EDUCATION FOR SUSTAINABLE DEVELOPMENT IN MAURITIUS

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Abstract
Natural resources are depleting rapidly, the bio-sphere is being affected. To counter those disasters, the concept of sustainable development (SD) has seen light and as a result of it, education for sustainable development (ESD), since SD cannot be achieved without education. Educators play a pivotal role in the basic education of youngsters and they are considered as the change agents responsible to carry out any changes in the education sector. Their perceptions of the changes occurring in their teaching are primordial since they help situate any possible flaws. This study attempts at examining State Secondary Educators' perceptions about the integration of ESD in secondary education. The possible barriers to its implementation are in addition highlighted. Moreover, remedies to counter those barriers are also brought forward. The study confirms the key role of Educators in mainstreaming ESD in secondary schools. ESD has also been seen to positively contribute to the overall development of students, making them responsible citizens and developing essential skills in them. In addition the study reveals that the Mauritian educational system is still lagging behind since it is still very traditional concentrating on dissemination of knowledge and targeting exams instead of developing lifelong learning skills to face and deal with future challenges.
KEYWORDS: Education, sustainable development, ICT, Mauritius, state secondary schools.

1. Introduction

Mauritius, an island with about 1.2 million inhabitants, does not have natural resources. The Mauritian economy has moved from that of a mono-crop agriculture economy to a service economy (Government portal, 2011). The aim of the government is that the country becomes resilient to the global changes. The societal and economic demand of the country call for the re-engineering of the educational system and as a result a Strategic plan 2008-2020 has been prepared with this objective (EHRSP, 2009). Mauritius has made commendable progress in its education sector and it now aims at a quality education which will ensure that the country is apt to face competition on the international scene (EHRSP, 2009).

The country also aims at sustainable development which has become a "buzz" term internationally. The "Maurice Ile Durable" project (MID) took form so as to reduce the ecological footprint of Mauritians by promoting responsible lifestyles that will ensure a better future for the island (Clever Dodo, 2012). The primary aim of this concept is to make Mauritius less energy dependent on fossil fuels. One of the MID projects is to make the country 65% energy autonomous by 2028 by encouraging use of renewable energies like solar, water, wind, biomass/biogas, etc. A White paper has been approved by the Cabinet, proposing to set up five committees which will be responsible for the political strategy in five fields which will be known as the 5E namely: energy, environment, education, equity and employment (Business Mega, 2011). Education, therefore, has an important part to play in this project.

This research aims at gauging the degree of knowledge of Educators about Education for sustainable development (ESD) and identifying the barriers to its implementation in the State Secondary Schools. Recommendations are also formulated for the possible solutions that can help promote ESD.

2. Aim of Research

This study aims at investigating the perceptions of Educators of the State Secondary Schools about ESD and the barriers to its implementation.

3. Object of Research

The object of the research pertains to the following:

1. To investigate Educators' understanding of the ESD concept.
2. To determine their perceptions regarding its contribution to development of students of secondary schools.

3. To assess the constraints in the implementation of ESD in secondary education.
4. To delineate the role of Educators in implementing ESD.
5. To identify the appropriate support required for mainstreaming ESD in secondary education.

4. Research Methodology

A qualitative approach, using unstructured interviews, was consequently deemed to be more adapted for the research being carried out.

Unstructured interviews proved to be appropriate for this research since it allowed gathering of in-depth information needed to reach the objectives set. This allowed gaining an insight in Educators' interpretation of ESD. As is characteristic of unstructured interviews (Moore, 2001), supplementary questions could be used to probe further into the Educators' knowledge of the subject. Confusions could be moreover cleared since it was a face-to-face conversation. Whenever questions were not clear, they could be rephrased or clarified. Interviewees could be, furthermore, encouraged to extrapolate on certain issues by further questions.

This kind of interview gave an idea of what areas needed to be covered in this particular research. Since the questions were not rigid or standard, it allowed gaining thorough information (Moore, 2001). Interviewees could develop their opinions at length and share their experiences freely. They could also add any information which seemed important for them, even if it was not directly linked to the question initially.

Three main questions were identified for the purpose of this study. They were aimed at finding out what were the Educators' perceptions of the contribution of ESD in secondary schools, what were the barriers and support required to its implementation. Wherever the flow of information stilted, supplementary questions were asked to gain in-depth understanding of Educators' perceptions and opinions.

Thirty Educators from seven State Secondary Schools were contacted. Convenience sampling was opted for since the interviewees were persons that could be easily contacted, are reliable and were willing to be interviewed. Thirty Educators were deemed enough for this study since it was made sure that at least one educator from different subjects taught at secondary level was interviewed. Moreover, Educators work according to a transfer system manned by the Zone Directorates. Therefore, all the Educators interviewed have worked in a minimum of 2 state schools. Hence, the sample is representative of the State Secondary Educators' population.

