

INSECT EXHIBITION AS A TOOL TO PROMOTE BIODIVERSITY CONSERVATION AMONG CHILDREN

Farah Hani Mohd Ma`in¹, Siti Fatimah Sabran^{1*}, Norradiah Ismail¹, Maryati
Mohamed¹, Nur Bahiyah Abdul Wahab² & Arney Sapaat¹

¹Centre of Research for Sustainable Uses of Natural Resources (CoR-SUNR),
Faculty of Applied Sciences and Technology, Universiti Tun Hussein Onn Malaysia,
Kampus Pagoh, KM 1, Jalan Panchor, 84000 Muar, Johor, Malaysia

²Institut Pendidikan Guru,
Kampus Temenggong Ibrahim, Jalan Datin Halimah,
80350 Johor Bahru, Johor, Malaysia

*Corresponding author: fatimahsb@uthm.edu.my

ABSTRACT

Strong understanding of biodiversity instilled in the early ages is critical to initiate the actions and sense of responsibility towards biodiversity conservation. However, poor effort in mainstreaming biodiversity could lead to lack of awareness and understanding on biodiversity among society, thus restricting effective conservation effort. Therefore, in this study, biodiversity conservation education was pursued using insects to promote awareness. This study aimed to gauge the level of biodiversity understanding and knowledge among primary school students before and after experiencing insect exhibition. This study involved two parts; insect exhibition (development of insect collection and posters) and surveys (using pre and post questionnaires). A total of 136 students of age 10 from four primary schools in Batu Pahat district, Johor, Malaysia participated in the exhibition. The results showed that the level of understanding on biodiversity's concept and function among the students was poor before experiencing the exhibition while 80.15% of their understanding has increased after the exhibition. In conclusion, the use of insect collection with interactive display and activities during the exhibition could attract students and improve their learning and understanding on biodiversity conservation.

Keywords: Biodiversity, conservation, understanding, insects, education

ABSTRAK

Kefahaman yang tinggi tentang kepelbagaian biologi untuk disemai pada usia awal sangat penting untuk melahirkan tindakan dan rasa tanggungjawab terhadap pemuliharaan kepelbagaian biologi. Namun, usaha yang lemah dalam mengarusperdanakan kepelbagaian biologi telah menyebabkan kurangnya kesedaran dan kefahaman tentangnya dalam kalangan masyarakat, sehingga membataskan usaha pemuliharaan yang lebih berkesan. Oleh itu, dalam kajian ini, pendidikan pemuliharaan kepelbagaian biologi dilakukan dengan menggunakan serangga untuk meningkatkan kesedaran tersebut. Kajian ini bertujuan untuk mengukur tahap kefahaman dan pengetahuan dalam kalangan pelajar sekolah rendah sebelum dan selepas

mengalami pengalaman pameran serangga. Kajian ini melibatkan dua bahagian; pameran serangga (pembangunan koleksi serangga dan poster) dan tinjauan (menggunakan soal selidik pra dan pasca). Seramai 136 pelajar berumur 10 tahun daripada empat buah sekolah rendah di daerah Batu Pahat, Johor, Malaysia menyertai pameran tersebut. Hasil kajian menunjukkan bahawa tahap kefahaman mengenai konsep dan fungsi kepelbagaian biologi dalam kalangan pelajar adalah kurang baik sebelum menjalani pameran tersebut sementara 80.15% pemahaman mereka meningkat setelah pameran berlangsung. Kesimpulannya, penggunaan koleksi serangga dengan paparan interaktif dan aktiviti semasa pameran dapat menarik minat pelajar dan meningkatkan pembelajaran dan kefahaman mereka mengenai pemuliharaan kepelbagaian biologi.

