

Effect of Environmental Education on Libyan Secondary School Students' Environmental Awareness, Knowledge and Attitude Affecting Environmental Behaviour

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Effect of Environmental Education on Libyan Secondary School Students' Environmental Awareness, Knowledge and Attitude Affecting Environmental Behaviour

Ismail Frhat S Dbab¹, S. M. Ferdous Azam¹

¹Graduate School of Management, Management and Science University, University Drive, Off Persiaran Olahraga, Section 13, 40100, Shah Alam, Selangor, Malaysia.

ABSTRACT

Globally, the value of environmental education is well recognised among communities. The task of environmental education is seen as one that will provide understanding and build resources for enhancing individual knowledge, awareness and attitudes that are relevant and vital to the conservation and protection of the ecosystem. The goal of this study is to analyse the effect of environmental education accessible through the school curriculum in Libya. Fundamentally, the mathematical method has been utilised to assess and evaluate the state of environmental education. This research explained that students of high secondary schools had a good outlook towards the environment. Strong understanding of these students is attributed to expanded sensitivity to environmental concerns across the scope of educational subjects. In addition, this research also showed that environmental education was only able to provide students with information, but was unable to alter the mind-set of the students towards environmental care. Awareness and attitude have a good but weak partnership. To shift the student's outlook towards more constructive is a rather difficult process and requires a number of considerations. However, environmental education tutors must retain this area in order to make it more important to Libya's growth.

Keywords: Sustainable education, Environment awareness, Schools, Students, Knowledge and Attitude.

1.0 Introduction

Climate change presents a new type of challenge for development. It is now widely acknowledged that climate change impacts amplify existing unfavourable conditions in developing countries (Farinha et al., 2018). Climate variability may be due to natural processes within the climate system or to variations in natural or anthropogenic external forcing (Mubiru, 2010). The primary cause of climate changes is the variation in gaseous content of the atmosphere, changes in the reflective properties of the earth's surface and alteration in intensity of sunlight reaching earth surface (Pickering and Owen, 1994). The causes of global climate change can also be traced to the activities of man that have resulted in an increased concentration of greenhouse gases in our atmosphere, including carbon dioxide, water vapour, methane, ozone, and nitrous oxide (Hartman et al., 2017).

It is apparent that major environmental and sustainability issues are fundamentally associated with the petroleum industry, a polluter by nature, in Libya. In a legal context it is also crucial for the role and importance of the judiciary in the enforcement of environmental legislation to be appreciated in most of the Arab countries, including Libya, where its key role has not perhaps yet been fully understood from the point of view of long-term environmental protection (Howlett et al., 2016). In future years Libya will face serious environmental challenges, not necessarily those associated with the oil industry, such as gas flaring, marine and groundwater pollution, but including declining per capita water resources and the loss of arable land. For example, water is in short supply with the situation deteriorating. Managing water as an economic resource and looking into the regional dimension of the water challenge are crucial for human welfare and economic growth and stability in the region (Kruger et al., 2020). As Libya industrializes and diversifies in line with the current economic policy, pollution-related health problems particularly in urban and industrial areas such as Benghazi and Misurata are bound to increase, with causes related to open municipal waste dumps and the use of leaded gasoline in vehicles and fossil fuels for power generation (Al-Naqbi & Alshannag, 2018).

Living organisms depend on components of the environment such as water, soil, and air, in order to survive on the earth. Accordingly, it is profoundly important to keep the components of the environment clean and fresh for the next generations. However, according to the Libyan Ministry, in recent decades, problems related to the environment have been dramatically increasing. Kamarudin, M. K. A., Idris, M., and Toriman, M. E. (2013) claimed that the influence of problems in the environment has been perceived since the late 20th century. According to them, insufficiency of natural resources for human beings is the biggest current environmental issue. One reason for such problems may be lack of environmental education. According to Okayama (2019), people's ignorance about environmental issues could be due to incomplete education, because education is the basic concept to generate awareness towards the environment. In order to show the outcomes of an incomplete education on environmental issues, people's knowledge about those issues should be explored (Nikolic, V., Vukic, T., Maletaski, T., & Andevski, M., 2020). According to Okayama (2019), Libya is lacking an effective 'environmental education policy'. Therefore, there should be a persuasive policy of environmental education focusing on issues about the environment (Borges & Benayas, 2019). Additionally, Kodama (2017) suggested that awareness of people towards environmental problems should be improved with the help of environmental education. In this way, people may realize how the environment is important for the sustainability of life.

