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Environmental education between cultures and societies

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Abstract

Advances in elementary school curriculums supply theoretical lessons about environmental education; such an approach does not hold much information according to the topic, indicating that younger pupils' level of knowledge is really depressed. In order to ensure effective environmental education, learning must be taught utilising a short piece of theoretical lesson that only offers the fundamentals and provides experiential experiments that illustrate scientific principles. Such activity gives even the weakest pupils' the motivation to study the subject in a fun way and allows the pupils' to learn at different levels thereby providing them with a practical and theoretical understanding of the material. Holon Institute of Technology (HIT) prides itself on its advanced academic achievements, application of innovative techniques that lead to creative teaching and new technologies. The students (Jews and Arabs) from HIT took part in action learning course that teaches environmental education by experience at Arab elementary school.

Keywords: Environmental education, elementary school, Hebrew, Arabic.

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1. Introduction

In the past decades, demographic and cultural changes are reshaping the Israeli society: It changed from a society constructed of a clear majority and minority to a society that is constructed of four central sectors or 'tribes' that resemble in their size: secular; national-religious; orthodox and Arabs. In the lights of this reality, a transition is needed from the common perception of 'majority and minority' to a new one that is based on a partnership between the sectors that construct the Israeli society. The president, in coordination with the Planning and Budgeting Committee of the Council for Higher Education, has launched the project 'Israeli Hope in the Academia', since the academia has an essential role in shaping the 'new Israeli order'. The project's aim is to base the campuses as spaces for creating shared Israelite society that enables maintaining the unique identity of each group, to express the talents and excellence of the Israeli society, to promote a united vision of partnership in the universities and colleges and to develop an Israeli intellectual, social and diverse leadership that is aware and attentive. In Israel, there is a separation between the Jewish education system and the Arab Israeli education system. The decision for this separation has both practical and ideological explanations. There are those who claim that the demographic realities dictate this separation. However, it is revealing that the policy since the founding of the state was to strengthen and preserve the Jewish identity amongst the Jewish sector, and coming to terms with the national identity of the Arab Israeli pupils. The ideological component is the more important of the two; this is evidenced by the fact that even in places where it would be possible to establish a combined education system, like in mixed cities like Ramla. Holon Institute of Technology (HIT) has developed an integral system of environmental education and training. The course is named 'Green Ambassadors', and the goal is to educate the next generation with environmental education. The course is divided into six groups; each group contains three to five Israeli Hebrew speaker students, whose goal is to provide information on environmental to Arabic school with Arabic speaker pupils'. The teams of the fifth-graders and sixth-graders from 'Al Omariya' school in Ramla have been chosen to take part in the project.

1.1. Environmental education

Environmental education is the key for creating a clean energy future for not only the nation but also the world. World energy consumption relies heavily on coal, oil and natural gas. Fossil fuels are non-renewable, that is, they rely on finite resources that will eventually dwindle, becoming too expensive or too environmentally damaging to retrieve. In contrast, renewable energy resources, such as wind and solar energy, are constantly replenished and will never run out. Due to the rising need for professionals and academics with a background and understanding in the energy field, HIT developed an integral system of environmental education and training and a new programme at the Faculty of Electrical Engineering. The Renewable Energy Programme gives the students technical and practical aspects of energy use (technology and methodology of the study) and energy efficiency. The programme also deals with minimising the environmental impacts of energy use, as well as with energy economy and environmental policy. This article presents a new challenge. Teach environmental issues with language difficulties. Israeli Hebrew speaker students teach environmental education in Arab school with Arabic speaker pupils'.

In Israel, there is a separation between the Jewish education system and the Arab Israeli education system. The decision for this separation has both practical and ideological explanations. Most schools in Israel and throughout the world are appraised by their ability to transfer a large quantity of information to the students over a 12-month period (Arar, 2012). As the amount of theoretical material is very large and the time teachers have to teach is minuscule, it is nigh impossible to ensure that students understand the material during the lesson. Such an issue of teaching a lot during insufficient time causes teachers to develop certain teaching patterns during the inaugural years of their teaching careers. Such a pattern is built by training teachers during their teaching studies. When a teacher approaches the class for the first time, he/she uses this specific pattern. If such a pattern

does not work, the teacher changes and improves it according to how he/she supposes it will be more efficient in class. The pattern holds in the teacher's mind and nature and defines a path to his/her future lessons (Simmons et al., 2010). As teachers face time pressures, it is difficult for them to change and modify this pattern. Moreover, each individual is different, so many pupils fail to absorb the study materials—an aspect that affects the pupil later in his/her learning. Due to the lack of time and erosion of teachers, teachers' lectures are delivered in a monotonous, tedious and even destructive manner in terms of curiosity and resourcefulness of the child (Osborne & Dillon, 2008).

