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# **DEVELOPING OPEN EDUCATIONAL RESOURCES (OER) FOR MALAYSIAN CLASSROOMS: THE HOTS EXPERIENCE**

**\*YOON SOOK JHEE, \*\*RAJENDRAN NAGAPPAN, ROSMA BINTI OSMAN, SEVA  
BALA SUNDARAM  
\*UNIVERSITI MALAYSIA SABAH  
\*\*SULTAN IDRIS EDUCATION UNIVERSITY  
\*sookjhee@yahoo.com**

## **Abstract**

The teaching of thinking skills has been emphasized in many ways in the Malaysian education system. Although efforts have been done to assist the teachers to teach HOTS, the impact to change students learning is minimal. One of the major reasons identified is the availability of resources based on Malaysian context. A study was conducted on the development of OER to host Bahasa Malaysia, English and History resources designed for Malaysian classrooms. The development of OER aimed to provide these resources to teachers. The study involved six teachers and 92 students of a suburban school in Malaysia. Observations, questionnaires and interviews were used to gauge the teachers' use and expectations of the OER. The findings presented in this paper focus on the OER as well as the HOTS elements in the OER. Findings suggest that although teachers show positive attitude in using OER, they need to be trained to use OER in a way that suits their respective students.

**Keywords:** Malaysia, thinking, Bahasa Malaysia, History, English, teaching

## **Introduction**

Thinking skills are emphasized in Malaysian education system through the curriculums (known as the Primary School Standard Curriculum and the Integrated Curriculum of Secondary School). The emphasis on thinking skills prompted the research team to ponder on the availability of resources for teachers to teach HOTS in schools. A review of OER in the Internet found that resources that are suitable to the Malaysian context are barely found. Hence, the idea to develop OER to teach higher order thinking skills (HOTS) integrated in different subjects matter arose. The development of OER involved four stages, namely determining the subjects matter, developing modules, verifying the modules and developing the OER. The paper aims to share some of the expectations and needs of the teachers in using open educational resources to teach thinking skills.

## **The needs of OER for HOTS**

The Ministry of Education introduced the teaching of thinking skills in both primary and secondary schools in 1992. In 1993, teacher training colleges started to introduce the subject in the teacher education curriculum. A few decades after its implementation, teachers are still finding it difficult to infuse thinking skills into content instruction. The basic problem seems to be that the teachers are reluctant to integrate various thinking strategies and skills in their classrooms (Rajendran, 1998). Teachers in Malaysia lack of references and teaching resources that could guide them to integrate HOTS and improve the overall quality of student learning through HOTS.

A review of the free resources based on Malaysian context reveals that Malaysian teachers are active in sharing lesson plans and producing learning materials. Often, these lessons have been conducted and thus are feasible for other teachers to use. These resources are mostly written in the form of blogs, rather than systematic and organized websites or databases. As such, the materials are not centralized. The development of this OER yields opportunity for inspired teachers to share their work in a more organized manner. Some organizations provide teaching and learning materials designed according to the Integrated Curriculum for Secondary Schools (KBSM) for teachers. However, access to these materials is only limited to the subscribers. Not all teachers are able to benefit from these websites.

There is an immense need to innovate how resources are made available to teachers and students currently. As for the starting point, this research aims to develop OER on thinking skills to be used by teachers and others who are interested in acquiring and teaching higher order thinking skills (HOTS).

## **HOTS in Malaysia**

Teaching of HOTS is offered as a subject in the teacher education programmes in both universities and teacher training institutes. HOTS is also integrated into subject matter to enrich the student teachers' capability to integrate HOTS in teaching and learning. However, a study done by Rajendran (2010) concludes that even though the teaching of thinking skills has been integrated in the pre-service teacher education, student teachers are not able to teach thinking skills effectively. The study also reveals that many teachers are reluctant to teach HOTS to their students because they lack knowledge on HOTS itself.

In-service teachers also show reluctance in integrating HOTS in teaching and learning. Although about 59% of teachers in Malaysia had received some form of training in teaching thinking skills, many were reluctant to incorporate it as part of their instructional strategies (Rajendran, 1998). It is therefore vital to establish continuous professional development in or out of the school to develop teachers' knowledge, skills, and confidence in integrating HOTS.

In-service teachers often cite lack of materials as one of the main challenges that lead them not to infuse HOTS in their lessons (RahilMahyuddin *et al.*, 2004). Materials on HOTS are widely available in the Internet, but only a handful is appropriate to the

Malaysian context. Materials obtained from the Internet need to be modified substantially before they could be used in the Malaysian classrooms. This again brings more responsibilities to teachers.

### **Creating modules of the OER**

The research team chose Bahasa Malaysia, English and History as the first three subjects to develop OER. As this was the first phase of the research which was conducted in 12 months, only three subjects were chosen. The teaching and learning of these subjects would need localised materials. This was vital to the integration of HOTS in the subject matter. The expertise available in the research team was also taken into account in choosing the subjects matter.

The next step involved the development of the modules. This stage began with determining the format of the module. The initial format was based on the lesson plans suggested by Rajendran (2010). The format was improvised from time to time. The final format included all the necessary details needed by the teachers in order to execute the lessons. The modules were also developed in a flexible way in which teachers were free to adapt the modules to suit their students.