The ultimate aim of environmental education (EE) is to promote environmentally responsible behavior (ERB). Traditional evaluations of environmental education have focused on knowledge gains and attitude changes with the assumption that a linear relationship exists between increased environmental knowledge and positive environmental behavior (Bellou et al., 2017; Thomas & Depasquale, 2016). Recent studies have shown that increased knowledge alone does not help to change behavior (Balasubramanian, S., & Shukla, V., 2020; Famiola & Wulansari, A., 2019). In an analysis of the variables related to the development of environmentally responsible behaviour, (Sutton & Gyuris, 2015) found that cognitive knowledge

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of the issue, positive attitudes towards the environment, locus of control and desire, or intention to act, were causally related to responsible environmental behavior. Long-term evaluations of students' developing conceptions concerning the environment are important for understanding the relationship between student conceptions and their environmental behaviors and decision-making (Abner et al., 2019).

Environmental awareness is of fundamental importance towards ensuring sustainable use of resources and sustainable development. Today's learners are the leaders of tomorrow and they must therefore be equipped with environmental knowledge to effectively manage resources and to see to it that the principles of sustainable development are realised. Lack of environmental awareness and insufficient information will hamper the use of resources in an environmentally responsible way and sustainable development (Amaral et al., 2015; Fawehinmi et al., 2020; Leal Filho et al., 2018; Y. L. Liu et al., 2019; Owusu et al., 2017; L. Wang et al., 2020). It is realised that most of the learners at middle and high schools in Libya lack the basic knowledge with regard to the need in preserving, protecting and conserving the environment. They do not understand the care for the environment. This is evident in schools where there are elements of littering, soil erosion, mismanaging of both the natural and physical resources and limited creative participation in environmental campaigns, projects and programmes by the learners (Guizzardi et al., 2017; Han et al., 2019; Hsu & Feng, 2019). These learners need to be conscious about the environment and learn to be sensitive towards the environment.

It is of utmost importance for the learners to be taught through environmental awareness programmes to be responsible citizens. Such longitudinal research is particularly important for young participants, as intervention effectiveness has been found to be greater among participants who were 18 years old or younger (Amado et al., 2017).Zutshi et al. (2016)explained that environmental awareness, knowledge, and commitment, are necessary to achieve environmental protection and restoration. The evaluation of environmental awareness, knowledge, and attitude conducted for this study involved the students from secondary school as participants. This study provided data for the analysis of levels of AKA components among the students evaluated. Evaluation of the levels of AKA should be an integral part of EE curriculum development, especially in Libyan higher education institutions.

2.0 Literature Review

Environmental Education

The main purpose of Environmental Education has been to develop in students an understanding and appreciation for the natural environment, through hands-on experiences (Jodoin, 2020). As a result of economic and moral battle between different stakeholders, environmental studies have been full of contradictions, controversies, and changes over the past few decades (Finnveden et al., 2020; Han et al., 2019; Q. Liu et al., 2019; Y. L. Liu et al., 2019; Tezel & Giritli, 2019). For example, the challenge presently is to find the balance between zero footprints and emissions, and what is good for the country economically.

Environmental Education is a process, which is holistic and involves the cognitive; the affective and psychomotor domains of human development in order to identify problems, find solutions and prevent new ones. Environmental Education can guide individuals and groups in making wise decisions in maintaining the quality of the environment and the quality of life (Cao & Chen, 2019; Khare, 2020). The objectives are clearly reflected in the aspects of environmental literacy. They indicate that the aspirations of Environmental Education go beyond developing the learners' knowledge and awareness of environmental concerns to active participation to resolve environmental problems. These objectives may also give Environmental Education a better direction. For the goals and objectives of Environmental Education to be effectively achieved, there is a need for the guiding principles of Environmental Education (Helm et al., 2019; Mamun et al., 2019; Wan et al., 2017).

Hartman et al., (2017) applied a survey to identify students' responses to environmental issues through action, which remain a key area for study. The energy incited by this study was evident in their work, their willingness to talk with researchers informally about their learning, and in the actions, they undertook to spark transformation. The results reflect that in our shrinking world, sustaining the environment relies on students becoming problem-solvers, critical-thinkers, and ultimately, change-makers. There is much debate about whether the foundation of environmental education (EE) is a part of Education for Sustainable Development (ESD), whether ESD is a part of EE, or whether the two must be considered as separate entities (Al-Naqbi & Alshannag, 2018; Bellou et al., 2017; Farinha et al., 2018). Savelyeva and Douglas (2017) and Shelest et al. (2017) gave an answer to the question regarding influences of the types of attitudes that individuals within a given culture are likely to develop, the types of environmental behaviors that individuals are likely to adopt, and more generally, beliefs about how to solve environmental problems.

The same factors are influencing the behavior of students, namely their attitude to the environment and to the problems related to it. Realizing the huge scale of this phenomenon, decision-makers of world rank and lately, nationally, are trying to establish firm and urgent measures for saving nature, for the preservation of the human environment; measures that are also covered by the education system.