Kata kunci: Kepelbagaian biologi, pemuliharaan, kefahaman, serangga, pendidikan

INTRODUCTION

A key aspect of Communication, Education and Public Awareness (CEPA) in biodiversity is measuring the level of understanding on biodiversity. The baseline data as reported by Ministry of Energy and Natural Resources (KeTSA) has demonstrated an alarming state that 91.6% of primary school students in Malaysia has low level of understanding on biodiversity (KeTSA 2019). In effort to engage people with biodiversity and other related issues, it is vital to find suitable mechanisms to deliver the message to the diverse yet different stages of the audience (Novacek 2008). One of the mechanisms that helps in delivering the message to larger audiences without considering their stages is through education. Education, whether formal or informal, is believed to deliver the message while at the same time engaging the public with biodiversity. Formal education can be obtained through learning in the classroom with teachers or lecturers teaching about subjects related to biodiversity, while informal education can be obtained through exposure and visits to institutions that are related to biodiversity such as museums, zoos and environmental centers.

The Aichi Biodiversity Target of Convention on Biological Diversity (CBD) and the Strategic Plans for Biodiversity 2011- 2020 have stated several targets that is related to public engagement with biodiversity and education about biodiversity, which are the Strategic Goal A, Target 1 and Strategic Goal E, Target 19, respectively. The strategic goal and target have emphasized mainstreaming biodiversity effort is not only to the government but also to the society as well. This can be achieved both by formal and informal education with the help of current technologies to deliver the message.

Children often become the target audience or participants in certain programs or activities because they are willing to learn and easier to receive new information, and also full of curiosity compared to the adults (Chen 2015). Indeed, it has been demonstrated that giving education about biodiversity to children and frequent involvement with nature in such early ages have enhanced individual's emotional bonds and interest in nature (Soga et al. 2016). However, to gain the children's attention to get involved and become close to nature, learning activities must be fun and meaningful so that the aim of the learning activities can be achieved.

Previous research by Soga et al. (2016) stated that children are becoming less likely to have direct contact with nature. This loss of human connections with nature will slightly affect their affective attitudes and willingness to conserve nature and biodiversity. This is due to several factors, either because of rapid urbanization, watching television, or playing games as children today spend t majority of their leisure time on screen-based entertainment. In order to

prevent “extinction of experience”, which is the progressive loss of human interactions with nature (Soga et al. 2016), children should be exposed to nature as frequently as possible. Additionally, children that have direct contact with nature both in direct (participating in nature-based activities) and vicarious experiences (nature experiences without having any physical contact with nature, such as through reading materials, talking with friends and family about nature and biodiversity, or through technologies such as television, films and websites) will slightly have positive attitudes and willingness to conserve nature and biodiversity.

Exhibition using insect collections have long attracted people to visit the natural history museum as a leisure activity for individuals or families. The exhibition plays an important role in giving information about biodiversity to the public. Moreover, exhibition also plays a role in giving informal education about biodiversity to the primary school children (Allen 2004). The exhibition is usually full of preserved specimen of animals and plants such as mammals, birds, leaves and many more (Winker 2004). In addition, exhibition must be fun and attractive in order to grab the attention of these primary school children while at the same time giving them informal education about biodiversity (Allen 2004). Additionally, an exposure to such exhibitions will give children freedom to explore and familiarize themselves with the biodiversity, while they explore and get along throughout the exhibition, it will trigger and encourage them to have deeper interest in biodiversity (Allen 2004). Exhibition that is full of interesting and suitable choices of animals for the specimen's collection, along with clear description on the specimens will encourage children to explore the exhibition on their own.

Effort in mainstreaming biodiversity has been long practiced and implemented by the people, sectors and other agencies that are related to biodiversity. This effort is challenging because it involves the cooperation of many people in order to make it work and succeed, particularly the public. Even though this effort of mainstreaming biodiversity is being implemented by all stages of audiences, it still faces weakness that cannot be avoided. One of the weaknesses in mainstreaming biodiversity nowadays is lack of human capacity and expertise (Navarro-Perez & Tidball 2012). In Malaysia, we are lacking of experts working in the field of biodiversity, making it more difficult to implement the effort of mainstreaming biodiversity (Malig 2016). Another weakness in mainstreaming biodiversity is less involvement of the public in the activities or program. This is due to lack of interest, vision and understanding of biodiversity, and conflicts from leaders and governments (Novacek 2008). Therefore, a simple yet powerful activity such as insect exhibition could potentially act as a tool to enhance the understanding of young generations towards biodiversity. The objective of this study was to determine the level of understanding on biodiversity among primary school students in selected schools in Johor before and after the exposure to insect exhibition.

