Developing research skills at secondary school

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Abstract

This paper reports the experience of Malaysian schools students in the learning of research skills through project work (as part of the course work in the social science subjects). The revision of Malaysian school curriculum using an integrated approach has brought a number of changes in the delivery of the curriculum. One of it is the introduction of project work in the learning of social science subjects. As part of the History coursework, students are required to carry out project work on their own based on a selected topic such as seeking and gathering information on the history of their village or housing area or charting their family tree. In Geography, topics on current issues such as environmental issues would be the focus of the projects. In the Living Skills course work, students are required to build a simple proto-type object such as a book shelf. Each student is required to submit a report on what they have done or gathered. The reports are assessed internally and the grades are re-examined by an external examiner for standardization purposes before the marks are recorded. The findings of the research showed that the students not only enjoyed the task but also found this part of the course to be useful. Teachers noted that the students acquired some research skills and gained the experience of doing research. However the teachers find it too demanding and taxing on the students’ time.

Keywords: Research skills, secondary school, social science, course work ;

1. Introduction

Research is a systematic process of collecting and analyzing information to increase understanding of the phenomenon under study. It is the function of the researcher to contribute to the understanding of the phenomenon and to communicate that understanding to others (Paul & Jeanne, 2004). Research skills are the abilities needed to undertake a research, including strategies and tools which can be acquired. It covers problem solving, critical thinking, analysis and dissemination. More emphasis on research is given at the university. Postgraduate and graduate students have to acquire the research skills before they carry out research for theses or dissertations. However, the training in research should have been started or begun at elementary school (Moore, 1990; Seago, 1992). If the students have research experience at various educational levels before advancing to graduate studies, they will acquire the skills of observation, manipulation, coordination and internalizing the research attitude, the habit of inquiry or problem solving and all the features of a good researcher besides possessing the knowledge of the skills of conducting research, the methods and materials needed to solve the problem, the collection of empirical data or observations, the analysis of data and drawing on of their findings to share with others (Seago, 1992). Thus,
various intervention and strategies, formal and informal, have been tried to inculcate research culture among future citizens.

2. Research skills in course work

One of these strategies is the introduction of the project work or course work in schools and universities to develop students’ research skills. In Malaysia, project work was first introduced in secondary schools through social science subjects (Geography, History and Living Skills), in line with Malaysia’s National Education Philosophy, which is to produce Malaysian citizens who are knowledgeable and competent, who possess high moral standards. The changes in the Integrated Secondary School Curriculum (ISSC) strategy was implemented in 1992, coursework assessment formed a part of Lower Secondary School Assessment (LSSA). The Malaysian Examination Syndicate, also agreed that coursework in History, Geography and Living Skills should be school based.

As pointed above, the Integrated Secondary School Curriculum (ISSC) in Geography which was introduced in 1992 (Zaidi, 1999) fostered the development of research skill through project work. Students are required to carry out an investigation based on a geographical issue/or problem studied at secondary level. Among the objectives, are: (i) to enable the understanding of geographical phenomenon, focusing on Malaysia in relation to other parts of the world (ii) to produce students who are knowledgeable, responsible, and appreciative and love of the country (Ministry of Education, 2000). Two objectives of the Geography curriculum related to coursework are ‘the student is able to do and develop his/her ability to think geographically and perform research by ‘identifying contemporary problems’, ‘collecting, arranging, analyzing and presenting the quantitative or qualitative data’ and ‘make responsible decision to solve problems (Ministry of Education, 2000). These learning outcomes are related to high-order thinking skills in cognitive domains (James & Gibbs, 1998; Nitko, 2004).

In the History, project work is focused on the aspects of Local History studied in Form One to Form Three in the secondary school. The purpose is to provide experiences in researching on the history of the areas around them. The coursework is divided to three components. In Form One, students need to seek and gather information on the history of their family and charting a family tree. In Form Two they will gather information on the history of their school and finally, in Form Three their coursework study covers finding out the history of their village or housing area and their school surroundings. Through the activities of seeking and gathering information the students will acquire their research skills and abilities such as observing, searching, collecting, categorizing and interpreting history information and facts besides fostering students’ interest towards History. Besides that, it is hoped that component provides the necessary exposure to the students the experience of being a historian, with their teachers’ guidance (Salleh et al., 2009).

