasizing the development of skillful labors in a community's area. The local government has trained the skill of occupations related the tourism including the producing of souvenir etc. Moreover, Mrs. Napasorn Kakai, also said that the tourist destination has an advantage, but it is not developed. The tourist facilities still have lacked for the standard including a non-international standard road into a tourist destination. PAO and City Municipality have participated to develop these things. The City Municipality has supported the creative tourism activities in the basic public utility, traffic, electricity which it has cooperated with the Provincial Electricity Authority to change the landscape, supporting the tourism by taking the electric wire into underground. It has also facilitated about the security by installing CCTV cameras around the local government and improving the traffic jam in the rush hour. PAO has observed out-local government tourist destinations to expand the tourism inside the province. According to the research of Gatti (2013), the simulated result has been shown that the expanding of the tourism affected the positive household-welfare management.

Ms. Warin Chinawong, the Chief of the NST Chamber of Commerce showed her attitude that the creative tourism is how to travel without eliminating the identity, culture or nature of such localities. And the locality can create the income from the creative tourism using the geography. If Nakhon Si Thammarat has been steadfast to make the identified tourism, it will be the sustainable of the locality. The local people have the income and make the sustainable by themselves, trying to push on the tourism which makes the sustainable for the locality. They participate in their culture or the role of local people including foods or living story, occupation, and activities in their daily life. But they should add more interesting story including Lan Ska village which is originally the agriculture, but it has been changed to be the Lan Ska village agriculture tourism, making fabric dyeing, orchard, or the clean-weather tourist destination which outsider tourist want to visit. Each of the tourists differently like, someone likes the city, and someone like the countryside, it should have the activities differently responding.

Mrs. Huwaidiyah Pitsuwan Useng said that the benefits that the community has gained from the creative tourist activity are the economic enchantment going to be better quality of life.

5. DISCUSSION AND CONCLUSIONS

The creative tourism has affected the valuable economy of Nakhon Si Thammarat province. An interesting conclusion is the feature of economy of the creative tourism in the highest income aspect. It is a part of the souvenir shops. When it has an income from a tourist amount 1 Baht, it can make the tourism multiplier in the province equal 2.16 Baht. And the highest leak-out is the restaurants. Although there is the revenue distribution which is lower than the souvenir shops and the accommodations, but it can also make the tourism multiplier in the province being the secondary from the accommodations. The tourist activities which are different and different place have affected to the different economy due to value of money, cost of living, employment

and many factors including “Festival and Events” every \$100 of a purchase, a visitor in a locality has making the total income in the locality \$39.80 (Janeczko, Mules, and Ritchie, 2002). According to the research of Robles Teigeiro and Díaz, (2014) studied the Estimation of multipliers for the activity of hotels and restaurants. According to the Table of Economic variables for the countries in the survey, indicates that the totally size and variety of economy in the locality influencing with the economy of Thailand from average backward multiplier = 1.58. If it equally has the revenue distribution in every tourism businesses, the tourism will affect more employment in the part of labors and agriculture (Neto, 2002). It should reduce of the outsider labors and producing the materials which used in the province or presentation the more local tourist destinations of tour operators, and the direct support of government and private sectors including the creation of the basic public utility of PAO co-operating with City Municipality or the landscape improvement by bringing the electric wire into underground. It has resulted in the attraction of tourists coming to the province and organizing the training occupied activity to a community for reducing the outsider labors, it will affect the more multiplier of tourism if the labors have purchased more in the province. It accords with the research of Cernat and Gourdon, 2007, 2012 saying that if the tourism makes the using of a product and service which are produced in the economic system; it will support those sectors and increase the income. So, the government sector should support the making income of communities to support and motivate the creative tourism. Presenting the strong point, it makes the revenue distribution to localities and local employment, creating the occupation, income to every communities which have participated the creative tourism from the equal tourist resource.

The research is made for understanding the benefits of the creative tourism business which has affected the sustainability of economy in Nakhon Si Thammarat province, Thailand. According to fictions and the aspect of entrepreneurs, the leader of organizations related with the tourism in Nakhon Si Thammarat province. Due to non-identified creative tourism activities, the tourism which is developed until be popular, depending on the ability of economic affect and opportunities for the employment of local labor (Lacher & Oh, 2012). Cohen (1996) indicated the natural, ethnic, and sexual tourism in Thailand which tends to increase and affect the negative effect in the economy and wide society. So, the entrepreneurs have to support the way of the creative tourism be more knowing, because the making of income gained from the tourism, depending on the public relations, the marketing, restoring ,and new thinking to support the products of tourism. The payment which the Thai and foreign tourist purchase in the activities during traveling, it can widely create the occupation and income to all of population (Hungm Tsaur, & Yang, 2012; Joshi, 2012). And it also makes the outstanding image which motivates the knowing of tourist. Moreover, amount of tourist is reduced, especially the tourist destination of community, the tourist is glad to pay for the good and interesting products (Lindroth, et al., 2007). And the tourist maybe has willing to pay the charge for visiting other same tourist destinations which is gained the less eco-experience (Joshi, 2012). Moreover, the eliminated waste system, especially the garbage which is lacked of systemically observing in the outside of local government’s area. It makes the condition of tourist destination be untidy, and unbeautiful. And the public utility management has been developing including the landscape improvement by bringing the electric wire into underground, changing traffic’s feature, making the traffic signs, and the tourism public relation in the province. According to the issue, it should be developed many fields together with the creative tourism development to have more potential and quality to create the income of the

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tourism in Nakhon Si Thammarat province. And it affects the revenue distribution to the local community and enhancing their quality of life.

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7. REFERENCE

- Baker, D. M. A. (2013). Understanding the Economic Impact of Tourism in the Asian Pacific Region Using the Tourism Satellite Account (TSA). [Article]. *International Journal of Business & Social Science*, 4(3), 15-22.
- Bank of Thailand (2014). *Foreign exchange rate*. [Online] Available: http://www.bot.or.th/Thai/Statistics/FinancialMarkets/ExchangeRate/_layouts/Application/ExchangeRate/ExchangeRate.aspx (March 7, 2014)
- Cernat, L., & Gourdon, J. (2007). *Is the concept of sustainable tourism sustainable? Developing the Sustainable Tourism Benchmarking Tool*. Paper presented at the United Nations Conference on Trade and Development, New York and Geneva.
- Cernat, L., & Gourdon, J. (2012). Paths to success: Benchmarking cross-country sustainable tourism. *Tourism Management*, 33(5), 1044-1056.
- Cohen, E. (1996). *Thai tourism : hill tribes, islands and open-ended prostitution : collected papers / Erik Cohen*: Bangkok : White Lotus, c1996.
- Designated Areas for Sustainable Tourism Administration (Public Organization) (DASTA). The Origin of Creative Tourism. [Online] Available: http://www.dasta.or.th/th/sustainable_creative-tourism.html (December 14, 2011)
- Djukic, A., & Vukmirovic, M. (2012). Creative cultural tourism as a function of competitiveness of cities. [Article]. *TTEM- Technics Technologies Education Management*, 7(1), 404-410.
- Farrell, B., & Twining-Ward, L. (2005). Seven Steps Towards Sustainability: Tourism in the Context of New Knowledge. *Journal of Sustainable Tourism*, 13, 109-122.
- Fernandes, C. (2011). Cultural planning and creative tourism in an emerging tourist destination. [Article]. *International Journal of Management Cases*, 13(3), 629-636.
- Gatti, P. (2013). Tourism, welfare and income distribution: The case of Croatia. [Article]. *Tourism (13327461)*, 61(1), 53-71.
- Huang, C.-H., Tsaur, J.-R., & Yang, C.-H. (2012). Does world heritage list really induce more tourists? Evidence from Macau. *Tourism Management*, 33(6), 1450-1457
- Janeczko, B., Mules, T., & Ritchie, B. (2002). *Estimating the economic impacts of festivals and events : a research guide*. Australia.
- Jitpakdee, R., Dungtripop, W., & Kayapan, P. (2013). *Economic Value Assessment on the Original Tourism Routs and the New Tourism Routs in Southern Thailand*. Bangkok: Thailand Research Fund (TRF)
- Joshi, P. V. (2012). A Stakeholders networking for sustainable rural tourism development in Konkan geion of Maharashtra state (India) [Article]. *Golden Research Thoughts*, 1(9), 1-7.
- Korez-Vide, R. (2013). Enforcing Sustainability Principle in Tourism via Creative Tourism Development. [Article]. *Journal of Tourism Challenges & Trends*, 6(1), 35-57.

- International Conference on Multidisciplinary Trends in Academic Research, September, 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.
- Lacher, R. G., & Oh, C.-O. (2012). Is Tourism a Low-Income Industry? Evidence from Three Coastal Regions. [Article]. *Journal of Travel Research*, 51(4), 464-472.
- Lindroth, K., Ritalahti, J., & Soisalon-Soininen, T. (2007). Creative Tourism in Destination Development. [Article]. *Tourism Review*, 62(3/4), 53-58.
- Neto, F. (2002). *Sustainable Tourism, Environmental Protection and Natural Resource Management: Paradise on Earth?* Paper presented at the The International Colloquium on Regional Governance and Sustainable Development in Tourism-driven Economies, Mexico.
- Office of the National Economic and Social Development Plan (ONESDP). (2011). *The Eleventh National Economic and Social Development Plan (2012-2016)*. Bangkok: Office of the National Economic and Social Development Plan.
- Provincial Administrative Organization (PAO). (2010). Master plan of tourism development in Makhon Si Thammarat province 2010-2014. Nakhon Si Thammarat: Provincial Administrative Organization.
- Pholphirul, P. (2007). Tourism Multiplier. *Piriya Pholphirul Blogspot*. [Online] Available: http://piriya-pholphirul.blogspot.com/2007/03/blog-post_30.html (December 13, 2012)
- Richards, G., & Raymond, C. (2000). Creative tourism *ATLAS News B2 - ATLAS News* (pp. 16-20). Tilburg: ATLAS.
- Richards, G., & Wilson, J. (2006). Developing creativity in tourist experiences: A solution to the serial reproduction of culture? *Tourism Management*, 27(6), 1209-1223.
- Rigall-I-Torrent, R. (2008). Sustainable development in tourism municipalities: The role of public goods. *Tourism Management*, 29(5), 883-897.
- Robles Teigeiro, L., & Díaz, B. (2014). Estimation of multipliers for the activity of hotels and restaurants. *Tourism Management*, 40(0), 27-34.
- Salman, D., & Uygur, D. (2010). Creative tourism and emotional labor: an investigatory model of possible interactions. *International Journal of Culture, Tourism & Hospitality Research*, 4(3), 186.
- Sangsnit, N. (2013). *Sustainable Tourism Development in Thailand*. Paper presented at the UNWTO Conference on Sustainable Tourism Development, Hyderabad, India.
- Schianetz, K., Kavanagh, L., & Lockington, D. (2007). The Learning Tourism Destination: The potential of a learning organisation approach for improving the sustainability of tourism destinations. *Tourism Management*, 28(6), 1485-1496.
- Tan, S.-K., Kung, S.-F., & Luh, D.-B. (2013). A Model of "Creative Experience" in Creative Tourism. *Annals of Tourism Research*, 41(0), 153-174.
- Temel, T. (2014). Family Planning, Growth, Income Distribution: Graph-Theoretic Path Analysis of Rwanda. *Journal of Economic Development*, 39(1), 1.
- UNESCO. (2008). *Experiential Learning is Key to UNESCO Creative Tourism Conference; Santa Fe International Conference on Creative Tourism, "A Global Conversation," brings theory to life during conference on developing creative resources*. [Online] Available: <http://search.ebscohost.com/login.aspx?direct=true&db=edsnbk&AN=1215ED6E8B4F3F98&lang=th&site=eds-live&authtype=ip,cookie,uid> (May 25, 2012)
- Vellecco, I., & Mancino, A. (2010). Sustainability and tourism development in three Italian destinations: stakeholders' opinions and behaviours. [Article]. *Service Industries Journal*, 30(13), 2201-2223.

International Conference on Multidisciplinary Trends in Academic Research,
September, 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

Wurzburge R., Aageson T., Pattakos A., & Pratt S. (2009). *Creative Tourism, A Global Conversation: How to Provide Unique Creative Experiences for Travelers Worldwide*. Santa Fe: Sunstone Press.

Yamane, T. (1973). *Statistics : an introductory analysis* (3 ed.). New York: Harper & Row.

Yazdi, S. k. (2012). Sustainable Tourism. *American International Journal of Social Science*, 1(1), 51-56.

ANALYSIS OF ENERGY DETECTION OVER CASCADED NAKAGAMI-M FADING CHANNELS

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ABSTRACT

In this paper, the problem of spectrum sensing using energy detection over cascaded Nakagami-m fading channels was addressed where all terminals are considered as vehicles. Closed-form expressions of detection probability were derived based on probability density function method. The validity of theoretical analyses was shown by comparing numerical results with Monte-Carlo simulations. The results indicate that the detection performance for cascaded Nakagami-m fading is even worse than the conventional Nakagami fading, which can be improved by diversity.

Keywords: Spectrum Sensing, Energy Detection, Cascaded Nakagami-M Fading, Probability Density Function.

1. INTRODUCTION

The problem of energy detection of unknown signals over a noisy channel, which has a myriad of applications in traditional communications and in emerging cognitive radio networks, has been addressed in (Urkowitz, 1967). An energy detector may help cognitive radios to determine whether or not a primary user signal is present. Cognitive radio and other applications have heightened the need for a more comprehensive analysis of the energy detector's performance in different wireless environments.

The energy detector is a threshold device, whose output decision depends on the comparison of the incoming signal energy to the threshold. This decision problem is a binary hypothesis test (Urkowitz, 1967). The main performance metrics are the probability of detection (P_d) and the probability of false alarm (P_f), which require averaging over fading statistics when the energy detector is used for the detection of signals over fading channels. Several papers have previously attacked this problem. For example, Kostylev (Kostylev, 2002) has derived the average P_d and average P_f for Rayleigh, Rician and Nakagami-m fading channels. Digham, Alouini and Simon (Digham, Alouini, & Simon, 2003) derive the P_d in Nakagami-m fading channels and Rician fading channels.

In order to increase the system performance diversity reception techniques have been applied with energy detection. For example, energy detection with maximal ratio combining (MRC), selection combining (SC) is analyzed in (Digham et al., 2003), (Digham, Alouini, & Simon, 2007) and with SC and MRC in (Pandharipande & Linnartz, 2007). In (Herath & Rajatheva, 2008), the authors derived exact P_d and P_f for an equal gain combining (EGC) detector with i.i.d. Nakagami-m fading branches. An energy detection performance analysis technique based on the moment generating function (MGF) was proposed in (Herath, Rajatheva, & Tellambura, 2009b) while (Herath, Rajatheva, & Tellambura, 2009a) considers SC diversity over Nakagami-m channels.

Most of the literature devoted for analyzing the performance of dual-hop relaying systems assumed classical fading channels i.e. Rayleigh, Rician and

Nakagami, which are commonly used to characterize the cellular radio systems. These statistical models typically assume a wireless communication scenario with a stationary base station above roof-top level and mobile station at street level. On the other hand, in vehicular communication systems such as inter-vehicular communications, intelligent highway applications and mobile ad-hoc applications, both the transmitter and receiver are in motion, experimental results and theoretical analysis demonstrate that *cascaded* fading distributions provide an accurate statistical model for mobile-to-mobile or vehicle-to-vehicle communications (Andersen, 2002; Chen, Karagiannidis, Lu, & Cao, 2012; Kovacs, Eggers, Olesen, & Petersen, 2002) and references there in. The product of N independent Rayleigh distributed random variables is called as *cascaded* Rayleigh fading channel which is presented in (Salo, El-Sallabi, & Vainikainen, 2006). For $N=2$, this reduces to *double* Rayleigh fading model which has been considered in (Erceg, Fortune, Ling, Rustako, & Valenzuela, 1997; Tirkan, Shirkhani, Taherpour, & Uysal, 2012; Uysal, 2005). Afterwards, this model has been extended to the *cascaded* Nakagami channel in (Ahmed, Yang, & Hanzo, 2011; Karagiannidis, Sagias, & Mathiopoulos, 2007; Shankar, 2011; Zheng, Wei, & Hamalainen, 2013).

In this paper, source and destination are assumed as moving terminals (vehicles). Thus, the channels between the source and destination terminals are assumed to have cascaded Nakagami- m distribution. We investigate the performance analysis of energy detection over independently but not necessarily identically distributed (i.n.i.d) *cascaded* Nakagami- m fading channels. Based on probability density function (pdf) method, the average detection probabilities are derived in closed-form. The results show that the performance under cascaded Nakagami- m fading is worse than that under other classical fading.

The reminder of this paper is organized as follows: Section II presents the system and channel model. Average detection problem of the energy detector is analysed in Section III. The numerical and simulation results are presented in Section IV. Finally, some conclusions are given in Section V.

2. SYSTEM AND CHANNEL MODEL

The energy detection of an unknown signal $r(t)$ is a binary hypothesis test problem as in (1):

$$r(t) = \begin{cases} n(t) & : H_0 \\ hx(t) + n(t) & : H_1 \end{cases} \quad (1)$$

where $x(t)$ is the unknown transmit signal, $n(t)$ is an additive noise signal, H_0 and H_1 refer to signal absence and signal presence, respectively. Also, h represents complex fading coefficient.

The energy detector operates by filtering, squaring and integrating the received signal $r(t)$. The decision variable Y of the energy detector maybe represented as

$$R = \sum_{i=1}^{2u} \hat{r}_i^2 \quad (2)$$

where $u = TW$ is the time bandwidth product.

By using the sampling theorem representation for band limited signals, the decision variable can be approximated as a sum of squares of Gaussian random variables. The signal-to-noise ratio (SNR) is defined by $g = |h|^2 E_s/N_0$ where E_s is

the energy of transmitted signal. Hence detection (P_d) and false alarm (P_f) probabilities conditional on the fading channel gain maybe expressed as

$$P_d = Q_u\left(\sqrt{2\gamma}, \sqrt{\lambda}\right) \quad (3)$$

$$P_f = \frac{\Gamma(u, \lambda/2)}{\Gamma(u)} \quad (4)$$

Where $Q_u(.,.)$ is the generalized Marcum-Q function. Note that in (5), the false alarm probability does not depend on SNR, fading reception scheme.

Average detection probability can be evaluated by averaging (4) by SNR distribution $f_g(g)$ as

$$\bar{P}_d = \int_0^{\infty} P_d f_g(\gamma) d_\gamma \quad (5)$$

3. PROBABILITY OF DETECTION OVER CASCADED NAKAGAMI-M FADING

Cascaded Nakagami-m Fading and SNR

For cascaded Nakagami-m fading channel, the magnitude is assumed to be the product of statistically independent, but not necessarily identically distributed Nakagami- m random variables (Karagiannidis et al., 2007). Specifically, we have $\alpha = \prod_{i=1}^N |h_i|$ where N is the number of random variables (which we define as "degree of cascading"). The probability density function (PDF) of $|h_i|$ is given by (Karagiannidis et al., 2007).

$$f_{|h_i|}(|h|) = \frac{2m^m}{\Omega^m \Gamma(m)} |h|^{2m-1} \exp\left(-\frac{m}{\Omega} |h|^2\right) \quad (6)$$

Where $G_{.,.}^{.,.}(\cdot)$ is the Meijer-G function (Karagiannidis et al., 2007) $\Gamma(\cdot)$ is the Gamma function (Karagiannidis et al., 2007) and the Nakagami- m fading parameter $m = \Omega^2 / E[(|h|^2 - \Omega)^2] \geq 1/2$ with $\Omega = E[|h|^2]$ and $E[.]$ denoting the expectation operator. Thus, the PDF of α can be given as

$$f_\alpha(\alpha) = \frac{2}{\alpha \prod_{i=1}^N \Gamma(m_i)} G_{0,N}^{N,0} \left(\alpha^2 \prod_{i=1}^N (m_i / \Omega_i) \left| \begin{matrix} - \\ m_1, \dots, m_N \end{matrix} \right. \right) \quad (7)$$

Note that the SNR is $g = a E_s / N_0$. The PDF of g can be calculated as follows:

$$f_g(g) = \frac{1}{g \prod_{i=1}^N \Gamma(m_i)} G_{0,N}^{N,0} \left(\frac{g \prod_{i=1}^N m_i}{\bar{g}} \left| \begin{matrix} - \\ m_1, \dots, m_N \end{matrix} \right. \right), \quad (8)$$

Where $\bar{g} = r \tilde{\mathbf{O}}_{i=1}^N \mathbf{W}_i = r \mathbf{W}$ with $r = E_s / N_0$.

