**NON-FORMAL EDUCATION FOR A SUSTAINABLE DEVELOPMENT**

**PROGRAM IN CAIRO**

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| ***Abstract*** *Education for Sustainable Development (ESD) is important for moving countries toward a sustainable future. In Egypt, ESD is not a common subject found in the national formal educational system, so non-formal education in ESD is needed. The research question is what is the best-suited structure for an experiential learning based ESD non-formal education program designed for private middle-school students in Egypt? To answer this question a review of existing international non-formal ESD programs and a needs assessment was conducted. The review examined five programs for common components; these components included activities such as experiments, camps, research, community engagement, general discussions about the topic at hand, and post courses activities to ensure the sustainability of their program. The needs assessment surveyed 285 students and 89 parents, and 15 interviews were conducted with science teachers in five international and private schools. Questions about the schools’ inclusion of sustainable development activities, personal behaviors, and specifics about the design of the program like the length, learning styles used, and the frequency of field trips was included. The results indicated that respondents saw a need for non-formal ESD programs in Egypt focused on three main topics; energy, water, and waste. They felt that the design of the program should be customized according to different students’ needs regarding the length and timing. Respondents also mentioned several challenges that should be considered such as the security status of the country, and the existing cultural barriers found in the Egyptian society towards conservation and SD. Based on these results, recommendations for a non-formal ESD program in Egypt are discussed*.  ***Keywords:*** *[sustainable development, non-formal education, needs assessment, education for sustainable development]* |

# Introduction

Sustainable development (SD) has been highlighted as a crucial development process that needs to be adopted by the world due to the accelerating decrease of natural resources which leads to the deterioration of the human environment and the negative impact it causes on the economic and social development (Drexhage & Murphy, 2010). SD calls for a convergence between three pillars: economic development, which ensures that economic growth maintains a healthy balance with the ecosystem; social equity, which tackles human inequality, social injustice, and poverty; and environmental protection, which tackles limited natural resources (Kates, Parris, & Leiserowitz, 2005).

Egypt has been suffering lately from developmental challenges, which prioritize the need for studying and exploring SD (Handoussa, 2010a). These challenges are caused by 1) the continuous decrease of water per capita and the increase of water pollution, 2) the continuous increase in energy demand that results in an increase of subsidies and a decrease of energy resources, 3) the continuous deterioration in the air quality, 4) the increase of waste resulting in pollution due to poor waste management, 5) the decrease of agricultural production due to pollution and encroachment of lands, and 6) the continuous decrease in the biodiversity in Egypt (EcoConServ, 2003; ESCWA & League of Arab States, n.d.; Handoussa, 2010a; ILO, 2010). Achieving the three pillars of economic, social, and environmental sustainable development in Egypt, would improve Egyptians’ quality and standard of living (Abu Al Naga, 2012). The Egyptian government in 2015 realized the importance of and the need for such a transition and developed a report called “SD Strategy. Egypt’s vision 2030” (EEDC, 2015). However, such a plan needs high level of awareness from the entire country in order to be implemented.

Education is the main driver behind raising people’s awareness; hence a movement for Education for Sustainable Development (ESD) has risen. While ESD is to be implemented worldwide, according to the strategic plan for the pre-higher education stage in Egypt 2014-2030 prepared by the ministry of education, and Egypt’s vision of SD 2030 report, there is no plan by the Egyptian government to mainstream ESD in formal education (EEDC, 2015; MOE, 2014). ESD initiatives have been focused on formal learning, however recently a great interest in non-formal education (NFE) has developed with a number of different initiatives and studies illustrating the importance of NFE (Rogers, 2004). Some researchers have highlighted that a greater portion of people’s awareness of sustainable topics comes from NFE (Ballantyne & Packer, 2005). Others have mentioned the importance of NFE as a complement to formal education on sustainability and argued that it is a better-suited tool for ESD (AEGEE, 2013).

There are different types of NFE, the para-formal type is widely used with ESD because it improves the comprehensibility of the formal curriculum and further builds on it in terms of life long skills, problem solving, and critical thinking. This type has been widely implemented in different countries through using experiential learning (Buckler & Heather, 2014). There are some factors that enhances ESD such as basing it on experiential learning which is frequently used in sustainability education because they both have similar objectives such as a student centered learning, and the development of several skills such as critical thinking, problem solving, and decision making (Cox, Calder & Fien, 2010).