In Living Skills, students are required to build and design different products and understand the use of technology. The objective of this subject is to enable students to be creative and innovative. Besides that, the coursework also trains students to be researchers by making them more aware of the surroundings around them in order to get ideas in designing a new product. From these activities, students can develop their research skills of collecting, processing and documenting systematically, besides learning to make wise decisions in designing and producing an innovative product.

3. Assessment of research skills in coursework

Eventhough the research skills were integrated in the social science subjects which are exam based, the students work was evaluated by teacher. The acquisition of the skills depends on how thorough the teachers had taught the research skills in terms how the teacher let the students go about using the knowledge and skills to examine an issue, make decision, research on an idea, synthesize the research, do the presentation and initiate a project. To see it through, a new form of assessment should be developed. The new assessment is to assess the development of research skills among students. The level depends on the changes in teachers’ teaching, either it is in depth or just on surface, quality of guidance to ensure the students carried their project work properly or just merely to fulfill the Lower Secondary School Assessment requirements ( Malaysian Examination Syndicate, 2004). Thus, it is important
to have an assessment instrument that would give equal opportunity to students and similar directions to teachers. An alternative instrument which is performance and task based was developed. The scoring rubrics will provide feedback on problems faced by teachers and for students to improve on. Zainuriyah (2009) through document analysis of the geography curriculum in her research has reconceptualised the construct ‘Ability to conduct a research’. A new scoring rubrics (Table 1) was developed by Zainuriyah to determine student’s ability to ‘Conduct a Research’ as shown below.

Table 1. Name of the table

<table>
<thead>
<tr>
<th>Score</th>
<th>Achievement</th>
<th>Indicator</th>
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| 5     | Excellent   | • Developed objectives of study that are appropriate and precise with the topic being studied  
       |              | • Used methodologies to collect information that are suitable to the research objectives. The methodologies are elaborated. Referred to resources that are relevant with the topic being studied  
       |              | • Listed many problems and sources of problems  
       |              | • Analyse the information gathered by making comprehensive inferences and conclusion as a result of the study undertaken  
| 4     | Good        | • Provide 4 suggestions that could be implemented in the area of study  
       |              | • Developed objectives of study that are appropriate with the topic being studied  
       |              | • Used methodologies to collect information that are suitable to the research objectives. The methodologies are elaborated. Referred to resources that are relevant with the topic being studied  
       |              | • Listed some problems and sources of problems  
       |              | • Analyse the information gathered by making inferences and conclusion from the study undertaken but there are some information that are not stated  
| 3     | Satisfactory| • Provide 4 suggestion that could be implemented in the area of study  
       |              | • Developed objectives of study that are not so appropriate to the topic being studied  
       |              | • Used methodologies to collect information that are not very suitable to the research objectives. The methods are not very well elaborated. Referred to resources but not very relevant to the topic being studied  
       |              | • Listed limited number of problems and sources of problems  
       |              | • Analyse the information gathered by making inferences and conclusion from the study undertaken but there are a lot of information that are not stated.  
| 4     | Weak        | • Provide 3 suggestion that could be implemented in the area of the study  
       |              | • Developed objectives of study that are very inappropriate to the topic being studied  
       |              | • Used methodologies to collect information that are not very suitable to the research objectives. The methods are not well elaborated. Referred to sources that are not very relevant to the theme being studied  
       |              | • Listed limited number of problems and sources of problem  
       |              | • Did not analyse the information gathered and only reporting the findings  
| 5     | Very weak   | • Most objectives of the study wrong  
       |              | • Used methodologies to collect information that are unsuitable to the research objectives. The methodologies are not explained. Referred to the sources that are not relevant to the theme being studied  
       |              | • Listed unsuitable problems and sources of problems  
       |              | • Did not analyse the information gathered, very few findings are reported  
       |              | • Provided suggestions that could not be implemented in the area of study.  

Source: Zainuriyah (2009)

4. Purpose of the Study

The objective of this research was to assess Malaysian schools’ students’ learning of research skills through project work (as parts of the coursework in the social science subjects).

5. Geography Project Work/Course Work

Lower secondary school students in Malaysia are required to carry out project work as part of the requirements of the social science subjects. For example, the project work/coursework in Geography was introduced as an alternative assessment to complement the standardized achievement test at Lower Secondary School. Students are required to conduct a small research and write a report of their findings. It is important to consider the type of assessment to align with the learning outcomes. The project work activities for Form Three secondary school
students require more than a week. They have three periods of geography and each period is 40 minutes. Usually, six weeks are needed for students to conduct the coursework and under the teacher’s guidance. The Department of Education or District Education Officer would give a briefing to the Geography Head teacher and set the PMR Geography coursework. After the briefing the Geography teachers would implement and plan the project work for their students in class. As the first step, teachers would explain and discuss the project work with the students. Then the students would plan their activities to carry out the project work under the teacher’s guidance. The teacher would guide the students in their activities through discussions, provide feedback, explain the relevant concepts and ask the students to present their work. The teachers would also guide their students to draw maps, graphs and charts.

