

*Journal
of
Teacher
Education
for
Sustainability*

Volume 14, issue 1, 2012

Editorial

This issue of the JTEFS consists of six papers that provide innovative ideas from a number of different national and cultural perspectives. I would like to thank all the members of the Editorial board and the language editors. My thanks are also due to the contributors to this issue.

The paper by Dimenäs and Alexandersson highlights environmentally-related issues intertwined with courses in natural sciences. The paper concerns two knowledge matters that are usually divided into two different subject traditions – water and justice. The authors focus on the way teachers consider instruction within the frameworks of these two discourses and how teaching is related to sustainable development. The findings suggest that water and justice are two examples that are suitable for the problematisation of sustainable development with respect to holistic education. Current educational policies in Sweden advocate a tendency towards a more closed and subject-centred discourse.

The paper by Salomäki and her colleagues considers the development of teachers' emotional skills by using arts and skills. The main problem is to determine which skills the teachers can achieve during intensive training of emotional skills and arts. The authors of the paper have used the course evaluations and post-evaluation material from one of the Comenius courses held in Cyprus in October 2008. The findings show that methods for teaching emotional skills can also be used for the personal and professional growth of teachers.

The paper by Barney and his colleagues focuses on problems regarding secondary school physical education in the United States of America. In the past, secondary school physical education has not been very effective in preparing youth for life after secondary school. One area to help improve secondary school physical education is in the preparation of pre-service physical education teachers. It is during the preparation of pre-service physical education teachers that they will be taught and trained regarding appropriate instructional practices in secondary school physical education. The National Association of Sport and Physical Education (NASPE) created a document regarding appropriate educational practices in secondary school physical education. For this study, a survey was adapted from the NASPE appropriate instructional practice document. Three hundred and thirteen pre-service physical education teachers from seven institutions of higher education throughout the United States were surveyed regarding their knowledge of appropriate instructional practices in secondary school physical education.

The paper by Lea juxtaposes the praxis of mentoring with its domination and examines the praxis of mentoring. The rationale of the inquiry is based on social reconstructivist principles, recognising that relational structures and human experiences are both productive and reproductive in nature and in effect. The inquiry has pedagogical implications for institutional practices in education and political implications for individual voluntary versus institutional organising. It is potentially counter-hegemonic against the discourse of globalisation inevitability. Overall, the paper investigates the development and socialisation of human agency in institutional and social associations in which the praxis of mentoring intervenes.

The paper by Mifsud discusses the historic development of environmental education in Malta and identifies environmental non-governmental organisations as the main promoters of environmental education in Malta. A context-based environmental education devel-

opment model was designed to illustrate the complex relations identified in the study. The study suggests a commitment towards locally produced materials, genuine environmental non-governmental organisations and funding up of a co-ordinating centre for the promotion of environmental education at all academic levels.

The paper by Muthersbaugh and Kern focuses on the perceptions of secondary pre-service teachers about the use of images to teach environmental sustainability topics integrated in their content area. The research explores the question what secondary pre-service teachers' perceptions of sustainability and using images to teach environmental sustainability topics in their content area are. The participants were comprised of secondary pre-service teachers enrolled in an instructional methodology course from a small university in the Pacific North-western United States. Teaching environmental sustainability and integrating lessons using images had a noticeable impact on pre-service teachers' perceived future teaching practices. The participants also changed beliefs over the course of the study about using images to teach environmental sustainability topics.

Astrida Skrinda

CROSSING DISCIPLINARY BORDERS: PERSPECTIVES ON LEARNING ABOUT SUSTAINABLE DEVELOPMENT

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Abstract

With regard to education, traditional environmentally-related issues have been intertwined with courses in natural sciences, which could entail opportunities as well as difficulties. The study concerns two knowledge matters that are usually divided into two different subject traditions – water and justice. In this article, we focus on the way teachers consider instruction within the frameworks of these two discourses and how teaching is related to sustainable development. The findings suggest that water and justice are two examples that are suitable for the problematisation of sustainable development with respect to holistic education. Current educational policies in Sweden advocate a tendency towards a more closed and subject-centred discourse, which means that the ability to successfully teach about sustainable development is made even more problematic.