Another point of view on environmental education was supported by (Liakos et al., 2019; Nikolic et al., 2020) and in the results of their research, they demonstrate the positive correlation between the three elements of ecological education, environmental knowledge, and ecological value. In contrast, (Al-Minhas et al., 2020; Cao & Chen, 2019; Yanti et al., 2018), proposed a new ecological education for the environmental education taking into account the new generation of Facebook users and the impact of computers on new gaming styles by teaching simulation games, a kind of re-education of the environment with educational activities that helps students to be involved in the simulation of ecological education situations and to help them to meet the needs and applicability of solutions in real life in different situations. Wan et al. (2017) proposed digital photography and journaling in the evaluation of field-based environmental education programs for students' development of attitude and environmental behavior.

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Trahan et al. (2017) proposed and encouraged the research of environmental education with direct application to engineering, chemical, and material fields to improve the industrial domain and ensure sustainability education for a new green market. Applying virtual reality and the possible effects of environmental education can also stimulate students ethical attitude, a topic under research for (Göçer & Sevil Oflaç, 2017) and the effects of environmental education.

In his studies, (Balasubramanian et al., 2020) suggests that faculty members need to identify gaps in ecological education and be more involved in identifying, developing, and implementing methods to ensure the development of students with competencies in ecological education as the future generation and future citizens. Environmental education is an opportunity for educational institutions to try to develop and contribute to the understanding of the relationships between human culture and human life, individual responsibility and society towards the environment, and the social action of personal behavior. (Borges & Benayas, 2019) consider that education for the environment has a significant influence on ecological awareness, adaptation of everyday lifestyle, and modeling of consumer behavior. Moreover, higher education institutions have recently recognized the importance of integrating sustainability aspects into education in order to make this impact focused and explicit.

Larrán and Andrades (2015) identified the importance of students' role as leaders, addressing their initiatives, activities, and the promotion of environmental education and protection. Young people are one of the most promising sectors of the society, they can be the promoters of change. Involving young people as environmental advocates can be a successful implementation of environmental protection. In the meantime, environmental education must include students as visionaries and creative thinkers. Issock Issock et al. (2019) mentions students are agents of change and are part of sustainable development's effects and it is time to transform the student's potential into action. Tezel and Giritli (2019) mentions that schools must put students at the centre of their activities for environmental education because students are producers of outcomes and their involvement is fundamental to all improvement. Studies in environmental education have received remarkably little attention of constructivism as a theoretical research foundation. Between 1989 and 1994 less than five research reports published in the journal of Environmental Education were based on constructivism except (Kiyenko, 2019) that reported on the young adolescents' perception on environmental issues which was explicitly constructivist based.

Awareness, Knowledge, and Attitude (AKA)

Regarding knowledge, (Jodoin, 2020) emphasized that students should acquire appropriate range of knowledge, understanding, and concepts about the environment so that critical judgment can be achieved. Further, experiences and reflection in the environment should be allowed to refine "environmentally focused skills, ...further relevant knowledge, and development of appropriate attitudes and environmental awareness".

These three components, attitude, knowledge, and awareness, play an important role on the impact students will have throughout their lives inside and outside the classrooms. According to the North American Association of Environmental Educators (NAAEE), levels of awareness are important goals in EE between kindergarten and 3rd grade. Levels of knowledge are important goals from 3rd through 9th grade. Levels of attitude are important throughout the entire educational career (Scholtz et al., 2017).

Balasubramanian et al. (2020) reflected upon the concept of forming attitudes in order to build on ecological literacy. This ecological literacy should not be interpreted as the knowledge of facts and concepts only, but “the knowledge necessary to comprehend interrelatedness, and an attitude of care or stewardship”. Therefore “knowledge, the attitude of caring, and a practical competence are the basis of an ecological literacy”. Avissar et al. (2018) stated that awareness and knowledge of environmental processes and systems play an important role in EE. However, these are not the only factors affecting the behavior outcome. Behavior is what people do, whether it is environmentally appropriate or inappropriate (Borges & Benayas, 2019). Behavior in general is supported by knowledge and attitude but there is not a direct cause-and-effect progression from knowledge to attitude to behavior (Howlett et al., 2016).

Awareness was studied along with environmental knowledge and concern by Vaughter et al. (2016). In this study the authors concluded that awareness and concern scores were significantly higher than knowledge levels in high school students. They linked this result with the fact that a primary source of environmental information is electronic media (Mishra, 2017) whereas awareness and concern can be picked up with little substantive knowledge.

