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Preschool Nature Education Module for Preschool Teachers Activities

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Abstract

The purpose of this study was to develop the Preschool Nature Education Module (PreNEM) based on Higher Order Thinking Skills (HOTS) as a professional exercise and guide for preschool teachers to undertake teaching and learning related to the environment. The process of developing the module involved three phases, which were the phase of needs analysis of the module elements, the module development phase, and the module implementation and evaluation phase. The developed module encompassed based on HOTS in the Malaysian Nature Education in Preschool (MyNEPs). Program in the components of weather, flora, fauna, insects and microbes for children to face the environment, environmental care and independence of life. This qualitative study involved four excellent preschool teachers who had at least 10 years of teaching experience as well as the quantitative study involved 29 children from four preschools in Selangor state, Malaysia. The research found that preschool teachers had great knowledge on preschool nature education, however, they lacked the skills and attitudes to implement teaching and learning based on HOTS. The teaching and learning implementation results using the PreNEM based on HOTS helped to increase the teaching skills of preschool teachers and increase knowledge, skills and the attitudes of children towards the MyNEPs program.

Keywords*:* Preschool Teacher, Nature Education, Module Development, Children and Higher Order Thinking Skills

Introduction

The National Education Philosophy (NEP) characterized education in Malaysia as a continuous effort towards expanding individual potential in a holistic and integrated manner to develop individuals who are balanced intellectually, spiritually, emotionally and physically based on the belief and compliance to God (Education Act 1996). Referring to the Malaysian Education Blueprint (MEB) 2013-2025, the transformation of education was created to prepare children to face the challenges of the 21st century in which they no longer only need to master the basic skills of reading, writing and counting after finishing school. Rather, they require thinking skills that are more critical, creative and innovative to be continuously competitive and relevant.

Literature Review

Environmental education has been introducing in 1998 into Malaysia education system with the publication of the Education Teacher's Guide across the Curriculum for primary and secondary schools and the preschool 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). The emphasis on Higher Order Thinking Skills (HOTS) is strengthened through MEB 2013-2025 through requiring each student to empower cognitive skills such as creative and innovative thinking, problem-solving and reasoning, and learning ability (Ministry of Education, 2013).

National Standard Preschool Curriculum

The Ministry remains committed to ensuring the structure of the preschool phase of education will be scaled up in successive waves, with the objective of ensuring universal preschool enrolment and an equal head start in education for all children. With this, the National Standard Preschool Curriculum (NSPC) is the guidelines used in most preschools in Malaysia and stated that preschool education is viewed as important experience for each child in Malaysia (Nor, 2016). The six components are the main domain that support each other and are integrated with critical thinking, creative and innovative. This integration of component aims to produce human balanced who are knowledgeable and competent, who possess high moral standards and who are responsible and capable of achieving high levels of personal well-being as well as being able to contribute to the harmony and betterment of the family, the society, and the nation at large.

This curriculum also emphasized on integrated learning that are able to provide children to gain self-learning experience that are more meaningful. Preschool teachers should be able to integrate components, skills and values in the process of teaching and learning among children. Integrated learning includes routine activities (circle time, recess and closing activities), learning activities and outdoor activities (physical activity and free play). Hence, the curriculum emphasis on conducive learning environments, effective teacher-child interaction, teaching and learning activities in light of the national curriculum.

Thus, the NSPC 2010 that was specific for preschool education was revised in 2017 to include elements of HOTS to meet current demands (Ministry of Education, 2017). The *NPCS that was* designed to produce students with 21st century by focusing on thinking skills, living skills and career that are based on moral values practice (Ministry of Education, 2017). It is hoped that the students are resilient and empowered through the standard curriculum. One of the elements in integrated learning that helps to develop this 21st century is outdoor activities. Outdoor activities helps to enhance and stimulate children's fitness (Stone & Faulkner, 2014) and intelligence (Waller, 2007).

Higher Order Thinking Skills

This centralized education system is important to ensure that the implementation of Higher Order Thinking Skills **(**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 (Davies, & Hamilton, 2018). 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 (Birbili, 2013; Ministry of Education Malaysia, 2013; 2017).

