

PROMOTING ENVIRONMENTAL SUSTAINABILITY AMONG OUM ADULT LEARNERS

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ABSTRACT

In line with the 2030 Agenda for Sustainable Development Goal 4 on Quality Education, Open University Malaysia strives to promote environmental education and create environmental awareness through its lifelong learning framework. The university has embedded environmental component in one of topic with one of its university courses that is offered in the first semester. Topic 10 within the OUMH1603 course on Learning Skills for 21st Century is titled Environment and Us. This study aims to measure the level of environmental literacy and examine the correlation between learner's disposition and learning experience among learners who have taken the course. The 2011 Framework for Assessing Environmental Literacy by the North American Association for Environmental Education was adopted for this purpose. Data were collected through online survey in two phases. The level of knowledge of the OUM students were proven to be high, ranging from an average means score of 3.86 to 4.33. The second part of the analysis shows that there is also a significant strong correlation between students' learning experience of the course (3.99 to 4.44) and their dispositions as well as their willingness to volunteer in environmental projects. The findings suggest that embedding environmental education within a widely distributed formal education framework can contribute positively to the effort to create environmentally literate adults.

Keywords: *Environmental literacy, environmental sustainability, adult learners, disposition*

1. Introduction

Environmental problems today are global issues, and every single person is expected to possess knowledge about the state of our environment within both local and global context through formal or non-formal education. Each of us must be responsible for greening our environment and balancing our ecological systems through sustainability

development actions. In an effort to create environmentally literate adults, many forms of environmental education have been introduced throughout the world. The goal of environmental education is to educate individuals to make them highly environmentally literate (Kisoglu, Gurbuz, Sulun, Alas & Erkol, 2010). As an Open Distance Learning (ODL) provider, Open University Malaysia (OUM) is ideally positioned to promote environmental education through its Lifelong Learning framework throughout Malaysia. This study aims to measure the level of environmental literacy and examine the correlation between learner's disposition and learning experience among first year learners who have taken the OUMH1603 course on Learning Skills for 21st Century and studied Topic 10 (The Environment and Us). The study adopted the 2011 Framework for Assessing Environmental Literacy by the North American Association for Environmental Education (NAAEE).

2. Literature Review

2.1 Environmental Literacy

Many researchers have discussed the concept of environmental literacy. The assessments of environmental literacy have been evaluated since the 1970s. Tools for environmental literacy assessment have increased tremendously under the new trend which offers a more holistic definition of environmental literacy including the distinction of its components.

A person who has environmental literacy skills is defined:

“as someone who, both individually and together with others, makes informed decisions concerning the environment; is willing to act on these decisions to improve the well-being of other individuals, societies, and the global environment; and participates in civic life.” (NAAEE, 2011).

This study adopted the NAAEE framework which consists of four components of measure: (i) knowledge and understanding concerning a wide range of environmental concepts, problems and issues; (ii) a set of cognitive and affective dispositions; (iii) a set of competencies (cognitive skills and abilities); and (iv) appropriate behavioural strategies to apply knowledge in environmental contexts. Each of the components are interconnected and affect each other. Therefore, the framework must be understood as a progressive development towards environmental literacy of every individual's life. The study will only focus on the first two components knowledge and dispositions of the learners.

2.2 Environmental Education and Education for Sustainability Development

Environmental Education (EE) is closely linked and associated with Education for Sustainable Development (ESD). The linkages are reflected at both the goals of EE, as described in the Tbilisi Declaration whereas ESD based on the Agenda 21 (McKeown & Hopkins, 2005). The exploration of EE covering the natural and artificial, technological and social, economic and political, cultural and historical aspects

(Sabo,2011). Constantly, ESD also covering the three strands, environment, society and economy. Thus, in this context, EE can contribute directly to the environmental strand in a sustainability manner. In addition, a crucial aspect that both EE and ESD can work is through the behavior change. EE through knowledge can assists people to rethink their behaviours toward better stewards of the environment whereas ESD can lead to social tolerance, equity and justice which requires cultural changes in the interaction among people (McKeown & Hopkins, 2005).

The 2030 Agenda for Sustainable Development is a blueprint for peace and prosperity for people and planet, now and in the future. It consists of 17 Sustainable Development Goals (SDGs). One part of the SDGs, SDG 4 focuses on Quality Education, whereby Target 4.7 states that:

“By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development”.

Specifically under target 4.7.1:

“Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment.” (United Nation, 2015).

The goal focuses on the knowledge, skills, values, and attitudes required by citizens to lead productive lives, make informed decisions and assume active roles locally and globally in facing and resolving global challenges. This can be acquired through education for sustainable development and global citizenship education (covered within Topic 9 of the OUMH1603 module).

2.3 Environmental Disposition

Six disposition components based on the work by NAAEE (2011) are used in this study: Sensitivity, attitudes, personal responsibilities, self-efficacy, motivation and intention. The definitions of these terms are stated below.