MATERIALS AND METHODS

Preparation of Insect Specimens for Insect Exhibition

Insect specimens (Figure 1) which were used for the exhibition, was prepared from field sampling activity in Hutan Lipur Bukit Soga and Taman Negara Johor Endau-Rompin. Additional insect specimens were obtained from the repository room in Universiti Tun Hussein Onn, Malaysia. Posters that consisted of information about biodiversity and insects were also prepared for the exhibition. Insects were selected as the main subject during the exhibition because insects are abundance, easy to be spotted, and connected to many interesting myths (Kemalok & Mohamed 2018).



Figure 1 An example of insect specimen for the exhibition

Construction of Questionnaires

The pre-treatment questionnaires consisted of four sections, which were A: demographic profile, B: understanding about terminology of biodiversity, C: understanding about concept of biodiversity, and D: understanding the function of biodiversity. On the other hand, the post-treatment questionnaires consisted of similar questions as in section B, C, and D but excluding section A. The closed and open-ended type of questions were constructed and verified by the subject matter expert.

Selection of Respondents

A total of 136 primary school students participated in this research which had been conducted in four primary schools in Batu Pahat district, consisted of 30 students from SK Pintas Puding, 30 students from SK Seri Binjai, 30 students from SK Tengku Mariam, and 46 students from SK Convent Batu Pahat. This research focused on the primary school students of age 10 (standard 4). This age group was selected because the students are undergoing their first-year of science syllabus (KPM 2016).

Conducting Survey

Approval from the selected schools and Pejabat Pendidikan Daerah Batu Pahat was obtained before conducting the survey. The survey was conducted before and after the implementation of the insect exhibition. The survey consisted of a set of questionnaires, which were pre-treatment questionnaires that were given before the exhibition and post-treatment questionnaires that were given after the exhibition. About 15 minutes of duration were given to the students to answer each surveys.

Administration of Insect Exhibition

The insect exhibition was administered to the students after the distribution of pre-treatment questionnaires. Using insects as a model for the exhibition, the concept selected was “*Biodiversity: Knowing insects*” and focused on the specimens of insects in giving brief introduction and explanation about biodiversity to the students. This is because this research aimed to give understanding about biodiversity in a simple way, yet understandable by the students. Using insects as a model for the exhibition, this research only focused on the roles and functions of insects as an example in biodiversity. The duration of the insect exhibition was about 45 to 60 minutes in each schools.

Data Analysis

The collected data was analyzed descriptively using Microsoft Excel. The results from the questionnaires were categorized into five levels of understanding which were very poor, poor, fair/moderate, good and very good.

RESULTS AND DISCUSSION

Demographic profiles of the students showed that 25% are male and 75% are female. 87.5% of the students are Malays, followed by Chinese (8.1%) and Indians (2.2%). Majority of the parents work in government sectors (26.5%), factory sector (13.2%) and business sector (9.56%). Among the four selected schools, two schools were located in urban areas and two schools were located in suburban areas, respectively.

The results from the pre-treatment survey showed that 83.8% of the students have never heard about the term ‘biodiversity’ before (Figure 2). Based on Figure 3, the pre-treatment results showed that the level of understanding on biodiversity was categorized as very poor (44.12%), while the results from the post-treatment survey showed that this category has decreased down to 8.1%. On the other hand, the pre-treatment results showed that the level of understanding on biodiversity categorized as very good was none (0%) while the results from the post-treatment survey showed that this category has increased up to 1.5%. In general, majority of the students have improved their level of understanding on biodiversity after exposure to insect exhibition.