According to Birbili (2013), HOTS encompasses the ability to use knowledge, skills and added value in reasoning and evaluation to solve problems, innovate and create. The implementation of HOTS is the main factor behind Malaysia recording an increased score in the Program for International Student Assessment (PISA) 2015 in the domains of scientific literacy, reading literacy and mathematical literacy. Thus, the implementation of HOTS in Science, Technology, Engineering and Mathematics (STEM) is considered more efficient through Environmental Studies. This is because Environmental Studies helps the future generation to control life and prosper in the future (Bento & Dias, 2017; Bower, Hales, Tate, Rubin, Benjamin, Ward 2008; Davies & Hamilton, 2018).

Even though education transformation has been implemented by the government, the practice of encouraging HOTS among children in hands-on activities still has gaps in its execution (Holstermann, Grube, & Bogeholz, 2010; White, 2014). Masnan, et al. (2020) found that the challenges faced by teachers in Malaysia are in terms of determining the goal of learning and the method to prepare effective nature activities for children. Thus, the shortage of materials that contain learning resources specifically to integrate elements of HOTS results in a need for commitment and ability to be guided by modules to implement hands-on nature activities (Acar, 2013; Nah & Waller, 2015; Maynard, & Waters, 2007).

For some time now, the changing nature of children's lives have been a major concern (Nah & Waller, 2015). In many countries, outdoor urban environments are no longer child-friendly spaces (Bento & Dias, 2017; Bower et al., 2008; Davies & Hamilton, 2018). With the advent of technology, children are playing less outdoors and prefer to stay indoors with their devices. Children's and family have limited opportunities to connect with the natural environment. Time for outdoor activities are diminishing and children are less and almost disconnected from the natural world as a result of globalisation and urban growth (Bento & Dias, 2017). To meet the needs of the children, natural environments and adaptable settings will help to provide the flexibility needed to keep the ongoing process of stimulation and to develop interest in any activities are maintained (Walsh, 2016).

Besides, there is a lack of knowledge of basic survival skills among children because more activities are focused on academic competencies. Likewise, parents are also get into the habit and mind-set that being outdoors is full of fears and dangers without realising of being too protective and we are raising generations of children who are unable to assess risk to themselves and others (Moss, 2015). Children's growth and development in outdoor environments are affected by children's interaction patterns with their environment. Knowing this is important for children's demands and unique development, it is found that most children are not well exposed to physical environment learning in most preschools in Malaysia (Masnan et al., 2020).

Preschool Nature Education

Preschool nature education activities are important and children enjoy it the most but they do not implement it actively or frequently due to safety concern, especially with high children versus teacher ratio, stress on cognitive activities and outcomes (Nah & Waller, 2015). In other parts of countries, people have developed knowledge of environment which has allowed them to survive through thousands of years. Young people frequently make use of the environment surrounding them to learn life and survival skills so as to build a strong

foundation of it and the most important survival pack is knowledge and skill based on experiences and practices (Maynard & Waters, 2007).

Ting & Siew (2014) stated that abstract concepts and connections between various subject areas come to life in a schoolyard enhancing comprehension and performance. The appropriate setting to conduct these activities is natural environment which in contrast to the built environment contain living and non-living material which includes rivers, lakes, forest and others (Scott, 2017). The purpose of nature education activities is to learn and practice skills for surviving in the outdoors. For example, they could learn what plants they can and cannot eat, how to set a camp, how to build a fire and so on. In building a strong foundation of effort to develop outdoor learning, there is still a need to know what makes such activities special and unique and provides us with a set of guidelines for making decisions about provision, planning and interacting with children (White, 2014). In few years back, the benefits of connecting to nature have been well documented in numerous studies and these include positive impacts to their social, psychological, academic and physical health.

Hence, leaning is about providing new, exciting and fun experiences and those activities provide this (Waite et al., 2015). Life skills such as basic survival skills and camping skills need to be learnt through activities and teacher must be wise enough to link the knowledge and skills of a certain subject with the competency to use them. Talking to the children about the types of activities or personal safety situations they may encounter and what they can do to be safe should be. In accordance of environmental awareness, children are hoped to demonstrate more environmental friendly behaviours and more interest in outdoor activities and pursuits (Glover et. al., 2013)

Methodology and Methods

Participants

This qualitative study analysis involved four excellent Preschool Teachers (PT1, PT2, PT3 and PT4) who had experience of at least 10 years and above. The sample was chosen using purposive random sampling, which was by looking at the education background, years of service, excellence recognition, and preschool education option based on NEP and NPCS from Selangor.