6. Methodology

The study was a qualitative study in nature using non-structured interview. The sample size for this study was four secondary school teachers with various academic backgrounds.

7. Findings

The findings of the study were divided into three parts:
1) Teacher guidance to students in implementing the coursework
2) Students’ acquired research skills in doing the coursework.
3) Students attitudes during the coursework activities

7.1. Teacher guidance to students in implementing the coursework

Generally teachers’ guidance focused on meeting the assessment requirements. Higher ability students was found to be able to do the project independently, however for the lower ability more guidance were needed and sometimes teachers also need to collaborate with the students in groups to complete the task together. The teacher also guided the students on the important headings to be included in the completed report according to the formal format of a report. For low level students, the teachers helped them to generate ideas and analyse data, draw findings and also corrected the draft report so that students could produce better coursework reports, otherwise, their examination result would be affected. Some students have to be forced to finish their project work, since they need to have a pass in project as part of the lower secondary school assessment as stipulated by the Malaysian Examination Syndicate.

7.2. Students attitude during the coursework activities

There are three scenarios that are apparent when the students were carrying out the coursework task. First, high ability students were creative, enthusiastic and tried to complete with the best work. Second, students with moderate level have high spirit, however they did not take it seriously and just wanted to complete the task. Third, students with a low-level ability did not want to participate or complete the coursework project unless forced by teacher. In the living skills course work, students showed high enthusiasm to complete the task such as developing the products or proto-type product using timber.

8. Discussion

Lettering The result of the study showed that coursework or project work, according to the teachers, is interesting to students’ learning process and helps in developing their research skills. Students also enjoy the project activities and were pleased with the report they produced. Course work project in the future should accommodate topics related to current issues or the local interest to provide students with the motivation. They have the opportunity to be creative and innovative, for example making a product or process which can contribute to improving the quality of
their daily life. Sufficient information and guidance from teachers is vital to enable the students to learn throught the experience of being a good researcher.

Course work project was carried out in groups. When working in the groups, several values were fostered and practiced among them. For example, collaboration, exchanging of ideas and sharing of information and helping each other to undertake the project activities. Values are important to gain cooperation and to build spirit of teamwork as well to inculcate cooperation in the process of research and project work.

Teacher guidance is important contribute during the process of teaching and learning, teachers can improve students’ learning activity, give encouragement to seek information from various type of references such as the newspaper, magazine, encyclopedia and internet. This process is easy for high ability students but for lower ability students it takes time and more planning to guide them. Learning to use tools such as taking photograph, outdoor video recording and etc will help students to acquire more data collecting research skills technique and learning about doing research.

Through project or course work, students were exposed with various skills. Students were trained to plan and implement the activities, analyse and draw conclusions from the data and the information collected. In planning the activities students also learned to draft the plan, prepare the questionnaires or interview questions and plan the time for interview. During the activities, students also were exposed on reporting information with diagrams, charts, tables and etc. These activities clearly showed the students applied creative and critical thinking skills. The ability to apply both these skills is very important.

This research also showed lower achievement students did not do well in writing the report and conclusion because they did not have enough data and idea to analyse it. Teacher should have alternative strategies to bring out the students’ ideas and involvement. Examples of these strategies such are training them to take photograph with a recording tape or video and teaching them how to write the report. For students who could not read or write, teachers could ask them to draw their ideas and provide data for them by asking their explanation; then to draw the figures and diagram or fill in the blank.

9. Discussion

Field work or project work in social science is a good learning experience for students to acquire information skills and field work skills to complete the given task. From these activities they learn inquiring skills and with discovery learning. This method of learning will make learning interesting and fun in for the students. During the field work, students foster relationship with the society. Coursework encourages students to develop their research skills such as searching for information and new knowledge on their own or in a group. In addition, coursework gives students the opportunity to acquire various knowledge and experiences which will become the foundation for continuous lifelong learning as stated in the Malaysian Education Philosophy.

References


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