Key words: *content, teaching, learning, civic science, socio-scientific, sustainable development*

Introduction

Global environmental change and a new agenda for teaching and learning

The industrialised world has developed into a production and consumption society with a highly advanced level of industrialisation. This process has led to markedly increased demands for energy, water and other natural resources. In developing countries, there is an increasing demand for a standard of living and consumption that is similar to that in the Western world. Until the 1960s, an awareness of environmental changes as a result of the industrial society was relatively low, and the first warnings of environmental changes crossing national borders did not emerge until they were related to the use of dichloro-diphenyl-trichloroethane and mercury in agricultural pesticides (Carson, 1962/2002). Another example is the acidification of water systems due to coal and oil combustion, especially in Scandinavia. Attempts to solve these problems have been made, while others have emerged. For instance, the radically increasing energy consumption in the Western world and, now, in several de-

veloping countries has contributed to huge emissions of greenhouse gases which are quite unambiguously regarded as a major cause of global warming. In this way, global warming is a result of human's usage of natural resources, which indicates that the changes are global and can be related to climate change (Mitchell, Lowe, Wood, & Vellinga, 2006), which is no longer a national, European, a North American issue; demands and increasing resource use are now parts of a global perspective. One estimation of the so-called ecological footprint shows that humankind overconsumes natural resources by approximately 30%. If, for instance, all inhabitants of the world consumed as much as the Swedes, humankind would require three globes with the same production level as the one we have today (World Wide Fund, 2008). Many organisations and interest groups are, currently, mobilised to draw attention to and fight different threats to the earth's environment and resources. One way to describe this mobilisation is to base it on the term 'sustainable development' which means that humankind is ensured a good environment as well as economic and social justice. In order to increase awareness, participation and the prerequisites for sustainable development, the vision of a sustainable future is increasingly explicitly formulated in the agenda of the educational institutions of several nations. With regard to education, traditional environmentally-related issues have been intertwined with courses in the natural sciences, which can entail opportunities as well as difficulties. The question is whether students really observe, take a stand for and care about the environment merely by the possibility of experiencing nature or learning about ecological processes. According to Anderson (2007), paradoxically, education does not facilitate the development of an understanding of the natural sciences for a larger number of students, and they are often not interested in this subject (George, 2006). In relation to teaching natural sciences, sustainable development as a teaching component is interesting since the term is marked by a heavy rhetorical frame. Normally, sustainable development is taught in a disciplinary organisation (Osborne & Dillon, 2008), which in itself can be an obstacle, but sustainable development can also be regarded as an interdisciplinary element. However, difficulties establishing interdisciplinary fields in education and research are often shown in terms of institutional obstacles caused by protecting disciplinary borders as well as the lack of organised points of contact.

In academia, several international reviews of interdisciplinarity draw attention to the fact that academic subject and department divisions can constitute powerful obstacles for its establishment. Here, this generally prevailing subjectivism means that one's own subject is regarded as the most important and other subjects are seen as bi- or support subjects. Thus, there are reasons to assume that a more integrative and interdisciplinary approach to conducting education may be more successful than the traditional ways (Persson, 2008). For instance, several studies have emphasised integrative perspectives, knowledge definitions and holistic approaches to sustainable development in education (Björneloo, 2004; Cullingford 2004; Jonsson, 2007; Nyberg, 2009). The question is whether studying this is relevant, especially at a time when it seems that subject centrism is being strengthened, and there is a tendency that students, to a larger extent than before, refer to their environmental knowledge

from the media rather than education in school (Reiska & Dahncke, 2008).