Average Detection Probability

The average detection probability can be obtained by substituting (3) and (8) into (5). Thus, the average detection probability can be re-written as

$$\bar{P}_d = \int_0^{\infty} Q_u\left(\sqrt{2\gamma}, \sqrt{\lambda}\right) \frac{1}{\gamma \prod_{i=1}^N \Gamma(m_i)} G_{0,N}^{N,0} \left(\frac{\gamma \prod_{i=1}^N m_i}{\bar{\gamma}} \left| \begin{matrix} - \\ m_1, \dots, m_N \end{matrix} \right. \right) d_\gamma \quad (9)$$

The main difficulty of calculation arises in evaluating the related integral of Marcum-Q function. Using the alternative representation of Marcum-Q function given in (Simon & Alouini, 2005), (3) can be written as

$$Q_u(\sqrt{2g}, \sqrt{l}) = \sum_{n=0}^{\infty} \frac{g^n \exp(-g)}{n!} \sum_{k=0}^{n+u-1} \frac{\exp(-l/2)}{k!} \left(\frac{l}{2}\right)^k \quad (10)$$

By using the definition of (10), the average detection probability over cascaded Nakagami- m fading can be re-written as

$$\bar{P}_d = \frac{1}{\prod_{i=1}^N \Gamma(m_i)} \sum_{n=0}^{\infty} \frac{1}{n!} \sum_{k=0}^{n+u-1} \frac{\exp(-\lambda/2)}{k!} \left(\frac{\lambda}{2}\right)^k \int_0^{\infty} \gamma^{n-1} \exp(-\gamma) G_{0,N}^{N,0} \left(\frac{\gamma}{\bar{\gamma}} \prod_{i=1}^N m_i \middle|_{m_1, \dots, m_N} \right) d\gamma. \quad (11)$$

Using the closed-form solution (Gradshteyn & Ryzhik, 2007), Eq. 7.813.1], we have

$$\bar{P}_d = A G_{1,N}^{N,1} \left(\frac{1}{\bar{\gamma}} \prod_{i=1}^N m_i \middle|_{m_1, \dots, m_N}^{1-n} \right) \quad (12)$$

Where

$$A = \frac{1}{\prod_{i=1}^N \Gamma(m_i)} \sum_{n=0}^{\infty} \frac{1}{n!} \sum_{k=0}^{n+u-1} \frac{\exp(-\lambda/2)}{k!} \left(\frac{\lambda}{2}\right)^k. \quad (13)$$

4. NUMERICAL AND SIMULATION RESULTS

In this section, the performance analysis of energy detection method over cascaded Nakagami- m fading channels is investigated by using several complementary receiver operating characteristic (ROC) curves: $\bar{P}_m = 1 - \bar{P}_d$ versus SNR (dB).

Fig. 1 shows the ROC curves for non-diversity reception under cascaded Nakagami- m fading with different the number of cascading parameter N by considering $u = TW = 1, P_f = 10^{-2}$. The obtained results clearly show that the ROC performance yields diminishing as the number of N increases. Besides, the ROC performance of considered system increases when the average SNR in links increase.

Fig.2 presents the ROC performance of considering system with $u = TW = 1, P_f = 10^{-2}$ over *cascaded* Nakagami- m fading channels for different value of fading parameters when the degree of cascading $N = 2$. It can be seen from figure that the ROC performance of proposed system increases with the value of m increases. It is also observed from both figures that the derived numerical (theoretical) ROC results (No-Line) provide an agreement to the simulation results (solid line).

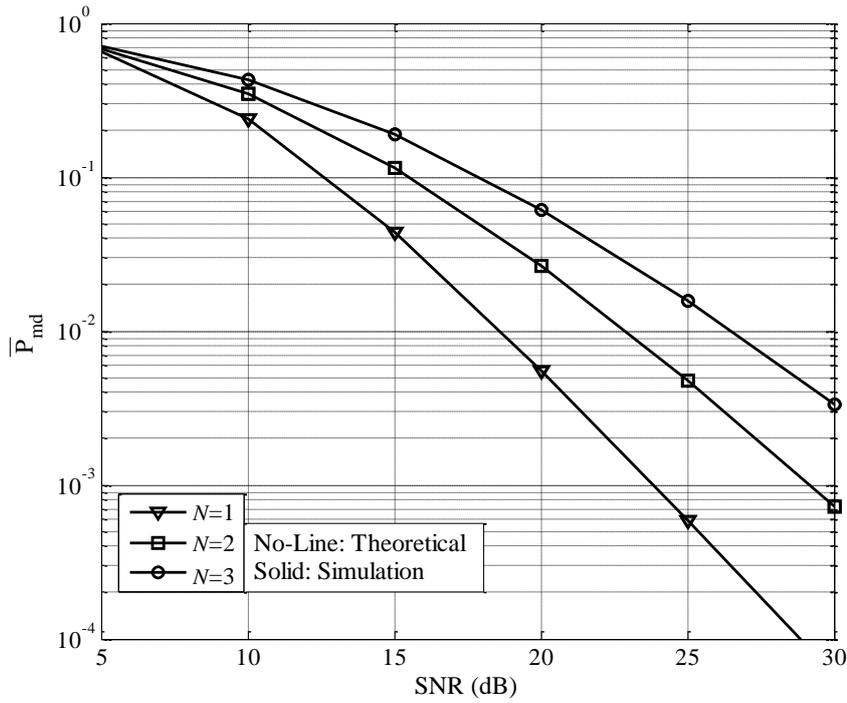


Fig. 1. Complementary ROC curves over cascaded Nakagami fading channels when $m = 2$.

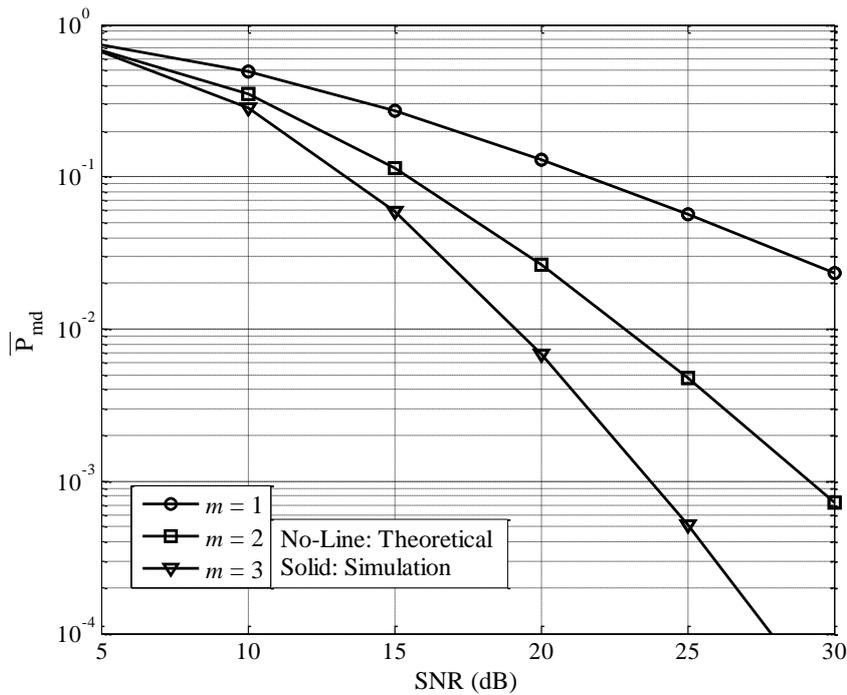


Fig. 1. Complementary ROC curves over cascaded Nakagami- m fading channels when $N = 2$.

5. CONCLUSIONS

The performance of the energy detector over cascaded Nakagami- m fading channel has been studied. Using the alternative version of Marcum-Q function, the closed-form

expressions of average detection probability under cascaded Nakagami- m is derived. Comprehensive performance results for energy detection have also been studied. Numerical and simulation results are provided to verify the theory analysis and derivations. The ROC performance is enhancing with the increase of the value of fading parameter m and decrease of the degree of cascading N .

6. REFERENCES

- Ahmed, S., Yang, L.-L., & Hanzo, L. (2011). *Probability distributions of products of Rayleigh and Nakagami- m variables using Mellin transform*. Paper presented at the Communications (ICC), 2011 IEEE International Conference on.
- Andersen, J. B. (2002). *Statistical distributions in mobile communications using multiple scattering*. Paper presented at the Proc. 27th URSI General Assembly.
- Chen, Y., Karagiannidis, G. K., Lu, H., & Cao, N. (2012). Novel approximations to the statistics of products of independent random variables and their applications in wireless communications. *Vehicular Technology, IEEE Transactions on*, 61(2), 443-454.
- Digham, F. F., Alouini, M.-S., & Simon, M. K. (2003). *On the energy detection of unknown signals over fading channels*. Paper presented at the Communications, 2003. ICC'03. IEEE International Conference on.
- Digham, F. F., Alouini, M.-S., & Simon, M. K. (2007). On the energy detection of unknown signals over fading channels. *IEEE Transactions on Communications*, 55(1), 21-24.
- Erceg, V., Fortune, S. J., Ling, J., Rustako, A., & Valenzuela, R. A. (1997). Comparisons of a computer-based propagation prediction tool with experimental data collected in urban microcellular environments. *Selected Areas in Communications, IEEE Journal on*, 15(4), 677-684.
- Gradshteyn, I., & Ryzhik, I. (2007). *Table of Integrals, Series and Products 7th edn* (New York: Academic).
- Herath, S. P., & Rajatheva, N. (2008). *Analysis of equal gain combining in energy detection for cognitive radio over Nakagami channels*. Paper presented at the Global Telecommunications Conference, 2008. IEEE GLOBECOM 2008. IEEE.
- Herath, S. P., Rajatheva, N., & Tellambura, C. (2009a). *On the energy detection of unknown deterministic signal over Nakagami channels with selection combining*. Paper presented at the Electrical and Computer Engineering, 2009. CCECE'09. Canadian Conference on.
- Herath, S. P., Rajatheva, N., & Tellambura, C. (2009b). *Unified approach for energy detection of unknown deterministic signal in cognitive radio over fading channels*. Paper presented at the Communications Workshops, 2009. ICC Workshops 2009. IEEE International Conference on.
- Karagiannidis, G. K., Sagias, N. C., & Mathiopoulos, P. T. (2007). N^* Nakagami: a novel stochastic model for cascaded fading channels. *Communications, IEEE Transactions on*, 55(8), 1453-1458.
- Kostylev, V. I. (2002). *Energy detection of a signal with random amplitude*. Paper presented at the Communications, 2002. ICC 2002. IEEE International Conference on.
- Kovacs, I. Z., Eggert, P. C. F., Olesen, K., & Petersen, L. G. (2002). *Investigations of outdoor-to-indoor mobile-to-mobile radio communication channels*. Paper

- presented at the Vehicular Technology Conference, 2002. Proceedings. VTC 2002-Fall. 2002 IEEE 56th.
- Pandharipande, A., & Linnartz, J.-P. (2007). *Performance analysis of primary user detection in a multiple antenna cognitive radio*. Paper presented at the Communications, 2007. ICC'07. IEEE International Conference on.
- Salo, J., El-Sallabi, H. M., & Vainikainen, P. (2006). The distribution of the product of independent Rayleigh random variables. *Antennas and Propagation, IEEE Transactions on*, 54(2), 639-643.
- Shankar, P. M. (2011). *Performance of N^* Nakagami cascaded fading channels in dual selection combining diversity*. Paper presented at the Wireless Communications and Mobile Computing Conference (IWCMC), 2011 7th International.
- Simon, M. K., & Alouini, M.-S. (2005). *Digital communication over fading channels* (Vol. 95): John Wiley & Sons.
- Tirkan, Z., Shirkhani, M., Taherpour, A., & Uysal, M. (2012). *Performance of cooperative amplify-and-forward protocols in vehicular ad-hoc networks*. Paper presented at the Wireless Communications & Signal Processing (WCSP), 2012 International Conference on.
- Urkowitz, H. (1967). Energy detection of unknown deterministic signals. *Proceedings of the IEEE*, 55(4), 523-531.
- Uysal, M. (2005). Maximum achievable diversity order for cascaded Rayleigh fading channels. *Electronics Letters*, 41(23), 1289-1290.
- Zheng, Z., Wei, L., & Hamalainen, J. (2013). *Novel approximations to the statistics of general cascaded Nakagami- m channels and their applications in performance analysis*. Paper presented at the Communications (ICC), 2013 IEEE International Conference on.

SOFTWARE PROGRAM DEVELOPMENT OF CERTIFICATE OF ORIGIN REQUISITION SYSTEM (COR) APPLYING FOR CERTIFICATE OF ORIGIN TO DEPARTMENT OF FOREIGN TRADE (THAILAND) BY USING QFD: A CASE STUDY COMPANY

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ABSTRACT

The objective of this study is to develop software program, certificate of origin requisition system (COR) for data generator to applying for certificate of origin to Department of Foreign Trade Thailand (DFT). The software program was developed according to Quality Function Deployment (QFD) principle as the main tool for complying with user requirements. The completed software program was verified and validated. Result of this research showed that software program, COR system was able to generate requisition data in the XML file conforming to DFT requirement in all 7 forms, and consumed time for generating the data till submitting to DFT within 3 minutes per form. The potential software program application showed time reduction of generating requisition data for 99.62% when compare to the original web application of DFT.

Keywords: Certificate of Origin, QFD, Software Development.

1. INTRODUCTION

Nowadays, Exporting is one of the most important business for Thailand. Not only employment but it also make income to Thailand. In 2012, Bank of Thailand (BOT) reported that, exporting value of Thailand was 652,087 million baht. One of the government policies support exporting is free-trade agreement policy that help reducing the importing tax for customers. In that case, the exported goods must be originated in Thailand. Therefore, customers gain the lower price of goods according to reducing importing tax. It would be advantage for manufacturers to compete with the others whose does not get this tax privilege.

However, the entrepreneur, who receive tax privilege requisition in Thailand, need to fill their requisition data in the form of department of foreign trade (DFT) via DFT website to getting the certificate of origin for each invoice of goods. This case study company had a problem about getting data to filling in DFT website. Each of three staffs, of this company, has to spend about 1.5 hours to getting data and filling those data in the form of DFT via the website. In July 2012, there were 220 invoices that staffs have to request DFT for certificate of origin which took time for 330 hours. This problem caused staffs have to work overtime about 1.5 hours per staff per day.

Currently, DFT provide Certificate of origin requisition methods for the entrepreneur sending the requisition data in XML format. Hence, the objective of this research is to develop software program in order to reduce time for query requisition data from database and generate to XML File for submitting to DFT by using the company case study.

To develop the software program that function in such a way of matching with the purposes of work by using software development life cycle model, V-Model (Nabil & Govardhan, 2010).

Moreover, this research design work process of software system to comply with user requirements by using Quality Function Deployment (QFD) as a main tool. QFD is a model used for designing the product that focus on quality insurance (Hierholzer et al., 2012).

2. REVIEW OF LITERATURE

Software development of Certificate of Origin Requisition System (COR System) is to be designed for generating requisition data in XML format file to request for Certificate of origin from DFT by using QFD as a main development tools focusing on user requirements (Heizer, & Render, 2008).

Quality Function Deployment

QFD is a technique used for product and service design to match with customer requirements. Not only innovation or technology designing but also assessing the product or services that make how well the needs of customers respond by using QFD.

Production planning by using House of Quality (HOQ) is performed to get the customer requirements, product insurance and strength points of competitors as the following 4 steps.

Step 1 Production planning

HOQ1 is built by getting customer requirements (on the right side of HOQ), product insurance and strength points of competitors compared with our product. HOQ1 is to be constructed as a diagram layout in a document (Figure 1).

Step 2 Product design

Customer requirements, from step 1, are used to set the part characteristic of the product, process attributes and design targets (at the base of the roof of HOQ). HOQ2 is to be constructed as a diagram in the document as shown in Figure 2; it is to be used in process planning.

Step 3 Process planning

Customer requirement importance ratings are to be weighed at the level 1-5 (on the left side of HOQ3 shown in Figure 3). Detail of work process of production and factors or production targets are to be included in process planning as process flow chart.

Step 4 Process control

Performance indicators are to be set for tracking production process. This process will reduce risk and prevent the mistake (Heizer & Render, 2008).

QFD principle was used for converting user requirements to be technical parts of products or services. There were many evidences demonstrated that QFD was a powerful tool used for designing the new products or services that reflex from customer requirements (Hierholzer et al., 2012; Ioannou et al., 2004; Barutçu. (2006). Barutçu (2009) reported that E-Store Website was a successful web design based on user requirements by using QFD as a tool of designing. The results of web design were enable to deliver a higher level of e-customers satisfaction. Hierholzer et al. (2012) showed that QFD was an effective tool for prioritizing the mission critical requirements from stakeholders for software development process. Ioannou (2004) showed that QFD was used as electronic retailers and website designer for identifying the important attribute of designing and also showed the relative importance and conflicting behavior between alternative design attribute.

3. RESEARCH METHODS

Population and tool for study

Three users, from the case study company, were recruited to fill in the study questionnaire No.1, tool for study. The data from those questionnaires were used as the customer requirements. All user requirement data were filled in the forms of DFT via the website and submitted them to DFT to request the certificate of origin of goods. The questionnaire was designed according to principles of Quality Function Deployment (QFD) and V- Model for

developing software program, namely “Certificate of Requisition System (COR)” for reducing the time of query invoices data as a requisition data to generate XML file as DFT format for submitting DFT.

Data Analysis

User Requirements

Data from questionnaire No.1 was gathered up for identifying user requirement. In addition, the users were interviewed regarding current operation flow to clarify their problems on query invoices data as a requisition data to generate XML file.

User Requirement Analysis

User requirements were used to build in HOQ of 4 phases. Then, the user requirement information of each HOQ was converted to be the part characteristic of the software function such as process attributes, design targets and control process of COR software. In addition, the designing phase of software was also conducted according to principle of V-Model.

COR Software System Development

System requirements from House of Quality phase 1 regarding technical functions of the software related to user requirements were used for designing software characteristics. The system architecture from House of Quality phase 2 was illustrated the targets of user requirements. Each unit of system from House of Quality phase 3 was converted to be each unit characteristics of COR software. Finally, COR software system was tested that it whether or not meet the target of user requirements by making software testing plan. Each step of Software program development was carried out based on each correspondent HOQ. The information of user requirements from HOQ 1 was converted to be system requirement of Software Development Life Cycle (SDLC). Then, HOQ 2 information was converted to be system architecture of SDLC. After that, information of HOQ 3 was converted to be unit design. Finally, information of HOQ 4 was converted to be system quality assurance which used as testing plan phase of SDLC.

Software Testing

Software program was tested to prove whether or not it meet the targets of this study. After software development, it was verified and validated. In addition, each software module was tested, and then combined modules were tested as integration test. The objective of software verification was to detect bugs or flawed points of the software, and those flawed points will be fixed. Then, the software was validated by comparing with user requirements and proved that all functions of the program worked correctly. The Software verification and validation were performed by V&V technique (Deshmukh and Kaushik, 2013).

Each unit of software was tested whether or not it work correctly and conform with unit designing phase by using Black Box testing method (Kumari, 2014). The black box testing was conducted to prove the software program work correctly as the following items:

1. Flawed Functional process
2. Loss of Function
3. Error integration between systems
4. Error decision between continue working and stop working system
5. Processing error

Black Box Testing was performed to check the results inputting data, for examples:

1. When data was input to the system, the system was whether capable to process the input data correctly or not.
2. When the invalid data was input to the system, the system was whether alert to tell the user or not.
3. When the invalid data was input to the system, the system was whether process correctly or not.

The XML file was checked that it was generated correctly as DFT format by using XML Format checker which provided by DFT.

After all system units have been tested, the combined system integration was tested according to integration testing method (Phakdeevatthanakul & Panichkul, 2008). Integration testing of combined units were tested to confirm that each unit was capable to work together correctly and complied with the specification of the software. Integration testing was performed by using Top-Down approach testing method (Anantsukasem, Taveesangsakulthai & Kuharojnanon, 2011). Top-down approach testing was conducted by adding unit by unit of the system to the test. The testing was started at the main unit which controlled the working of other units. The principle of top-down approach testing was elucidated as follows.

1. All testing processes were operated by using the main unit which send parameter or data to the testing unit.
2. The testing unit was designed to get the parameters from other unit for its working. A stub module was set to use as a unit for sending parameter or data to the testing unit.
3. Every additional new module was tested. Every unit of software was combined and passed the integration testing that means the software has been passed the verification. Thereafter, the software was validated in the SDLC step as system test phase.

System test

In this phase, the developed software was proved that it was capable to work properly with other elements such as devices or data. The system was checked whether compatible and work correctly as the specification and complied with user requirements.

In addition, the system was tested by using Alpha & Beta Testing in order to meet the user satisfaction on software system performance. It was separated into 2 steps of testing.