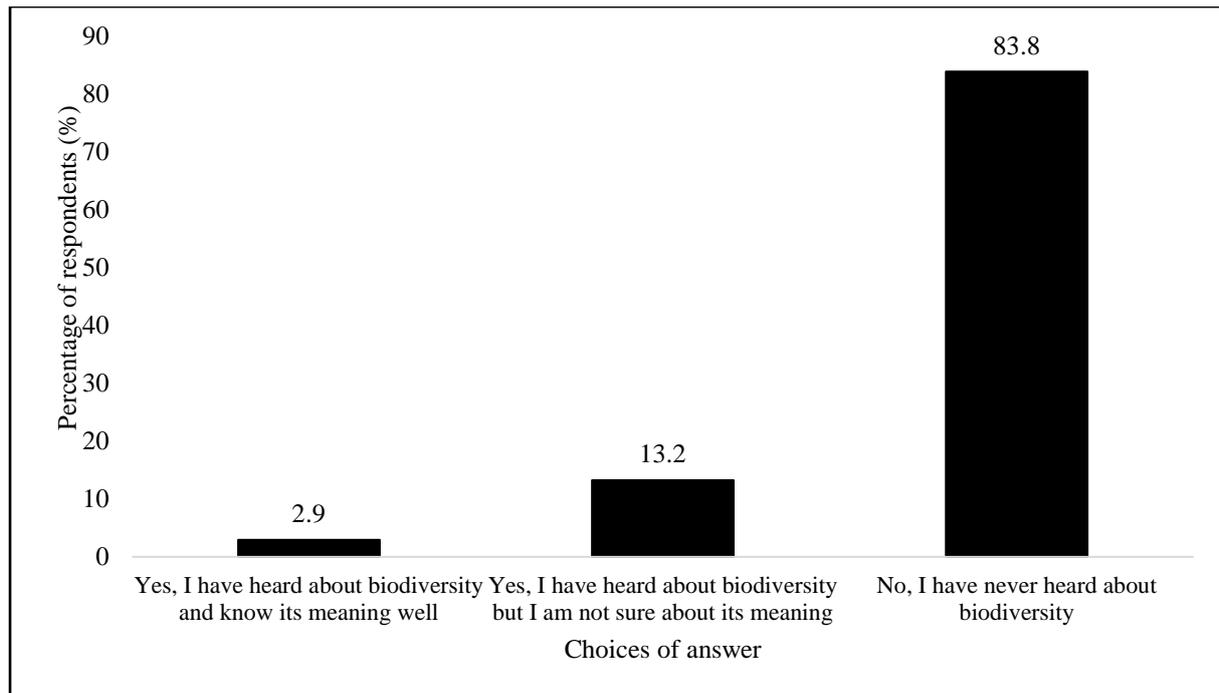


Figure 2. Percentage of respondents that have heard or know about biodiversity

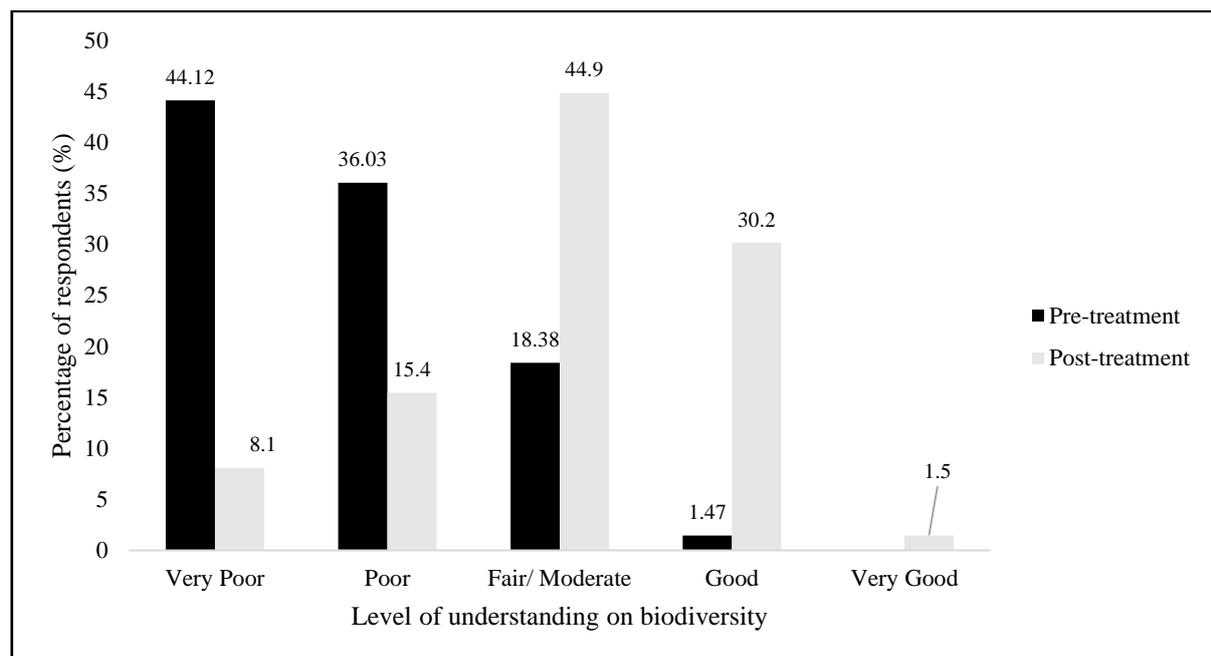


Figure 3. Comparison on the level of understanding of biodiversity using insects as model on pre-treatment and post-treatment among 136 students

Figure 4 shows that 80.15% of the students have increased their level of understanding on biodiversity in this study. However, 14.71% of the students has decreased their level of understanding on biodiversity while the level of understanding on biodiversity for 5.15% of the students remained unchanged after exposure to the exhibition. The decreasing might be due to some misinformation during the exhibition session. Further work needs to be done to validate the disadvantage.