According to Ruth Wilson (1994), teaching environmental education in early childhood includes the growth of a sense of curiosity as well as an appreciation of the beauty and mystery of the natural world. Education also includes developing problem-solving skills and developing an understanding and appreciation of the world around us. The goal of environmental education is to develop a population that recognises environmental topics. Studies have shown that most individual positions are formed at a very early stage of life, meaning the teaching environment in early childhood is of great importance (Bjorna & Mikkelsen, 2003).

Advances in elementary school curriculums supply theoretical lessons about energy efficiency; such an approach does not hold much information according to the topic, indicating that younger pupils' level of knowledge is really depressed. In order to ensure effective learning about energy efficiency, students—especially younger age groups—must be taught utilising a short piece of the theoretical lesson that only offers the fundamentals and provides experiential experiments that illustrate scientific principles. Based on a teaching activity that motivates students to analyse and research the subject of energy efficiency, it is possible to search for answers and solutions about the environment. Such activity gives even the weakest students the motivation to study the subject in a fun way (Simmons et al., 2010) and allows the students to learn at different levels—namely, hearing, feeling and sight—thereby providing them with a practical and theoretical understanding of the material that, by the end of the process, is stored in their long-term memory for future use in their everyday lives. After the lesson, the pupils become representatives among their family and friends circles. Such representation is a significant persuasive power related to environmental education for pupils' circles in their various institutions, making it possible to spread the knowledge and information to a big portion of the population in a short time.

2. Holon Institute of Technology

HIT was established in 1969 and became an independent public academic institution of higher education in 1999, certified by the Council of Higher Education of Israel. HIT focuses on the teaching of sciences, engineering, computer science and technology, management of technology and design. It also emphasises multi-disciplinary theoretical and practical research of innovative technologies from a professional, scientific, economic and cultural perspective. HIT trains highly qualified students in the realms of science, engineering, management and design, and play an important role in their integration upon graduation into key positions within the industry. HIT aspires to quality and excellence in teaching and innovative research and strives to introduce novel and unique cutting-edge teaching and research technologies. HIT also prides itself on its advanced academic achievements, application of innovative techniques and interdisciplinary professionalism that lead to creative teaching and new technologies. HIT aims to utilise the intellectual and professional potential of each and every student so that they can fully integrate into the fast-paced technological world of today. Providing superior technological and scientific education enables HIT graduates to enter key leadership positions in both the private and public sectors.

2.1. Faculty of Engineering

The last decades have been dominated by the rapid changes introduced by the technology revolution, which has a tremendous influence on our daily lives. Today, we are facing a myriad of new

challenges. Technology-based industry has matured in many ways and the required skills for future engineers are much more complex in a world where 'machines/computers' execute many of the engineering tasks. Most of all, we are facing a new generation of sophisticated students, who were born into the digitised/multimedia world. The mission of the study programme is to encourage and initiate academic development, through the development of new study programmes and methods while being responsive to the rapidly changing trends in the field. The proper education of the undergraduate students must also be a function of market needs and predictions of how technology will develop in the foreseeable future. In order to ensure that our graduates are well qualified to meet the future needs of the market, meticulous attention must be paid to maintain a high standard in the fundamental courses and impart practical tools and skills. It is also important to introduce a wide variety of new subjects. The aims and goals of the Engineering Faculty are to provide the students with a rich and comprehensive study programme, and keep the study programme updated to meet the ever-changing requirements for engineers of the future, enrich the student's theoretical knowledge as well as teach practical and design skills and knowledge; adapt its teaching methodologies and techniques, focusing on understanding as a goal; enable students to achieve skills such as self-learning and to acquire expertise via practice by understanding constantly, update the teaching methods and the study programme to maintain relationships with the various relevant industry sectors that introduce the students to state-of-the-art equipment and facilities, for conducting experiments that reinforce their understanding of the theoretical and practical issues studied in the courses promote research in the various fields; and explore cooperation with other institutes in Israel and abroad.

2.2. Renewable energy program

The energy field is thriving, due to several factors: the world energy crisis, political trends that create a rise in oil prices and other environmental topics. All of these have brought upon us the emergence of new and fascinating fields dealing with energy. The introduction of alternative (renewable) energy sources for the electrical grid and the realisation that there's a need to improve and optimise the current network using modern tools have brought upon a new research field called the smart grid. The smart grid field creates a new interaction among various disciplines. Its goal is to create an electrical grid that is controlled by computers that are interconnected via a cutting-edge communication network. This is an entirely new technological and conceptual revolution. Following the receipt of an award for research, funded by the Chief Science Officer of Israel, a research group and the renewable energy and smart grid excellence centre were founded in HIT in June 2011 with the purpose of encouraging research and creation in the field of energy. At the heart of the centre, the renewable energy and smart grid laboratory was established. The laboratory is equipped with state of the art equipment and experiments, including photovoltaic energy, water energy, wind energy, fuel cells and smart metres and smart grid equipment (Friman, Matsliah & Beck, 2013).

