

DESIGN AND ANALYSIS OF WEBQUEST MATERIALS FOR SCHOOL MATHEMATICS

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WebQuest is an inquiry-oriented teaching technique that incorporates the use of information from the internet in the process of teaching and learning mathematics. The proponents and developer of WebQuest, Bernie Dodge (1997, 2005) and Tom March (1998, 2000) claimed that WebQuests are designed to maximize learners' time well, emphasized on using information rather than looking for it, and can help to improve students' higher order thinking through open ended questions and authentic task. Well designed WebQuest is learner-centered embracing constructivist philosophy; critical dan creative thinking, understanding and transformational learning; authenticity and situated learning environments; inquiry-based learning; scaffolding, differentiation, cooperative and engaged learning (Lamb & Teclehaimanot, 2005). WebQuest comprises six main elements: Introduction, Task, Process/Procedures, Resources, Evaluation and Conclusion.

Objectives

The aim this research was to develop WebQuest instructions on teaching selected school mathematics topics as support materials for teaching of mathematics in English. Specifically, the objectives were to design inquiry based activities for selected primary and secondary school mathematics topics and to conduct an evaluation of the WebQuest materials in terms of the content and design and attitudes towards the WebQuest instructions.

Research Questions

Specifically, this study sought to address the following research questions:

1. What were the teachers' responses toward the content and design of the WebQuests?
2. What were the students attitudes towards the WebQuest instruction?

Methodology

The main aim of this research was to design and evaluate WebQuests activities for selected school mathematics topics. The research design was divided into two stages: (1) design and development and (2) evaluation. The main users were primary and secondary school students and teachers. Six steps outliped by Dodge (2005) had been used to design and evaluate the WebQuest materials. First is to choose suitable topics in the primary and secondary school mathematics curriculum, second to choose a design, next to include evaluation techniques aligned with the content and activites in the mathematics curriculum. This is followed by designing the process, then include motivational element such as effective set induction, graphics and other attractive design and finally evaluate the WebQuest by getting teacher feedback. A workshop attended by nineteen mathematics teachers was held at the Educational Technology Division, Ministry of Education to introduce and evaluate the WebQuests materials.

Findings

Initial findings showed that WebQuest instructions were interesting, fun, provide a platform to increase higher order thinking, can enhance cooperative learning among the students and provide a break from the textbook and traditional way of teaching mathematics.

The activities prepared for the mathematics lesson were 'out of the classroom' real problems and thus allowed the students to look at mathematics as something that is not only confined to the mathematics classroom.

Limitations in using WebQuest as perceived by the teachers include limited Internet facilities in schools, limited computer skills for both teachers and students, time spent to search for information and to complete the exercises given and language proficiency since English language was used for the activities.

Teachers involved found that WebQuest instruction can facilitate mathematics learning although a few were concerned that it would only benefit the 'good' students.

Discussion and Conclusion

SchoolNet is one of the five Information and Communications Technology (ICT) initiatives emphasized by the Ministry of Higher Education in the 8th Malaysian Plan. Among others, SchoolNet encourages mathematics teachers to use available Internet resources to help them teach effectively. The use of Internet as a dynamic teaching and learning tool can increase student engagement and understanding and provide a contextual environment for the students. The Internet can also be used as a platform for electronic teaching and learning activities. Mathematics teachers should take advantage of the opportunities using the on-line information available. But how can mathematics teachers use the Internet effectively? One suggestion is to use WebQuest, a strategy that utilizes the Internet for educational purposes (Yoder, 1999).

The WebQuest technique provides teaching ideas to mathematics teachers as a complement to the current mathematics curriculum. WebQuest was found to be an impetus to improve higher order thinking by giving students opportunities to solve real life problems (Allan & Street, 2007). WebQuest also helped to create mathematics connections which enable students and teachers to link mathematical concepts and skills and relate topics within and across areas. The use of WebQuest was an interesting and meaningful way to encourage mathematics teachers to consider alternatives to traditional teaching.

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