Karami, Shobeiri, Jafari, and Jafari (2017) conducted an investigation on 386 students from the universities of USA, UK and Denmark. The results of the research and the suggestions are: There is a meaningful relation between economic, political, technological dimensions of the dominant social paradigm and the students' environmental attitudes. The higher the dominant social paradigm points are, the lower the perception related to the environmental issues is. Environmental attitude points change from country to country. This is because every country has a different socio-cultural structure. Similarly, Shah and Naghi Ganji (2019), in their study, conducted in Bursa, during 2016- 2017 school year. By analysing the reports prepared by the directors of 14 schools chosen for the project and the official reports prepared during the supervision, the effect of the activities on creating environmental awareness in children was researched. It was observed that it is one of the factors which makes the environmental education difficult that the teachers do not have efficient awareness of the environment.

In the same manner, Bechtel, Corral- Verdugo, Asai, and Riesle (2006) in their studies on environmental attitudes and knowledge of high school students, they conducted a survey and test questions to the students before and after giving them a 10-day long environmental education course. After the course, there was detected important differences in both the level of the students' knowledge and their attitudes. There was detected increase in the rate of 60% in students' knowledge level about the matter Low, Gao, and Teo (2016), they analyzed the change in attitudes, motivations and behaviors of Canadian students towards ecology after performing an 8-month long environmental education program. They also analyzed the possible effects on

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developing the changes in attitudes, motivations and behaviors of their families towards ecological situations. At the end of the research, no any meaningful difference in ecological attitudes of the students was found, and the effects of the research on the students and their families were found quite weak.

Alferaih (2017) studies whether the environmental attitudes and behaviors of Libyan and Turkish students studying in the universities of Turkish Republic of Northern Cyprus are efficient or not. The study aims to get information about the relationship between these attitudes and behaviours of the students and the classes and departments they study in, and to make a general evaluation about efficiency and effectiveness of the environmental education in our country. The participants are 300 Libyan and Turkish students studying in 2015-2016 academic years. This study, in which quantitative research method and relational screening model were used, was done by getting answers from the students to questions of the survey, which was used as a tool for collecting information, by giving the students enough time. While gathering the data, environmental knowledge test, survey of attitude and behavior were used.

This study proposed five hypotheses and modelled the following structure on the basis of above context (Figure 1).

H1: There is significant positive effect of environmental education on student's environmental awareness.

H2: There is significant positive effect of environmental education on student's environmental knowledge.

H3: There is significant positive effect of environmental education on students' environmental attitude.

H4: There is significant positive effect of environmental education on student's environmental behaviour.

H5: There is significant mediating effect of environmental awareness, knowledge and attitude on students environmental behaviour by the environmental education.

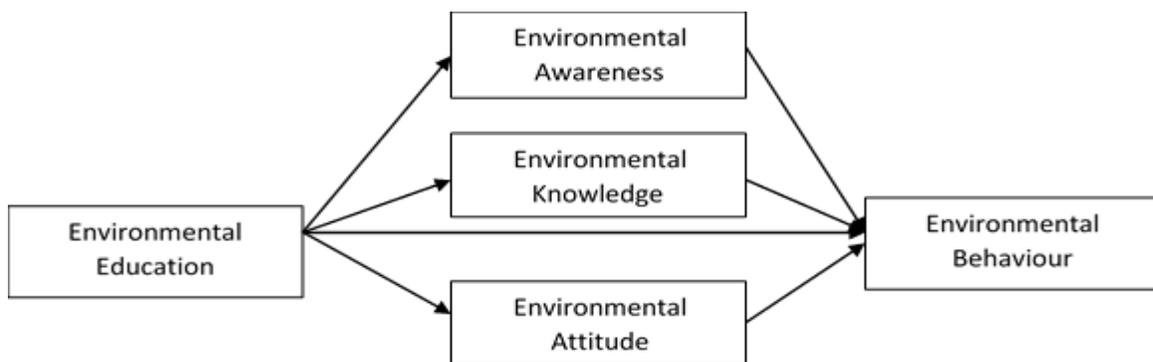


Figure 1: Conceptual Model

3. Methods

A standard rating questionnaire was developed for the purposes of this study. The developed questionnaire passed through many stages, explained and guided by recommendations. First, by reviewing academic literature explained earlier in chapter two, some questionnaire items were taken directly from previous studies in the same field, such as respondents' demographic aspects. Second, some items were developed specifically for this study, such as environmental activities in the study curriculum. These items were elicited and checked through literatures review. Third, a small group of subscribers and experts have reviewed the preliminary version of the questionnaire to assess the face validity of its selected items and to ensure that selected items reflect the study's dimensions and factors. Some research questions and scales were reviewed and revised accordingly. Questionnaire drafts were prepared by a number of academic scholars, and pre-tested with different groups of potential samples to assess whether the questions were appropriate and representative for both proposed independent and dependent factors, and to map the possible options for survey questions. This study conducted a pilot test with 50 respondents from four public schools of Libya as a convenience basis before finalizing the instrument. Necessary alterations were then done to the questionnaires before conducting the research. In this study, content validity was measured through three popular techniques. These were (1) the experts, proficient and skilled in same area, opinion; (2) the detail definition of each construct in relation with theory; (3) measuring internal consistency by Cronbach alpha. Reliability analysis was used to test internal consistencies of each construct ensuring a high degree of generalization across items within the test. The instrument consisted of 41 questions covering different aspects of the current global and local environmental issues with five-point Likert scale questions. The "Awareness" section contained 09 questions that measured perception and concern towards environment. The "Attitude" part had 09 questions to evaluate the sense of responsibility of participants. The "Knowledge" part had 10 questions to measure their knowledge about environment. There were 08 questions on environmental education as curriculum. Lastly, there were 05 questions pertaining to environmental behaviour and commitment towards its sustainability.