The developmental problems facing Egypt need to be addressed by people who are aware of SD and who are able to change behaviors in order to have a sustainable society. By conducting a program review and a needs assessment, this paper takes a step towards designing a non-formal education for sustainable development program for middle school students. The aim is that such a program could introduce the concept of SD at middle school so that young Egyptians will be aware and inspired for their future careers and daily life choices. Also, this research contributes to the limited literature found on Egypt in relation to NFE needs and design.

A review of five different ESD non-formal programs in different parts of the world can help us to understand which practices and components are most commonly used. This approach makes it possible to build on existing programs, learn from previous experiences, and to not duplicate efforts (NAAEE, 2009). It is also important in choosing programs or components to incorporate in a non-formal program in Egypt that they be evidence-based, relevant to Egyptian culture, and viable. A research was performed in order to discover what programs’ components should be included to develop the needs assessment surveys. Five programs were selected as representative of NFE programs according to three criteria: geographical location, program structure, and impact and type of support. The programs were chosen to ensure geographical diversity as they operate in different areas around the world, in the U.S.A, Europe, Africa, U.K., and Asia. Also, they were chosen to ensure diverse structures when it comes to activities offered to learners such as including experiments, camps, research, community engagement, general discussions about the topic at hand, and post courses activities to ensure the sustainability of their program. The third criterion was to ensure that these programs were successful either because they included evaluations that demonstrated an impact on learners, or because they had support through different schools or government entities.

The program review revealed a number of initiatives for students around the world that incorporate experiential learning and living sustainably during the time of the program, while focusing on sustainable values. Each of the programs primarily focuses on students in schools, but some also offer their courses/ programs for adults. These five programs are further detailed in (Table 1) in order to highlight the different components used in each. These components were addressed in students’ and parents’ surveys in order to assess the need and interest for each one in Egypt.

In addition to a review of existing programs, a needs assessment was conducted before designing a non-formal education for SD program based on experiential learning. Needs assessments are used prior to designing educational projects in order to serve participants better, to set priorities according to the data gathered, to allocate resources appropriately, and to gather ideas from different stakeholders (NOAA, 2009). According to the guidelines for excellence in non-formal environmental education programs, needs assessment is one of the first steps that should be taken in order to ensure there is a need that will be fulfilled (NAAEE, 2009).

Mixed methods research will be applied in order to assess program needs. Mixed methods research inquirers draw liberally from both quantitative and qualitative assumptions when they engage in their research (Creswell, 2003). According to Creswell (2002), mixed methods research is mainly used to understand a research problem in a comprehensive way. It allows room in one study for collecting, analyzing, and mixing both quantitative and qualitative data. The combination of quantitative and qualitative methods is complimentary and allows for more complete analysis (Creswell & Clark, 2011). This type of research was used in the present study in order to gather complete data from three different stakeholders (students, parents and science teachers) since there is a gap in the literature available to make assumptions about NFE needs in Egypt. Furthermore, mixed methods allowed for data triangulation, using different sourcesof information in order to increase the accuracy of a study (Creswell & Clark, 2011).

In this study priority was given to quantitative methods to understand the general preferences of stakeholders. Also, it used concurrent mixed method design, which is converging quantitative and qualitative data in order to provide a comprehensive analysis of the research problem (Creswell, 2002). Quantitative data was collected through surveys with students and parents in order to assess the need for a non-formal field study education for sustainable development program, to learn which components they would be interested in, and to discover their daily behaviors regarding sustainable activities. Each item on the survey was chosen based on the review of the five non-formal education programs. For each program its components have been identified to understand what a non-formal education program engage learners in to reach the learning outcomes. Also, to understand what practices are included in these programs in order to ensure its sustainability post courses.

The qualitative component was gathered through in-depth interviews with teachers in order to dig deeper and examine the general trends of schools. This method also made it possible to understand students and parents from the perspective of experienced teachers. Science teachers were chosen since according to Shohdah (1992) science teachers are more aware of environmental problems than other subject teachers. These stakeholders were selected from international and private schools.

Table 1: Components of five different non-formal programs around the world

**Method**

Data was gathered through five different schools, an American international school targeting upper class students, an American international school targeting middle class students, a British international school, a private school that includes British, national and American curricula, and an American international school with a religious affiliation. In two cases student and parent surveys were distributed throughout the middle grade due to the limited number of classes, in one case it was an equal sample of students from the three/ four grades were chosen, and in two cases, classes were selected by the head of the middle school grade according to convenience, one in each grade. The total number of surveys collected from students was 285, and from parents it was 89. As for the teacher interviews, it depended on how many teachers were dedicated for the middle school grade, in some cases head of science departments were interviewed, or teachers teaching several middle school grades, or teachers teaching only one grade. Teachers were also selected by the head of middle school grade according to the availability of the teachers, and the total number of teachers was 15 (Table 2).

