

DISCOVERY TEACHING OF FINGERPRINTS USING FORENSIC SCIENCE

Lim Loong Fatt

Department of Mathematics and Science Education

Faculty of Education

University of Malaya

Science is often perceived to be a difficult subject by many students. This is especially true for the pure science subjects of Physics, Chemistry and Biology. Contrary to the aspirations of the Malaysian Government to increase the science workforce to achieve an industrialised country status, students are shying away from taking these science subjects. Among the reasons given is that these subjects are dry and boring. It is also difficult to deny that the content of the sciences harbour many confusing and abstract concepts, principles, laws and theories which are difficult to understand or commit into memory. Many strategies have been tried to overcome this problem including the use of ICT to facilitate understanding and to promote greater interest in science. This effort is not only very costly but the courseware developers are fighting a losing battle with the super fast, interactive and highly enjoyable software games available commercially. Could we find some other strategies that are less expensive but more effective?

The researcher has observed that many school children are hooked to the program, Crime Scene Investigation (CSI) on television. This program has become so popular that it has bloomed into many series and also in many different languages. The idea of the episodes is to keep the viewers guessing and slowly unfold the truth using forensic and logical evidence. Can we then use this great interest and bring the forensic science into the classroom? Will the students learn science as they enjoy solving the cases presented? This is a huge research project which would need a lot of manpower, time and cost. As a start the researcher has tried to find out if the simple learning of fingerprints can be taught through the identification of criminals among students.

Objectives

For this initial research, the objectives were to examine

1. The effectiveness of using the discovery method and forensic science to help students learn science;
2. The problem-solving abilities of students to solve criminal cases using scientific knowledge; and
3. The perceptions of students on the use of this strategy to help them learn science.

Research Questions

1. Can the students learn about fingerprints through the discovery method?
2. Can the students make careful observations to classify and identify different types of fingerprints?
3. Can they analyse the data collected in graphical representation?
4. Can the students identify the minute details of fingerprints for matching?
5. Can the students identify the criminals using fingerprint evidence?
6. Is there a significant difference between male and female students in their worksheets performance?
7. Is there any significant difference between the high ability and low ability students in their worksheets performance?
8. Is there a significant difference between urban and rural students in their worksheets performance?
9. What are the perceptions of the students about learning science through forensic science?

Methodology

The research was carried out in two mixed gender secondary schools, one urban and the other located in a rural area. As the worksheets were deemed quite simple, secondary Form Two students were used. At the urban school, 98 students (50 or 51% boys) took part while the rural school students totalled 160 (47 or 30% boys) were involved. The sample from each school comprised of high, average and low achievers.

Ink pads and magnifying glasses were given to the students who worked in pairs to complete the worksheets and try to solve the two criminal cases given. They were encouraged to discuss with their partners to identify their own fingerprints, similarities of patterns among own and partner's fingers, classify the different types, categorize 100 different fingerprints, report the results in a bar chart, identify minute details of fingerprints and finally solve two crimes based on the fingerprints obtained from a stolen car and a murder knife. When they had finished, a questionnaire was given to each one of them to express their perceptions of this strategy of learning. The whole exercise took about two hours to complete.

The tasks in worksheets were allocated certain marks depending on the difficulty level. The marks were added to give the final scores for the whole worksheet. Descriptive statistics were used in describing the students' performance in the various tasks while the student's t-test was used to seek any significant differences in the stated variables.

Findings

1. Generally the students were not used to this alternative strategy of discovery learning, with many of them not trusting their own observations and need to confirm with teachers/researcher.
2. Their performance in the various tasks in the worksheets were fairly good in the easier tasks like identifying and classification but poor in observing the minute details of fingerprints and drawing of the details.
3. Less than half of them can draw bar charts to represent the collected data of the different types of fingerprints.
4. Less than half of the students identified the criminals based on the evidence.
5. There is no significant difference between the male and female mean scores on the worksheets.
6. There is a significant difference between the low and high ability students in their mean scores on their worksheets.
7. There is a marked significant difference between the rural and urban students in their mean scores on the worksheets. Many rural students could not answer at all some of the questions on the worksheets and easily gave up when they cannot proceed. The urban students were observed to discuss more with their partners to answer the questions or solve the crimes.
8. However the majority of the students gave favourable comments in the questionnaire. The mean score for the questionnaire was above 70% indicating they liked this strategy of learning science.

Discussion and Conclusion

This study shows that students are so accustomed to spoonfeeding by the teacher to the point of not trusting their own observations and conclusions. This is especially true for the rural students as they compared to their urban counterparts, have less resources available to them. As one of the fundamental science process skills is careful and accurate observation, it is imperative that students be given opportunities to enhance this skill. Problem solving is another essential skill for a good scientist and hence, students should be allowed to practise this skill.

This strategy of bringing forensic science into the classroom has geared potential to not only enhance the learning of science but to build greater interest in the subject. Some teachers believe that half the battle is won if the students' enthusiasm can be aroused. Teachers would not need to teach but change role to guide instead. Maybe we can make the students find information themselves as presently information is literally at the fingertips, being easily accessible through the vast reservoir available through the internet.

The results of this study also indicate to us that rural students should be given greater attention, otherwise the gap between them and the urban students would become too big for any efforts to bridge it.

References

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