5. Understanding the Meaning of ESD

Singh (2011) in his study about value education has stated that there is no one correct interpretation of ESD. This explains the lack of consensus as far as ESD is concerned and thus there is no universal definition of ESD (Yang, Lam and Wong, 2010). There are, furthermore, many terms to define the education that addresses SD. Shallcross and Robinson (2007) encountered terms like environment education, education for sustainability as well as education for sustainable development. This is to a certain extent due to the fact that the concept is complex, contested and continually evolving (Elshof, 2005; Down, 2006; Landorf, Doscher and Rocco, 2008).

ESD as pointed out by Shallcross and Robinson (2007, p.139), is "a process of journeying towards sustainability". This is also supported by Mckeown (2002), who pinpoints to the fact that ESD provides individuals with the necessary knowledge and skills, which gear them towards lifelong learning, thus helping them manage the environmental, social and economic challenges bound to spring in their life. This argument is also supported by Tormey et al (2008). ESD for Holbrook (2009) is about developing social and personal aptitudes, which will eventually result in responsible citizenship. ESD is regarded as a strategy to deal with unsustainable development patterns by De Haan, Bormann and Leicht (2010). There is no distinct definition of ESD as purport De Haan et al (2010) but the definition is nevertheless consistent, implying a change in knowledge, attitudes, behaviours and values (Shallcross and Robinson, 2007). However, for its implementation, a working definition is a prerequisite.

ESD looks at the inter-linkages between society, economy and environment (De Haan et al, 2010). The goal of Education for sustainable development is to establish locally relevant and culturally appropriate approaches guided by the values and principles that are inherent in sustainable development (UNESCO, 2005). ESD, furthermore, accommodates the evolving nature of the concept of sustainability. ESD sets as prime objective the promotion of sustainable life patterns (Mammino, 2011). It promotes

participatory learning and higher-order thinking skills through pedagogical techniques. It also takes into account the context, global issues and local priorities (UNESCO, 2005; Shallcross and Robinson, 2007).

It is also recognised by the international community that it is through education that the values, behaviour and lifestyles for a sustainable future can be fostered. Education is seen as the driving force for bringing such changes (Kevany, 2007; United Nations, 2009).

6. Literature Review

Sustainable development is becoming a very common term nowadays (Golob, 2009). There was a growing concern about the impact of human society on nature (Kevany, 2007) and from this concern has emerged the concept of sustainable development (SD) in the 1980s.

The 21st century requires youngsters with entrepreneurial skills (Madumere-Obike, 2010). Pigozzi (2010) calls for secondary and primary education to focus on the development of 21st century skills to prepare the latter for their lives beyond formal education. Students cannot make the vital connections between what they learn and their own life experiences. Education cannot remain traditional where there is only transmission of knowledge, information and values (Uzzell, 1999). Conventional methods of teaching and learning will hence not fit the needs for the development of a sustainable society. Learning should enable learners to develop their ability to make sound choices (Sund and Wickman, 2008).

6.1 Challenges and Barriers

Velazquez et al (2005) in their study have highlighted a series of barriers that have deterred sustainability in higher institutions. These barriers are, namely, the lack of awareness, support, funding, organisational structure, time factor, standard definitions of concept, training, policies, information as well as resistance to change among others. Mckeown's (2002) as well as Shallcross and Robinson (2007) highlighted the fact that lack of awareness has impeded on the progress of ESD. This fact is also revealed by Madumere-obike (2010) in his study on public and private secondary schools in Abia State, Nigeria. Lack of methods is another barrier to ESD as Klavins and Pelnena (2010) put forward.

As Velazquez et al (2005) had explained, the organisational structure being bureaucratic, decisions are slow thus delaying progress of ESD. The formal educational system similarly proves to be an obstacle in endeavours for incorporating sustainable issues in education. Its rigid and highly bureaucratic structure deters initiatives towards sustainability. Educators need the proper resources as well as incentives to come out of the traditional educational structures (Svanström, Lozano-Garcia and Rowe, 2008). Moreover, Educators have to follow the official curriculum rather than develop a school-based curriculum which responds to the needs of the students according to Yang, Lam and Wong (2010) in their study on secondary teachers' beliefs about ESD in China.