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| --- | --- | --- | --- | --- |
| Stakeholder | Total number of respondents | Gender | | Age |
| Females | Males |
| Students | 285 | 134 | 151 | 11 – 14 years old |
| Parents | 89 | 53 | 36 | Late twenties - forties |
| Teachers | 15 | 9 | 6 | Mid-twenties - forties |

Table 2: Total number of respondents

Middle-school students (n=285) were surveyed to assess the need for a non-formal education for sustainable development program, to find out which components they would be interested in, and to discover their daily behaviors regarding sustainable activities. Closed-ended questions were used because they are easy to administer, to analyze, and help to avoid poor articulation from children (Crawford, 1997). They also make it possible to obtain data from a large number of respondents. The survey consisted of 22 questions, questions one through seven a Likert scale was used with choices varying from ‘strongly agree’ to ‘do not know’. These questions were used to understand students’ general preferences when it comes to non-formal education program structure. Questions eight through ten closed/ open questions were used, students were offered pre-defined choices and an ‘other’ area in case respondents had additional responses that were not included. These four questions asked about specifics such as the length of the program, preferred learning styles, preferred topics, and the frequency of the field trips. Questions 12 through 22, a Likert scale was used with choices varying from ‘always’ to ‘never’, and an ‘other’ area in case respondents had additional thoughts. These questions were used to discover their daily behaviors.

Another survey was developed for parents to assess their sustainable activities, their preferences when it comes to summer programs and what kind of activities they would like their children to engage in. Surveys were sent for parents in order to allow them the opportunity to do it in the comfort of their home and return it back to school, a total of 285 surveys were sent and 89 were returned. Definitions of SD and NFE were written as an introduction for the survey in order to help ensure a common understanding. The questionnaire consisted of 18 questions; they were a mix between closed and open questions to make it less time-consuming for parents to respond (Polit & Hungler, 1993). The open-ended questions were included, as these provide more diverse detail. These details were needed for the study to understand whether parents are aware of the sustainable development activities done in school with their children and to understand the potential barriers that the program would face. The first four questions were dichotomous questions with a choice of yes and no with a related open question to obtain more details. These questions were concerned with general trends included in schools regarding SD and non-formal education programs, to identify whether parents think there is a need for ESD, and to identify whether they would send their children to a summer school. Questions five through seven were concerned with the non-formal education program, parents were given predefined choices with an ‘other’ area in case respondents had additional thoughts. These questions were specific to understand parents’ preferences regarding non-formal education programs like the length, price and camping. Questions eight through 18, a Likert scale was used with choices varying from ‘always’ to ‘does not apply’. These questions were used to discover their daily behaviors. Finally, parents were given two consent forms to sign, one for their children to participate in the study and the other is for them.

Another set of questions was developed for science teachers. Interviews were conducted with 15 science teachers to understand what kind of activities the school encourages, what kind of activities middle school children enjoy, and their suggestions for a non-formal program design. Interviews were chosen in order to get more in depth data and opinions regarding current school practices and the design of a non-formal program. In each school the head of science department was interviewed, while the rest had shorter experiences varying from three to five years.

Quantitative and qualitative data were analyzed concurrently and integrated into the overall interpretation of results. The open-ended questions were analyzed through quantitative content analysis by the researcher with the aim of quantifying emerging characteristics and concepts. Content analysis is the process of analyzing verbal or written communications in a systematic way to measure variables quantitatively (Polit & Hungler, 1995). Themes were extracted from the qualitative responses in parents’ surveys and then these themes were grouped and quantified. The researcher noted teachers’ responses during the interviews. Themes were extracted from these notes and grouped accordingly and then quantified. In both cases, the researcher engaged in an interactive process between a careful reading of the text, design of preliminary themes, fitting of texts into these themes, and refinement of themes till most of the text fitted into the existing set of themes (Franzosi, 2007). An external researcher did the same procedure, and 90% of the themes were similar. The other 10% were reached discussed until agreed upon.

**Results**

The results were generally consistent between the five different schools, so they were combined for the purposes of analysis. This section presents the combined results both quantitative and qualitative, for the student and parent surveys and the teacher interviews.