Alpha Testing step was performed at the place of developer team as simulation test. This test was conducted in order to investigate the bugs and errors of the software function.

Beta Testing step was performed by users at their workplace as in the real situation. In this step, the numbers of bugs or errors were normally to be found more than Alpha Testing. After all tests were performed, user satisfaction on software performance was investigated by using questionnaire No. 2 and interviewing.

4. RESULT

User Requirements

User requirements from questionnaire No.1 regarding software characteristics were read as scoring system (Table 1).

Software Characteristics	Score
Easy to access	23
Data format comply to the specification of DFT	30
Correctness of system	26
Processing Time	23
Saving budget of hardware	9
Information security	15
Low storage usage	12
Data Management	18

Table 1 Score of each program characteristic.

Program characteristic of the software was focused on the top 3 of important user requirements as follows:

1. Data format comply to the specification of DFT
 2. Correctness of system
 3. Processing Time
-
1. Data requisition manipulation system was set in the software program for supporting ability to add, modify, delete data, and search for requisition data. This software characteristic was scored as important at the second level because requisition data manager allow user to access the data easier and be able to manipulate the data that make the system be friendlier. Finally, this manipulated data will be complied with DFT specification.
 2. XML file generator system was set in the system for XML generating function. The target of this software characteristic was ability to generate XML file within 5 steps, and a work process was not complicated to work, and generated XML as DFT specification format. This software characteristic was scored as important at the third level because it is to be related with using DFT schema to generate XML file as DFT specification and this module will be related to data validation. In only case of data complies with DFT specification, the system will allow user to generate XML file.
 3. Database system was set for supporting requisition data management including data manipulation. Database system has to be kept integrity. Target: this software characteristic, requisition data, was to be kept correctly and integrity. This software characteristic was scored as important at the second level because this topic is to be related with all technical requirements.
 4. Login system was set for supporting security to control the access authority to login the system by using single sign-on that user account and user name of each person was designed to use the same code.

User requirement analysis

User requirements from questionnaire No.1 were used as initial requirement of house of quality (HOQ) No.1 (Figure 1) that demonstrate technical requirements as follows:

1. User friendly, user interface was not complicated to understand. Target: user was able to generate XML file and submit to DFT to request certificate of origin within 3 minutes.
2. DFT schema was used to generate XML file to request certificate of origin. Target: generated XML file was accepted by DFT for 100%.
3. Data Validation: Requisition data was validated complying with DFT specification before using for generating XML file. Data validation was done to prevent rejection from DFT. Therefore, the software program has to have ability to check requisition data as a data validation. Target: all required data has to be filled in before submitting to DFT. This software characteristic was scored as important at the first level because it related to all user requirements.
4. User who can manipulate the data in the system was designed to have a permission to do so. This function was set for data security. Target: un-permission person cannot access the system.
5. No duplicated data storage was set for reducing confusion of user that caused of using error data, and reducing memory backup of computer. This software characteristic was scored as important at the second level.

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		Column	1	2	3	4																											
Row #	Weight/Importance	Development Characteristics	data requisition manipulation system	XML File Generator System	Database System	Login System	COR System	Paper Document	DFT Website																								
		Requirements																															
1	576.00	Friendly User Interface	○	○	○	○	4	1	3																								
2	504.00	Use DFT schema	○	○	○		5	5	5																								
3	801.00	Data Validation	○	○	○		5	2	5																								
4	738.00	User Permission Control			○	○	4	2	4																								
5	951.00	No duplicate data	○	▲	○		5	2	4																								
6	486.00	Web application	○	○	○	○	5	2	5																								
8	1116.00	Data Manipulation Function	○	○	○		4	3	3																								
Target Value			Ability to manipulate data in 5 steps.	Ability to Generate XML file in 5 step	Ability to keep data correctly	Ability to use single sign-on to access to system																											
Weight/Importance			36882	29274	46548	13284																											

Figure 2 House of Quality No. 2. The requirements for HOQ No.2 were demonstrated as follows:

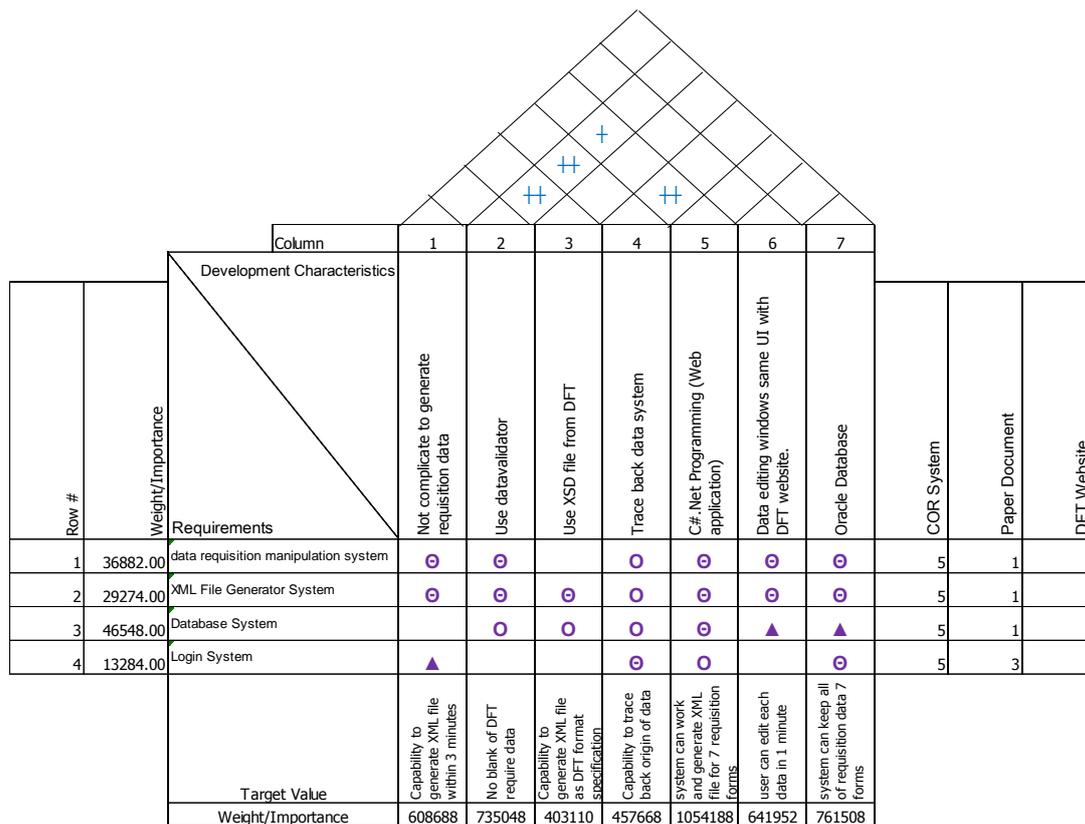


Figure 3 House of Quality No. 3.

1. The requirements for HOQ No.3 (Figure 3) were demonstrated as follows: Work process was not complicated to understand and user be able to generate XML file in 5 steps to achieve the target that XML file will be generated within 3 minutes.
2. Data validator was used to ensure that the validated data will be filled in to generate XML file. This software characteristic was scored as important at the second level because it is related with requisition data manipulation.
3. XSD file from DFT as schema was used to set XML format as DFT specification. Target is to generate XML file complying with DFT format specification.
4. Trace back data system was set to ensure that who and when the origin of data has been input in the system. The period of time of each input data will be able to trace back within 3 years as government sector system. Target: software program has trace back system.
5. C# .Net Programming (Web application) was used to build web application by C# programming language. Target: software system is able to generate XML file for 7 requisition forms that comply with DFT format specification.
6. Data manipulating window was set to be same as DFT data editing window as DFT web application because user familiar with it. Target: user will be able to edit each data within 1 minute. This software characteristic was scored as important at the third level.
7. Oracle database was used regarding it has many functions such as data manipulation, data security. Target: system will be able to keep all 7 forms of requisition data.

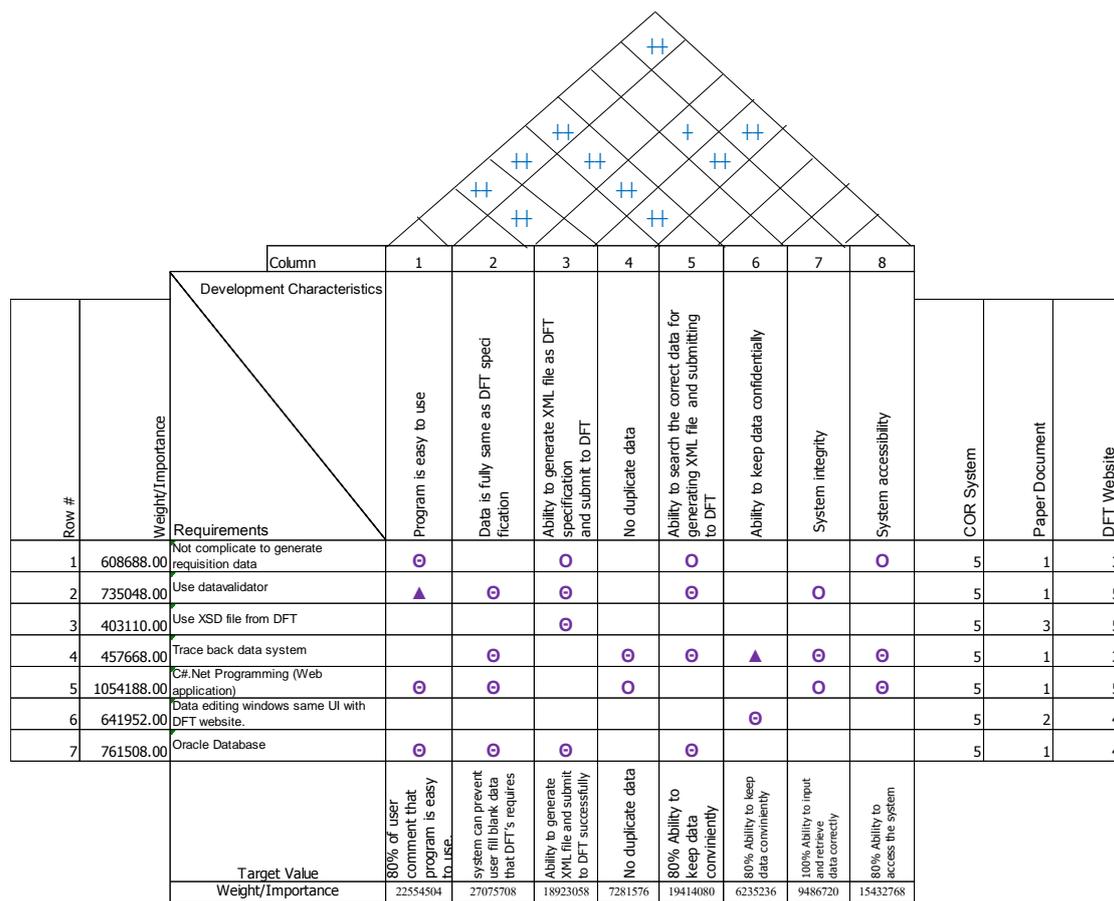


Figure 4 House of Quality No.4 House of quality No.4 (Figure 4) was demonstrated as follows:

1. Program was design to be easy to use to achieve the target by reducing work process time. Target: 80% of user comment that program was easy to use.
2. Data was fully same as DFT specification to prevent DFT rejection. Target: software system was set to prevent lacking required data of DET. This software characteristic was scored as important at the third level and it related to correctness of using data validator and trace back data system.
3. Ability to generate XML file as DFT specification and submit to DFT was set in the software system. This software characteristic was scored as important at the second level since it related to data validator to check whether the XML file was generated correctly as DFT specification or not. Generating XML file correctly as DFT format was designed that XSD file as a schema to be used for setting the XML characteristic. This designation will support work process on reducing time for generating XML file.
4. No duplicate data was designed to prevent using out of date data and error data on the process of generating XML file.
5. Ability to search the correct data for generating XML file and submitting to DFT was set in the system. Target: 80% satisfaction of users on data manipulating method. This software characteristic was scored as important at the first level since it related to data validator in data manipulation process and data trace back system.
6. Ability to keep data confidentially was set in the software system. Target: 80% data confidential acceptance from users.
7. System integrity was set in the software system. Target: 100% correct data was input in the software system.

8. System accessibility was set in the system. Target: 80% ability to access the system.

System design

All user requirements of 4 phases of HOQ were converted to technical software complying with DFT specification for all 7 standard forms of DFT. Four requirements in the HOQ No.2 were included in the software system as follows:

1. Requisition data form management
2. Generate XML system
3. Database system
4. Login system

Login system was designed that only authorized user will be able to access the system by inputting username and password to access the system (Figure 5). If user input invalid username or password, system will not allow that user to access the system and alert message box said that user cannot access system.



Figure 5 Login screen design

After access to system, system showed on window that parameters were input to use working function including generating requisition data form for getting data that kept separately. Then, those data were combined with other database for generating XML file. This process, search function, was used to search requisition data to generate XML file. Whereas, delete function was used to delete requisition data. As for editing data, requisition data was selected for editing (Figure 6). In case of filling data in as not complete, data validator was set to work in alert condition for user to complete the specified data.



Figure 6 Requisition data editing page

Certificate of Origin Requisition System (COR) Development

It was found that web application was built by COR with Visual studio as C# .Net Programming Language by using .Net framework.

Software Testing

Black box testing was used for unit testing to get the result that user be able to view and compare the result with DFT specification. As for login system, login function test showed that all login function tests were passed (Table 1).

In addition, it was found that simulation test was performed by using data requisition generating form demonstrated software program supporting querying requisition data for generating XML file. The XML file for requesting certificate of origin was tested by using DFT test program before submitting to DFT, and it showed that the XML file for requesting certificate of origin was submitted successfully (Figure No. 7).

After each unit testing finished, integration test was performed by combining all units to work together. It showed that all parameters were transferred between system units as top-down approach testing from login page (starting page) to main page system and data editing page. The system test showed that developed software system, according to designed house of quality, was complied with standard specification requirements of DFT.

Login Testing	Expected Result	Testing Result Pass/Fail										
		Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	
		1	2	3	4	5	6	7	8	9	10	
1. Input Username and password correctly.	Able to access to system	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
2. Input invalid username with invalid password.	Able to access to system	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
3. Input Username correctly with invalid password.	unable access to	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
4. Not input username and password	unable access to	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
5. Input username correctly but not input password	unable access to	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

Table 2 Requisition data editing page

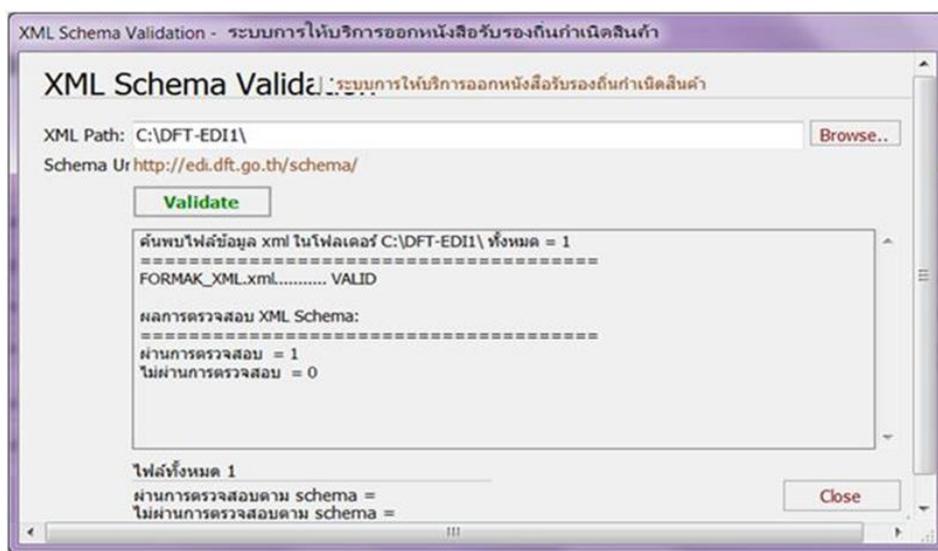


Figure 7 Requisition data editing page

User Acceptance Test

User acceptance test comprise of 2 phases as follows:

1. Alpha testing

It was found that the XML file of requisition form generated manually in DFT website was same as the XML file generated by using COR System. Then, COR System was used for simulation test of generating the XML file. The results showed that COR System generated the requisition form for further generating XML file of 10 and 20 models of goods successfully within 20.48 And 20.51 seconds (in average), respectively (Table 3).

Experimental average time of requisition				
Form Type	10 Models		20 Models	
	Input Manually (min)	Generate by COR System (sec)	Input Manually (min)	Generate by COR System (sec)
FORM A	91.67	20.04	150.59	20.27
FORM AI		20.36		20.36
FORM AK		20.76		20.59
FORM D		20.55		20.39
FORM E		20.33		20.59
FTA AU		20.86		20.35
FTA IN		20.43		21

Table 3 Simulation test of generating data requisition for 10 Models and 20 Models comparing between input data manually and using COR System.

Therefore, it was showed that the developed software program, COR system, met the target of generating the XML file for submitting DFT successfully within 3 minutes. In comparison with inputting data manually for 10 models of goods consumed time for 91.67 minutes, so that COR System was able to reduce work process time for 5,479.72 seconds or 99.62%. As for generating the XML file manually for 20 models of goods consumed time for 150.59 minutes but COR System was able to reduce work process time for 150.34 minutes or 99.76% (Table 3).

2. Beta Testing

It was found that COR software system was tested at the users' department. The result showed that the XML file generated by using COR software system was met DFT specification.

After Beta Testing, questionnaire No.2 was used for evaluating the software system performance and user satisfaction from 3 users. The user evaluation results regarding software system performance was summarized as follows:

System evaluation results

1. COR System was capable of generating XML File of all 7 requisition forms for submitting to DFT.
2. In case of users have to correct or modify data, they were able to access the editing point within 1 minute.
3. Users can login to the system by using single sign-on account.
4. Users can search data in the system, i.e. search the requisition data that has been submitted to DFT.
5. There is no duplicated data.
6. Data can be stored and managed all of 7 requisition forms.
7. The system can be traced back for the original data, date, time and user who input, correct or manipulate the data.
8. All 3 users gave feedback that they were very satisfy with this system.

Security evaluation results

1. Recalled data was checked as correct data.
2. System was accessible all the time.
3. In case of inputting invalid username or password, the system will not allow that user access to it.
4. System accessible controlled was suitable.

5. DISCUSS & CONCLUSION

The software program, COR System, was developed according to Quality Function Deployment (QFD) as the main tool for designing the program that reflexed from the users in a case study company. COR System showed capability of generating XML file complying to DFT format specification for all 7 requisition forms as follows: Form A, Form AI (ASEAN-India), Form AK (ASEAN-Korea), Form D, Form E, FTA Thai-Australia, FTA Thai-India. All of them were passed the testing with XML validator from DFT. This study was performed in a case study designed to use this software in the real situation with all requisition forms. It was found that all requisition forms were generated as in the XML file that be able to submit to DET successfully within 3 minutes. In addition, COR System was capable to reduce the working process time for 99.62% when compared with the manual method that the case study company used before.

6. REFERENCES

1. Kitti Phakdeevatthanakul & Panida Panichkul (2008). *Software Engineering*. Bangkok : KTP Comp & Consult.
2. Vansamon Anantsukasem, Nutchta Taveesangsakulthai & Nakul Kuharojnanon (2011). *Innovate Virtual Make-up Application*. Bangkok: Chulalongkorn University.
3. Andreas, Hierholzer , Georg, Herzwurm , & Harald, Schlang. (2012). *Applying QFDfor Software Process Improvement at SAP AG, Walldorf, Germany*. Germany: Universitätzu Köln.
4. George, Ioannou, Katherine, C. Pramataris, & Gregory, P. Prastacos. (2004). *A Quality Function Deployment Approach to Web Site Development : Applications for Electronics Retailing*. Athens : Athens University of Economics and Business.
5. Jay, Heizer, & Barry, Render. (2008). *Operations Management*. New Jersey : Person Education. 83
6. Kusuma, Kumari B. M. (2014). Software Testing for Finding Errors. *International Journal of Scientific Research And Education*. 2(2), 283-289.
7. Nabil, Mohammed Ali Munassar, & A. Govardhan. (2010). A Comparison Between Five Models Of Software Engineering. *International Journal of Computer Science*. 7(5), 94-101.
8. Omprakash, Deshmukh, & Mandakini, Kaushik. (2013). A Overview of Software Verification and Validation and Selection Process. *International Journal of Computer Trends and Technology*. 4(2), 176-182.
9. Süleyman, Barutçu. (2006). *Quality Function Deployment in Effective Website Design : An Application in E-Store Design*. İşletme Fakültesi Dergisi. 7(1), 41-63.