In this study, the population is Libyan secondary school students. Student registration was the most appropriate sample frame for this study. This study targets only Libyan students pursuing education from public secondary schools at Tripoli, Bayda, Benghazi, Sabah and Misrata. There are more than 56,000 student studying in these schools. However, due to the confidentiality universities do not share the information with the researcher. Hence, this study applied convenience sampling for this study. In relation to sample size, researcher suggested that sample size is as long as more than 50 and less than 500 is adequate to perform final test. A total of five schools agreed for collaboration with the researcher and a total of 500 questionnaires were distributed where 410 completed questionnaires were returned and used by researcher for data analysis. An independent research assistant was utilised for administering of questionnaires and data collection. The research assistant was also briefed about the subject matter in order to assist respondents who needed clarity on questions.

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This study maintained confidentiality for the data and ensured privacy for the respondents. Mention was also made that participation was voluntary and respondents could withdraw from the study at any time they wished to. The SPSS calculated raw data from the surveys. Descriptive statistics for the demographics (primary and predictor) was examine by the means, frequencies, standard deviation, and range. To ascertain the influence of the biographic variables on dependent variable, inferential statistics such as the T-Test and ANOVA were computed. Correlation analyses were used to determine the relationship between independent and dependent variables. This software calculated the MLR of two or more dependent and independent variables. The study involved using this software for data analyses with a significance level of .05.

4. Results and Discussion

The aim of the study was to investigate the influence of environment education on knowledge, attitude and awareness of environment and environmental behaviour in school children in Libya. This chapter presents the statistical methods used for data processing. Reliability test of pilot research was performed on a group of 50 students, and the analysis where done later on basis of validation, correlation, and regression analysis. A survey was carried out between December,2020 and January, 2021 for a period of 30 days. Approximately 500 sets of questionnaire were distributed to achieve an appropriate sample size of 410. Personal distribution of questionnaires was conducted.The majority of respondents of study were aged 15 to 17 years (78.5%), followed by those aged 12 to 13 years (21.5%). More than half percent of the students were male, while 48.1 percent were females.All the variable means were higher than two. It ranged from 2.3152 to 3.5061.

Factor Analysis (FA) is a multivariate approach that is commonly used to calculate construct validity. The correlation matrix is calculated for all variables in four stages of the FA process, factor extraction, factor rotation, and final decisions on the amount of underlying factors are made. In inferential testing, it is commonly used and is reliable in avoiding type-one errors. Factor extraction is often used for an Eigen value of more than one (1) applied as per guideline.

As a rule of thumb, only variables with factor loadings of 0.32 or more are considered useful. The cut-off point of the loading size would depend on the specifications of the analysis. As the loading size is influenced by the homogeneity of the survey scores, this study would be useful for an interpretation of a higher load of 0.4. Under the five variables of this study, the combined results of factor analysis show that 18.35 per cent of variations explain.

Table 1: Exploratory Factor Analysis

Variables	EE	EAW	EK	EA	EB
Cronbach Alpha	0.847	0.913	0.945	0.733	0.727

EE 1	0.532		
EE 2	0.437		
EE 3	0.566		
EE 4	0.712		
EE 5	0.605		
EE 6	0.546		
EE 7	0.675		
EE 8	0.762		
EAW 1		0.654	
EAW 2		0.764	
EAW 3		0.438	
EAW 4		0.648	
EAW 5		0.637	
EAW 6		0.625	
EAW 7		0.654	
EAW 8		0.592	
EAW 9		0.565	
EK1			0.344
EK 2			0.654
EK 3			0.735
EK 4			0.217
EK 5			0.738
EK 6			0.773
EK 7			0.688
EK 8			0.735
EK 9			0.277
EK 10			0.748
EA1			0.651
EA2			0.649
EA3			0.653
EA4			0.787
EA5			0.450
EA6			0.634
EA7			0.475
EA8			0.355
EA9			0.664
EB 1			0.684
EB 2			0.568
EB 3			0.658
EB 4			0.677
EB 5			0.645

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This study evaluated data against the all-important assumption of structural equation modelling. The fitness indices indicated that the data fit well with the survey data. All overall goodness-of-fit statistics were within acceptable fit. The Normed Chi-square was below 5, with RMSEA and RMR equalling less than 0.10 and 0.08 respectively. This result was supported by the values of normed fit index and other fit indices that were well above the desired level, indicating support for the conceptual model. Consequently, these results suggest that the conceptual model was well and adequately fit and gave confidence to test proposed hypothesis.