Results from Student Surveys: Before they were introduced to SD, students were asked if they knew what it was. Only students in two of the schools reported a familiarity with it. Students were given the choices as a Likert scale from ‘strongly agreed’ to ‘strongly disagree’ and ‘don't know’ throughout questions one to seven. The results presented group strongly agree with agree and strongly disagree with disagree. For the first question, 43% of students agreed to attend a sustainable development summer program, however among them (27 students) wrote underneath that they agree to go if not in the summer, 18% students disagreed, 9% said they don't know, and 30% were neutral. The majority of students agreed (42%) to the question that asked about their interest in implementing what they learnt in the summer program as a school project, 29% disagreed, 23% were neutral and 6% disagreed. Moreover, 64% of students agreed to implement projects in collaboration with people living in communities visited throughout the ESD program, 19% were neutral, 12% disagreed, and 5% didn't know. There was a high interest among students in learning how to live sustainably, as 67% agreed, 18% were neutral, 9% disagreed, and 6% didn't know. Additionally, camping rather than going home question got the highest number of agreement (76%), while 11% disagreed, 9% were neutral, and 4% didn't know.

On questions eight through ten students were given choices that depend on each question. The first question asked about the length of the program, 44% of students chose a week, 21% chose two weeks, 8% chose three weeks, 11% chose four weeks, and 8% chose two months. The topic that students preferred to learn about was energy (n=155) followed by water (n=148) followed by waste (n=99), and the two least chosen topics were biodiversity (n=94) and agriculture (n=86). Question ten asked students about their favorite way to learn about something. Activities and videos were the most preferred (n=189), followed by media (n=127) and group work (n=97), and the least preferred were listening to experts and reading. For question 11, 159 student indicated that they would like to have as many field trips as possible during the length of the program, while 52 chose from two-three field trips, 29 chose one-two field trips, 21 chose three-four, and 22 chose none.The second section of the survey asked about students’ lifestyles giving them choices ranging from ‘always’ to ‘rarely’ and ‘does not apply’. The results presented show only the practices that are performed by the respondents and group ‘always’ and ‘usually’ together (Figure 1).

Figure 1: The SD practices adopted by students

Results from Parent Surveys:Eighty-nine parents were asked 11 questions that were categorized into three different sections, the first focused on their knowledge about SD and the school, the second asked about their preferences regarding ESD program, and the third asked about their sustainability practices. The results of the first section are summarized in Table 3. For question one, the majority of parents’ thought ESD is important because they are concerned with resources such as water and energy (n=29) since their scarcity affects them directly.

Table 3: Results of the first three questions

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| Question | Yes | No |
| Q1: Do you think educating children about SD is important? | 88 (99%) | 1 (1%) |
| Q2: Do you know of any SD activities done at school with your children? | 35 (40%) | 52 (60%) |
| Q3: Does the school provide non-formal education programs in the summer? | 16 (18%) | 72 (82%) |

The second section of questions starts with asking parents whether they will be willing to send their children to a summer program, 65 parents said yes, and 17 said no. The reasons indicated by parents as to why they wouldn't send their children to a summer program are: seven said to take a break from academic year, two said that their children are good at school, one said due to sports related commitments, one said that the whole family will move out of Egypt, and one said that their children is too young to go to a summer program. Also, in regards to their preference length of the program, 10 parents indicated they would like it to be for one week, 35 parents preferred two weeks, eight preferred three weeks, 17 preferred four weeks, and two preferred more than a month. The next question focused on the amount of money they are willing to pay for a two weeklong summer program, the majority of the parents (n=69) chose 1,000-5,000 LE, three chose 5,000-10,000 LE, two chose above 10,000 LE, one chose less than 1,000-5000, and six said it depends on the activities offered. Furthermore, when asked about their preferences regarding overnight options, 56 parents indicated they would like their children to come back home, and 30 parents indicated they would like the program to be a camp. For those 56 parents, 36 indicated that they would be fine if for longer trips their children could sleep over, and 20 said no.

The final section of the survey asked about parents’ lifestyles giving them choices from ‘always’ to ‘rarely’ and ‘does not apply’. The results presented will group always and usually and the results of those versus each question are presented in order to get a sense which practices are not done by parents (Figure 2).

Figure 2: The SD practices adopted by parents

Results from Teachers Interviews: Fifteen teachers were asked seven questions to understand their view on ESD, current practices in their schools, and the suggestions they have for a summer program. The qualitative answers were grouped under different themes in order to be able to quantify emerging characteristics and concepts. The first question had a unanimous agreement among the teachers that ESD is important with a highest concern with depletion of resources. Furthermore, the majority of teachers (n=11) indicated that their schools have sustainable development activities while four said no. These activities were then specified, activities related to waste were mentioned 18 times, Non-formal educational trips were also mentioned eight times, Water related activities were mentioned three times, and green clubs and celebrating earth day were mentioned five times.