EFFECT OF COMPUTER-BASED ACCOUNTING INFORMATION SYSTEM (CBAIS) ON THE QUALITY OF ACCOUNTING INFORMATION AND MANAGERIAL PERFORMANCE OF SUGAR INDUSTRIES

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ABSTRACT

The study aims to determine characteristics of Indonesian sugar industries, as well as the influence of the implementation of computer-based accounting information system (CBAIS) to the quality of accounting information and managerial performance of the sugar industries. The research method was a survey with the research type was a descriptive and verificative. The research population were the sugar industries in Indonesia. Data consists of primary and secondary data. Data were analyzed making use of linear regression. This study showed that the sugar mills are mostly located in Java. Most of the sugar mills either in Java or outside Java is owned the central government in the form of state-owned enterprises (BUMN) and the rest is privately owned. Most of them making use of a business area with a mixed pattern between the rights of exploitation (HGU) and the right to build (HGB). Most of sugar industries gained canes in two ways namely planted by the company and bought from farmers. The application of CBAIS of sugar industries are still categorized sufficient, which indicates the condition is not very bad or very good also. The quality of accounting information of sugar industries are good category and its managerial performance are also good. Both categories have not shown the ideal category namely is very good category. The application of CBAIS significantly affect the quality of accounting information and the accounting information quality significantly influence the managerial performance of the sugar industries. The study concludes that in order to win the competition in the international sugar market, the national sugar industry revitalization program that include short, medium and long term, should intensify improvement program of CBAIS. By improving the quality of CBAIS will result improved quality of accounting information and further improve the managerial performance of Indonesian national sugar industries.

Keywords: CBAIS, Quality of Accounting Information, Managerial Performance, Cane, Sugar Industry.

1. INTRODUCTION

Background

The granulated sugar or white sugar is derived from sugar canes that is also called cane sugar, but granulated or white sugar is the most popular title, due to as white crystalline solid like sand. Granulated or white sugar is one of the nine staple food Indonesian society, which is consumed as a sweet flavoring to food or drinks. In addition, granulated sugar is also a raw material in the food and beverage industries. The mention of granulated sugar more often simplified by simply referred to "sugar", therefore the next even this article uses the term of "sugar" for the granulated or white sugar.

Currently, to meet the needs sugar of private consumption as well as food and beverage industries, can not be met from domestic production. Indonesia faces a variety of constraints to meet the needs of the domestic consumption. Whereas Indonesia has a

comparative advantage in the form of natural resources, human resources and climate are suitable for sugar cane cultivation.

Sugar cane plantation business and sugar industry in Indonesia has started since the Dutch colonial era. But the Indonesian sugar industries in its development face some problems. According Khudori (2009) in Yusbar Y. (2010), Indonesian sugar history shows that the Indonesian sugar industries have experienced the golden era of 1930 to 1940 with high sugar cane production and the second largest exporter in the world. But now Indonesia turned into a second sugar importer after Russia. According Syafa'at, et al. (2005), the issues of national sugar industry still revolves around the gap between low productivity, inefficiency of a sugar factory, and fewer sugar cane plantation area are faced with increased demand for sugar and import sugar.

Currently sugar industries profile is fixed with the old condition that is not efficient, which is characterized by government policies that are not integrated (Surono, S., 2011). Due to inefficiency sugar industries, from year to year the number of the sugar industry continued to decline. According to the Indonesian Sugar Council (2010), from as many as 179 sugar industries in 1930, now (2013) only of 61 sugar industries in Indonesia, they consist of 52 as state-owned enterprises and 9 as private companies.

Sugar demand is increasing from year to year due to population growth, economic recovery, and development of food and beverage industry. Increasing the amount of sugar demand in Indonesia is faced with the condition of Indonesian sugar industries productivity slowdown. So it becomes a problem that has lasted a long time, since the Indonesian sugar industry declined from one of the world's sugar producer to become an importer of sugar (Yusbar Y., 2010).

Indonesian sugar industries must be addressed. Moreover, the government is targeting self-sufficiency in 2014 with a production target of 5.7 million tonnes to meet the needs of community and industry needs. In order to achieve this target, had been being launched the National Sugar Industry Revitalization Program that implemented through revamping existing sugar industry and development of new sugar mills. Revitalizing existing sugar industry implemented through "intensification of land" with the increase in land productivity and sugar industries productivity where production in 2009 amounted to 2.55 million tonnes only. New sugar mills revitalization implemented through the "land extensification " of 350,000 hectares with a number of sugar industry of 10 @ 15.000 TCD (tons crushed per day) or 25 @ 6.000 TCD (<http://www.kemenperin.go.id/artikel/21/Revitalisasi-Industri-sugar>).

Meanwhile, the Minister of State Owned Enterprises Dahlan Iskan, said that this year's (2014) his ministry has revitalized 12 sugar mills from 22 sugar mills owned by PT Nusantara Plantation which unhealthy condition. Dahlan Iskan explained, the revitalization of 12 sugar mills prioritized in improving management. According to him, the poor management of sugar industries of Indonesia to be the main cause of the national sugar requirement is not fulfilled. "The issue is not on the machine. Using new machine, if management is bad, it will be able to cause failure", he said. (<http://www.kemenperin.go.id/artikel/4326/Revitalisasi-Pabrik-Gula,-Kemenperin-Gelontorkan-Dana-Rp-154-Miliar>).

In-inefficiency resulting in productivity and profitability of sugar companies is low, so that Indonesia can not compete with the other countries in the world. Currently the price of domestic sugar production can not compete with the price of imported sugar. As of June 2012, the price of sugar in the domestic market is Rp. 9,300 per kg, while imported sugar (refined sugar) costs only Rp. 4000-5000 per kg. As an agricultural country, Indonesia should be able to become the world sugar exporter, but now even Indonesia became the second sugar importer after Russia. Of course this is a challenge for management to be able to set the price of sugar is more competitive in the domestic market and the global market.

Revitalization Program of the National Sugar should be a planned and integrated program, because the program is cross-sectoral, and have a major impact both economically or politically. Based on the above, the National Sugar Industry Revitalization Program is not enough to just touch the technical aspects only, but also needs revamping the aspects of managerial. This national sugar revitalization program is only focuses on the intensification and extensification of land, establishment and modernization of machinery / equipment for sugar. Therefore, it should also be noted managerial performance through improvement of information systems and technologies, one of which is Computerized Accounting Information System (CAIS). In many ways, the performance of managerial efficiency due to the manager's knowledge of the accounting information system (AIS) and CAIS is applied, which impact on the quality of accounting information for management decision making. Computerized Accounting Information Systems (CAIS) provides benefits to the company and the ability to balance the challenges and reduce the communication gap.

According to Dahlan Iskan, a lot of people said that to fix the sugar factory, the machines must be replaced with new all, because the engine was old, but the government did not fully believe it. "We have more confidence to reorganize its management and is also important that the plant is open to farmers, do not deceive farmers, cheat its rendemen, the cost of planting and so on, and it was implemented this year and the results were outstanding," he said. Moreover, Dahlan said, if the previous year there were 22 sugar mills were still a loss, now only one factory that loss, located in South Sulawesi. It was, said Dahlan, because the government proves that the sugar mills can rise without investment of new machinery. " Thus, what is done by the sugar mills with the procedure will be very efficient to sugar mill," he said. (<http://www.investor.co.id/agribusiness/pemerintah-benahi-manajemen-pabrik-gula/46584>).

Problem Formulation

Based on the above description, the problems of this research can be formulated as follows:

1. How does the influence of application computerized accounting information system (CAIS) on the quality of accounting information sugar industries of Indonesia.
2. How does the influence of the quality of accounting information on managerial performance sugar industries of Indonesia

2. LITERATURE REVIEW

The most important system of information which has been used in management of business organization is accounting system of information. Accounting information system (AIS) of is a strict formalism information system which is in the most direct way had influence on common quality, especially reliable accounting facts, indexes and information on which we build business decisions of user from and outside of company (Mihailovic, et al., 2010).

Accounting information system is a system that provides accounting information for management. Therefore, accounting information system is an internal control for all activities that occur in a variety of procedures and business processes, covering the areas of production, marketing, finance and human resources. Furthermore, according to Mihailovic, et al., (2010), accounting information with their qualitative characteristics, especially relevance and reliability, are the most dynamic and realistic part of the information system in company. Therefore, the accounting information, especially those that come from management accounting, are considered as very important resource and as principal instrument in process of decision making at all hierarchical levels of management. According to Soudani, Siamak Nejadhasseini (2012), AIS is the whole of the related components that are working together to collect, store and disseminate data for the purpose of planning, control, coordination, analysis and decision making.

Weydan (2012) in the study to identify the affect of applying accounting information systems on increase the profitability, and reduce the cost of banks in Jordan. The most important results that banks rely on accounting systems, by linking all the banking services of banks each department separately and linking between all departments at the same time, reliance on accounting information systems to satisfy the clients through the implementation of banking clients as quickly and with minimal effort, Thus achieving a competitive advantage among banks, also the some of the actors in the commercial banks that Banks attempt to provide accurate information by showing the financial position for the clients and provide electronic access by the client to their account and make any deposit, withdraw and transfer money using the full connection between the electronic accounting systems. The most important recommendations of the study to provide stafftrained and fully aware of the accounting information systems and taking into consideration the culture of the client bank, which in turn leads to increased competition and attract clients and thus speeding up the implementation of banking services and not to loss of time and then reduce cost.

Bawaneh (2011), conducted the study to examine the effects of information technology and accounting information system on the quality of accounting university education for Jordanian financial institutions working in Jordan and listed on Amman Stock Exchange in 2010, because these institutions are recruiting the major part of fiesh accounting university graduates by showing the advantages of using information technology and its importance in developing the accounting information system. The study, also, investigates the importance of information technology in developing the accounting information system and then the expectation ability of the quality of accounting university education. It was shown that employers do recognize that advances in information technology and the developing of accounting information system have a positive interaction effect on the quality of accounting university education. Furthermore, the respondents believed that more applications of information technology in accounting university education, and training hours for accounting students are needed in order to increase the quality of accounting university education and to bridge the gap between theory and practice in accounting education.

Jamil Abdallah, Ahmad Adel (2013) found that there is a presence of an impact when using the accounting information systems on the quality of financial statements submitted to the Income Tax and sales Department in Jordan, the study recommends to focus on the development of the devices used in the department, train and development of the staff on an ongoing basis to enable them to continue to perform their jobs and improve the quality of financial statements in the department.

A well-designed computerized accounting information system (CAIS) can add value to the organization by : improving the quality and reducing the costs of products or services by reducing the amount of wasted materials, improving efficiency of operations by providing more timely information, improved decision making by providing accurate information in a timely manner, and sharing of knowledge by providing competitive advantages. So the information produced by well-designed CAIS can improve decision making (Bawaneh, 2011; Romney & Steinbart, 2003).

Sulub, Saed Ahmed, 2014 investigated the impact of computerized accounting information systems (CAIS) on reducing costs in Somaliland business companies; a case of Telesom Company and Shaam Construction Factory. The study findings showed that there is a significant impact for computerized accounting information systems on reducing costs at Telesom Company and Shaam Construction Factory. It illustrated a positive correlation between each item of accounting information systems (Human resource, Hardware and Equipment, Software, and procedures) and the reduction of costs at Telesom Company and

Shaam Factory. The study recommends retaining the highest levels of computerized accounting information systems through keeping up human resources, hardware and equipment, software, and developing work procedures with the development of computerized accounting information systems. And also recommends making further studies to know the impact of CAISs on reducing costs in other companies and sectors.

El-Dalabeeh, Abd el-Rahman kh; Alshbiel, Seif Obeid (2012) identified the role of computerized accounting information systems (CAIS) in reducing the costs of medical services provided at King Abdullah University Hospital. The study findings showed that there is a significant role for computerized accounting information systems in the reduction medical services costs at the hospital. It illustrated a positive correlation between each component of accounting information systems (human resources, hardware and equipment, software, databases, and procedures) and the reduction of medical services costs at the hospital. The study recommendations included retaining the highest levels of computerized accounting information systems through keeping up with the latest developments in the fields of software, hardware and databases, conducting regular maintenance which helps raise the level of services provided to patients at King Abdullah University Hospital, developing work procedures along with the progress of computerized accounting information systems.

According to the above, and based on the findings of previous researches, this study hypotheses can be arranged as follows:

Hypothesis 1: Application of computerized accounting information system (CAIS) significantly affects on the quality of accounting information sugar industries of Indonesia

Hypothesis 2: The quality of accounting information significantly affects on the managerial performance sugar industries of Indonesia

2. METHODOLOGY

The study aims to determine the characteristics of Indonesian sugar industries, as well as the influence of application computerized accounting information system (CAIS) to the quality of accounting information and managerial performance of Indonesian sugar industries. The research using a survey method and the type of this research was descriptive and verificative. The study population was the sugar industries in Indonesia as many as 52 industries of state-owned enterprises. The unit of analysis was the sugar industries. Research data was composed of primary and secondary data. Primary data were obtained directly from respondents through questionnaires via electronic mail / postal mail and or telephone interview. A total of 52 questionnaires were distributed and 31 were received back the equals to (59.62 %) which is considered good and acceptable. At each company (sugar industry) was taken respondents as much as two people consisting of accounting and finance manager, and director/administrator of the sugar industry. Secondary data was obtained through a literature study and via internet. Data were processed and analyzed using linear regression by the computer program SPSS (Statistical Program for Social Science). The study describes the relationship inter variables through hypothesis testing. Operationalization of the variables in this study are described in Table 1 below.

Table 1. Operationalization of the Research Variables

Variables	The concept of variable	Dimension	Indicator	Size	Scale of data
Application of Computerized Accounting Information System (X) (Azhar Susanto, 2013)	The level of quality of the application computerized accounting information system	Hardware	- Input and Processor memory - Output - Communication	Working power	Ordinal
		Software	- Operating system - Software system - Software application	Working power	Ordinal
		Brainware	- Manager of information system - Information system analyst - Expert communication - Database Administrator - Programmer - Operator	Level of education and work experience	Ordinal
		Procedure	The series activities of transactions	Efficiency and effectiveness	Ordinal
		Database	- External financial data - Conceptual of financial data - Internal of financial data	Completeness and data security	Ordinal
		Network communication	- Server - Terminal - Network card - Switching Hub - Channels of communication	Extent/scope of communication network	Ordinal
The quality of accounting information (Y)	The quality of accounting information	Relevance	- Predictive value - The value of feedback - Timely	Information Conformity with the requirement of the user	Ordinal
		Reliability	- Belief of representative - Objective - Neutral	The level of confidence in the information	Ordinal
		Could be compared	- Could be compared	The use of the method of measurement and/or	Ordinal

				disclosure of the same to the same event	
		Consistency	-Consistency	Consistency	Ordinal
		Understand able	-The shape and the common term	The ability to be understood	Ordinal
Managerial performance (Z)		Planning	- Work program - Realization of work	Comparison between the realization of the work and program of work	Ordinal
		Organizing	-The division of tasks / jobs -The working relationship -Work facilities	Determination of tasks / jobs according to their ability	Ordinal
		Supervision	- Implementation of the task/job - Complaints of work	Deviations the task from that should be done	Ordinal
		Coordinating	- Coordination with other managers that my level - Coordination with subordinates	effectiveness of coordination	Ordinal
		Control	- Use of resources - Provision of sanctions or rewards	Optimizing the use of resources	Ordinal
		Representation	- Settlement of complaints - Communication of public	Relationship to the outside the name of the company	Ordinal
		Investigation	- Data collection and delivery information - Measurement of work results	Measurement results and work analysis	Ordinal
		Valuation	- Assessment of performance continuously	Assessment of performance	Ordinal

To determine the state of each variable used as categories assessment presented in Table 2.

Table 2. Categories Assessment of the Research Variables

No	Real Score on Variables			Category
	CAIS (X)	Quality of Accounting Information (Y)	Managerial performance (Z)	
1.	2604 – 3100	2604 – 3100	2473 - 2945	Excellent
2.	2108 – 2603	2108 – 2603	2002 – 2472	Good
3.	1612 – 2107	1612 – 2107	1531 – 2001	Enough
4.	1116 – 1611	1116 – 1611	1060 – 1530	Ugly
5.	620 – 1115	620 – 1115	589 – 1059	Very ugly

Indonesian Sugar Industries

Historians estimate that sugar cane plants derived from East Indian and South Pacific. Around the 8th century Chinese and Arab traders distributed India's cane brought from the Gangga River to the South Indian Ocean, and traders stayed in Java Island and also introduced them. In the era before the 14th century cane sugar consumed as a sweetener, although the number are still slightly.

Around the 14th and 15th century, Chinese traders found the ways of making sugar from sugar cane. It encouraged other nations to produce cane sugar from sugar cane. In Europe, Portugal and Spain established some sugar mills. Since this century has been begun which sugar cane is widely consumed as foods and drinks.

In Java (Indonesia), sugar cane milling process in a large scale began in the middle of 17th century, which is managed the Chinese. Production center was concentrated in the rural areas around Batavia (now Jakarta). Sugar production in Java reached its glory as widely traded commodity to foreign countries. At that time, Java sugar industries became a very profitable trade commodity were exported to various countries in Europe and Japan.

Then in the early 19th century, the modern sugar industry built in Subang Regency, West Java, managed the wholesalers from the UK. But the large and modern industry can only survive within a decade. This occurs due to a mistake in choosing the location of industry, namely in places inhabited very rare. Then, the destruction of the UK's sugar industry was replaced by the Dutch sugar industries. This system was born as a means to make Java as land exploitation country of Netherlands. Originator of this system, Van den Bosch, using native bondage ties that exist in the cultivation of export crops. It turns out that this system worked well, the profits obtained to be used to build the Netherland from economic destruction. In line with the improving economy of the Netherlands, the Dutch private groups demanded that Java was opened for private exploitation (<http://history1978.wordpress.com>).

At the end of the 19th century saw various political and economic events in the Dutch East Indies (now Indonesia) and in the world. At that time many sugar plantations neglected due to the political turmoil that reduced the production of sugar cane, and sugar production also decreased dramatically. Then, the sugar industry increased again towards the 20th century. Nederlandsche Handel Maatschappij (NHM) to be the only company that was backed by the colonial government to undertake a program of forced cultivation in sugar cane plantations of sugar cane production back so abundant.

Era of the 1940s, when the Japanese occupation, sugar production in Java began experiencing sluggishness. Sugar cane land left abandoned neglected, and the sugar mill ceased operations due to a shortage of raw materials. Indonesian sugar industry setbacks continue long even Indonesia achieved its independence in 1945.

After Indonesian independence, government produced some policies to re-restore the glory of the national sugar industry. Beginning in the 1950s set the price of sugar at a low level. However, these policies resulted in decreased arousal sugar industry investment. At 1971 established National Logistics Agency (BULOG) which controlled the prices and distribution of the national sugar. A year later the government issued a policy of intensification of land, and the further development of the program was launched TRI (People Sugar Cane Intensification) in 1975. Then 1980s, given the cane fields in Java has decreased, the government of Indonesia expanded sugar cane areas outside Java. Thus the number of sugar factories in Java were shrinking due to delays in the supply of raw materials, but not accompanied by a significant increase in sugar production outside Java.

Under reformation government in 1998, Indonesia declared National Sugar Industry Revitalization Program as a national priority program in order to create an efficient sugar industry and competitive. Since 1998 the sugar industries have had increasing production although have not been able to meet domestic consumption needs.

The development of the sugar industries are done in an integrated manner from plantations, processing, marketing and distribution are supported by stakeholders including support institutions such as research and development institutions, human resources, finance/banking and transportation (Directorate General of Agro and Chemical Industry, Ministry of Industry, 2009). Ministry of Industry (2009) noted that it is technically and comparative, Indonesia has great power not possessed by other countries to continue increasing the national sugar production. Indonesia has taken control sugar processing technology, has lots of labor either farmers or employee sugar mills who are skilled, land area outside of Java, and the existence of a new sugar factory outside of Java. Opportunities are wide open to be achieved, namely the increasing demand white sugar for consumption and refined sugar for industrial fulfilled all this time partially of the imports, the potential area that can support the development of the sugar industry such as Papua, Sumatra and Sulawesi, sugar industry stakeholders to support increased production of sugar, operational cooperation with domestic and foreign investors, and the diversification of crop processing into bioethanol and other products.

Furthermore, based on those opportunities, the Directorate General of Agro and Chemical Industry, Ministry of Industry in 2009 making programs and action plans sugar industries development ahead divided into short, medium and long term as follows:

(1) Short-Term (2010-2015)

- Continuing the revitalization of national sugar industries 2007 - 2009 for on-farm and off-farm to increase production quality of white sugar
- Compose revised white sugar and conduct socialization intensively to sugar factories in order to implement new quality standard
- Provide raw sugar import quota for refined sugar industry that is tailored to the domestic needs of refined sugar for the food and beverage industries
- Directing new investment in integrated sugar industry with cane plantations.
- Revise policy rules on import sugar which is tailored to the development of the national sugar at this period.

