Environmental Preschool Education Module Based on Higher Order Thinking Skills (HOTS)

Abdul Halim Masnan
*Abdul Halim Masnan, Universiti Pendidikan Sultan Idris; abdul.halim@fpm.upsi.edu.my*

Elyssa Heinzie Josin
*Elyssa Heinzie anak Josin, Universiti Pendidikan Sultan Idris; josinelyssaheinzie@gmail.com*

Azizah Zain
*Azizah Zain, Universiti Pendidikan Sultan Idris; azizah.zain@fpm.upsi.edu.my*

Nur Arifah Syahindah Zainudin
*Nur Arifah Syahindah Zainudin, Universiti Pendidikan Sultan Idris; indaharifah94@gmail.com*

**ABSTRACT**

The purpose of this study is to identify the essential elements (knowledge, attitudes and skills) to build the conceptual framework, Environmental Preschool Education Module for 6 years old students, based on Higher Order Thinking Skills (HOTS). Researchers use descriptive research designs using qualitative methods such as interview, observations and document analysis. The module development process involves three phases namely the phase of elements analysis, module development phase and module evaluation and implementation phase. HOTS-based Environmental Education Module development includes four clusters which are flora and fauna, self-taught skill, safety skill and survival skill theme. The participants of this study were 4 excellent preschool teachers who had at least 10 years of teaching experience and 40 preschool students in Selangor district. The findings show that preschool teachers have a high level of knowledge about HOTS but paucity of skills and attitudes in implementing HOTS-based learning. Therefore, HOTS-based Environmental Module is able to enhance teaching skills among preschool teachers and improved knowledge, high order thinking skills and attitudes of preschool students towards environment.

**Keywords:** Environmental preschool, education module, higher order thinking skills

**Introduction**

The National Education Philosophy describes education in Malaysia as a continuous effort towards expanding individual potential in a comprehensive and integrated way to produce balanced and harmonious human beings in terms of intellectual, spiritual, emotional and physical harmony based on God's belief and obedience (Education Act, 1996). Education system in Malaysia consists of preschool education, primary education, secondary education, and higher education. One of the most essential educations is preschool education as it is the earliest formal education received by an individual in his or her life development apart from informal education received at home.

The primary goal of preschool education is to broaden the potential of preschool children using comprehensive and integrated way in the physical, emotional, spiritual, intellectual and social aspects through a safe, nourishing, entertaining and engaging learning environment that is fun, creative and meaningful (Ministry of Education, 2017). Therefore, upon education curriculum transformation, the Malaysia Education Blueprint 2013-2025 has emphasized the concept of High Order Thinking Skills (HOTS). Malaysia Education Blueprint 2013-2025 is the transformation of educational system to equip the individuals holistically, with the competitive, quality and integrated manner through the world-class education system (Ministry of Education, 2017).
According to Birbili (2013) HOTS are the ability to apply knowledge, skills and values in making reasoning and reflection to solve problems, make decisions, innovate and create something. Even at preschool level, the teaching and learning process should be inserted with HOTS to produce quality preschoolers in terms of mental and physical aspects. HOTS emphasized the application of critical thinking skills, creative thinking skills, skills in thinking and thinking strategies in education using a comprehensive and systematic approach. As proven, HOTS has been explicitly incorporated in the National Standard Preschool Curriculum to meet new policy demands to integrate knowledge, skills and values Ministry of Education (2017). Therefore, the application of the concept of HOTS in education, especially early education, has the potential to improve the positive understanding of preschoolers on a particular area studied (Nooriza Kassim & Effandi Zakaria, 2015).

**Background of Study**

Education revolution in the STEM field exposed additional opportunity toward development of children. A solid foundation in this area is important to offer educational options for more exposure regarding real world, especially involving the environment (Perikleous, 2004). Preschool is one of the educational institutions for early childhood exposure in awareness of the importance of preserving the environment (Mohammed Zohir & Nordin 2007; Moroye, 2005). Environmental Education helps future generations to control their lives and prosper the future (Oltman, 2012). One way to conduct environmental education is to integrate environmental education into teaching in the classroom.

In 1998, environmental education has been introducing into Malaysia education system with the publication of the Education Teacher's Guide across the Curriculum for primary and secondary schools and the pre-school level of the book was published in 2005. Through the Malaysian Education Development Plan (PPPM) 2013-2025, the implementation of HOTS is an important agenda at every level of schooling until the high institution level (Ministry of Education Malaysia, 2017).

This centralized education system is important to ensure that the implementation of HOTS is effective. HOTS is based on Bloom's Taxonomy which has six levels of cognitive development and can be clearly categories into low-level thinking skills which consist of remembering, understanding and applying while high level thinking skills is analyzing, evaluating and creating (Anderson, Krathwohl, Airasian, Cruikshank, Mayer, Pintrich, Raths, Wittrock, 2001).