Table 2 shows the results for hypothesis testing including beta value, significant value, and critical value. Results revealed that all hypothesis were significantly supported with p-values less than 0.05. Not surprisingly, all significant factors have positive effect on environmental behaviour.

Table 2 Path coefficient for the Final Model for hypothesis testing

Variable	Variable	Path Coefficients	Sig.	Critical Ratio
Environmental Awareness	← Environmental Education	.432	0.000	12.053
Environmental Knowledge	← Environmental Education	.448	0.000	8.157
Environmental Attitude	← Environmental Education	.284	0.000	5.381
Environmental Behaviour	← Environmental Education	.287	0.000	4.798
Environmental Behaviour	← Environmental Awareness	.125	0.000	3.755
Environmental Behaviour	← Environmental Knowledge	.097	0.003	2.845
Environmental Behaviour	← Environmental Attitude	.058	0.048	1.937

One of the objectives of this thesis is to investigate the mediating effect of awareness, knowledge and attitude on the students' positive environmental behaviour in Libyan secondary schools through environmental education. To measure this mediating effect, the researcher presents the direct, indirect as well as total effect results below in Table 4.12; 4.13 and 4.14. Based on the findings, it is clear that there is significant mediating effect of environmental education on students' awareness, knowledge and attitude of environmental behaviour. Therefore, the H5 is accepted.

Table 3 Mediation Analysis

	Environment awareness	Environment knowledge	Environment attitude
Direct Effects			
EB	.235	.205	.201
EE	.021	.073	.062
Indirect Effects			
EB	.000	.000	.000
EE	.026	.041	.130
Total Effects			
EB	.235	.205	.201
EE	.040	.124	.148

Education at school is also the primary medium for influencing the optimistic perceptions and actions of individuals towards environmental treatment. According to traditional thinking, the attitude of individuals to environmental issues can be changed by making them more knowledgeable through environmental education. These theories are related to the belief that, if we make anyone more informed, they will be more conscious of existing environmental concerns or problems and will therefore feel more accountable for changing the cause of pollution.

According to Filho (1997), environmental education is the strongest way to communicate the awareness and importance of environmental sources in order to enable citizens to utilise environmental services in a more productive fashion. School curriculum plays an important part in the development of highly knowledgeable pupils. Schools are the major organisations that seek to develop students' environmental awareness. In order to create a sense of obligation within the individual, this environmental knowledge needs to be educated from the early life of the school. However, the degree of efficacy of environmental education amongst schools is still unequal and still minimal (Pudin et al., 2004). The major challenge is the absence of more basic environmental topics in the academic measure of the research, which implies that students may not have the same experience of environmental awareness (Choudhary et al., 2019).

Individual knowledge and attitudes towards the environment are key and essential tools to enhance individual perceptions of the environment. In order to develop student awareness on environmental conservation, environmental education is therefore necessary. Through a high

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degree of environmental consciousness, it will implicitly change the actions of students to behave positively. Generally, students' expertise is strong, whereas students' environmental awareness and sensitivity are poor. This research is comparable to Aroff and Kasa (1987), who observed that studying more successfully was focused on psychological principles such as observation, learning, feeling, and integration. Information acquired from classroom sessions alone is not adequate to form the student's sense of obligation for environmental awareness. As a consequence, the teacher plays an important part in teaching and fostering the correct mindset and obligation for the world of the pupil (Alsagoff, 1992). The success of environmental education provided would result in a strongly accountable culture for ensuring cleanliness around them. Information on school students' awareness and perceptions towards environmental development at the national level have been gathered in a variety of countries. For example, Bechtel et al. (2006) reviewed four such nation-wide studies in Mexico, the United States, Japan, and Peru, which explained the knowledge and cross-cultural analysis of ecological belief structures.

The goal of environmental education is to foster understanding and responsibility of economic and environmental interdependence, integrating the skills required to safeguard the climate (Hoerisch, 2002). Several schools have formally classified their students as another major in education. The different education offered to students would have an effect on the equality of skills acquired. Based on studies by Choudhary et al. (2019) at the University of Delhi, India, the majority of non-science-based students replied half of the environmental issues incorrectly, this study clearly indicates that non-science-based students have no awareness of environmental issues compared to science-based students. However, both the scientific and non-scientific background have assumed that the individual is primarily responsible for the protection of the environment, while the secondary responsibility lies with the government, industry and environmental groups. Study in China also explained that environmental education has become an elective course in secondary schools and that extra-curricular activities related to the environment will be sponsored by the State Education Commission (McBeath & McBeath, 2009).