(2) Medium Term (2015-2020)

- Ban imports of sugar in general, except for industries who have an investment facility, bonded zones and the use of refined sugar with special requirements (for medicines, baby food, etc.)
- Promote Indonesian sugar products to various countries if production has exceeded domestic demand

- Perform replacement equipment and engine of the sugar industry with evolving technologies and efficient processes.

(3) Long-term (2010-2025)

- Indonesia into a sugar-exporting country in Asia Pacific. The development of the sugar industry with the cluster approach is highly dependent on the effectiveness of the relationship between government and business (public - private partnership) and coherence. For effective cooperation and coordination is necessary to have institutions that encourage regular communication and continuous.

On the other hand, the Indonesian sugar industries still remain facing substantial challenges, namely the presence of tight sugar price competition with Brazil, India and China as the main sugar producing countries of the world and more efficient production costs in these countries. It requires the parties involved to make continuous improvements.

3. RESULTS AND DISCUSSION

Profile of Indonesian Sugar Industries

In this study, Indonesian sugar industries are classified into several criterias based on the location of a mill, company ownership, management, status of land, and ownership of sugar canes. Table 3 shows the profile of the Indonesian sugar industries based on these criterias.

Table 3. Indonesian Sugar Industries Profile

No	Criteria	Details			Details			Details		
		Type	Number	%	Type	Number	%	Type	Number	%
1.	Location	Java	46	79,31	Outside Java	12	20,69	-	-	-
2.	Ownership of company	Government	53	91,38	Private	5	8,62	-	-	-
3.	Land ownership	Right to cultivate	11	18,97	Right to build	15	25,86	Mix	32	55,17
4.	Ownership of sugar canes	self-owned sugar cane	6	10,34	Purchase to farmers	2	3,45	Mix	50	86,21

Based on the Table 3 above is known that the location of Indonesian sugar industries as much as 79.31 % are in Java and 20.69 % are located outside Java. The location of the sugar industries in Java are scattered in several areas of West Java, Central Java, Yogyakarta and East Java, while outside Java are located in Lampung, South Sumatra, North Sumatra, Gorontalo, and South Sulawesi. Operational state of sugar industries in Java and outside Java are not much different. Both face inefficiencies due to machinery and equipment used are too old, and implementation of a computerized accounting information systems (CAIS) are also already out of date.

Furthermore, based on the ownership of the company, as much as 91.38 % of sugar industries in Java and outside Java are owned by a government or state-owned enterprises (SOEs) and only 8, 62 % are owned by the private sectors. Either the sugar industries owned government or private, both are as a limited company. State-owned sugar industries are more heterogeneous compared to private sugar industries, namely are scattered in various regions across the archipelago with various sizes and production capacities. In addition, the state-

owned sugar industries have advantages over private sugar industries, which have human resources more experienced than the private sugar industries.

In terms of ownership of land used for business, Indonesian sugar industries consist of three types of right to cultivate (RTC), right to build (RTB) and the mix between RTC and RTB. As much as 18.97 % of the sugar industries using the RTC, 25.86 % using the RTB and most of them (55.17 %) use a system of land with a mixture of RTC and RTB.

Last of ownership of sugar canes, namely that of sugar canes as raw material for the sugar industries are obtained three ways. First, sugar canes planted and managed by company (self-owned sugar cane), second, sugar cane planted and managed by farmers (purchase to farmers) and third, a mix between the both. The research results show that as many as 86.21 % of sugar industries gain sugar canes with a mixture system namely self-own and purchase to farmers, then 10.34 % of the sugar industries obtain sugar canes from self-own, and 3.45 % of the sugar industries purchase to farmers.

Effect of Application Computerized Accounting Information Systems (CAIS) on the Quality of Accounting Information

Failure IPO (Initial Public Offering) of SOEs in 2013 was a stark warning that the SOEs must be able to meet the expectations of stakeholders and be able to develop innovation, efficiency, and increasing service to customers. It would require no small amount of capital. Inevitably, the SOEs currently require a capital expenditure to develop quality products and services. Unfortunately, investment or additional capital from the state is very difficult to be realized. One of the significant capital expenditures for SOEs is investing in information and communication technology system (ICT) that can improve the performance of the company. Unfortunately, information system investment in the SOEs has been less effective and less according to business needs and too dependent on ICT vendors that service quality is not good (<http://www.investor.co.id/home/totalitas-bumn-perkebunan/63922>).

ICT investment of SOEs particularly computerized accounting information system should be able to integrate sub-systems or components of both physical and nonphysical interconnected and cooperate each other in harmony to process transaction data related to financial issues into financial information. This is in accordance with Mc Leod and Schell premise that the accounting information system must be able to collect data and to explain the activities of the company, transforming data into information and provides useful information to users inside and outside the company (Minardi, Arif; in <http://www.investor.co.id/home/totalitas-bumn-perkebunan/63922>).

One of the components in a computerized accounting information system (CAIS) is a human resources (HRs). HRs are a user of the system, therefore the system will be good and bad depending on the quality of human resources operate the accounting information system. Managers and other HRs should have knowledge computerized accounting information system in the sugar industry include accounting knowledge and information system. Good financial management and transparent requires knowledge and skill in applying accounting information system. The ability of the accounting information system to produce highly qualified accounting information affecting on managerial performance of industry concerned.

The research result shows that the state of implementation of computerized accounting information system on the Indonesian sugar industries obtain the real score of 2,038 as shown in Table 4. Based on the assessment category in Table 2 for variable application of CAIS, the value of this score indicates that the application of CAIS at Indonesian sugar industries is still included in enough category. This result indicates that the application of CAIS at Indonesian sugar industries has not met the excellent category. This is because the sugar industries are still using outdated AIS components such as hardware,

software, brainware, procedure and communication network technology. In this case, the weakest components are the brainware and network information technology.

The research result of the variable quality of accounting information on the Indonesian sugar industries obtain the real score of 2,116 as presented in Table 4. Based on the assessment category in Table 2 for variable quality of accounting information, the value of this score indicates that the quality of accounting information generated Indonesian sugar industries is good category. The weakest criteria of quality of accounting information are relevance and reliability. Although the quality of accounting information is good, the management should improve the quality of accounting information into excellent category especially by enhancing the relevance and reliability of information, in addition to other criteria those are included “can be compared”, “consistency”, and “understandable”.

Table 4. Scoring and Category of Variables

No	Variables	The number of question item	Expected score	Real score	Category (criteria based on Table 2)
1.	Application of Computerized Accounting Information System (CAIS)	20	3,100	2,038	Enough
2.	Quality of Accounting Information	20	3,100	2,116	Good
3.	Managerial performance	19	2,945	2,245	Good

Further research result of the regression analysis namely the effect of the application computerized accounting information systems on the quality of accounting information. It shows adjusted R square-value of 0.125 , which means 12.5 % of variation in the quality of accounting information (variable Y) can be explained by variations of the application of computerized accounting information system (variable X), while the remaining 87.5 % is explained by other variables. F value is computed at 5.281 with probability 0.029. Because the probability is smaller than 0.05, so the regression model can be used to predict the quality of accounting information, or it can be said that the application of computerized accounting information system significantly affect on the quality of accounting information.

Based on the result mentioned above can be made linear regression model the effect of application computerized accounting information systems (X) on the quality of accounting information (Y) sugar industries of Indonesia with the following :

$$Y = 2.518 + 0.208 X$$

This means that if there is an increase of 10% quality of the application computerized accounting information system (X) will have effect on improving the quality of accounting information (Y) by 2.08%. The above equation model provides valuable information that the government should not hesitate to make capital expenditures to develop quality products and services through investment in advanced information and communications technology

system (ICT). Provided that such investment is able to integrate sub-systems or components in the CAIS for improving the quality of accounting information.

Effect of Accounting Information Quality on Managerial Performance of Indonesian Sugar Industries

Based on the research result as shown in Table 4, the state of the sugar industries managerial performance gain real score of 2,245. Based on the assessment category in Table 2 for variable managerial performance, the score indicates that the managerial performance of Indonesian sugar industries is good category. This result proves that managerial performance of Indonesian sugar industries has not met ideal category that is excellent. The weakest dimension of managerial performance is the control aspect. Managerial performance can be improved be integrated in various dimensions such as planning, organizing, coordinating, monitoring, representation, investigation, and assessment, and especially suppression of the control.

Furthermore based on regression analysis, adjusted R square value is 0.542 , which means that for 54.2 % of the variation in corporate managerial performance (variable Z) can be explained by the variation of the variable quality of accounting information (variable Y), while the remaining 45.8 % is explained by other variables. Analysis of variance shows F value calculated at 36.487 with a probability of 0.000. Because the probability is smaller than 0.05, the regression model can be used to predict the performance of managerial company or it can be said that the quality of accounting information (variable Y) significantly affect on the managerial performance Indonesian sugar industries (variable Z).

Based on the result mentioned above can be made linear regression model the influence of accounting information quality (Y) on managerial performance (Z) by the equation as follows:

$$Z = 0.478 + 0.710 Y$$

This means that if there is an increase of 10 % of the quality of accounting information (variable Y) will give the effect on increasing of managerial performance (variable Z) of 7.10 %. The above equation model provides a stronger argument about the benefit of capital expenditure to develop quality products and services in information and communication technology system (ICT) that is capable of integrating sub-systems or components in the CAIS thus improving the quality of accounting information. Then, the further positive impact is the improvement of managerial performance of Indonesian sugar industries, which is the basis for victory in the competition enters an increasingly competitive international market.

4. CONCLUSIONS AND RECOMMENDATIONS

1. Application of CAIS in Indonesian sugar industries is still enough category which indicates the condition is not very bad or also not very good. This is because the sugar industries of Indonesia still use obsolete or outdated components of CAIS, especially the brain-ware component and communication network technology.
2. The quality of accounting information generated CAIS Indonesian sugar industries is good category. This category has not shown excellent category as accounting information quality criteria required in modern business. The critical point of the quality of the accounting information which causes this condition is less relevance and reliability of information. Improving the quality of accounting information has to be more focused on improving both in order to get more relevant and more reliable information.

3. Category of managerial performance Indonesian sugar industries is also good. Managerial performance should be improved into excellent category on various its dimensions namely planning, organizing, coordinating, monitoring, representation, investigation, assessment, and especially in the aspect of control.
4. As much as 12.5 % variation in the quality of accounting information resulted by variation of application computerized accounting information system (CAIS).
5. Application computerized accounting information system significantly affects on the quality of accounting information.
6. As much as 54.2 % variation in the managerial performance of Indonesian sugar industries caused by variation of the quality of accounting information.
7. The quality of accounting information significantly affects on the managerial performance of the Indonesian sugar industries.
8. Improving the quality of computerized accounting information system (CAIS) will result an increase the quality of accounting information and further improve performance of managerial Indonesian sugar industries.
9. Improve quality of application computerized accounting information system (CAIS) should be integrated in various components of information system including hardware, software, brain ware, procedure and communication network technology, with emphasis on the weakest components namely brain ware and network information technology. Improving the quality of brain ware done through training of personnel for understanding and to be expert to use CAIS well and properly to create harmony in the CAIS. Increasing information network technology done through the development of on-line information system linking among location a mill, plantations, branch offices and headquarter, or among various departments within a sugar industry.

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6. REFERENCES

References to a Journal Publication

- Bawaneh, Shamsi S. (2011). Information Technology, Accounting Information System and Their Effects on the Quality of Accounting University Education: An Empirical Research Applied on Jordanian Financial Institutions. *Interdisciplinary Journal of Contemporary Research in Business* 3.2 (Jun 2011): 1815-1840.
- Dewan Gula Indonesia. (2010). *Laporan Gula Indonesia (beberapa tahun)*. Jakarta.
- El-Dalabeeh, Abd el-Rahman kh; Alshbiel, Seif Obeid. (2012). The Role of Computerized Accounting Information Systems in Reducing the Costs of Medical Services at King Abdullah University Hospital. *Interdisciplinary Journal of Contemporary Research In Business* 4.6 (Oct 2012): 893 – 900.
- Jamil Abdallah, Ahmad Adel. (2013). The Impact of Using Accounting Information Systems on the Quality of Financial Statements Submitted to the Income and Sales Tax Department in Jordan. *European Scientific Journal*, suppl. December 2013/SPECIAL/edition vol.1 ISSN: 1857–7881 (Print) e-ISSN 1857-7431.

International Conference on Multidisciplinary Trends in Academic Research, September 29-30, 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- Mihailovic, Ivan; Randelovic, Dragana; Stojanovic, Dragan. (2010). Accounting Information as Resource for Business Decisioning. Scholarly Journals. Faculty of Tourism and Hospitality Management in Opatija, Biennial International Congress. Tourism & Hospitality Industry: 1067-1074.
- Romney, M. B. & Steinhart, P.J. (2003), Accounting Information Systems, Prentice Hall, New Jersey.
- Soudani, Siamak Nejadhasseini. (2012). the Usefulness of an Accounting Information System for Effective Organizational Performance, International Journal of Economics and Finance 4.5 (May 2012): 136-145.
- Sulub, Saed Ahmed. (2014). The Impact of Computerized Accounting Information Systems on Reducing Costs in Somaliland Business Companies. SSRN Working Paper Series Rochester: Social Science Research Network. (May 2014).
- Surono, S. (2011). Akankah Berhasil Swasembada Gula Tahun 2014? Jurnal Manajemen Usahawan Indonesia, Vol. 40 No. 4 (Juli – Agustus 2011), 433-450.
- Susanto, Azhar. (2013). Sistem Informasi Akuntansi, Struktur-Pengendalian-Resiko-Pengembangan, Lingga Jaya. Bandung.
- Syafa'at, dkk. (2005). Laporan Akhir Pengembangan Model Permintaan dan Penawaran Komoditas Pertanian Utama. Pusat Penelitian dan Pengembangan Sosial Ekonomi Pertanian Balitbang Departemen Pertanian. Jakarta.
- Wedyan, Lu'ay Mohammad Abdel-Rahman; Gharaibeh, Adnan Turki Said; Abu-dawleh, Ahmad Ibrahim Mohammad; Hamatta, Hatem S. Abu. (2012). The Affect of Applying Accounting Information System on the Profitability of Commercial Banks in Jordan (A field study from Management's Viewpoint). Journal of Management Research 4.2 : 112-138.
- Yusbar Y.; A.F. Aulia; S. Martadi. (2010). Permintaan Gula Pasir di Indonesia. Jurnal Ekonomi Vol 18 No. 03 (2010), Lembaga Penerbit Fakultas Ekonomi Universitas Riau, Pekanbaru.

References to a Web Source

- (<http://www.investor.co.id/agribusiness/pemerintah-benahi-manajemen-pabrik-gula/46584>) (January 4, 2013).
- <http://history1978.wordpress.com> (May 1, 2013)
- <http://www.kemenperin.go.id/artikel/21/Revitalisasi-Industri-Gula> (February, 18. 2013)
- Minardi, Arif. (2012). [Online] Available : <http://www.investor.co.id/home/totalitas-bumn-perkebunan/63922> (June 11, 2013).

EVALUATING THE PERCEIVED USABILITY OF VIRTUAL LEARNING ENVIRONMENT IN TEACHING ICT COURSES

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ABSTRACT

This paper focuses in evaluating the perceived usability of Virtual Learning Environment (VLE) utilized as a blended learning tool in teaching ICT courses in Isabela State University. Descriptive research method using survey was employed to gather responses from a total of 120 third year students enrolled in IT59 course during the first semester, SY 2013-2014. Overall, the VLE's general interface design, VLE-site specific design, student-centred instructional design, and overall usability of the VLE were rated very satisfactorily. This implied that the VLE conformed to the different usability issues presented and was satisfactorily accepted by the students. However, 95% of the students still preferred to use both VLE site and the classroom for learning. Taking online assessments were most liked. In contrast, deadline of submission were least liked. Other problems they found critical in using the VLE were insufficient time in answering activities, deadline of submission, and expensive computer/internet rental. The study concludes that the evaluation of the VLE conformed to the different usability issues presented. Also, students were positive regarding the usability of the VLE site and its support to learning. However, pedagogical issues such as incorporating learning activities that deal with active learning, problem solving, and authentic learning should be provided. It should also attempt to fully engage students in learning by incorporating activities that are interactive and collaborative in nature; grades and other incentives should be promptly reported to continually motivate students; internet access should be addressed.

Keywords: E-Learning, VLE, Usability, Blended Learning, Descriptive Research.

1. INTRODUCTION

Along with the rapid advancement of ICT, education has become one of its primary applications. Consequently, ICT integration into teaching and learning is now one of the priority concerns among schools and universities. In order to address this need, the concept of e-learning has been established. E-learning as defined by Babo and Azevedo (2009) is an information system that processes, stores, and disseminates course materials and supports communication associated with teaching and learning. Accordingly, it provides several functionalities such as electronic distribution of course syllabi, ability to post hyperlinks to websites, forum for the exchange of ideas, wikis which allows student to swap ideas and information on projects, chat rooms for real time discussion, facilitate e-mailing and messaging (teacher-to-student, student-to-student), facilities for students to submit work assignments electronically, means to administer quizzes and tests online, and reports teachers' grades and feedback to students Janossy (2008). Today, the term e-learning has captured a wider scope from the use of personal computers and the Internet to the utilization of more advanced applications, as well as devices or tools for more effective teaching and learning.

Literature in the area of e-learning points out that the quality of educational software is significantly related to its interface quality (Buzhardt *et al.*, 2005; Cantoni *et al.*, 2004; Hinostroza and Mellar, 2001). Regardless of the technical type of the platform, such as desktop software or an internet website, the interface remains equally problematic when dealing with the behavior of the user. The interface quality of educational software or websites, moreover, has a serious impact on the learning outcome of the student (Gauss and Urbas, 2003). Crowther *et.al.* (2004) argue that the impact of a poor interface design in education is more serious than in business. It impairs a student's overall motivation, as well as their learning performance, and has serious moral and ethical implications. In essence, interactivity between student and interface has been considered as the most important aspect in several studies on how to improve the quality of education through e-learning (Cantoni *et al.*, 2004; Ellis and Blashki, 2004; Chou, 2003; Gauss and Urbas, 2003). According to the interface consistency theory that deals with the interaction between the user and the interface, increasing the consistency levels of the user interface results in a significant decrease of error rates in computer and web-based tasks (Ozok and Salvendy, 2004).

Usability is the extent to which users can use a computer system to achieve specified goals efficiently and effectively while promoting feelings of satisfaction in a given context of use (ISO 9241). Usability evaluation (UE) consists of methodologies for measuring the usability aspects of a system's user interface (UI) and identifying specific problems (Dix et al. 2004; Nielsen 1993). Moreover, usability evaluation is an important part of the overall user interface design process which ideally consists of iterative cycles of designing, prototyping, and evaluating (Dix et al. 2004; Nielsen 1994). According to Melis, et.al. (2003) making an e-learning system usable basically involves two aspects: technical usability and pedagogical usability. Technical usability involves methods for ensuring a trouble-free interaction with the system, while pedagogical usability aims at supporting the learning process. Both aspects of usability are intertwined and tap the user's cognitive resources. The main goal should be minimizing the cognitive load resulting from interaction with the system in order to free more resources for the learning process itself.

This study evaluated the usability of Virtual Learning Environment in a blended learning modality of ICT courses offered at Isabela State University.

The VLE was evaluated with specific usability designs such as: interface designs, and student-centered instructional designs; and general usability in terms of the following: ease of use, efficiency, effectiveness, ease of remembering, and satisfaction. This is also to examine whether the users experienced any 'barriers to learning'. The usability of VLE's can have a huge influence on learning and this aspect is considered as the most influential in determining initial impressions of an interface.

2. REVIEW OF LITERATURE

Heuristic Evaluation

A heuristic evaluation or guidelines-based expert evaluation may be the first assessment of an interaction design based on the user task analysis and application of guidelines for Virtual Environment (VE) user interface design. One of the goals of heuristic evaluation is to simply identify usability problems in the design. Another important goal is to identify the usability problems early in the development lifecycle so that they may be addressed, and the redesign iteratively refined and evaluated (Nielsen and Mack, 1994). In a heuristic evaluation, usability experts compare

elements of the user interaction design to guidelines or heuristics looking for specific situations in which guidelines have been violated, and therefore are potential usability problems. The evaluation is performed by one or more usability experts and does not require users. A set of usability guidelines or heuristics that are either general enough to apply to any VE or are tailored for a specific VE is also required.