Time constraint has been perceived as a major constraint in integrating ESD (Dawe, Jucker and Martin, 2005; Velazquez et al, 2005; Down, 2006). The already restricted time-table and the constraints of the context make it difficult to change the way lectures are delivered in universities (Tormey et al, 2008). During the study done by Hopkinson and James (2010), the crowded curriculum has been identified as a key barrier. This is sustained by various other studies (Down, 2006; Reunamo and Pipere, 2011). Holbrook (2009) suggests more flexibility in the time-tables. More time should be allocated for field trips and work.

The irrelevancy of ESD to certain disciplines is also identified as deterring its application to learning (Dawe et al, 2005; Velazquez et al, 2005). Reid and Petocz (2006) as well as Winter (2007) conversely mention the lack of understanding as hampering the efforts of academics in engaging in ESD. Sustainability is too abstract and far from reality (Filho, 2000), thus Educators find it difficult to integrate in their teaching. It requires the acquisition of new knowledge. More so, attitudes and behaviour have to undergo changes. Quite a number of studies on higher education have pinpointed lecturers' beliefs and attitudes as considerable barriers to the implementation of ESD (Dawe et al, 2005; Velazquez et al, 2005; Lozano, 2006). Moreover, Down (2006) emphasises on lecturers' area of expertise as a constraint. She explains that according to her findings, lecturers could not teach topics that were outside their area of expertise.

The collaboration and involvement of everyone should be sought for the common good (Zhang, 2010). ESD should be everybody's concern. Sustainable actions are the responsibility of each and everyone but at the same time better actions can be brought about if they are supported by a societal framework. Down (2006) brought to light that lack of support from government and community made lecturers feel isolated. She also argued that conferences, journals and international networks could be of help to lecturers. As

has been emphasised by Hopkinson et al (2008), students and teachers do not have access to information about effectiveness and success of ESD initiatives. There should be information sharing at all levels. In Winter's study (2007), it was put forward that information improperly disseminated was among the reasons for slow progress in ESD. In the same study, teachers' workload and the fact that the term ESD was complex proved to be major hurdles.

Hopkinson et al (2008) have highlighted lack of students' interest and slow pace of curriculum review processes as barriers to engagement of ESD. It has also been found that policy commitment allowed the integration of ESD. Similarly, it was found that for ESD to be mainstreamed into education, it has to be integrated into the educational policies and get proper support from the government, the local community and main stakeholders (Varga et al, 2007). Various studies have shown that lack of support leads to failure of ESD. Shallcross and Robinson (2007) talk about lack of support from Ministries as well as lack of coordination between Ministries.

Winter (2007) claims that educational policies are political thus serving political purposes. Thus she posits that political restructuring is important for a more sustainable world. Holbrook (2009) goes further when he talks of political will and partnerships for the success of the transformation needed for SD. Pigozzi (2010) also supports this view. Liu (2009) recommended that Ministries of Education created policy and professional development programmess to promote ESD. Varga et al (2007) too claim that integrating ESD into educational policies will help mainstreaming ESD.

In countries where there is a proper framework, ESD is being successfully integrated into the teaching and learning processes. There exists for instance in China, an organisational structure whereby a mechanism has been established, ensuring the programme is implemented as a shared venture (Zhang, 2010). Through pilot projects, the Chinese government has tried grounding SD in school realities, bringing students to examine real development issues and lifestyles. Integrating ESD-related activities across the curriculum in various subjects have stimulated the creativity of students, fostering cooperative problem-solving (Zhang, 2010). In Ireland, there exists a regional centre of expertise (RCE-Ireland) where all stakeholders are members and which aims at having a regional learning space to ensure that ESD is integrated at all the levels of education (Tormey et al, 2008).

Similarly the development of ESD has been shaped by the Japanese Government through government supported projects at university level. ESD policies have further contributed towards ESD practices in Japan (Nomura and Abe, 2009). However, according to the study of Niu et al (2010), though in China ESD has been acknowledged as the facilitator for the national struggle for quality education, more changes in the educational policies for higher education are needed to put into practice the vision of these policies. Higher education and educational policies are not able to cater for the rapid economic development in China (Niu et al, 2010).

Winter (2007) in her study on ESD in secondary curriculum in English schools, mentions how schools have concretely incorporated ESD activities on environmental and global topics present in the National Curriculum. However, she also highlights the difficulties of long-term activities such as litter-picking, planting and recycling since they are not only time consuming, costly but they can also be questioned about their educational value and the fact that schools should take up those responsibility not students and teachers.

The concrete implementation of ESD in schools implies pedagogical challenges. Training is hence primordial to the success of ESD (Filho, 2000; Zhang, 2010). China is the example showing how training promotes ESD. Zhang's study (2010) explains how in Beijing, ESD has become an accredited training programme among in-service teachers since 2007. Special training programmes have been organised for teachers and school principals for ESD activities to be a success. According to the same author, well-designed and continued training is critical to bringing best practice and fostering new directions. With training, ESD practitioners are well informed and equipped.