The next question asked was to learn about teachers’ experiences with children, and what kind of activities children liked to do. Teachers thought the activities enjoyed the most by children are hands-on ones (n=11), followed by activities that have an impact that children could see (n=5), followed by field trips (n=4), followed by experiments (n=2), and finally group work, videos and projects were each mentioned once. The next question focused on gaps and opportunities regarding ESD, four teachers said that there were no gaps and 11 indicated there were gaps. The gaps mentioned fell under two main themes, cultural barriers (n=4), and educational system barriers (n=5). The fifth question focused on whether schools encourage SD inclusion in activities and education and how. The majority of teachers said that schools encourage inclusion of SD (n=11), three said that their school didn't, and one said that the school neither encourages nor discourages since initiatives come from teachers. The next question dealt with non-formal education offered by schools in the summer, and eight teachers said yes, and seven teachers said no. The non-formal education programs mentioned by the teachers were categorized as SD related topics (n=7) and SD non-related topics (n=7).

The final question was concerned with the suggestions teachers could give for a non-formal education program. These suggestions fell under five different themes. The first theme was concerned with the topics to start with which was mentioned by six teachers; these topics included waste, water (the Nile), renewable energies, rural areas, and sewage treatment. The second theme was planning which six teachers mentioned, which included having a set of objectives for the program because SD is broad, teaching a concept at a time, managing lack of security, asking existing programs, starting small, and applying the program in the winter break rather than the summer break. The third theme was concerned with the format of the programs’ components, which was mentioned by seven teachers, they indicated the importance of engaging the children through performance-based activities, fun activities, hands on activities, changing behavior and life style activities and effective activities. Four teachers mentioned the importance of establishing follow up activities for sustainability such as applying projects in schools in order to change the environment to suit what they learnt, and establishing clubs in schools in order to keep these groups communicating together about SD and to establish projects with different communities. Two teachers mentioned the fifth theme, which highlights the importance of tying the non-formal program with the formal curriculum.

**Discussion**

The results provided in the previous section help to understand what is the best-suited structure for an experiential learning based ESD non-formal education program designed for private middle-school students? The results give a general understanding of a topic that is not commonly researched, including important aspects of Egyptian culture that should be considered, and recommendations to design the program.

According to the results, 99% of parents and 100% of teachers thought ESD was important. The most common reason given for both their opinion was related to conserving resources, a topic especially relevant in Egypt due to the current resource shortages (Handoussa, 2010b). Hence, parents and teachers are aware that there is a need for a non-formal education program for ESD in order to increase the awareness of SD as students do not appear to be getting this information from their formal schooling. These non-formal ESD field programs would introduce SD to students and expose them to different current resource management practices and introduce them to the values of living sustainably.

*Time of the program***:** The students’ results showed that 43% agreed or strongly agreed to learn about SD in the summer. There are several reasons why others were not interested, which can also be drawn from the parents and teachers’ answers. It was obvious during the data collection phase that there is no culture of education-related activities in the summer. Furthermore, both the parents’ and the teachers’ answers show that the majority of schools do not provide summer education activities, and schools that do have summer programs are offering more non-educational activities such as athletics, scouts, and camping. Given these responses, it may be important to design the program so that it will not be based solely in the summer, and will include time slots such as in the middle of the school year as part of schools’ curricula, and during the spring and winter breaks. Since these vary from one school to another, collaboration between the program and schools will be necessary in order to customize the programs to the schools’ and students’ timing preferences.

*Length:* The length of the courses would vary according to the time preferences since it will be shorter if the courses will be conducted in the middle of school year or during breaks, and will be longer if in the summer. According to the results obtained from students, the majority indicated that one week is the length preferred, the second choice was two weeks. As discussed earlier, these answers could be based on the fact that students do not want to spend long periods in educational activities in the summer. However, it was also indicated by the majority of parents that two weeks is their preferred length. It should be noted that these length preferences were based on conducting the program in the summer, so it may not be relevant to the design of programs that occur during the school year or in the breaks. Therefore, different packages of the program need to be offered, first based on the timing of the program and second on the length. This could also be customized according to different student groups requests, which is also a technique used by some of the non-formal ESD programs reviewed. For example, in the UK program, the packages of the courses vary in length from a single day field trip to a multiple week camp.