E-learning in HEIs

Bada and Khazali (2006) observed that most HEIs in Uganda such as Makerere University, Kampala International University, Kyambogo University, Makerere University Business School and Nkumba University have websites and they use wireless technology for internet connectivity. Most students are interested in e-learning, have access to internet and email and can use them very well. Most HEIs use the distance learning approach as one of the methods for degree courses, especially where students work and have little time to attend classes. The introduction of e-learning in HEIs should not totally take over from the traditional means of delivery. E-learning should be used to compliment the traditional means. This view is supported by Bada and Khazali (2006) who argue that online methods of content delivery should be blended with the traditional methods of learning. However, Ugandan institutions face several challenges whenever they try to use blended learning. For example there is lack of vision and poor management, lack of a clear integration framework, bandwidth limitation, resistance to change, inadequate training of staff, poor infrastructure and high software costs. In addition to that, recognition of e-learning as a feasible method of learning is also still a challenge. This is affirmed by Bada and Khazali (2006) indicating that the stakeholders believe face-to-face learning allows students to interact more with their instructors and also that there is more value for money.

Kim and Seo (2009) designed, developed and evaluated the usability of an e-learning platform supporting education for gifted children. An instructional model is created as basis of the e-learning platform's design and development. The e-learning platform is utilized in an actual classroom set-up for six months with a sample of 55 gifted students and 16 teachers evaluating the usability of system. Significantly, the authors' findings were appropriate both in instructional support and technical support. Further investigations were required to utilize learning content management system for offering gifted learners more highly individualized instructions and to provide the appropriate strategies for instructors guiding them according to their learning orientation and level of task commitment.

Al-sarrayrih, et al. (2010) evaluated the Learning Management System of TU Berlin, Information System for Instructors and Students (ISIS) focusing on the ISO-9126 characteristics of usability, functionality, and reliability. The results indicated that the usability and functionality aspects of the system are well received. However, the perceived reliability of ISIS should be increased to improve user satisfaction.

Frameworks for integrating e-learning in HEIs: The E-Learning Framework

Designing an e-learning framework needs careful analysis and investigation of the resources available to the institution. Khan (2005) asserts that design, development, implementation and evaluation of e-learning systems require thorough analysis and investigation of how to use the attributes and resources of the Internet and digital technologies. Khan further reflects on various factors important to e-learning. He identified the following factors that cover various online learning issues; pedagogical, technological, interface design, evaluation, management, resource support, ethical, and institutional. These factors discussed in the eight dimensions of the framework

can provide guidance in the design, development, delivery and evaluation of e-learning environments.

Another useful framework is a model for developing an integrated e-learning culture in a large organization by Newton and Ellis (2006). The integration of e-learning is influenced by the various activities relating to e-learning. These are organizational priorities, learning environment, instructors' roles and learners' needs for developing an integrated e-learning culture in a large organization. All the four factors should be considered so that the extent of e-learning integration suits the organization that wants to embrace e-learning integration. This is important because different organizations have different priorities, different learning environments, different roles and different needs. In addition to the four factors of integrating e-learning, Newton and Ellis (2006) suggest that the policy makers' views should also be considered.

The above reviewed e-learning frameworks have been used to solve unique e-learning problems. Nevertheless, these frameworks do not address the issue of e-learning integration with other teaching methods in its entirety. They mainly cover issues of e-learning systems development, application, and adoption.

E-learning Integration Theories

Although some scholars have argued that the requirements for face-to-face learning are the same as those for e-learning (Díaz, 2009), and that the difference is only manifested in the effort put in by teachers, a number of scholars have argued otherwise (Kituyi and Kyeyune, 2012; Bada and Khazali, 2006; Sankale, 2006). In order to deepen the understanding on the subject of e-learning integration, some e-learning integration theories were consulted as seen in the following sub-sections:

Design Theory of Blended Learning. Designed by Huang et al (2007), the Design Theory of Blended Learning tries to explain how different types of learning including face-to-face and computer aided forms of learning can be used together for better performance. They argue that blended learning can be achieved if there is a well-designed curriculum showing the various activities involved in the learning process. In this theory, the proponents suggest various factors that influence the success of blended learning as flexibility, whereby a number of tools such as discussion forums, e-mails and boards are used to enhance learning. In addition, the authors argue that technology-based learning allows learners to undergo self-paced learning and monitor themselves without the direct supervision of the teacher. Therefore learners using blended learning are provided with a variety of learning options from which they can adopt effective learning processes.

However, for successful blended learning to occur, there should be a series of activities executed through four phases, including pre-analysis, design of activities and resources, instructional assessment, and instructional verification. The analysis phase is aimed at studying the learners' characteristics, objectives and learning environment. In the design phase, the blended learning implementing institutions are supposed to come up with the overall design of the learning process, clearly showing the learning units, delivery strategies and required resources. In the instructional assessment phase, the implementing institution is supposed to carry out an evaluation of the learning process, curriculum evaluation, and evaluation of the learning activities identified in phase two. The deliverables of blended learning theory include the analysis report, design report, and evaluation report in each phase respectively.

Criticism of the Design Theory of Blended Learning. Generally, there is little literature that evaluates blended learning studies. This is perhaps because blended

learning is a relatively new issue that has not yet attracted as much attention as other research areas. However, some scholars such as Hadjerrouit (2008) have argued against blended learning. In his 2008 paper, Hadjerrouit argues that “blending face-to-face learning with information technologies cannot provide effective teaching and efficient solutions for learning”. Further, Díaz (2009) argues that there is no significant difference between face-to-face and online learning. Nonetheless, Hadjerrouit (2008) suggests that blended learning can be effective if research is conducted with an aim of developing appropriate pedagogy and in effect proposes a model through which blended learning can be implemented. The “successive cycle” model can help remove shortfalls in the process of integrating learning i.e. face-to-face learning, computer-based learning and online learning.

In addition to the above, the blended learning theory is limited in a number of ways. For example the model does not show the learning content for which different learning methods are designed. In fact, there is no mention of content design at all in the design phase. The various learning methods to be used in blended learning are unknown. None of the reviewed models (Huang et al. 2007; Hadjerrouit, 2008) did identify the relevant stakeholders for successful blended or integrated learning. Moreover Kituyi et al. (2012) argue that stakeholders must be identified and each given specific roles for successful e-learning to take place. Kituyi et al. (2012) identified the five most important stakeholders for e-learning are the government, the school, the private sector, the teacher and the learner.

Despite the weaknesses identified above, blended learning remains a method of choice for better teaching in HEIs (Carman, 2005). Therefore, it is important that appropriate frameworks are designed to guide the integration of various teaching methods in the learning process. Blended learning theory is a good initiative towards integration of learning, although it does not show how each learning method integrates with others as is the case of (Hadjerrouit, 2008) which highlights face-to-face, computer-based and online learning as the components of blended learning. The only and perhaps the most significant weakness of blended learning model by Hadjerrouit (2008) is the lack of activities, stakeholders and key deliverables of each component listed in the model.

3. RESEARCH METHODS

The study used the quantitative descriptive survey research method. A sample size of 120 Bachelor of Science in Information Technology (BSIT) students ($N=120$) enrolled in IT59 ICT course during the second semester, school year 2013-2014. They served as respondents to evaluate the perceived usability of the VLE used as a blended learning tool in teaching and learning ICT course. The delivery of the course passed took a total of 18 weeks (equivalent to 90 hours). A usability evaluation questionnaire adapted from the work of Ssemugabi and de Villiers (2010) consisting structured and unstructured questions was used. The instrument consists of four categories namely: *Category 1* General Interface Design; *Category 2* VLE-site Specific Design; *Category 3* Student-centered Instructional Design; and *Category 4* The Overall Usability of the VLE site. It has 24 sections with 76 questions/statements structured using the 5-point Likert scale format and one (1) statement structured using Nominal scale. In addition, open-ended questions were also asked to reinforce their answers. The questionnaire is available in a paper-and-pencil format which is self-administered.

Descriptive statistical tools such as mean/weighted mean, percent frequency distribution and percentage were presented to analyze the results of the study. SPSS (Statistical Package for Social Sciences) version 20 and Microsoft Excel 2007 are the software used in computation.

The item mean/weighted mean of responses per criterion reference were computed and interpreted such as 5 (4.20-5.00) means strongly agree; 4 (3.40-4.19) means agree; 3 (2.60-3.39) means neither agree nor disagree; 2 (1.80-2.59) means disagree; and 1 (1.00-1.79) means strongly disagree.

4. RESULTS

Table 1 presents the summarized mean perception of respondents on Category 1- General Interface Design. A grand mean of 4.38 or equivalent to “strongly agree” shows that the general interface design of the VLE site is satisfactory accepted by the students. Interestingly, two sections have the highest mean rating, one is help and documentation (4.54) where facilities such as online help and glossary and links to other resources are found to be helpful and useful. Moreover, flexibility and efficiency of use (4.53) evaluates how the VLE site sufficiently guides new users and customization of settings to suit users’ needs.

Though rated “strongly agree”, one of the least rated section is match between the VLE system and the real world (4.28). This evaluates use of languages naturally, use of terms properly, and correspondence to real-world objects. Another is user control and freedom section (4.28) which focuses on user’s control over the site and availability of buttons, icons, hyperlinks, and logouts to freely manipulate the site.

Table 1. Summarized Mean Perception of Respondents on General Interface Design Category.

General Interface Design Section	Weighted Mean	Descriptive Equivalent
1. Visibility of system status	4.46	Strongly agree
2. Match between the VLE system and the real world <i>i.e. match between designer model and learner model</i>	4.28	Strongly agree
3. User control and freedom	4.28	Strongly agree
4. Consistency and adherence to standards	4.36	Strongly agree
5. Error prevention, specifically prevention of peripheral usability-related errors	4.36	Strongly agree
6. Recognition rather than recall	4.34	Strongly agree
7. Flexibility and efficiency of use	4.53	Strongly agree
8. Authenticity and minimalism in design	4.37	Strongly agree
9. Recognition, diagnosis, and recovery from errors	4.33	Strongly agree
10. Help and documentation	4.54	Strongly agree
Grand Mean	4.38	Strongly agree

Table 2 presents the summarized mean perception of respondents in terms of Category 2- VLE Site Specific Design. It shows that the VLE site specific design is satisfactorily complied with a grand mean of 4.46 described as “strongly agree”. The simplicity of VLE site navigation, organization and structure (4.45) pertains to

adaptation of the site interface, and proper link to pages and documents. On the other hand, relevance of VLE site content for learning (4.48) evaluates appropriateness of the content as to level of understanding and viewing of grade books.

Table 2. Summarized Mean Perception of Respondents on VLE Site Specific Design Category.

VLE Site-specific Design	Weighted Mean	Descriptive Equivalent
11. Simplicity of VLE site navigation, organization and structure	4.45	Strongly agree
12. Relevance of VLE site content for learning	4.48	Strongly agree
Grand Mean	4.46	Strongly agree

Table 3 presents the summarized mean perception of respondents on Category 3 - Student-centered instructional design. As shown from the result, it indicates that the VLE site as a tool offers highly acceptable student-centered instructions with a grand mean of 4.51 equivalent to strongly agree. Remarkably, the VLE recognizes students' cognitive level (4.68) and there is feedback mechanism and assessments (4.67) provided by the VLE site to students. Though rated "strongly agree", one of the least rated section was collaborative learning (4.41). This evaluates facilities for group activities, collaboration among students, role of instructor in the team, and availability of discussion forum with co-learners. Another was motivation, creativity and active learning section (4.39) which focuses on self and external motivation; engagement to VLE site and its look-and-feel; attraction to content and interactions, short rather than long quizzes; and enjoyment and interest in doing learning assessments.

Table 3. Summarized Mean Perception of Respondents on Student-centered Instructional Design Category.

Student-centered Instructional Design	Weighted Mean	Descriptive Equivalent
13. Clarity of goals, objectives and outcomes	4.51	Strongly agree
14. Collaborative Learning	4.41	Strongly agree
15. Appropriateness of the level of learner control	4.45	Strongly agree
16. Support for personally significant approaches to learning	4.53	Strongly agree
17. Cognitive error recognition, diagnosis and recovery	4.68	Strongly agree
18. Feedback, guidance and assessment	4.67	Strongly agree
19. Meaningful context	4.50	Strongly agree
20. Motivation, creativity and active learning	4.39	Strongly agree
Grand Mean	4.51	Strongly agree

In addition to the evaluation results of the three categories presented, students were also asked to evaluate *Category 4*- Overall usability of the VLE site and its support for learning.

Table 4 shows the weighted mean responses of students for each statement/question relating to the overall usability of the VLE site. The responses of the factors associated with ease of use (4.23); efficiency (4.27); effectiveness (4.58); easy to remember (4.62); and satisfaction (4.38) got a total weighted mean of 4.42 described as “strongly agree”.

Table 4. Mean Perception of Respondents on Category 4- Overall Usability of the VLE site.

Statement	Weighted Mean	Descriptive Equivalent
A. Ease of use: I found out the VLE system easy to use.	4.23	Strongly agree
B. Efficiency: The VLE system is fast to work with.	4.27	Strongly agree
C. Effectiveness: The VLE system performed tasks properly.	4.58	Strongly agree
D. Easy to remember: Once I learn how to use the VLE system it will be easy to use it the next time.	4.62	Strongly agree
E. Satisfaction: I was satisfied with the VLE system.	4.38	Strongly agree
Total Weighted Mean	4.42	Strongly agree

Interestingly, students were also asked as to their preference in learning. It was revealed that 95% of students preferred to use both class and VLE site for learning, compared with 3% who would prefer the VLE site only and 2% who preferred class instruction only.

Further, as presented in Table 5, a very good rating of 4.37 was noted when asked “*how well the operation of VLE site as a supplement to class instruction*” and a highly commendable rating of 4.43 on “*overall rating of the VLE site*”.

Table 5. Mean Perception of Respondents on Statements F and H of Category 4- Overall Usability of the VLE site.

Question	Weighted Mean	Descriptive Equivalent
F. How well did the VLE site work as a supplement to class instruction?	4.37	Very Good
H. What is your overall rating of the VLE site?	4.43	Very Good

In general, the statistics in the previous paragraphs show that students were affirmative regarding the usability of the site and its support for learning. This is confirmed further by some of their remarks:

- ”I am attracted with the graphics, text used and the GUI of the site.”

- “A pop-up dialog box informs me before and after taking an exam/quiz.”
- “I am motivated and felt worthy when my instructor provides positive feedback about my work.”
- “I enjoy doing self-test, assignments, projects in VLE because it makes me realize that I can do things on my own.”
- “I love doing assignments, activities, and learning by reading assignments shared by my classmates.”

However, remarks and feedbacks that should be addressed include:

- “Some of the terms defined are confusing leading to the misunderstanding of the concept/topic.”
- “Due to poor Internet connection, I don’t have enough time to finish my learning activities especially the online quiz.”
- “Some part of image does not easily load due to size of the image.”
- “The module is too long; modules and activities must be separated.”
- “I don’t enjoy doing projects and assignments because I don’t understand the instructions/examples.”

The respondents were also asked on question “*What attracted and you like most in the site?*” Two topmost answers were Assessment (28%) and Motivation (23%) indicating that students were most attracted with different assessment activities and motivated to use the VLE site because of the graphics, text, and graphical user interface. On the contrary, lower percent frequencies were recorded for Active Learning (2%), Problem Solving (3%), and Authentic Learning (3%).

The students’ response on question “*What did you like least about the Site?*” the deadline of submission (42%) and answering the quiz (15%) were least liked. On the other hand, least rated items were the following: paying internet fee (1%), no available laptop (2%), loading the site (2%), VLE site design (2%), lack of time (3%), and use of forum (5%). On the positive note, 7% of the students mentioned that they do not have problems with the VLE.

Further, based from the answers of the students on the question “*What problems you found most critical in the VLE system.*” the researchers were able to identify serious problems that students encountered while using the VLE site. It appears that time duration of quizzes is not sufficient (35%), computer/internet rental is expensive (13%), and deadline of submission of activities (13%) were among the critical concerns that the researchers should address. On the other hand, very minimal responses were drawn on the following: focus on other social network site (2%) and not learning from the site (2%). In spite of the critical issues recognized, 8% of the students stated that they did not encounter problems in using the VLE.

5. DISCUSSIONS AND CONCLUSIONS

By evaluating the usability of the VLE in teaching ICT courses, each category reveals the following analysis of the results:

Category 1 - General Interface Design

The overall general interface design of the VLE is satisfactorily accepted by the students. It was revealed that help and documentation section is highly acceptable. This implies the VLE is very suitable and useful in providing online help facilities and links to other resources helpful in learning. Similarly, the VLE site guides novice

users/students sufficiently and it is flexible enough to enable students to adjust settings to suit their needs such as customizing profile settings.

Though rated “strongly agree”, one of the least rated section was the “user control and freedom”. It was revealed that students’ inability to exercise control over the VLE resulted to uncomfortably using the VLE for the first time –i.e. accessing, downloading lessons, uploading their learning tasks, and communicating with their instructor and co-learners. In addition, the VLE pages must have the required navigation buttons or hyperlinks and an exit (log-out) must be clearly marked. These should be dealt with accordingly to address user control and freedom over the VLE site. Another least rated section although rated “strongly agree” was the “match between the VLE system and the real world”. The students encountered different web terminologies, icons, and symbols on the VLE site that lead to confusion. Consequently, languages, metaphors, and terminologies used in the VLE site should also be improved to ensure understandable and meaningful symbolic representations used within the context of the performed tasks.

Category 2 - VLE-site Specific Design

The overall VLE site specific design is satisfactorily accepted by the students. It was revealed that VLE site-specific design conformed to simplicity of VLE site navigation, organization and structure which means that students always know where they are and which options to go to next in the VLE site. Also, available links are directed to correct documents/pages and that related information is placed together. In terms of relevance of content for learning, the result shows that the content is appropriate to what is to be learned and to their level of understanding. Likewise, students are interested to view records of their learning activities and grade book. However, it was noted that students were more familiar and found it easier to use the course menu structure rather than course maps. This means that students should be oriented/trained in the use of course maps to navigate the site.

Category 3 – Student-centered Instructional Design

The overall student-centered instructional design of the VLE indicates that the VLE site as a teaching and learning tool offers highly acceptable student-centered instructions. It was worth mentioning that the respondents satisfactory agreed that the VLE provides feedback regarding learning activities and appreciates quantitative feedback in terms of activity grades. This directly associates with their responses that the VLE has the capability of recognizing students’ limitations of knowing wrong concepts but tries to correct as part of learning considering the instructor as the intervening factor. Majority of the students agreed that the VLE system recognizes that every student is entitled for every mistake and lessons learned from that mistake are worthwhile.

Further, findings that were evident and worth mentioning were: the course e-syllabus is useful; calendar provides useful information; different strategies support learning; knowledge in meaningful context is presented helpful in learning; and the VLE site provides intrinsic (self) motivation to learners.

On the other hand, though rated “strongly agree”, least rated issues that should be resolved were related to presentation of knowledge presented in authentic way; engagement to the VLE site; and collaboration with other learners/students initiated or supported by the VLE site. Thus, to address the issues, sufficient learning activities that is interactive and collaborative in nature should be presented; frequent instructor’s support and feedback; external motivation to learn and accomplish course requirements (i.e. display of grades on time, incentives and positive feedback) should

be strengthened; and to promote creativity by engaging students in the different activities available in the VLE site.

Further, the study also recognized that instructor's delay of providing feedback and reinforcement is due to the unmanageable time schedule and poor Internet access as well.

Category 4 - The Overall Usability of the VLE site

The responses for *Category 4- Overall usability of the VLE site* factors associated with ease of use; efficiency; effectiveness; easy to remember; and satisfaction were highly commendable. Overall, the students highly accepted that the VLE site is fast to work with, performed tasks properly, and once they learned how to use it, it is easier the next time, and that they were satisfied using the VLE site.

Although highly accepted, a lower mean rating was noted on the "ease of use" factor which means that students are faced with normally occurring problem of using a new system. This issue will eventually be remedied as the students gain more exposure to the system. The study also revealed that 95% of the students still preferred to use both class and the VLE site for learning over use of VLE site only and use of class instruction only. It was also reported that despite of some general interface design constraints and less effective motivational factors identified, still a highly commendable rating was reported on how well the VLE is operating as a blended learning tool in learning ICT courses. Similarly, respondents also had high regards to the overall rating of the VLE site. The results can be associated with their preference of using both class and the VLE site for learning.