Educators need to be familiarised with innovative pedagogical approaches. It is of utmost importance that they can adapt the practices and thereafter integrate successfully ESD in their instruction. Similarly, according to Elshof (2005), pre and in-service professional development has been judged primordial to change the perception of Educators. According to findings in Elshof's study (2005), technological studies teachers say they preferred having workshops and activities where business and industry practitioners were present and best practices shared.

Content and methodology are important for global sustainability (Tormey et al, 2008). Innovative technological education can capture the minds of the young generation (Elshof, 2005). The use of ICTs can thus open up avenues whereby innovative and creative pedagogical approaches can be used for ESD.

Holbrook (2009), similarly, talks about support technology that answers the expectations of the students. Moreover, in the case of Educators (Madumere-Obike, 2010), emphasis on ICT will allow the latter to keep up to date with the present trends.

7. Data Collection

Thirty interviews were carried out with Educators from 7 State Secondary Schools. The interviews took from 30 to 50 minutes each. Notes were taken by the interviewer and a tape recorder was used to ensure that all points were considered.

8. Data Analysis and Results

The findings of the present study reveal lack of knowledge of Educators about ESD. When probing more through the research questions, some admitted integrating some aspects of ESD in their teaching, while others only broached the subject. Various barriers to the proper integration of ESD were in addition highlighted. The Educators gave their respective opinions on the ways they believe these barriers can successfully be overcome or countered. They also shared their perceptions on the contribution of ESD in education. As Educators, they have a role to play in mainstreaming ESD in secondary education and they have tried delineating it while bearing in mind the school realities.

During the interviews conducted, it was found that the majority of the Educators associated the ESD and SD concepts to environment mainly while a few were unaware of the terms. This mirrored the debates in the literature. Cotton et al (2007), while doing a research on lecturers' beliefs and attitudes on ESD in higher education have also found out that most lecturers attributed ESD to environment rather than society and economy. Elshof (2005) similarly pointed out the relation of ESD to environment predominantly. Kagawa (2007) also highlighted this fact in his study. Klavins and Pelnena (2010) revealed that this can be positive since environment science is interdisciplinary.

The study revealed that some Educators were not aware of the concept of ESD whereas some found it too abstract or theoretical. This shows clearly a deficiency in the knowledge and information about ESD and SD. Mckeown's (2002) and Velazquez et al (2005) revealed that lack of awareness hinders the progress of ESD.

The main barriers highlighted to the implementation of ESD in secondary schools according to this study are lack of facilities, inadequate curriculum framework, bulky syllabus, time constraint and lack of support among others. The interviewees moreover gave their opinions on how these barriers can be overcome. The lack of adequate resources has been marked as a major constraint in ESD implementation. Indeed, ESD projects require funds, resources and facilities without which they cannot be carried out. Students need to have more activity-based learning since ESD cannot remain theoretical to be understood and actualised. This fact was highlighted in the interviews.

Curriculum framework is of high consideration according to the study since the interviewees say they consider only their syllabus content which is based mainly on the curriculum. Educators who said they integrated themes and values of ESD in their teaching did so since these were in their official syllabus. The rest touched ESD only tangentially. Yang et al (2010) mentioned the fact that secondary Educators concentrated only on formal curriculum neglecting students' needs.

Through the interviews, it was found that support was essential. A big work needs to be done therefore at the Ministry level to bring forward policies including ESD. Varga et al (2007) and Liu (2009) posited ESD should be included in educational policies. Nomura and Abe (2010) showed the impact of educational policies on ESD practices in Japan. Their study shows that the community also needs to be sensitised about ESD and the role it plays in a student's life. But all this needs a proper framework. The bureaucratic structure has also been seen as a major obstacle in the implementation of ESD as per findings. It's a top-down hierarchy where power rests at the head of the pyramidal structure of the Ministry of Education.

Interviewees admitted they required the necessary support to mainstream ESD in their teaching. They emphasised that resources should be made available and all stakeholders should be involved. The role of Educators cannot at any cost be neglected concerning the implementation of ESD. They are the change agents through which transformation is deemed to occur. The interviewees in this study, acknowledged their role in integrating ESD in secondary schools.

First and foremost, training is essential and this has been rightly recognised by Educators in the study. The latter say they should always keep up to date, they should recycle themselves as often as possible

since they are the one, who prepare the youngsters for their future lives. They are seen as the change agents. Hence, regular in-service training should be at their disposal. Also, to remedy to this lack of knowledge about ESD, workshops should be held.