2.3. Social involvement unit

One of the many goals of the social involvement unit, which is a part of Dean of Students Office, is to promote the social involvement of students and staff in the community. It also promotes weak applicants and students at the institute by offering mentoring, tutoring, emotional support, guidance to learning and adjustments in school. Over the years, the unit has worked in many education and welfare arenas to promote immigrants, youth and more. The social involvement unit serves as a professional centre to encourage and promote the social impact of students and staff and to leverage knowledge, expertise and human capital for the benefit of the community through social involvement projects and course actions involving meaningful activities.

2.4. Action learning course

The action learning course is an academic course which combines academic learning with social activities. These courses deal with processes and social challenges, reveal different ideologies and develop critical thinking and pragmatic ideas. Students receive course credits and a grade for being part of such course. Participating students enrol in courses that involve action and activities to engage in the experiential learning process, thereby creating a dialogue and cross-fertilisation between being taught in the classroom and experiencing the reality in the real world (Fernandez, Primo, Lovaton & Olivvera, 2016). A learning experience includes meeting with social organisations, institutions and state authorities and carrying out practical work with diverse populations. Through experience, students strengthen their academic skills, formulate ethical attitudes toward reality, develop professional and civilian perspectives and realise how they can influence their surrounding in the present and hereafter.

3. 'Green Ambassadors'

The action learning course is named 'Green Ambassadors', and the goal is to educate the next generation with environmental education. The course is divided into six groups; each group contains three to five Israeli Hebrew speaker students, whose goal is to provide information on environmental to Arabic school with Arabic speaker pupils'. The teams of the fifth-graders and sixth-graders from 'Al Omariya' school in Ramla have been chosen to take part in the project. This article presents a new challenge. Teach environmental issues with language difficulties. Israeli Hebrew speaker students teach environmental education in Arab school with Arabic speaker pupils'.

Under the guidance and supervision of Dr. Hen Friman, 'HIT' has built an innovative course that combines action and activities to increase the awareness and accessibility of the community in an experiential way. The end goal is to create 'Green Ambassadors'—children with a high level of environmental awareness. This course is divided into two parts. The first part, focused on frontal teaching, delivers knowledge from extensive environmental fields to students. The second part of the course shows how the theory becomes practical and concrete. At this stage, students are asked to introduce to the fifth-graders and sixth-graders from 'Al Omariya' school in Ramla, lesson with language barrier focused on presenting the environmental issues: energy efficiency (saving), solar energy (Figure 1a), energy conversion, air pollution, water pollution, waste and recycling (Figure 1b).



Figure 1. (a) Presenting the principle of solar energy. (b) Recycling an old tire for a chair

In whole-class instruction, only one person can speak at a time, and shy or slow-learning pupils may be reluctant to speak at all. When pupils work in groups of 2–4, however, each group member can participate extensively, individual problems are more likely to become clear and to be remedied, and learning can accelerate. With justification, co-operative learning has become widespread. Not only can

it increase academic achievement but also it has other virtues. By working in small groups, pupils learn teamwork, how to give and receive criticism and how to plan, monitor and evaluate their individual and joint activities with others (Figure 2a and b). It appears that modern workplaces increasingly require such partial delegation of authority, group management and co-operative skills. Like modern managers, teachers may need to become more like facilitators, consultants and evaluators, rather than supervisors.



Figure 2. (a) Creative work in groups. (b) Frontal learning in small groups

3.1. Education between cultures and societies

During the course when the theory becomes practical and concrete, the Israeli Hebrew speaker students' need to teach Arabic speaker pupils from the fifth-graders and sixth-graders at 'Al Omariya' school in Ramla. The Israeli Hebrew speaker students' transferred the material in the form of experiments (Figure 3a), images and models (Figure 3b) sometimes were also required to translate by the teaching staff at the school.



Figure 3. (a) Simulation of the ozone hole through an experiment.
(b) Simulation of soil pollution using a soil layer model

In January 2018, 160 pupils from 'Al Omariya' school in Ramla gathered at an impressive ceremony held at HIT, where pupils received the certificate (Figure 4a) as a child with high environmental awareness (Figure 4b). The HIT students get Certificates of Appreciation and appreciation for their great contribution to the success of the course (Figure 4c).



Figure 4. (a) Certificate in two languages for the course participants. (b) HIT students get Certificates of Appreciation. (c) Pupils from the 'Al Omariya' school in Ramla received the Certificate

4. Conclusion

Concentrate efforts on the improvement of education for sustainable development marked the beginning of a serious reform to cover all types of education and training from preschool to vocational and post-university.

The action learning course 'Green Ambassadors' in the community powered by the social involvement unit of HIT, that in this way, we can contribute to society and future generations.

The investment of great effort and good will of students can also overcome the language barrier.

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