*Camping:* Another aspect that needs to be considered is whether the program should be based on camping or should be short field trips and students would go back home afterwards. According to students’ results, the majority of students (76%) indicated that they would prefer the program to be based on a camp rather than going back home. This percentage is even higher than those who agreed to attend an ESD program in the summer, which indicates that this is their general preference for any program. Nevertheless, the majority of parents indicated that they would like their children to go back home rather than camping for the whole period. However, the majority also indicated that they would accept camping for longer trips, and those who were reluctant because of security concerns, are likely to be willing if security ceases to be an issue.

These results show the potential impact of cultural and political differences. Most of the non-formal ESD programs reviewed were based on camping and made other customizations based on requests from different schools regarding the length of the camp. Camping is considered beneficial for students, because it is an opportunity where students are given the value to belong to a community of their own, and it offers them the experience to satisfy their need for physical activity, creative expression, and a true participation in a community which cannot be satisfied within schools (American Camp Association, 2015). Due to the various benefits of camping, the program will be designed as a part of the courses, however it could be customized based on requests.

*Topics:* The program will offer topics depending on students’ preferences and teachers’ and parents’ suggestions. Students’ survey results indicate that the majority would like to learn more about energy, followed by water, and then followed by waste. These results are the same as the teachers’ suggestions. Also, one of the teachers indicated that the program should offer courses based on one topic so it would be simpler for the children to understand and in order not to overwhelm them. Parents also suggested the same three topics; however they also felt that it was important for children to understand SD in general, its importance, the global perspective, and reducing consumption. Thus, taking the above into consideration the topics that will first be developed would be the three top topics Egypt has been suffering from, energy, water and waste (Handoussa, 2010b). Each topic should address at first SD in general and the global perspective and then be applied more specifically to the Egyptian context. None of the programs reviewed include in their courses a general introduction of SD; this is likely because there is more integration of SD in the formal education curricula in these countries. This is not the case in Egypt however, so a non-formal education program here should include the general introduction.

Another important point that was mentioned by teachers several times was that the courses should relate to the formal curriculum. This strategy is used in general with non-formal education in order to serve as a compliment to formal education (Earth Charter Initiative, 2009). This strategy also is used in the five non-formal education programs that have been reviewed to formulate the research methodology questions (Table 1). Implementing this approach would entail reviewing curricula in order to formulate a course that would be complimentary. Also, it would be essential to have strong communication channels with teachers prior to course implementation in order to understand what they want their students to learn.

*Program implementation approach*: The assessment offered information on how to design the program in terms of learning styles, what content to include based on gaps in students’ sustainable behaviors, interactions with different communities and decentralization of the program.

*Styles of learning*: According to students’ survey results, the majority preferred to learn through activities, followed by watching videos, followed by group work, followed by expert speakers, and then reading. Also, the majority of students indicated that they would like to go to as many field trips as possible. These answers were supported by teachers’ interview responses in which they indicated that the most enjoyed activities students liked were hands-on activities, followed by activities where they could see the impact or effect quickly, followed by field trips, experiments, group work, videos, and projects. The program design should include the five different learning styles, because it will help ensure that the knowledge will address the preferences of the maximum number of students (Cheminais, 2002). However, this strategy should be used along with respecting students’ preferences by giving different weights to each style. Hence, the bigger weight should be on activities and field trips while applying a lesser weight to videos, expert speakers, and group work and very little weight to reading.

*Learning sustainable personal behaviors*: The majority (67%) of students indicated their interest in learning sustainable personal behaviors. Parents and teachers also highlighted personal behaviors in the question referring to the importance of ESD asked, they indicated the importance of children’s own development, gaining of skills, and acting as active citizens. Also, some parents wrote in the comments part that children should learn how to behave sustainably specifying waste and consumption related behaviors. Teachers also indicated that personal behavior should be included in the program. Hence, the program should promote changing personal behaviors to be more sustainable. This strategy is used in three out of five of the reviewed non-formal programs, which ensures that the knowledge and information provided by the courses are integrated into the students’ life styles. The priority in this matter will be based on the section of students’ and parents’ surveys that asked about their personal behavior. In this section, the students’ results indicated that the low scoring practices were volunteering, donating, being plastic conscious when it comes to bags or water bottles, reusing plastics, and being energy conscious. In parents’ results indicated that the low scoring practices are the same but adding other practices such as waste separation, and littering.