This qualitative study through descriptive analysis involved 29 children (6-year-old) tendency of the children towards the Malaysian Nature Education in Preschool (MyNEPs) Program. The children have been selected from Preschool 1, Preschool 2, Preschool 3 and Preschool 4 in Selangor State, Peninsular Malaysia as participants.

Research Design

An interview was conducted among the preschool teachers who conducted the teaching and learning activity in the classroom. Observation was also conducted to evaluate the implementation of the module using a teaching and learning observation form based on NPCS. Observation and document analysis were also conducted to determine the three elements of knowledge, skills and attitudes of the teachers in using the model, and subsequently to review the interest (Kumar, 2014).

The Preschool Nature Education Module (PreNEM) development process involves three phases namely the phase of elements preschool nature education analysis, module development phase and module evaluation and implementation.

Phase 1

The element preschool nature education 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 Malaysian Nature Education in Preschool (MyNEPs)

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 and experienced preschool teachers.

Phase 3

The implementation and evaluation the Preschool Nature Education Module (PreNEM) involves the usability test of the HOTS-based Malaysian Nature Education in Preschool (MyNEPs) Program in four preschools.

Results and Discussion

The results were analysed based on the main objective of the study. The required elements which were knowledge, attitudes and skills using the HOTS model were obtained from the interview and observation of the four PT as a guide for the Preschool Nature Education Module (PreNEM) development.

Knowledge

PT1 stated that MOE had prepared a nature education module and guideline that is standardized throughout Malaysia that helped him implement HOTS. PT2 said that the State Education Department (SED) played an important role such as providing workshops for HOTS implementation at the preschool level. PT3, however, said that teachers should not be burdened with the implementation of HOTS, and that they need knowledge, skills and a positive attitude to manage teaching and learning based on HOTS. PT4 stressed that each teacher must have documenting skills such as journal writing or daily note-taking on children regarding the HOTS activities.

Attitudes

PT1 stated that teachers need to consider the cognitive level of children before planning teaching and learning. PT2 suggested that teachers should encourage children to ask high-level questions in an activity. PT3 said that the teaching and learning approach that encourages HOTS in children include problem-solving, projects and inquiries. PT4 shared teaching and learning materials that encourage HOTS in children in the classroom such as time-lapse videos.

Skills

PT1 stated that teaching and learning linked to HOTS is difficult to implement without exploration and investigative activities. PT2 found that materials and resources help save teachers' time. PT3 stressed on the teacher's confidence as a success factor behind the implementation of teaching and learning based on HOTS. PT4 emphasised on the need for a support system as a guide to implement teaching and learning based on HOTS in the classroom.

The quantitative study to evaluate the applicability of the Preschool Nature Education Module (PreNEM) involving 29 children from four preschools in Selangor showed an increase in terms

of knowledge, skills and attitudes of the children towards the Malaysian Nature Education in Preschool (MyNEPs) program.

Data Analysis of Preschool 1

Based on document analysis in Table 1 that has been done, pre-test achievement was 32.75 while the mean of post-test achievement was 36.13.

Table 1.
Document Analysis Pre-test and Post-test

No.	Group	Mean	N	Std. Deviation	Std. Error Mean
1	Pre-test	32.75	8	6.475	2.2.89
2	Post-test	36.13	8	4.581	1.619

Sig value p = 0.019 <0.05 in Table 2 showed that there was a significant difference between children after undergoing the MyNEPS Program.

Table 2.
Significant Value

Group	Mean	Std. Deviation	Std. Error Mean	Sig value	Result
Pre-test	- 3.375	3.159	1.117	.019	Significant
Post-test					

Data Analysis of Preschool 2

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

Table 3.
Document Analysis Pre-test and Post-test

No.	Group	Mean	N	Std. Deviation	Std. Error Mean
1	Pre-test	35.86	7	2.854	1.079
2	Post-test	35.29	7	4.192	1.584

Sig value p = 0.785 < 0.05 showed that there was a no significant difference between children after undergoing the MyNEPS Intervention Program.