The study also revealed the contribution of ESD to development of students. Interviewees agreed that ESD can contribute positively in students' lives. De Haan et al (2010) drew attention to the contribution of ESD in shaping the full personality of a child. However, the contribution of ESD should be highlighted to the students. They should be aware of the input of ESD in their lives.

9. Recommendations

Based on the results of the present study, some recommendations are proposed to alleviate the problems regarding the integration of ESD in secondary schools. China is the example to follow in this connection. It has taken this country more than a decade to be able to make ESD progress. As in the case of China, ESD should form part and parcel of the educational policies, whereby proper guidelines are established. Moreover, a proper curriculum framework should exist so that learning outcomes are known well in advance.

Projects like selection bins and recycling, collection of rain water, compost making, greenhouses as well as the use of photovoltaic screens should be encouraged at school level through sponsorships and government recognition. Corporate Social Responsibility fund is very appropriate for sponsoring costly school projects, thus encouraging schools and motivating staff and students. For these projects to be successful, coordination between Ministries is primordial. Other stakeholders, like parents and the community, should also be involved.

A heavy school workload is observed through the findings of this research. Activity periods can be used for ESD projects. Activity classes should be properly structured with the help of the Ministry of Education. Resource persons should be sent to schools to inform, guide and share best practices. Students should be encouraged to cooperate in co and extra-curricular activities through reward systems.

Resource centres could be set up at schools whereby information is readily available. Moreover, use of ICT should pervade the schools. This will allow research of data and use of technological tools will also trigger interest of students, thus leading to SD through reduction in paper and toner usage. Moreover, platforms should be developed whereby schools can share experiences and best practices. The Internet should be profusely used for this purpose.

10. Conclusion

This study has shed light on the understanding Educators have on ESD. They have also pointed out the barriers and solutions to its implementation. Educators have widely agreed that ESD can bring positive contribution in education though they cannot really talk extensively on it. This betrays their lack of certainty in the way this concept is beneficial to the education of students.

Based on the results of the present study, some recommendations are proposed to alleviate the problems regarding the integration of ESD in secondary schools. Students should be provided with necessary facilities so as not only to understand the ESD concepts but also put into practice knowledge acquired in their interests and for the society at large. The use of Corporate Social Responsibility funds may be made available under the guidance of relevant authorities so as to implement successfully ESD projects.

ICT is not to be ignored as it provides the necessary tools for SD. For example, the minimum use of paper for printing purposes can be achieved by viewing contents online. This can also reduce the use of toners, which are relatively costly. Through the Internet, appropriate platforms should be developed whereby schools can share experiences and best practices.

ESD is, therefore, a necessity in this world where natural resources are getting depleted with the rapid growth of the population. ESD is a solution towards sustainable environment, economy and society. Mauritius, being a small island state, has to integrate ESD in its school curriculum in order to develop the youngsters into responsible citizens. Deterioration of the environment, economy and society can have major consequences on the country. Hence, awareness of ESD in school is to be given priority for SD. At this stage, benchmarking with countries like China can reveal benefits that can be expected in the long run.

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L’EDUCATION POUR LE DEVELOPPEMENT DURABLE

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S u m m a r y

Les ressources naturelles s'épuisent rapidement, la bio-sphère est affectée. Pour contrer ces catastrophes, le concept de développement durable (DD)a vu la lumière et à la suite de celui-ci, de l'éducation pour le développement durable, depuis le DD ne peut pas être atteint sans l’éducation. Les éducateurs jouent un rôle essentiel dans l'éducation de base des jeunes et ils sont considérés comme des agents de changement compétents pour mener à bien les changements dans le secteur de l'éducation. Leurs perceptions des changements qui se produisent dans leur enseignement sont primordiales car elles permettent de situer les défauts possibles. Cette étude tente d'examiner les perceptions à l'état les éducateurs du secondaire a trait à l'intégration de l'Education de développement (EDD) durable dans l'enseignement secondaire. Les obstacles possibles à sa mise en œuvre sont en outre mis en évidence. En outre, les remèdes pour contrer ces obstacles sont également mis en avant. L'étude confirme le rôle clé des enseignants dans l'intégration de l'EDD dans les écoles secondaires. L'éducation pour le développement durable a également contribuer positivement au développement global des élèves, faisant d'eux des citoyens responsables et de développer les compétences essentielles en eux. En outre, l'étude révèle que le système éducatif mauricien est toujours à la traîne, car il est encore très traditionnelle en se concentrant sur la diffusion des connaissances et en ciblant des examens au lieu de développer tout au long de compétences d'apprentissage pour affronter et résoudre les défis à venir.