Interacting with different communities & decentralization:. The majority of students indicated an interest in collaborating on projects with communities visited during the program implementation. Also, two teachers highlighted this as they felt it would be impactful to include work with communities as a component in the program. Also, another teacher mentioned the importance of contacting existing educational programs for collaboration. These strategies have been applied in the non-formal programs that were reviewed. The first approach that has been used is to help communities with the obstacles they are facing through research and implementation, the second is to engage communities by being the source of information (experts) when it comes to the topic at hand, and the third is by engaging youth from these communities and offering them to take the courses of the program.

These three approaches should be implemented through the program design. The first approach to collaborate with communities on projects related to the obstacles they face, would make it possible to incorporate hands on projects, and would give students the opportunity to see the impact of working with communities, help them become active citizens and problem solvers, and enable them to better understand SD’s social aspect. All of these were things that parents and teachers felt a SD program should include. The second approach should be used in the program so that children can learn the full story from community members who are “experts”, rather than from a reading or a teacher. This would enhance learning by giving students an understanding of different community perspectives, and would decentralize the knowledge source so that they see that the program is not the only knowledge provider. The third approach should also be used to include community youth in the program so they too would get more knowledge and capabilities. All of these approaches would help enhance the current lack of active citizenship in Egypt (Baraka, 2008), because students will get to engage with different communities, they would be introduced to the different issues communities face, and they would become part of the society.

*Pricing:* Parents were asked about the amount of Egyptian pounds they would pay for a two weeklong program. The majority of parents felt that the appropriate amount would be something in between 1,000 LE - 5,000 LE, a few (4%) said they will be willing to pay from 5,000 LE – 10,000 LE, and others (3%) said they will be willing to pay above 10,000 LE. In this regard for a two weeklong courses it should be priced between 1,000 LE – 5,000 LE while taking into consideration the different time length packages that will be offered and adjusting the prices accordingly. It is difficult to know if this price range is workable in Cairo. Hence, a feasibility plan will need to be developed and in case the range suggested by parents proved to be less than what a program needs to be sustained, a sliding scale could be used. This technique would allow the program to offer all students the same services but for varying prices depending on the purchasing power of participating families.

*Sustainability practices***:** In order to ensure the program has an impact on students and to ensure the sustainability of the program’s learning objectives, evaluation and post-program activities should be implemented.

Since the program will be implemented for the first time, evaluation will be a necessity. Evaluation tools should be developed in order to gather information about activities, characteristics, and outcomes of the program and to make judgments about the project, improve effectiveness, and to ensure the objectives are met (NOAA, 2009). Pre and post behavior and knowledge assessments should be used in order to understand whether students have gained knowledge during the program and whether this knowledge has translated into action. Also, post program evaluation should be conducted with parents and teachers in order to understand whether they see a difference in the students’ behaviors and if they have any suggestions or feedback regarding the program or the components of the program. According to data gathered and its analysis the program should be changed to improve upon negative feedback, or to accommodate any suggestions made, or to improve the impact on students.

The majority of students indicated their interest in implementing what they have learned during the program as projects in their schools. This was also mentioned in teachers’ interviews highlighting the importance of changing the practices in schools to be more sustainable. This would enable a program to have a bigger impact on students because they would get used to sustainable practices starting from the school, and this could also lead to changing their parents’ behaviors. It was also mentioned by teachers that establishing clubs in schools after the program implementation would help ensure the sustainability of the program. Different suggestions were made regarding the activities of these clubs such as maintaining the projects implemented in schools, coming up with new sustainable practices to be implemented in the school, keeping a communication channel between the program and alumni, and continuing to work with communities they have visited before, or to initiate new connections and projects with new communities. Therefore, the design of the program should include projects and clubs in order to maintain relationships with alumni, to ensure further progress of alumni, and also to be able to evaluate the program’s impact on alumni. These activities could also be a way to change schools’ practices into more sustainable ones, mainstreaming sustainable practices, and widening the impact of the program to students who did not attend the program. In fact, four out of five programs reviewed used these techniques (see Table 1).

## *Recommendations for ESD non-formal program*

Several recommendations emerged from this assessment. These recommendations have been categorized according to culture-specific needs and program structure, while giving the culture category the priority so that the program would be an appropriate fit for Egypt (see Table 4 for a summary).