Table 4.
Significant Value

Group	Mean	Std. Deviation	Std. Error Mean	Sig value	Result
Pre-test	.571	5.287	1.998	.785	No Significant
Post-test					

Data Analysis of Preschool 3

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

Table 5.
Document Analysis Pre-test and Post-test

No.	Group	Mean	N	Std. Deviation	Std. Error Mean
1	Pre-test	31.50	6	3.782	1.544
2	Post-test	35.67	6	1.506	.615

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

Table 6.
Significant Value

Group	Mean	Std. Deviation	Std. Error Mean	Sig value	Result
Pre-test	- 4.167	3.601	1.470	.036	Significant
Post-test					

Data Analysis of Preschool 4

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

Table 7.
Document Analysis Pre-test and Post-test

No.	Group	Mean	N	Std. Deviation	Std. Error Mean
1	Pre-test	34.00	8	2.619	.926
2	Post-test	36.38	8	2.925	1.034

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

Table 8.
Significant Value

Group	Mean	Std. Deviation	Std. Error Mean	Sig value	Result
Pre-test	- 2.375	3.739	1.322	.115	No significant
Post-test					

Data Analysis of Pre and Post MyNEPS Program Test

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

Table 9.
Document Analysis Pre-test and Post-test

No.	Group	Mean	N	Std. Deviation	Std. Error Mean
1	Pre-test	33.59	29	4.355	.809
2	Post-test	35.90	29	3.426	.636

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

Table 10.
Significant Value

Group	Mean	Std. Deviation	Std. Error Mean	Sig value	Result
Pre-test	-2.310	4.176	.775	.006	Significant
Post-test					

Based on the t-test, there was an increase from the pre-test to the post-test. Analysis showed that there was a significant difference in Preschool 1 in which p = 0.019 < 0.05, and Preschool 3 at p = 0.036 < 0.05. However, there was no difference in Preschool 2 at p = 0.785 > 0.05, and Preschool 4 was p = 0.115 > 0.05. Overall, the children who followed the Malaysian Nature Education in Preschool (MyNEPs) Program showed a significant difference at p = 0.006 < 0.05.

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 on preschool nature education. However, this preschool nature education proves that it is effective in improving teachers' pedagogical skills. The findings also found that preschool teachers capable of conducting teaching and learning using the preschool nature education based on HOTS effectively.

The findings of document analysis and observations also shows HOTS is effective in the learning process thus improved preschool children's knowledge, skills and their attitudes towards Malaysian Nature Education in Preschool (MyNEPs). It also shows that the techniques and activities in this Preschool Nature Education Module (PreNEM) help them in learning and understanding about nature education.

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

Limitations of the Study

The limitations of this study was only to develop the Preschool Nature Education Module (PreNEM) based on HOTS as a teaching and learning guide for preschool teachers. The developed module encompassed knowledge, attitudes and skills in the Malaysian Nature Education in Preschool (MyNEPs) Program in the components of weather, flora, fauna, insects and microbes for children to face the environment, environmental care and independence of life.

Recommendations for Further Research

This development of the the Preschool Nature Education Module (PreNEM) based on HOTS is forecast to provide guidance, exercise and deeper understanding regarding the use of activities connected to HOTS as well as increase awareness to the environment. In a study by Acar (2013), it was proven that the development of a learning module through playing in preschools had successfully created a learning environment that was planned and systematic,

which consequently increased the motivation and understanding of teaching and learning concepts among children.

Based on the results of the analysis, it is clear that this Preschool Nature Education Module (PreNEM) gives a positive effect towards the teachers' teaching and learning and helped increase the knowledge, skills and attitudes based on HOTS of the children towards the Malaysian Nature Education in Preschool (MyNEPs). By achieving the objective, this study was able to help the researcher develop the nature module based on HOTS suitable with the level of preschool children (White, 2014).

Conclusion

Overall, based on these findings, it is clear that the Preschool Nature Education Module (PreNEM)is effective and has an impact in making the learning skills practical, easy and accurate among students. This study is also hoped to contribute in addressing the possible effects that may help to develop these activities in preschools and to offer some recommendations to enhance children to participate in outdoor survival activities.

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