The next step involved verification of the modules. The modules were used in a school involving six teachers. For each subject, two teachers tried out the modules. The teachers provided feedback on various aspects after they had completed all the modules. These aspects included preparation of the lessons, implementation of the lessons, integration of HOTS, students' participation, learning activities and suggestions to improve the modules. Apart from teachers, students were also given a chance to express their feelings on classroom learning when their teachers were using the modules.

### **Creating the website**

The final step of developing the OER involved designing the OER website and uploading the OER for public viewing. After conducting a survey of the available hosts, the research team decided to host the OER website using SIEU's server. The content management system used by SIEU was Joomla version 1.7. Technical assistance was sought from the ICT Department to develop and upload the frame of OER website. The research team then decided the theme, layout and content of the website. Finally, the modules were uploaded. The OER website required maintenance from time to time. The research team held the responsibility to maintain and monitor the use of the website.

Upon deciding to host the OER using SIEU's server, the research team faced some technical issues in developing the OER. Firstly, the research team had to abide the rules and policy practiced by SIEU throughout the period of developing the OER and also after launching the OER. The site could only be accessed from 8am until 5pm. Restricted access before the OER was launched slowed down the development of the OER. Secondly, the research team had minimal knowledge about Joomla 1.7. The ICT Department provided basic training on operating Joomla to the research team. The

research team also received information through webinar, forum discussions and online workshops related to Joomla.

### **Data Collection**

This study involved 6 teachers and 92 students of a suburban secondary school in Perak, Malaysia. The teachers were teaching Bahasa Malaysia, English and History. The students of the teachers also participated in the study.

The study involved observations, questionnaire and semi-structured interviews. Observations on classroom teaching and learning were conducted to yield information on questioning, technology and instructional activities. The research team observed 16 teaching and learning sessions.

Two sets of questionnaire were prepared. The teachers answered the first set of questionnaire which focused on teacher preparation, lesson implementation and classroom management. The second set of questionnaire which focused on lesson implementation and classroom management was answered by the students.

Similarly, two semi-structured interviews were conducted at the end of the study. The teachers were interviewed individually to obtain information on their understanding of HOTS, importance of teaching HOTS, and experience in carrying out the modules. Focused group interviews with five or six students of each participating class were also conducted. The interviews focused on the learning activities, encouragement in asking questions during the lessons, and the opportunities for exploring new ideas, making decisions and proposing solutions in the classroom.

### **Teachers' expectations and use of OER**

The findings discuss the teachers' expectation and use of OER in two parts. The first part addresses specifically on the implementation of the OER. The teachers showed interests in using the OER. The teachers expected that OER would be able to arouse the students' interest in learning the subject through integration of HOTS. They commended that the students' interest was aroused through the use of a variety of activities including chess, crossword, and jigsaw puzzle. Students had more opportunities to talk during the lessons.

However, the teachers also showed very minimal knowledge on ways to use OER. This brought some implications to the use of the OER. Firstly, the teachers followed the modules strictly, without making necessary amendments to suit their teaching styles. This caused them to feel burdened by the activities that had to be carried out as suggested by the module. Secondly, the teachers faced problems in achieving the learning outcomes. Although lessons could be prepared according to the modules, not all learning outcomes could be achieved because not all students were able to follow the lessons. Apart from that, external factors such as the school environment and classroom condition also affected the teaching and learning process. Thirdly, the teachers also faced time constraint in delivering the lesson. The teachers could not

complete the lessons when there were activities involving grouping, discussion, and presentation.

The second part of the findings addressed the HOTS elements of the OER. The teachers felt that the HOTS element in the modules could be improved. Two teachers felt that more HOTS elements need to be included in the modules. They commented that the HOTS elements in the modules were easy and straightforward, thus were not challenging for the students to achieve. One teacher showed satisfaction with the integration of the HOTS elements in the modules. She stated that the modules were aligned with the syllabus and infused with positive values. The modules allowed the students to think, analyse, compare, and differentiate. The students also expressed satisfaction on learning HOTS in the lessons. The HOTS lessons enabled them to be disciplined and be brave in giving ideas and presenting their work.

### **Sustainability of the OER**

The sustainability of the OER is ensured in two ways. Teachers from other secondary schools in the Batang Padang district are invited to use the OER. Firstly, teachers from the schools are invited to contribute their lesson plans to the OER. The lesson plans could be remixed from the original lesson plans uploaded in the OER website. The research team also encourages teachers to record and submit videos and photos depicting best practices of teaching HOTS in Malaysian classrooms. The lesson plans, videos or photos will be reviewed by the research team to ensure that the materials are related to integrating HOTS into subject matter and that no copyright infringement will be caused by publishing the materials.

Secondly, the use of OER will be incorporated in teaching and learning in SIEU. The project will be introduced to lecturers and students of the teacher education university. Lecturers and students are welcomed to use and contribute new materials to the OER. Lecturers could also share their knowledge on Creative Commons through this OER.

### **Conclusion**

Teachers need continuous support in the forms of ideas and resources to sustain the integration of HOTS in teaching and learning. The HOTS OER provides a platform which the teachers could use, reuse, remix and contribute their knowledge and materials. This initiative is of utmost importance as these resources are based on the Malaysian context. The use of OER will bring benefits especially to teachers from remote areas where access to printed materials is scarce. The second phase of this study will involve other core subjects taught in the schools. It is also hoped that more teachers and schools will be involved in re-creating or contributing resources to the OER.

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