In general, the students were positive regarding the usability of the site and its support for learning. This is further confirmed by some of their constructive remarks such as the use of graphics, text and the GUI of the VLE site; use of dialog boxes to inform users; feedback and positive reinforcement, and enjoyment and passion of doing learning tasks. However, issues that should be addressed include: inconsistency of using language, terms, and representation; slow loading of images due to size; long modules/lessons; and poor internet connection. It was revealed that Assessment and Motivation were most liked by the respondents. They are interested in doing different assessment activities like online quiz, exercises, projects, assignments, and forum done in the VLE site. Moreover, students were motivated to use the VLE site because of the graphics, text, and graphical user interface. Also, they were encouraged to improve their skills and to study well while using the VLE. On the contrary, lower percent frequencies were recorded for Active Learning, Problem Solving, and Authentic Learning. These implied that few students used other website to acquire more resources, acquire more knowledge while surfing the VLE, and discovering things in their own initiative. This further means that students relied heavily on the available learning resources, learning activities, and the used learning methodologies provided in the VLE.

Majority of the respondents' least like were deadline of submission of learning tasks and answering the quiz. These issues relatively correlate to most critical problems encountered in the VLE site. It is quite ironic that they are interested in doing learning activities but they least like submitting the activities on time and answering time-bound quiz online. This indicates that there is a need to still motivate and encourage the students of the purpose of taking and submitting tasks on time. On the other hand, no available laptop; loading the site, VLE site design, lack of time, and use of forum were minimally rated. It is therefore notable that the VLE site is satisfactorily compliant in terms of technology, instructional design, and time aspects.

It is also worthy to note that some mentioned that they do not have problems with the VLE.

Overall, based on the findings of this evaluation, the Usability of the VLE satisfactory conformed to the different usability issues presented. Moreover, it was determined that students were affirmative regarding the usability of the VLE site and its support for student-centered learning. The evidences of this study and other studies (Janossy, 2008; Picolli, 2001; Kim and Seo, 2009; Al-sarrayrih et al, 2010; and Lee, et al 2009) indicate that perceived ease of use, along with perceived usefulness, teaching materials, design of learning content were identified as factors related to usability of the VLE site. In addition, this study found out that help and documentation, flexibility and ease of use, relevance of VLE site content for learning, cognitive error recognition, diagnosis and recovery, feedback, guidance and assessment, effectiveness, and ease of remembering were the strongest factors of the VLE's usability. However, pedagogical issues such as incorporating learning activities that deal with active learning, problem solving, and authentic learning should be provided. It should also attempt to fully engage students in learning by incorporating activities that are interactive and collaborative in nature; display of grades on time, other incentives, and positive feedback should be promptly reported to continually motivate students; internet access should be addressed.

6. REFERENCES

Reference to a journal publication:

- Al-sarrayrih H. S., Knipping, L., & Zorn E. (2010). Evaluation of a Moodle based learning management system applied at Berlin Institute of Technology based on ISO-9126. *Proceedings of ICL 2010 Conference*. September 15-16, 2010, Hasselt Belgium.
- Babo, R., & Azevedo, A. (2009). Learning management systems usage on Higher Education Institutions. *In Proceedings of 13th IBIMA Conference - Knowledge Management and Innovation in Advancing Economies: Analyses & Solutions*. pp.883-889.
- Bada, J. K., & Khazali (2006). An empirical study on education strategy to E-learning in a developing country. *Proceedings of the Fourth International Workshop on Technology for Education In Developing Countries*, 10-12 July 2006, Iringa, Tanzania.
- Buzhardt, J., Abbott, M., Greenwood, C., & Tapia, Y. (2005). Usability testing of the classwide peer tutoring-learning management system. *Journal of Special Education Technology*, Vol. 20, No. 1, pp. 19-29.
- Cantoni, V., Cellario, M., & Porta, M. (2004). Perspectives and challenges in e-learning: Towards natural interaction paradigms. *Journal of Visual Languages and Computing*, Vol. 15, pp. 333-45.
- Chou, C. (2003). Interactivity and interactive functions in Web-based learning systems: A technical framework for designers. *British Journal of Educational Technology*, Vol. 34, No. 3, pp. 265-79.
- Crowther, M.S., Keller, C.C., & Waddoups, G.L. (2004). Improving the quality and effective of computer-mediated instruction through usability evaluations. *British Journal of Educational Technology*, Vol. 35, No. 3, pp. 289-303.
- Ellis, K., & Blashki, K. (2004). Toddler techies: a study of young children's interaction with computers. *Information Technology in Childhood Education Annual*, Vol. 2004, pp. 77-96.

International Conference on Multidisciplinary Trends in Academic Research, 29-30 September 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- Gauss, B., & Urbas, L. (2003). Individual differences in navigation between sharable content objects – and evaluation study of a learning module design. *British Journal of Educational Technology*, Vol. 34, No. 4, pp. 499-509.
- Hadjerrouit S. (2008). Towards a blended learning model for teaching and learning computer programming: A case study. *Informatics in Education*, 2008, Vol. 7, No. 2, pp.181–210.
- Hinostroza, J.E., & Mellar, H. (2001). Pedagogy embedded in educational software design: report of a case study. *Computers and Education*, Vol. 37, pp. 27-40.
- Huang R., Ding M., & Zhang H. (2007). Towards a design theory of blended learning curriculum. Beijing Normal University.
- Janossy, J. (2008). Proposed model evaluating C/LMS faculty usage in higher education institutions. Paper presented at *MBAA Conference*, Chicago, IL.
- Kim, S., & Seo B. (2009). The development of e-Learning platform for gifted children education. Published on *International Journal for Educational Media and Technology*. Vol.3 Num.1, pp 39-51.
- Kituyi G. M., & Kyeyune, R. (2012). An analysis of E-learning information system adoption in Ugandan Universities: Case of Makerere University Business School. *Information Technology Research Journal* Vol. 2(1), pp. 1-7.
- Lee B., Yoon, J., & Lee, I. (2009). Learners' acceptance of e-learning in South Korea: Theories and results. *Computers and Education*, Vol.53 No.4 pp.1320-1329.
- Melis, E., Buedenbender, J., Andres, E., Frischauf, A., Goguadse, G., Libbrecht, P., Pollet, M., & Ullrich, C. (2001). ActiveMath: A generic and adaptive web-based learning environment. *Artificial Intelligence and Education*, 12 (4), pp. 385-407.
- Newton, D. & Ellis, A. (2006). A model for e-learning integration. Proceedings of *E-Learn 2006: World Conference on E-Learning in Corporate Government, Healthcare and Higher Education*, Association for the Advancement of Computing in Education, Honolulu, Hawaii.
- Nielsen, J., & Mack, R. L. (1994). Executive summary. In Nielsen, J. & Mack, R. L. (Ed.), *Usability inspection methods*, New York, John Wiley & Sons, pp. 1-23.
- Nielsen, J., & Phillips, V.L. (1993). Estimating the relative usability of two interfaces: Heuristics, formal, and empirical methods compared. In: *Proceedings of INTERCHI 1993*: pp. 214-221. New York: ACM Press.
- Ozok, A.A., & Salvendy, G. (2003). The effect of language inconsistency on performance and satisfaction in using the web: Results from three experiments. *Behaviour and Information Technology*, Vol. 22, No. 3, pp. 155-63.
- Piccoli, G., Ahmad, R., & Ives, B. (2001). Web-based virtual learning environments: A research framework and a preliminary assessment of effectiveness in basic IT skills training. *MIS Quarterly*, Vol. 25, No.4 pp.401-426.
- Reference to a book:*
Carman, J. M. (2005). *Blended learning design: Five key ingredients*. Agilant Learning.
- Dix, A. J., Finlay, J. E., Abowd, G. D., & Beale, R. (2004). *Human-computer interaction*. 3rd Ed. Harlow Assex: Pearson Education Limited.
- Reference to a web source:*
ISO (1998). ISO 9241: Guidance on usability standards. [Online] Available: <http://www.iso.ch/en/CatalogueListPage.CatalogueList?ICSI=13&ICS2=180> (May 1, 2013)

International Conference on Multidisciplinary Trends in Academic Research, 29-30 September 2014. MTAR © 2014 Bangkok, Thailand.
Global Illuminators, Kuala Lumpur, Malaysia.

- Khan, B. H. (2005). A framework for e-learning. [Online] Available: <http://www.bookstoread.com/framework> (January 13, 2013)
- Sankale, J. (2006). E-learning activities for Kenya. Kenya Ministry of education. [Online] Available: <http://www.checkpoint-elearning.com/article/2495.html> (April 19, 2013)
- Ssemugabi, S. & De Villiers, M.R. (2010). Usability and learning: A framework for evaluation of web-based e-learning applications. Research article, SACJ, No.45 [Online] Available: <http://sacj.cs.uct.ac.za/index.php/sacj/article/viewFile/37/20> (April 20, 2013)

ENTREPRENEURIAL ENGAGEMENT OF ENTREPRENEURSHIP GRADUATES BATCHES 2008 -2012 OF ST. PAUL UNIVERSITY MANILA

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ABSTRACT

The study was pursued to determine the Entrepreneurial engagement of St. Paul University Manila Entrepreneurship graduates Batches 2008 to 2012. The study's focal concern is to find out the number of entrepreneurial ventures of the graduates right after graduating from the University. It also determines the challenges encountered by the graduates from launching an entrepreneurial ventures and recommendations to improve the curriculum.

To determine the entrepreneurial engagement, a complete enumeration sampling method was used. A researcher constructed questionnaire was developed. The results revealed that majority of the entrepreneurship graduates were employed in different industry, and did not attempt to engage in entrepreneurial activity right after graduation. It was found out that those who were presently engage in entrepreneurial ventures established their business through self-venture and that being a graduate of the University entrepreneurship program was a factor in the decision to put up their own business. It revealed that lack of capital, good business location, lack of experience and family's decision employed were the challenges encountered by the graduates that prevents them from launching their own entrepreneurial ventures. The findings showed that business implementation, business opportunities, accounting and marketing management subjects are courses in the curriculum that helped the graduates to become an entrepreneur. The findings also revealed that exposure to actual business operation and activities, increase attendance to trainings and seminars and setting-up a system for a simulated business operation as an alternative to thesis were recommended by the graduates in order to improve the B.S. Entrepreneurship curriculum.

Keywords: Entrepreneurial Engagement, Business Opportunities, Entrepreneurship Curriculum, Entrepreneurship Graduates.

1. INTRODUCTION

One of the disciplines in tertiary education being encouraged by the Philippine government is in the area of Business and Entrepreneurship. The government has recognized the role played by Entrepreneurs as drivers of economic growth in our country. Young graduates of this course have been encouraged to venture into their own small or medium scale enterprise as this created jobs and business opportunities to others. Based on the July 2013 Labor Force Survey (LFS) of the Philippine National Statistics Office (NSO), the employment rate in July 2013 is estimated at 92.7 percent. The self-employed sector ranked as the second largest percentage making up 28.3 percent of the total employed in July 2013. The same study also revealed that the population aged 15 years and over in July 2013 is estimated at 64.468 million. Out of this number, 41.178 million persons were in the labor force. The data could be an indicator on the growing number of young individuals who saw an opportunity for self-growth in the area of business and entrepreneurship.

In response to the call of the national government to promote entrepreneurship among college students St. Paul University Manila (SPU Manila) started offering B.S. Entrepreneurship in the AY 2004 -2005 in accordance with the rules and guidelines as stated in CHED Memo Order (CMO) No. 17 Series of 2005, with the main objective of preparing

the students for a business career as entrepreneurs in any craft, trade or industry they may find lucrative and fulfilling to engage in. The program emphasis is placed on small and medium scale enterprise development, the identification and prioritization of investment opportunities, and the harnessing of organizational skills needed for business to take off. The SPU Manila graduated its first batch of BS Entrepreneurship in the AY 2007-2008.

Five years after St. Paul University Manila offered BS Entrepreneurship, the researcher being the current chairperson of the Business Management and Entrepreneurship Programs would like to find out whether the university was successful in developing an entrepreneurial culture among its graduates by determining the entrepreneurial engagement of its graduates after they have graduated from the University. This scenario, prompted the researcher to conduct a study to determine the level of entrepreneurial engagement of St. Paul University Manila entrepreneurship graduates from batch 2008 to 2012.

Statement of the Problem

This study aims to determine the level of entrepreneurial engagement St. Paul University Manila Entrepreneurship graduates Batches 2008 to 2012.

Specifically, it aims to answer the following:

1. What is the present employment status of the Entrepreneurship graduates?
2. What is the entrepreneurial engagement of the respondents in terms of:
 - 2.1 number of entrepreneurial ventures right after graduation
 - 2.2 present entrepreneurial ventures
 - 2.2.1 number of years the business has been running
 - 2.2.2 present position
 - 2.2.3 type of business
 - 2.3 Challenges encountered in launching entrepreneurial ventures.
3. What courses in the entrepreneurship curriculum helped the respondents to become an entrepreneur?
4. What improvements in the curriculum of BS Entrepreneurship may be recommended to enable SPU Manila graduates to engage in entrepreneurial ventures after graduation?

Scope and Limitation

The study covered B.S. in Entrepreneurship graduates of St. Paul University Manila-Business Management and Entrepreneurship Programs (BME) from Batch 2008 to 2012. The researcher intends to determine the number entrepreneurial venture these graduates have created and/or attempted after they have graduated from the university. The study did not intend to get the entrepreneurial engagement of graduates from the other discipline of Business Management and Entrepreneurship program namely; B.S. Administration major in Marketing Management as well graduates of Legal Management. Whatever the result of this study could not be generalized to other graduates of the other program not covered by this study.

Significance of the Study

This study on the entrepreneurial engagement of Entrepreneurship graduates of St. Paul University Manila can provide significant information with regard to how well the Business Management and Entrepreneurship program of the University have prepared and instilled to the graduates the values of Entrepreneurship. With this study, information generated may prove useful and valuable to management, especially in decision making and in the design for a more effective Entrepreneurship curriculum. By having an understanding on how the present entrepreneurship curriculum program of the university have or have not help the graduates in their entrepreneurial ventures after graduation will allow them to come up with teaching strategies that will sustain or improve the entrepreneurial spirit among its students.

Likewise, the data that will be generated through the response of the graduates will provide them with the insights on how well the present curriculum has prepared them for their entrepreneurial engagement after graduation.

2. REVIEW OF RELATED LITERATURE

The Entrepreneur

What and who is an entrepreneur? How does one become an entrepreneur? Is being an entrepreneur a product of its environment, where values, belief, attitudes and disposition are influenced by other people and institutions or does a person born to become an entrepreneur?

Regardless of how a person becomes an entrepreneur, these individuals share a commonality, these persons perceives business opportunities in the environment. They assume risks and put together resources required to bring a new enterprise into existence among others.

One simple definition of entrepreneur is that he or she is someone who is self-employed (Co, 2007). Tony Fernandez, CEO of Air Asia and the person responsible for turning a debt-laden enterprise into one of the most successful business operation and considered by many as one of the most successful entrepreneur/businessman in Asia today, was able to turn Air Asia into a success story through excellent entrepreneurial decisions and by assuming risks that nobody else will dream of doing.

Greene (2013) book author, consultant and an educator defines an entrepreneur as a person who own, operate and take the risk of a business venture. Entrepreneurs identify the unmet needs of the market and then provide a service or product to meet those needs in so doing an entrepreneurs assumes all the risks of his/her decisions and is directly affected by the consequences of those decisions. On the other hand, others define entrepreneurs as inventors of ideas that they evolve to creation (Kaviv, 2011)

Characteristics of an Entrepreneur.

Different authors have attempted to profile and distinguished an entrepreneurial mind-set. Although there is no single characteristics that typify entrepreneur today, however, review of related literature showed a common behaviors that has be ascribed to entrepreneurs. Some of which are the following:

Passion for Business

According to Kuratko (2014) passion for business is a fundamental emotional experience for entrepreneurs. The entrepreneur's passion mobilizes him/her to create a coherent understanding of his environment and arouse the person to mobilize his business venture. An entrepreneurs passion for business also stems for his belief that such an undertaking will influence and transform people's lives , it is also the driving force that allows the person to work hard for an extended period of time and persevere when the going gets tough (Barringer, et. Al. 2012)

Determination and Perseverance

Setbacks, obstacles and failures are inevitable in any entrepreneurial activity most especially to those who are trying to establish a new business venture. Developing business idea may require a certain degree of experiments before achieving the desired outcome. The determination of the individual to success as an entrepreneur can overcome setbacks and obstacles.

Creativity and Innovativeness

Creativity allows a person to expressly turn his ideas into action that eventually generate products or services that allows the person to earn income for him and his employees. As the business grows the entrepreneurs need to innovate to improve his products or innovations or find new markets for such products or services.

Internal locus of Control

Most successful entrepreneurs believe in themselves. To them the success or failure of a business venture is not by fate or luck (Kuratko, 2012). To the entrepreneurs success or failure is a product of their action. Thus, setbacks and failure are within their own control and influence.

High Level of Energy

Creating a business ventures often requires long hours of hard work and sacrifices. It is not new to hear from successful entrepreneurs how they have put in long hours of hard work in order to attain what they envisioned for the company.

The Role of Entrepreneur in a country's Economic Development.

According to Adam Smith (1937), economic development is brought about by individuals who set out to produce valuable goods and service for their personal gains and profit in the conduct of performing the activity for personal motives or reason. In the process unintentionally they benefit others through the product and services they produce and as people respond positively to economic opportunities these pushed them increase their activity that is best for the interest of the community and society as a whole and as the cycle continues the whole country eventually gains and benefits.

The statement above attributed a country's economic development to the work of individuals who set out to work for the benefit of the larger community and society. These men and women are the "entrepreneurs" (Co, 2012). This is why entrepreneur is sometimes called the "backbone of the economy."

It is a common occurrence in any modern society that people depend on one another for their respective needs however, there are some members of the society that bring upon themselves the duty of providing goods and services which members of the community need but cannot provide themselves while others are consumers other people supply goods and services, these are the entrepreneurs and as more goods and services are demanded to these entrepreneurs the more profit they earn and more money circulating in the economy that helps fuels economic prosperity.

Entrepreneurial activities do not only provide goods and services the county needs but in the process of these activities they employ other people. The employment created through entrepreneurship creates opportunities that allow people to earn money which gives them more purchasing power and as people improve their buying power the more profits the entrepreneur earns enabling him to hire more and more people thus the cycle of economic development hasten.

Moreover, (Hisrich, et. Al 2005) stated that the role of entrepreneurship in economic development involves more than just increasing the per capita output and income. According Hisrich, the entrepreneurs play an important role in constituting changes in the structure of business and society by continually innovating products for the markets and stimulating the market through their creation of new investment ventures.

Education and Entrepreneurship

Many countries now recognized the important role entrepreneurship play in a country's economic growth and social cohesion. Thus, it has become the policy goal of many governments to develop a culture of entrepreneurial thinking amongst its population. According Tandon, (2010) developing entrepreneurial mind-set can be done in a number of ways; legislating to encourage risk-taking, and national campaigns and by integrating entrepreneurship into education system.

An article in the Philippine Star dated November 11, 2013 and written by Michio Kaku urged the Philippines to foster innovation and entrepreneurship to join the ranks of developed nations in the same article, Kaku said that the Philippines government and society

should now promote the spirit of innovation and entrepreneurship to be successful in the future. Kaku also said that the key to harnessing the opportunity to be ahead in the future is in education.

Moreover, according to the study of (Montevirgen, 2003) the skills and knowledge acquired by an individual through his/her education is closely linked to the person's success in finding an employment in the future.

Bringing up a person to an environment of what is called "enterprise culture" can significantly affect a person's attitudes, values and beliefs that lead him/her to act like an entrepreneur. A culture is a powerful phenomenon and helps shape a persons' behavior. Researchers agree on the considerable and vast effect of culture on entrepreneurship. It can affect a person's interpretation of the environment, risk taking attitude, and creativity. Culture is defined as a set of shared values, beliefs and expected behavior embedded in the values that shape national institution's social, political, technological and educational system (Kariv, 2011). In a book published by the University of the Philippines for Small-Scale Industries (2011), it was mentioned that conditions that can foster the enterprise culture can be simulated in the classroom environment through lectures, exercise and practical work thus, it can be said while entrepreneurship culture develops naturally starting from growing up years to adulthood, education can set up conditions similar to or resembling culture through lectures, discussions, exercises and practical work.

In the United States, entrepreneurship education is a fast growing area in colleges and universities. Many universities offer at least one course in entrepreneurship at the graduate and undergraduate level and few actually have a major or minor concentration in the area of entrepreneurship (Hisrich, et.al. 2005).

Rewards, Risks and Challenges of Entrepreneurship

Any person who intends to plunge into any entrepreneurial activities must have some form of knowledge on how to start and sustain a venture. They must keep in mind that while entrepreneurial activity can open a lot of opportunities for personal gains and improvement they must also realized the challenges, risks, frustrations and demand it entails.

The Rewards

It is not uncommon to hear stories of people who have reap monetary rewards for his long hours of hard work, passion and dedication he has invested in creating a business venture. The opportunity to make money, be your own boss, express your creativity and the reward of gain a strong sense of self- satisfaction are just a few of the many rewards that usually accompanied an entrepreneurial engagement.