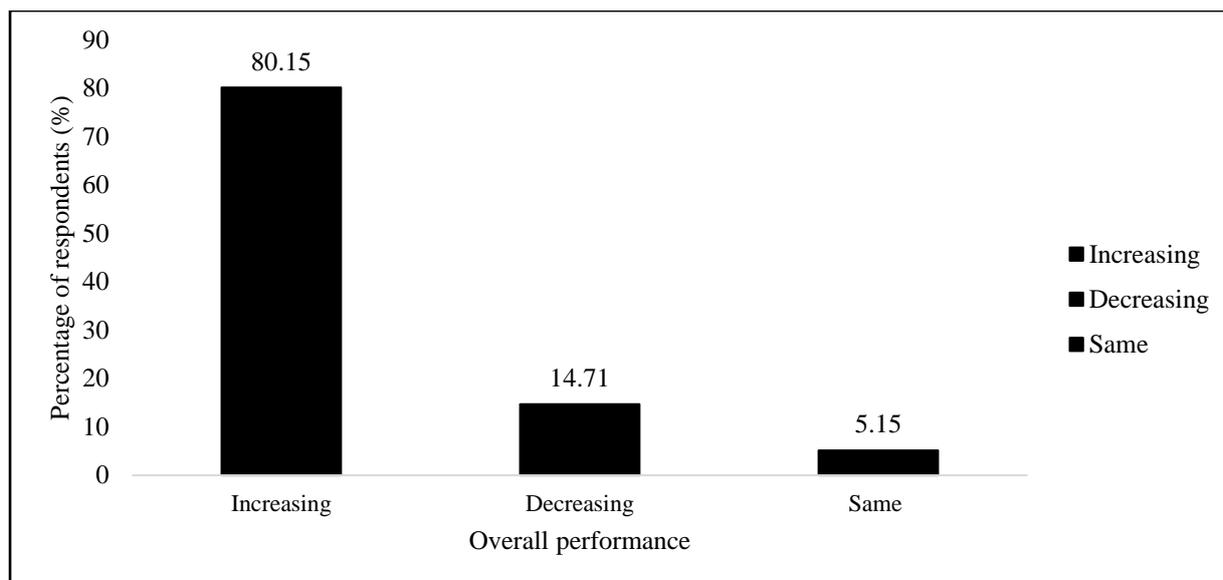


Figure 4. The overall performance of students on understanding of biodiversity

The study is also limited by the lack of information on the correlation of demographic profile of the students and their level of understanding on biodiversity. Although the current study is based on a small sample of participants, the findings suggest that the level of understanding of biodiversity can be positively affected by experiencing the insect exhibition. This result is in line with one previous research conducted by Soga et al. (2016) which showed that children who participated in nature-based activities will have a greater understanding about biodiversity as compared to the children who do not participate. Therefore, early exposure towards nature-based activities such as participating in insect exhibition is proven to be helpful in enhancing the level of understanding on biodiversity.

Furthermore, the results presented in this study emphasizes the importance of informal learning (Randler et al. 2007) in biodiversity, such as learning in the setting outside of school areas and visiting zoos. The exhibition gave freedom for the children to explore during the exhibition which allowed them to discuss among themselves about biodiversity and to get familiar with the specimens, making them engaged with biodiversity terms. Providing knowledge about biodiversity in such an interactive way during the exhibition was helpful in improving the understanding about biodiversity.

CONCLUSION

This study has shown that the level of understanding on biodiversity among the selected primary school students has increased after experiencing the insect exhibition. The informal learning about biodiversity obtained from the exploration during the exhibition was helpful in providing knowledge about biodiversity.

ACKNOWLEDGEMENTS

The study was financially supported by Ministry of Higher Education (MOHE) through Fundamental Research Grant Scheme (FRGS/1/2017/WAB13/UTHM/03/1). Gratitude is also extended to Pejabat Pendidikan Daerah Batu Pahat, SK Pintas Puding, SK Seri Binjai, SK Tengku Mariam, and SK Convent Batu Pahat for allowing us to conduct this study.