Culture recommendations. According to results obtained, there is a need for non-formal ESD program to fill the gap existing due to lack of ESD in formal education in Egypt. A feasibility plan will need to be developed in order to make sure that the program could operate with the price range suggested by parents, and if not, other techniques should be used such as a sliding scale. Furthermore, the security challenge in Egypt will need to be taken into consideration while designing the program, and this could include implementing shorter programs and conducting activities close to home. In addition, the program should begin with three top topics relevant to Egypt; energy, water and waste. Because Egyptian children are unlikely to have a background in sustainable development, it will be important to address general SD concepts within each of these topics using both a global perspective, and a local perspective. In order to expand SD beyond the program into the broader Egyptian context, relevant communities should be integrated within the program by: 1. engaging communities to be the source of information (experts) when it comes to the topic at hand 2. conducting projects with communities to help them overcome their obstacles 3. engaging youth from these communities and offering them to take the courses of the program. Furthermore, in order to contribute to cultural change, the program should promote changing personal behaviors to be more sustainable, and the priority in this matter will be to volunteering, donating, being plastic conscious when it comes to bags or water bottles, reusing plastics, and being energy conscious.

Structure recommendations**.** Given the responses, collaboration between the program and schools will be necessary in order to customize the programs to the schools’ and students’ timing and length preferences. Also, the program design should be built upon school activities and formal curricula to include the knowledge that students lack and further develop the schools’ sustainable practices. These approaches would entail reviewing curricula in order to formulate a course that would be complimentary, as well as building strong communication channels with teachers prior to course implementation in order to understand what they want their students to learn. The program design should include the five different learning styles, but give priority to activities and field trips while less priority to videos, expert speakers, and group work and the least priority to reading. Furthermore, due to the various benefits of camping, the program will include camping as part of the courses, however it should be customizable based on parent and children preferences. Conducting evaluations such as pre and post behavior and knowledge assessments for students, and post program evaluation for parents and science teachers is crucial to improve upon negative feedback, to accommodate any suggestions made, and to improve the impact on students. Also, the program should maintain relationships with alumni through post program activities and projects in order to sustain learning.

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| --- | --- |
| **1. Cultural recommendations** | **2. Structural recommendations** |
| * A non-formal ESD program should be implemented. * Conduct a feasibility plan. * Work within security circumstances. * Start by pressing topics: water, energy & waste. * Include community members in activities & projects. * Focus on changing personal behaviors. | * Customize length and timing according to different groups. * Build on existing school based activities and school curriculum. * Use inclusive learning (activities, videos, group work, use of experts, and reading). * Build the program around camping. * The program should be evaluated * Post program activities should be implemented such as projects, and clubs |

Table 4: Summary of recommendations according to culture and structure

# Conclusion

Several researchers have argued for the use of non-formal education to teach children about ESD. However, in Egypt there are few ESD non-formal education programs for children. The aim of this study was to assess the need in Cairo for ESD non-formal program, and to understand what middle school students and their parents would prefer in such a program. This research also sought to understand the current general trends in Egyptian private schools, and the challenges that might be faced by such a program in Egypt.

The results indicate that respondents acknowledge that there is a need for non-formal ESD program in Egypt that stresses three main topics; energy, water, and waste. These are the top three developmental issues Egypt is facing. Also, a program should build on existing formal curricula, school-based activities, and should tie those activities to local communities. Respondents indicated activities as their preferable learning style among others, so a program should be inclusive giving more weight to activities. Besides, a program should be focusing on changing personal behaviors to support sustainable initiatives. Furthermore, results indicated that the design of the program should be customized according to different students’ needs in terms of the length, and timing. These findings were similar to international programs’ approach in the design of their courses. However, there were also challenges mentioned that were specific to the situation in Egypt. One challenge is the security status of the country; hence a program should provide shorter courses or provide activities that are based in schools or local communities. Another challenge is the existing cultural barriers found in the Egyptian society towards conservation and SD. In order to sustain such a program many techniques should be implemented such as post program evaluations, projects, and clubs.

For future research, in depth interviews or focus groups could be implemented with students and parents in order to understand more about their views regarding ESD or SD. Also, this gap could be tackled by conducting evaluation when implementing the program. Furthermore, interviewing different stakeholders, such as already existing NFE programs in Egypt, would help validate the results of this research. In addition, this research study should be implemented with public schools in order to develop another ESD non-formal education program that is customized to this population.

In conclusion, Egypt has been facing a number of problems that need to be tackled in a sustainable manner. However, in order to make a smooth transition towards SD, education and awareness need to include SD skills, principles, and values. One way is to implement ESD through the design of a non-formal education program that takes into account the recommendations of the current study’s program review and needs assessment. This research also has provided evidence that non-formal education has the potential to be an effective tool for moving sustainable development forward in Egypt.

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