Environmental sensitivity can be defined as one’s willingness to make positive attempts towards environmental issues (Cabuk and Karacaoglu, 2003). The level of consciousness and awareness of individuals of environmental sensitivity can be raised through appropriate environmental education.

According to Uitto, Juuti, Lavonen and Meisalo (2004), environmental attitude is a learned predisposition to respond positively or negatively with respect to the

environment or environmental events and their significant effects. Change of attitude from negative to positive, or from having no predisposition to positive attitude, or becoming more positive is possible through several approaches including learning, persuasion, and social influence.

Personal Responsibility is the ability to regulate one's own thoughts, feelings, and behaviours, along with a willingness to be responsible for choices made based on the social and personal results (Joshi & Rahman, 2015; Manstead, 2018; Mergler, 2008; Pan, Chou, Morrison & Lin, 2018).

Self-efficacy is defined as “one’s judgments of their capabilities to organize and execute courses of action required to attain types of performances” (Bandura, 1986, p. 391). Self-efficacy beliefs affect individuals’ choice of tasks, their effort, and their persistence. Self-efficacious individuals are likely to work harder on a task and persist for longer periods of time than less self-efficacious individuals.

Matsumoto (2009) described motivation as the willing investment of effort in aim of accomplishing a goal. Intrinsic motivation relates to the involvement in activities or endeavours for their inherent satisfaction that the individual experiences solely for participating in the act. Extrinsic motivation is related to participating in activities or endeavours for their instrumental value or recognizable expected outcome (Ryan & Deci, 2000).

According to Brönmark and Hansson (2002), environmental responsibility behaviour is determined by various situational factors such as knowledge of environmental issues and intention to act. However, information that illustrates the pattern of relations between knowledge of environmental issues and the intention to act on environmentally sound behaviour has not been widely explored (Shafii, Saudi, Pang Abu, Sapawe, Kamriding & Saudi, 2019; Yilmaz, Boone, & Andersen, 2004).

3. Research Methodology

The study adopts a quantitative approach using two survey instruments. The first phase of data collected through an online survey targeting 1861 new learners taking OUMH1603 course from OUM learning centres that distributed throughout Malaysia. The questionnaire contains two sections: a) demographic profile of OUM learners which comprises of gender, age group, and mode of entry, and b) Environmental knowledge component comprises of 10 questions that are based on 5-point Likert scale, including one question on prior knowledge of the environment. The questions were based on the content of Topic 10 (The Environment and Us) and are assessed using the knowledge cognitive domain components.

The second phase involved 180 learners who have participated in the first phase of this study. Data were collected using an instrument designed to examine the correlation between six components of the learners’ disposition with their learning experience; and a question to measure their intention to volunteer in environmental projects for their ‘Community Service’ course that they will enroll during their 3rd or 4th semester. The

instrument used consist of a set of questionnaires separated into two parts; 1) the disposition items; and 2) intention to volunteer. The collected data were analysed to determine the disposition of OUM adult learners, and the relationships between the measured dispositions to the intention to volunteer.

Data captured from both phases of this study were analysed using SPSS Software version 26.

4. Findings & Discussion

4.1 Knowledge Component

The first part of the survey totaling to 162 learners (56 male learners and 106 female learners) responded to the questionnaire which focuses on the environmental knowledge. The demographic profile shows that the three largest portions of learners were between 25-34 years old (43.8%) followed by the age group of 15-24 years old (27.8%) and 35-44 years old (21.6%). 75.3% of respondents have entered OUM through the normal entry qualification, while the remaining 24.7% respondents have entered through the open entry mode. This distribution is similar to the general distribution among normal and open entry learners at OUM.

Table 1 tabulates the findings on the six main components of the knowledge component based on the framework of assessment of environmental literacy by NAAEE (2011). The average mean score has been calculated and ranked to reflect the overall level of environmental knowledge acquired by learners that was measured in the first phase of the survey.

Table 1: Knowledge component (cognitive domain) based on framework of assessment of environmental literacy.

Knowledge Component (Cognitive domain)	Average Mean Score	Ranking
Physical and ecological systems	3.94	3
Social, cultural and political systems	4.23	2
Environmental issues	4.33	1
Solutions to environmental issues	4.23	2
Citizen/public participation	3.92	4
Action strategies	3.86	5

All six components were ranked based on the average mean score. The first rank with the highest score was on the knowledge about environmental issues. While, the second rank was distributed equally between two components: (i) the social, cultural and political systems; and (ii) the solutions to environmental issues. Third ranking was given the physical and ecology systems component, followed by the fourth rank that was given

on knowledge on citizen/public participation. Fifth rank, the lowest was given on action strategies. Overall, the average mean components ranged between 3.86 to 4.33.