However, the extent to which HOTS's Early Education based on the preschool is still in insufficient condition. Some studies also show that teachers are less prepared in terms of knowledge, pedagogical skills and attitude to teach HOTS (Rajendran, 2001; Ministry of Education Malaysia, 2012; 2017).

According to Mohammed Sani (2007), he found that teacher having difficulties in determine their teaching direction and methods to provide effective activities for child development. Preschool teachers are unequipped to prepare appropriate environmental materials and teaching activities when dealing with diverse student environments. In addition, the level of awareness among children related to the environment was also low. They are more susceptible to interactive technology including computer, television, gadgets. Oltman, (2012) mentioned that children have limited involvement with nature with lead to inadequate awareness about environment.

**Research Methodology**

Propose of Study

The purpose of this project is to identify the essential elements (knowledge, attitudes and skills) to build the conceptual framework, Environmental Preschool Education Module for 6 years old students, based on Higher Order Thinking Skills (HOTS). This project also to evaluate the feasibility of modules in teaching by preschool teachers and the effect of the module on knowledge, high order thinking skills and the attitudes of preschool students towards environment.

Sampling

This study was conducted in a Selangor district. Participants for the study was the 4 excellent preschool teachers (PT1 – PT4) selected using purposeful sampling who had at least 10 years of teaching experience and 40 preschool students (6 years).
However for the pilot research, 29 students have been selected from Pekan Bangi Preschool, Teras Jernang Preschool, Batu Enam Preschool and Kampung Bahagia Preschool as participants for the pilot study.

**Design of the Study**
Researchers use descriptive research designs using qualitative methods such as interview, observations and document analysis.

The module development process involves three phases namely the phase of elements analysis, module development phase and module evaluation and implementation phase.

**Phase 1**
The element analysis phase using the HOTS model and literature review for the initial formation of this module. The interview method for four excellent preschool teachers was also used to determine the specification of these HOTS -based Environmental Education teaching module.

**Phase 2**
The module development phase involves the provision of materials, expert review and validity of the module content. The module is then revised and refined by four experts comprising academicians, preschool management, excellent teachers or key instructors, and experienced preschool teachers.

**Phase 3**
The implementation and evaluation phase involves the usability test of the HOTS -based Environmental Education teaching module by four teachers in government and private preschools.

**Results**

i. **Preschool Teachers Response to the Element Knowledge for Model Development**

Base on document analysis that has been done, PT1 said that Ministry of Higher Education (KPM) provides modules and guidelines to help her implementing HOTS at preschool. KPM outline and provide relevant modules in the implementation of HOTS in preschool level to be consistent across Malaysia

PT2 said that National Education Department (JPN) provides workshop and seminars regarding implementation of HOTS at preschool. JPN play an important role in providing opportunities, special courses, workshop, and seminars in the implementation of HOTS at preschool level for preschool teacher.

PT3 mention that teacher should not be burden with the implementation of HOTS and need to have positive knowledge, skills, and attitude while conducting classes. Teachers need to have positive knowledge, skills and attitudes while implementing the HOTS in the preschool classroom

PT4 also state that each teacher should have the skills in documenting the work of children. Teachers should have a journal or a dairy to jot child's skill development in activities based high-level thinking skills can be noted.

ii. **Preschool Teachers Response to the Element Pedagogical Skills for Model Development**

Based on interview that has been done, PT1 said that teacher should reconsider preschool student’s level of thinking before design a learning objective.

... to design a learning objective that is appropriate to the student’s level of thinking. (PT1: 2).

Submit Date: 10.07.2018, Acceptance Date: 22.08.2018, DOI NO: 10.7456/1080SSE/193

Research Article - This article was checked by Turnitin
Copyright © The Turkish Online Journal of Design, Art and Communication
PT2 mentioned that teachers should encourage preschool students to ask high-level questions based on the activities carried out.

Encourage preschool student to ask high-level questions based on the activities carried out. Encourage pupils to submit high-level questions by providing questions based on the activities carried out (PT2: 6).

PT3 shared his learning method to motivate high thinking skills is by problem solving, projects, and questionnaires approach.

The learning method I use to motivate students to think critically is through problem solving, projects, and questionnaires (PT3: 4).

PT4 shared an example of teaching tool that teachers practice while implementing HOTS in the classroom such as time-lapse videos.

Video demonstration of a relevant process and object such as seed germination process, color mixing process. (PT4: 3)

Preschool Teachers Response to the Attitude Element for Model Development

PT1 said the implementation of HOTS is hard when the lesson plan did not involve exploration or investigation.

...when an activity does not involve exploration or studying elements of a material, it is quite difficult to implement the value of HOTS in teaching (PT1: 4)

PT2 mentioned that the extra material and references could help to save teacher’s time.

.. materials or sources that can be used as references to save time. Encourage pupils to submit high-level questions by providing questions based on the activities carried out (PT2: 3).