According to Loughland et al. (2003), environmental education is not based on the assumption that children know and believe, but strategy development needs to be based on children's understanding. In Turkey, Tuncer et al. (2005) clarified that the style of education is one of the issues of the group since there is a dissimilar introduction of the school in another school. His study also explained that private school students are more informed regarding environmental concerns, more responsible for regional environmental issues, and that they still have a good response to address challenges relative to public school students. This study showed that private school students had parents who were more qualified and appeared to be working, relative to public school students, and this impact can be measured at the parents' level of education. The study further clarified that the school plays an important function, depending on the skill and expertise of the teaching staff, the level of education, the programme offering and the social environment (Gamoran & Nystrand, 1994). This has demonstrated that schooling, other than school hours, is also essential for enhancing students' awareness and actions towards the community. According to a survey conducted in Singapore, students' perceptions of the highest source of knowledge have come from newspapers, magazines and books (Hutaibat,

2019). In the study, most of the students claimed that the primary source of knowledge was reading books, magazines and newspapers (37.5 per cent), followed by 'general education at school' (30.7 per cent) and 'television and radio' (16.2 percent).

The findings revealed that the majority of students were mostly affected by the environmental issues (72.1%) where 67.7% of respondents had a stronger understanding of environmental problems. In comparison, students (61.1%) were worried with their local environmental concerns. The findings revealed that, overall, environmental understanding of environmental subjects was strong. This finding has been reported elsewhere too (Nabsiah, A.W. & A. Ismail, 2001). Earlier findings are still agreed on the result (Chua, K. B., Quoquab, F., and Mohammad, 2019). This study looked at environmental issues among students in America. The finding is also compatible with other studies (Dalvi-Esfahani, M., Ramayah, T., & Rahman, A. A., 2017) which have shown that Malaysians usually have fairly positive understanding of the basic science idea. In addition, these results were consistent with other studies (Aminrad, Z., S.Z.S. Zakaria, S. Hadi & M. Sakari, 2012) in which students' environmental perception, attitudes and actions were observed in Singapore.

The analytical assessment revealed that the students had a strong degree of environmental awareness in this research. This high degree of awareness may be attributed to the media which may have an effect on their schooling in these later years where more environmental subjects are included. The finding has been verified earlier (Mensah, 2020). The research on assessing environmental awareness among university students found that most of them had a high degree of attitude as well as knowledge. This may be attributed to the disparity in their personalities, affected by their lifestyle and families, and further to the focus on environmental attitudes and awareness by the government and the media in the years to come. The high degree of awareness can often rely on the knowledge of the atmosphere of the teacher (Nagel, 2004). There can be avenues to improve people's environmental awareness, such as encouraging flyers, seminars on environmental concerns or mass and mobile media (Cottrell, 2003). Some researchers have therefore confirmed that a rise in environmental awareness, a healthy mind-set and, as a consequence of this shift in action, environmental conservation is taking place (Luna-Arocas, Danvila-Del Valle & Lara, 2020).

Overall, the findings revealed that 82.8% of respondents accepted on environmental concerns. This indicates that the most of the student's outlook towards environmental concerns was constructive. It is represented that the majority of respondents agreed on environmental issues. This showed that most respondents gave greater attention to the world than they did to their specific needs (Kyriakopoulos, Ntanos & Asonitou, 2020). In general, the attitude of students towards environmental subjects was optimistic, but in some subjects they displayed a negative attitude when they had some personal conviction that sacrifice could be needed (Mensah, 2020). Many social scientists have found out that the optimistic approach is conditioned by primitive views, including a broad variety of beliefs and behaviours on more complex environmental issues (Borges & Benayas, 2019). On the other side, the optimistic outlook can come from environmental entertainment, such as outdoor or indoor activities (Kusumawati, Utomo, Suharyono & Sunarti, 2020).

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The statistical analysis revealed that there was a positive correlation between awareness and attitudes regarding environmental problems, whereas the relationship between awareness and knowledge was slight. There was also a weak relationship between awareness and attitude. It is provided that students with a high level of awareness have demonstrated that their attitude towards the world will improve, but knowledge does not rely on awareness. Students can learn from other opportunities such as parents, teachers or the media (Nagel, 2004). but the outcome can indicate uncertainty elsewhere (Chakraborty, Singh, & Roy, 2017). He has demonstrated that the rise in awareness increases the attitude. In addition, one of the studies has shown that there is a connection between awareness and a good attitude. As awareness improves, there is a rise in optimistic attitudes towards subjects (Cole, Quinn, Akturk & Johnson, 2019). There could be a high association between knowledge and attitudes due to certain demographic variables such as age, income, and so on (Fehr & Andrade, 2016). The association between concern and age has been documented. They claimed that younger people appeared to be more serious with environmental quality than older generations. In addition, other researchers clarified the connection between age and environmental subjects (Janmaimool, 2017).