The above ranking was used to improve the content of the module as well as to prepare additional learning material with a focus on action strategies. The rating for environmental issues is indeed positive, as this is the component that is foreseen to subsequently create a change in the learners' attitude and dispositions at large. Realisation of the state of environmental problems may create environmentally literate individuals who through the understanding of the social, cultural and political systems and the solutions to environmental issues could perhaps increase their capabilities to influence and possibility find practical solutions to resolve pressing environment issues. The third rank and the fourth rank on physical and ecological systems and on citizen/public participation require further attention. It is important for learners to comprehend the intricate relationship between natural systems and events that occur on earth, particularly in improving decision making and strategies that are proposed to resolve increasing critical environmental issues such as the climate change. Equally important is the understanding of public participation through environmental activities at community, local authorities or NGOs level which is not well explored within the topic. The focus of the topic was centred more towards individual responsibilities and action towards improving their own carbon footprint. Additional materials that have developed as an outcome of this finding also focused on individual action strategies. The assignment embedded in the course requires the use 21st century skills and knowledge on global citizenship education that the learners are exposed to through nine other topics in the course. The assignment requires direct involvement of the learners to resolve current issues in environment. Further efforts to strengthen the learning materials as well as create embedded curriculum as suggested by Liang, Fang, Yeh & Liu (2018) are being explored.

4.2 Relation between disposition and learning experience

The second part of the survey was distributed to 180 students who have participated in the first part of the study and only 39 responded to the second part of the research.

Table 2 summarised the findings to examine whether there is any correlation between student disposition and the learning experience in the course.

Table 2
Correlation

		Sensitiv ity	Attitude	Personal responsibi lity	Self- efficacy	Motivat ion	Intenti on
Learn ing experie nce	Pearson Correlati on	.317*	.426**	.695**	.526**	.593**	.676**
	Sig. (2- tailed)	.049	.007	.000	.001	.000	.000
	N	39	39	39	39	39	39

***. Correlation is significant at the 0.01 level (2-tailed).*

**. Correlation is significant at the 0.05 level (2-tailed).*

**. Correlation is significant at the 0.05 level (2-tailed).*

Table 2 shows that all the components of dispositions are significantly correlated to students' learning experience, with personal responsibility has the strongest positive correlation score ($r = .695$, $p < 0.001$) and the sensitivity component has a moderate positive correlation ($r = .317$, $p < 0.05$). This indicates that students' learning experiences of learning the course are significant, moderate to strongly correlated to their disposition of environmental sustainability.

4.3 Relation between learning experience and intention to volunteer in environmental projects

Table 3
Correlations

		Learning	Volunteer
Learning experience	Pearson Correlation	1	.778**
	Sig. (2-tailed)		.000
	N	39	39
Volunteer	Pearson Correlation	.778**	1
	Sig. (2-tailed)	.000	
	N	39	39

***. Correlation is significant at the 0.01 level (2-tailed).*

Table 3 shows that there is a significant strong correlation between students' learning experience of the course and their willingness to volunteer in environmental projects ($r = .778$, $p < 0.01$). This is an indication that students are willing to be involved in environmental projects, such as community service when they learned the course.

In this study, the researchers found that the students' learning experience correlated strongly with their intention to sustain the environment. This is in congruence with the study by Iman, Miarsyah, and Sigit (2019), who proposed that the knowledge of environmental issues has a relation with the intention to act. The sensitivity component, on the other hand, has a significant moderate correlation with the learning experience with indicates that students have this disposition whether they learn the course. This is most probably due to the reason that the roles of families, educational institutions, mass media and non-governmental organisations have influenced the development of environmental sensitivity (Turkum, 1998). It was also found that OUM students learning experiences is strong and positively correlated with their volunteering intention to participate in environmental projects, such as community service. This is supported by Measham and Barnett (2008) who found that it is important to emphasise on promoting education to enhance environmental volunteering.

5. Conclusion

The assessment environmental literacy framework adopted by OECD (2011) used in this study showed a good assessment tool to interpret both the level of knowledge of environmental sustainability and the level of disposition of environmental sustainability among OUM Open and Distance Learning (ODL) students. The level of knowledge of the OUM students were proven to be high ranging from average mean score 3.86 to

4.33. The environmental issues component ranked first and the last ranked was the action strategies. The action has been taken by revising the learning materials (Topic 10) to improve the content of the last sub-topic 10.5 Ecological Footprint and You. The results proven that in the effort to create environmentally literate adults, formal environmental education is necessary and must be embedded in the university courses. The environmental knowledge is crucial as without the basic knowledge of the environment one may not be able to make a sound judgement and decision making towards the environmental issues. In relation to this study, the students' learning experience correlated strongly with their intention to sustain the environment and concluded that OUM students learning experiences is strong and positively correlated with their volunteering intention to participate in environmental projects, such as community service. Based on the study and literature reviews conducted, the best way to increase environmental awareness among OUM adult learners through the formal education by introducing the environmental education through one of the university courses and designing practical assignments to participate in environmental projects.

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