REFERENCES

- Allen, S. 2004. Designs for learning: Studying science museum exhibits that do more than entertain. *Science Education* 88(S1): 17-33.
- Chen, Q. 2015. Ready for school? Impacts of delayed primary school enrollment on children's educational outcomes in rural China. *International Journal of Educational Development* 45: 112-128.
- Malig, M.L. 2016. Global Forest Coalition Annual Report 2016- Defending Community Rights in Forest Policy at Local, National and Global Levels. <https://globalforestcoalition.org/annual-report-2016/> [29 October 2020].
- Kemalok, J. & Mohamed, M. 2018. Serangga dan mitos suku kaum Jakun, Kampung Peta, Mersing Johor. *Serangga* 23(1): 1-11.
- KPM (Kementerian Pendidikan Malaysia). 2016. *Kurikulum Standard Sekolah Rendah-Dokumen Standard Kurikulum dan Pentaksiran Sains Tahun 4*. Putrajaya: Kementerian Pendidikan Malaysia.
- KeTSA (Kementerian Tenaga dan Sumber Asli). 2019. *Kajian Baseline Pemuliharaan Biodiversiti berkaitan Dasar Kepelbagaian Biologi Kebangsaan 2016-2025*. Putrajaya: Kementerian Tenaga dan Sumber Asli.
- Navarro-Perez, M. & Tidball, K.G. 2012. Challenges of biodiversity education: A review of education strategies for biodiversity education. *International Electronic Journal of Environmental Education* 2(1): 13-30.
- Novacek, M.J. 2008. Engaging the public in biodiversity issues. *In the Light of Evolution II: Biodiversity and Extinction* 105: 11571-11578.
- Randler, C., Höllwarth, A. and Schaal, S., 2007. Urban park visitors and their knowledge of animal species. *Anthrozoös* 20(1): 65-74.
- Soga, M., Gaston, K.J., Yamaura, Y., Kurisu, K. & Hanaki, K. 2016. Both direct and vicarious experiences of nature affect children's willingness to conserve biodiversity. *International Journal of Environmental Research and Public Health* 13(6): 529.
- Winker, K. 2004. Natural History Museums in a Post biodiversity Era. *Bioscience* 54(5): 455-459.