Based on the methodological study performed by Aminrad et al., (2013), the interaction between perception, information and attitudes has shown that knowledge and attitudes have poor relationships. The environmental education offered at the school will offer students a high degree of awareness regarding environmental development, but will not be able to shift the student's attitude towards environmental conservation. According to previous study by Said et al., (2007), the majority of students gained knowledge of nature by watching documentary film on television and the student's participation in environmental activities, such as outdoor activities, community projects and campaigns, was rather controversial among students. Participants with low environmental experience can often learn from the environmental information acquired mainly from the media. However, Malaysian companies believe that television was the most effective source of information on the environment (Nurizan et al., 2004). This study is comparable to the research performed by Shojaei and Bolvardizadeh (2020) where more than 50 per cent of students aged 12 and 13 claimed that television was the primary source of environmental knowledge. Consequently, the media can profit from improving its use of formal schooling in classrooms (Aini et al., 2003). Overall, this research explained that most students only acquired high awareness of environmental concerns but little attention to environmental care practices. The accountability of the students for environmental care would also be low. So this will clearly explain why knowledge has a weak relationship with the attitude of students towards the environment.

Henderson (1984) suggested that environmental education is sometimes related to literature that describes outdoor experiential education. In Canada, the propensity to merge school curricula definition with outdoor sports, school-based initiatives and camping programmes at all levels makes this partnership fair (Henderson & Potter, 2001). This is analogous to the education framework in Japan, where there is no unique topic for environmental education, however the ecological point of view of the overall curriculum is included in each subject (Kodama, 2017). The Japanese school education system also focuses on an outdoor project that will provide children with regional values and challenges through hands-on learning to improve students' knowledge and awareness (Kodama, 2017). Nowadays, though, students'

understanding of environmental problems can be gained not just from educational institutes, but also from a number of other outlets, such as television, journals, the internet and several more. Normally, students' daily lives are surrounded by this kind of resource that works both as a material for entertainment and education. This may be utilised by policy makers to establish rigorous environmental education for this platform, as both educators and students have a common source of environmental awareness. However, the school remains the primary organisation for supplying students with schooling and environmental-related information. The instructor must then perform an important function by giving a positive example and still add a noble value to the safety of the environment. Overall, advances in the area of environmental education also reflect positive hope and have a strong chance to step ahead. Environmental education tutors must ensure that this sector is sustained such that it becomes more important to Libya's growth.

5.0 Study Limitations

It is possible to conclude, but not possible to determine, the triggers of outcomes of this research, which suggests this study simply lays out possible influences but may not identify the root causes. It might be fair to presume, though, that there are two forms of forces affecting results, including issues relating to the participant, such as lack of time or inspiration, as well as issues connected to the social and systemic, such as an absence of instructional programmes targeting the environment. A part of the educational implications revolves around the manner in which institutional interventions are placed in place to support and encourage the awareness of teachers training and education, particularly when it comes to sparking enthusiasm and encouragement among students by making the use of extracurricular activities linked to sustainability on campus more common. In the light of a more prosperous potential outlook, it is crucial that higher education works to provide access to additional knowledge and learning resources in this area, both in formal and informal environments.

6.0 Recommendations

It is highly advocated that well-qualified educators be enrolled in the high schools so that students are equipped with what is required. A school garden's great potential to further foster environmental knowledge in secondary school students is that it can present to them numerous kinds of plants and animals that need to be protected. The education system should place special emphasis on environmental awareness in our secondary schools. This would have the students involved in developing environmental awareness skills, as well as inspiring them to improve these skills. Besides from the environmental problems, our activities provide diverse options with different therapies. The Libyan government supports further studies to be conducted in various areas of the country.

7.0 Conclusion

The study concluded that a high degree of understanding and information plus a positive outlook on the part of students will emerge from the condition of the family, teachers, the media, private reading and school education with regard to the climate, which enhances the environmental viewpoint between students and society as a whole. The report suggested other significant variables to be researched, such as age, schooling, incomes, ethnicity, urban/rural impacts on the

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climate, among others. Schools can, above all, have links to environmental facilities and knowledge in order to improve environmental sources and subjects in school libraries. These materials draw the attention of students and instructors to study and, as a result, to successfully teach sustainability issues such as global change, waste control, ozone, acid rain, greenhouse gas effects and environmental impacts. The research also suggests that the topic of environmental education is deemed an independent syllabus in the Libyan education framework.

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