PT3 shared that teacher’s determination and confidence is the key to ensure the success of HOTS implementation.

In my opinion, to ensure effective HOTS implementation at preschool is dependent on teacher’s determination and confidence. Teachers need to master knowledge, pedagogical skills, and have positive attitudes (PT3: 4).

PT4 respondent suggested that they need support systems as guidelines in implementing HOTS in the classroom.

I need a form of support system in applying HOTS at pre-school level (PT4: 4).

Result and Data Analysis

Based on pilot study conducted at four preschools in the Selangor district, there is significant improvement toward preschool student’s knowledge, high order thinking skills, and their attitudes towards the environment.

There are 29 preschool students (6 years) from Pekan Bangi Preschool, Teras Jernang Preschool, Batu Enam Preschool and Kampung Bahagia Preschool took part as participants for the pilot study.

i. Data Analysis of Pekan Bangi Preschool
Base on document analysis that has been done, pre-test achievement was 32.75 while the mean of post-test achievement was 36.13.

Sig value $p = 0.019 < 0.05$ showed that there was a significant difference between students after undergoing the MyNEPS Intervention Program.

### Diagram 1

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>32.75</td>
<td>6.435</td>
<td>(29.92, 35.57)</td>
</tr>
<tr>
<td>Post</td>
<td>36.13</td>
<td>4.531</td>
<td>(33.18, 39.08)</td>
</tr>
</tbody>
</table>

### Diagram 2

ii. Data Analysis of Teras Jernang Preschool

Base on document analysis that has been done, pre-test achievement was 35.86 while the mean of post-test achievement was 35.29.

Sig value $p = 0.785 < 0.05$ showed that there was a significant difference between students after undergoing the MyNEPS Intervention Program.

### Diagram 3

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>35.86</td>
<td>3.159</td>
<td>(33.51, 38.21)</td>
</tr>
<tr>
<td>Post</td>
<td>35.29</td>
<td>4.192</td>
<td>(31.96, 38.62)</td>
</tr>
</tbody>
</table>

### Diagram 4

iii. Data Analysis of Batu Enam Preschool

Base on document analysis that has been done, pre-test achievement was 31.50 while the mean of post-test achievement was 35.67.
Diagram 5

Sig value $p = 0.036 < 0.05$ showed that there was a significant difference between students after undergoing the MyNEPS Intervention Program.

Diagram 6

iv. Data Analysis of Kampung Bahagia Preschool

Based on document analysis that has been done, pre-test achievement was 34.00 while the mean of post-test achievement was 36.38.

Diagram 7

Sig value $p = 0.115 > 0.05$ showed that there was no significant difference between students after undergoing the MyNEPS Intervention Program.

Diagram 8

v. Data Analysis of Pre and Post MyNEPS Intervention Program Test.

Based on document analysis that has been done, pre-test achievement was 33.59 while the mean of post-test achievement was 35.90.
Diagram 9

Sig value p = 0.006 < 0.05 showed that there was a significant difference between students after undergoing the MyNEPS Intervention Program.

Diagram 10

Discussion

The findings show that preschool teachers have a high level of knowledge about HOTS but paucity of skills and attitudes in implementing HOTS-based learning. However, this module proves that it is effective in improving teachers’ pedagogical skills. The findings also found that preschool teachers capable of conducting teaching and learning using HOTS-based Environmental Module effectively.

The findings of document analysis and observations also shows HOTS is effective in the learning process thus improved preschool student’s knowledge, high order thinking skills and their attitudes towards environment. It also shows that the techniques and activities in this module help them in learning and understanding about nature.

In addition, the activities included in the module are indeed helpful and effective to give preschool students a better understanding and memorization of things in a simpler, easier and more practical way. Besides, it will also facilitate preschool students to revise the lessons and so on. This clearly demonstrates that these interventions have shown positive outcomes for preschool students in Selangor district schools.

This finding coincides with the study of Zalizan et. al, (2005) where learning skills should involve various components such as environmental, emotional, sociological, physical and psychological impacts on the learning process. In a nutshell, HOTS-based Environmental Module is able enhance teaching skills among preschool teachers and improved knowledge, high order thinking skills and attitudes of preschools student towards environment.

Conclusions

The findings show HOTS is effective in the learning process thus improved preschool student’s knowledge, high order thinking skills and their attitudes towards environment. Therefore, HOTS-based Environmental Module is able enhance teaching skills among preschool teachers and improved knowledge, high order thinking skills and attitudes of preschools student towards environment.

Based on these findings, it is clear that the HOTS-based Environmental Education Module is effective and has an impact in making the learning skills practical, easy and accurate among students. This will indirectly help them improve academic achievement.
References


Pericleous, E. (2004). The Status of Environmental Education in Cyprus Today. Dlm. MIO-ECSDE. The status of environmental education in the mediterranean countries within the formal &amp; non-formal educational systems, 34.