The Risks

While rewards of being an entrepreneur are many, the risks associated of being an entrepreneur are equal in number and cannot be ignored. Risk of failure often top the list while risk can be minimized it however cannot be totally eliminated. A bad decision can entirely ruin the enterprise, long hours of hard work, unwanted responsibilities were also usually cited as the risk involved in any entrepreneurial engagement.

The Challenges

One of the most important challenged faced by entrepreneurs today is to continually offer innovation on the ways product and services are delivered to the marketplace. A proactive entrepreneurs posses a keen sense to see connections and spot opportunities, to take advantage of them and by creating new market for these products or service. (Bessant & Tidd, 2011).

As cited in the book on Entrepreneurship published by University of the Philippines Institute for Small-Scale Enterprises (UP SSI, 2007), the Department of Trade and Industry recognizes the major challenges for the Philippines micro enterprise, small enterprise and

medium enterprise ((MSME). These include: competition in export markets, and influx of mass-produce products at cheaper price, existence of small domestic markets and limited local market, need for imported parts and materials and limited industrial linkages, lack of basic management techniques, barriers to start up businesses, lack of support in the areas of fund-raising and research development and limited economic activities at the local market.

Theoretical Framework

The study is supported by several theories on the role of education in the development of a person.

Hunt (1967) developed the Conceptual System theory which describes human development in terms of increasingly complex system for processing information about people, things, and events. Furthermore, the theory describe that growth is an interactive function of the person's level of personality development (or stage) and the environmental conditions he countered. Moreover, the theory states that optimal development occurs when the environment facilitates the conceptual work necessary for the person's conceptual growth. Thus, according to Hunt it is necessary to plan the environment to keep people growing conceptually. The theory also highlighted the need to identify the proper teaching strategies that match the different stages in the development of a person. In other words, the closer a teaching strategy is tailored to the learners' conceptual level, the more learning will take place.

By the conceptual system view, therefore, we can link the importance of education in a persons' life in the formation of who and what he may become in the future. Through this theory it can be assumed that the skills learned by a person in an educational environment may have influence him or her choice of professional direction later on in his life or for that matter his decision to venture into an entrepreneurial undertakings.

To determine the level of entrepreneurial engagement of the graduates the researcher formulated a conceptual paradigm as shown in Figure 1.

Entrepreneurial engagement is a newly developed concept that viewed entrepreneurship as a process that includes an intention to establish a firm or start-up activity (Hessels, et.al, 2009). The BS Entrepreneurship Program refers to the curriculum offerings of the program which have directly exposed the entrepreneurship graduates in the field of entrepreneurship. On the other hand, BS Entrepreneurship graduates include the different batch of graduates from SY 2007-2008 to 2011-2012.

The study will look into the entrepreneurial engagement of the SPU Manila graduates in terms of the number of years the business has been running, the graduates' present position, the type of business they are currently engaged in, the challenges in launching entrepreneurial ventures and the number of their entrepreneurial attempts. Moreover, the study will also identify the courses in the entrepreneurship curriculum that help the graduates become an entrepreneur and their recommendations on how to improve the curriculum to enable SPU Manila graduates to engage in entrepreneurial ventures after graduation.

The findings of the study will served as a basis to enhance the curriculum of SPU Manila BS Entrepreneurship discipline to attain the objective of the program and also on the efficacy of the University's Entrepreneurship curriculum in developing an entrepreneurship culture among its graduates.

Conceptual Framework

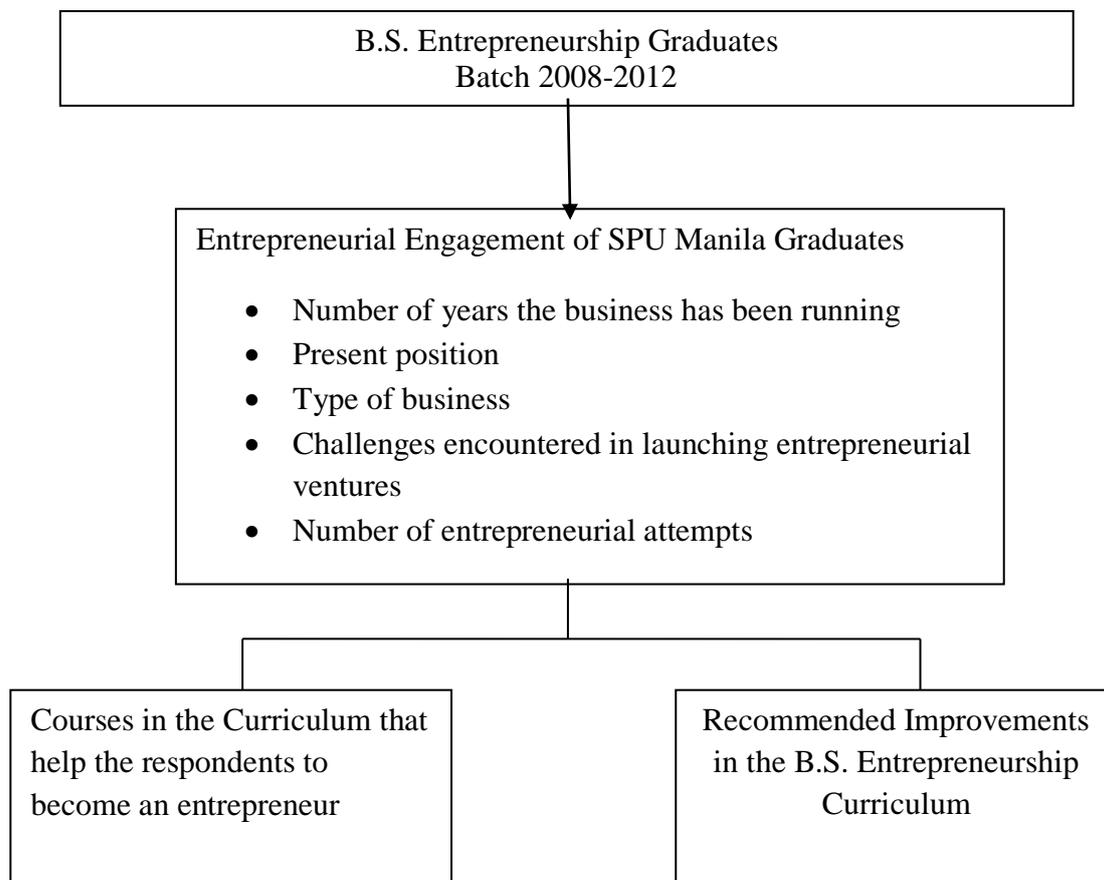


Figure 1 The Conceptual Framework on the Entrepreneurial Engagement of St. Paul University Manila Entrepreneurship Graduates

3. METHODOLOGY

Research Design.

This study employs a quantitative design in analyzing the entrepreneurial engagement of SPU Manila entrepreneurship graduates.

This study used the descriptive approach because the researcher endeavored to describe and document the extent of entrepreneurial venture created and attempted by the graduates after graduation. According to Alcantara (2010) descriptive research is an approach that records events which are described, interpreted, analyzed, and compared. It is concerned with condition, relationships, opinions processes, evident effect developing. Furthermore, descriptive research purpose is to understand the world as experience by another (Ary et al. 2014)

Sampling and Population

The population generated in this study included entrepreneurship graduates of SPU Manila Batch 2008 to 2012. The researcher used the complete enumeration method.

Respondents of the Study

The study covered the entire graduates of SPU Manila Entrepreneurship graduates from SY 2007-2008 to SY 2011-2012 (Appendix A). A total of 24 participants were generated by the study. From the total population 16 graduates responded. Their response were tabulated and analyze by the researcher. The respondents were chosen to primarily determine how well

their curriculum have or have not prepared them in launching entrepreneurial ventures after graduation.

The participants of the study were drawn from the following batch of graduates; one (1) respondent from Batch 2008, eight (8) from batch 2009, fifteen (15) from batch 2010, five (5) from batch 2011 and, three (3) from batch 2012.

Research Instrument

A researcher constructed questionnaire for gathering the data was used. The questionnaire consists of three main (3) parts. In part 1 the respondents were asked some personal information, in part 2 the respondents were asked of their present source of income either self- employed, employed or unemployed, their entrepreneurial engagement after graduation and in part 3 the respondents were asked on the challenges encountered from launching an entrepreneurial activity and their suggestions to improve the curriculum.

Prior to administration, the questionnaire was presented to Dr. Elizabeth D. Ramos, the current dean of the College of Business and Management (CBM) to determine the content validity of the questionnaire.

Data Gathering Procedure

Prior to the administration of the questionnaire, the researcher sought the assistance of the Registrar's Office of St. Paul University Manila for lists of graduates from Batch 2008 to 2012. The questionnaire was floated to target participants using electronic means such as; social media, and e-mail. Telephone conversation was also used to verify some of the answers made by the respondents. The researcher asked the participants to e-mail back their response. The questionnaire were floated and retrieved from October 31, 2013 to January 10, 2014.

The items in the questionnaire were retrieved, tabulated and interpreted by the researcher upon the submission of the questionnaire by the respondents. The breakdown of retrieved questionnaire per batch was as follows: (0) Batch 2008-2009, (8) Batch 2010-2011, (3) Batch 2011-2012, and (2) Batch 2012-2013. The total retrieved questionnaire represents 66.67% of the total population.

Statistical Treatment

The research data were analyzed using descriptive statistics. Descriptive statistics which includes frequencies and percentage were used in the research to determine the entrepreneurial engagement of the respondents.

4. RESULTS AND DISCUSSIONS

Present Employment Status of Entrepreneurship Graduates

Table 1. Employment status of Entrepreneurship graduates

	Frequency	Percentage
Self-Employed	3	18.75%
Employee	11	68.75%
Unemployed	2	12.5%
TOTAL	16	100%

Table 1 shows frequency distribution of the present employment status of the respondents. Of the 16 who participated, 11 (68.75%) of the respondents were currently employed, followed by 3 (18.75%) who were self-employed and 2(12.5%) who were unemployed.

The B.S. Entrepreneurship graduates who are currently employed were connected in diverse field such as; firearms and ammunition, electrical manufacturing, banking, retail,

furniture sales, business process outsourcing, automotive company and leasing industry. Majority of the respondents occupies a rank and file position. Of the two who answered that they are currently unemployed just recently resigned from their position. The data also revealed that three of the respondents while employed are at the same time helps in operating their family's business or engaged in the management of their own business.

The Entrepreneurial Engagement of the Respondents

Table 2. 1 Entrepreneurial engagement right after graduation

	Frequency	Percentage
Yes	5	31.25%
No	11	68.75%
TOTAL	16	100%

Table 2.1 shows the entrepreneurial engagement of B.S. Entrepreneurship graduates after graduation. Majority of the respondents, 11 (68.75%) did not attempt to engage in entrepreneurial ventures while 5 (31.25%) did attempt to put up an entrepreneurial venture after they graduated from the University.

For those who attempted to put up their own entrepreneurial venture after graduation. Three are full time entrepreneurs while the remaining two are employed while being an entrepreneur. They said that being a graduate of the University Entrepreneurship Program was a factor in their decision to put up their own business.

Based on the result, it can be deduced that St. Paul University Manila's Entrepreneurship curriculum is a contributory factor in the graduates decision to put-up their own business.

However, it can also be said that the graduates' exposure to their family's business even while they are still student of the University was also a factor in their decisions to put up their business or in their decision to help in the operation of their family's business. As cited by Kariv (2011), family members and home environment that support and encourage independence, achievement and responsibility on a daily basis appear to be highly important factors in prompting entrepreneurship.

Table 2.2 Present Entrepreneurial ventures

Types of Entrepreneurial Venture	Frequency	Percentage
On line selling of bicycle parts	1	16.66%
School supplies	1	16.66%
Independent photographer	1	16.66%
Bakeshop	2	33.33%
Car Services	1	16.66%
TOTAL	6	100%

Table 2.2 shows the present entrepreneurial ventures of the graduates. Two of the respondents (33.33%) are engaged in bakeshop business, while on-line selling of bicycle parts, school supplies, independent photography, and car services generated a frequency distribution of 16.66% respectively.

From the total number of entrepreneurial ventures only three of the entrepreneurial engagements were established through self business venture. Two answered that their

business already exists even while there is still a student and one respondent answered that her present business was inherited from her parents. From the three full-time entrepreneur one respondent answered that she chose to put-up her venture after she has try working in an industry.

It can be deduced from the results that the business background of the graduates' family was a factor in the present entrepreneurial engagement of the graduates.

Table 2. 2. 1 Number of years the business has been running

	Frequency	Percentage
0 to 6 months	1	16.66%
7 months to 1 year		
More than 1 year	2	33.33%
More than 2 years	3	50.00%
TOTAL	6	100.00%

Table 2.2.1 displays the number of years the business has been operating. It can be viewed that majority the respondents business (n=3 or 50%) is operating for more than 2 years while (n=2 or 33.33%) is operating for more than 1 year. 1 respondent (16.67%) is in the 0 to 6 months operations.

Those businesses that have been operating for more than two years are businesses that are already established even while the graduates are still enrolled in the University. While those operating for 0 to more than 1 year are the self business ventures which the graduates themselves founded.

Based on the results it can be concluded that the self-business ventures of the Entrepreneurship graduates is still in the start-up phase of the business life cycle one reason for this is that most of the respondents are a recent graduates of the University's Entrepreneurship program.

Table 2.2.2 Present position

	Frequency	Percentage
Owner/General Manager	4	100%
Part Owner/Partner		
TOTAL	4	100%

Table 2.2.2 reveals the present position of the graduates who were operating their own business. All of the respondents (n=4 or 100%) considered themselves as the owner and general manager of their business.

The data showed that part of the reward and in an entrepreneurial activity is not being accountable to other authority in managing the affairs of the business.

Table 2.2.3 Types of Business

	Frequency	Percentage
Product	3	50.00%
Service	3	50.00%
TOTAL	6	100%

Table 2.2.3 shows the types of business of the respondents' present entrepreneurial engagement. Fifty percent 50% of the entrepreneurial ventures is into product category as well as the service category.

The data revealed that entrepreneurship graduates of St. Paul University Manila considered both types of business when they create an entrepreneurial engagement.

Challenges Encountered In Launching Entrepreneurial Ventures

Table 2.3 Challenges encountered in launching entrepreneurial ventures

Challenges Encountered that Prevents the graduates from launching his/her business	Frequency	Percentage
Lack of Capital	2	28.57%
Lack of Good Business Location	1	14.28%
Family's advice to get employed first to be exposed in the industry	1	14.28%
Lacks of experience in the kind of business the graduate wants to enter	1	14.28%
Family Problems	1	14.28%
Profitability of the business venture	1	14.28%
Total	7	100%

Table 2.3 reveals that lack of capital (n=2 or 28.57%) as the major challenged faced by entrepreneurship graduates that prevents them from launching their business. The data also revealed other factor such as; lack of good business location, family's advice to get employed first, and lack of experience, family problems, and profitability of the business venture receiving a percentage rating of 14.28% respectively.

A study conducted by the University of the Philippines Institute for Small-Scale Industries (UP ISSI, 1998) revealed that only about 25 percent of the business graduates majored in entrepreneurship went into business. The lack of money or capital to start a business was cited as their main reason.

Courses in the Entrepreneurship Curriculum That Helped the Graduates Become an Entrepreneur

Table 3. Courses in the entrepreneurship curriculum that helped the respondents become an entrepreneur

Course	Frequency	Percentage
Business Implementation	2	22.22%
Business Opportunities 2 -	2	22.22%
Accounting Subject	2	22.22%
Marketing Management subjects	1	11.11%
Marketing Strategy	1	11.11%
Tourism subjects	1	11.11%
TOTAL	9	100%

Table 3 reveals the courses in the Entrepreneurship curriculum that helped the respondents to become an entrepreneur. It showed that Business Implementation, Business Opportunities 2 and Accounting subjects received a frequency percentage rating of 2 (22.22%) each. Other

subjects like Marketing Management, Marketing Strategy and Tourism subjects received a similar rating of 1 (11.11%).

Recommended Improvements in the Curriculum of BS Entrepreneurship to Enable SPU Manila Graduates To Engage In Entrepreneurial Ventures after Graduation

Table 4. Recommended Improvements in the curriculum of BS Entrepreneurship to enable SPU Manila graduates to engage in entrepreneurial ventures after graduation?

Recommend Improvements in the BS Entrepreneurship Curriculum	Frequency	Percentage
Exposure to actual business operation	3	20.00%
Exposure where students can meet and experience different kinds of people who will eventually help them; physically and mentally in putting up their own business.	2	13.33%
More attendance in trainings and seminars	2	13.33%
OJT exposure to small business so that they will be inspired to put up their own small business first. Exposure to big companies like bank is too broad and will require big investment. Small business operation can inspire the students to put up business from scratch.	1	6.66%
Exposure to different kinds of activities, courses or programs that will help the students discover their passion and ambitions that will later on help and encourage the graduates to put up their own business. Exposure to actual business not just inside the campus	1	6.66%
Business Implementation subject should set up a “real business” that can sustain long term existence such as the location (off campus), people management and product development	1	6.66%
Require every students to have their own business before they graduate	1	6.66%
A course in investment	1	6.66%
The school must set-up a system where the students can put-up their own small or trial” business as part of the curriculum as an alternative to thesis. Have the business registered so the students will really feel on how to be a true entrepreneur. The grades should not be based on sales or returns of the business but rather on the realization and experience they learned from the operation.	1	6.66%
Better facilities for Business Opportunities classes	1	6.66%
Entrep Program should have experiential subjects/lesson wherein students will be involve in real business	1	6.66%
Total	15	100%

As reflected in Table 4, the data showed the results of the survey from the responses of the graduates on their recommendations in improving the B.S. Entrepreneurship curriculum that will enable the graduates to engage in entrepreneurial activity after graduation. The data revealed that most of the respondents recommended exposure to actual business operation (n=3 or 20%) be part of the curriculum. While increase the students attendance to trainings and seminars as well as activities where students can meet and experience different kinds of people that will eventually help them in putting up their own business received a similar rating of 15.38% respectively. The data also revealed that graduates wanted a “real business”

in their Business Implementation and that the University should create a program where the students can put up their own small business as part of the curriculum or as an alternative to thesis with a percentage rating of 6.66% respectively.

5. CONCLUSION

The study revealed that majority of the B.S. Entrepreneurship graduates were employed in the different industry and that majority of them occupy a rank and file position. Only a few of the graduates have ventured into entrepreneurial practice. It can be concluded that majority of the B.S. Entrepreneurship graduates of the University did not attempt to engage in entrepreneurial ventures right after graduation. The findings also revealed that lack of capital, lack of good business location, lacks of experience, family's decision, family problems and the profitability of the business venture were the challenges encountered by the graduates that prevents them from launching their own entrepreneurial ventures. The study shows that exposure to actual business operation and activities that will help the students discover their passion for business, On-the-Job training exposure to small business operations, increase attendance to trainings and seminars and setting-up a system for a simulated business as an alternative to thesis were recommended by the graduates in order to improve the B.S. Entrepreneurship curriculum.

6. RECOMMENDATIONS

Considering the findings and conclusions drawn from the study, the following recommendations are submitted:

1. St. Paul University Manila Entrepreneurship graduates to engage in entrepreneurial activity to enable them to apply theoretical leanings into actual practice.
2. St. Paul University Manila should encourage its Entrepreneurship graduates to venture into entrepreneurial activity and that the University should create a system that would track the entrepreneurial ventures of its graduates.
3. St. Paul University Manila may consider enhancing the B.S. Entrepreneurship curriculum every 3 years to better adapt to the needs of the graduates and to cope up with the changes in the environment that affects the students' entrepreneurial development. The curriculum review should require the presence of different stakeholders such as; students, alumni, parents, and faculty members to fortify the curriculum enhancement.
4. St. Paul University Manila may consider reviewing its present On-the-Job Training for their B.S. Entrepreneurship students. The researcher recommends an extensive immersion program to actual entrepreneurial practices of real-life entrepreneurs where students will have more chances of hands-on learning on the areas of business like; product development, packaging, pricing, physical distribution, scouting for good location and how to find sources of capital. It is recommended that the program be part of the Entrepreneurship curriculum with equivalent number of units.
5. St. Paul University Manila-Business Management and Entrepreneurship Programs should create a venue for simulated micro-business enterprise while they are still students of the program. The simulate micro-business program should start during the sophomore year of the entrepreneurship students.
6. It is also recommended that future research may be conducted on other factors not covered by this study areas like; effects of family in the decision of the graduates to engage in entrepreneurial activity, and relevance of OJT/Practicum on the B.S.

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Entrepreneurship students, and the effects of the graduates social group in their entrepreneurial development.