Research in the field

In present-day Sweden, it is relatively difficult to attract upper secondary and university students to education that includes scientific topics, that is, to studies that traditionally contain general issues on humankind and natural resources. An explanation is that students experience scientific education as objective without questioning its value (Gustafsson, 2007). Moreover, there is a tendency that teachers in elementary school have doubts when teaching natural sciences (Appleton, 2008). We can also argue that this is a response to upper secondary school and university teachers' traditional and non-reflective ways of structuring and arranging education in other forms than separated topics (Dimenäs, 2007; Solaug, 2008). There have, however, been many attempts to change this, and much progress has been made during the last decades. Ernst (2009) shows positive effects for teachers who use the environment as a context in education. Other examples include projects which integrate science and technology both in and for actual issues (Stringer, 1992). This has been developed in a way that is sometimes referred to as civic science, in which an aspect of democracy is integrated (Clark & Illman, 2001; Bäckstrand, 2003; Gustafsson, 2008; Ljunggren, 2008; Englund, 2009). Researchers have found evidence for the conclusion that students' learning is supported by similar aspects and that they become engaged in societal issues (Kahne & Spurte, 2008). Recent projects draw on socio-scientific issues of ethics in the context of science education (Sadler, Amirshokoohi, Kazempour, & Allspaw, 2006a; Sadler, Barab, & Scott, 2006b; Öhman, 2006; Lundegård & Wickman, 2007). Current examples include genetic engineering as well as questions of global warming and the greenhouse effect (Hewitt, 2002). The latter means that an interdisciplinary perspective is applied to controversial subjects with ethical aspects in focus. Examples of similar areas are environmental issues, stem cell research, genetic manipulation (Lewis & Leach, 2006) and biodiversity (Harris & Ratcliffe, 2005; Lindemann-Matthies, Constantinou, Junge, Köhler, Mayer, Nagel, Raper, Schüle, & Kadi-Beltran, 2009).

In a study by Sadler et al. (2006a), teachers in primary and upper secondary school had different approaches to the idea of integrating ethical aspects when teaching natural sciences. In their study, one group of teachers completely refrained from the idea claiming that there is no connection between ethics and natural sciences. Another group believed that it was not their responsibility to integrate this issue while a third maintained the importance of ethical aspects in teaching natural sciences, which is being used by some in their current research (Sadler et al., 2006a; Arnesen, 2008). There are also critics who underline the importance of students' drawing attention to and challenging both traditionally subject-specific aims as well as social-humanistic ones (Zeidler, Sadler, Simmons, & Howes, 2005; Popov, 2008). According to Lundegård and Wickman (2007), there is no doubt that divergent aspects enhance teaching about the environment with regard to sustainable development. In fact, they maintain that it is fruitful to include values in relation to sustainable development at an early stage in order to relate them to 'facts'. They argue that education is not a matter of merely focusing

on facts. If so, students cannot discuss values and only discover the divergent perspective until afterwards. Instead, a consensus should be the driving force of all dialogues.

Content and content organisation from an interdisciplinary perspective

The question about content and content organisation is constantly in focus as long as access to new information and knowledge is continuously increasing through societal changes, such as innovations through research and development work. This, in turn, leads to questions of how educational access to an increasing amount of subject matter can be prioritised in relation to, say, the knowledge field of sustainable development. With regard to higher education, Olausson (2005) claims that, in Sweden, changes in content and the amount of content have become a field so vast that the present subject structure needs to be changed. Also, in natural science education, it seems that societal changes may result in reforms due to the fact that the subject matter is growing and continually changing. This often leads to discussions which raise different suggestions for priorities, such as in the curricula, study resources and choice of subject content in a concrete teaching situation (Rutherford, 1990; Andersson, 2001; Dimenäs, 2007). In discussions about natural science didactics, the question of what particular subject content to choose and why has, far too seldom, been problematised since natural science is so much more than a set of constitutions, principles and theories (Östman, 1998; Roberts, 1998; Solomon, 1998). Latour (1987) and Kolstö (2006) note that there is a risk when offering students 'pre-packed knowledge' in contrast to activities where their experiences and questions form the basis for learning. In their study, Oscarsson, Jidesjö, Karlsson and Strömdahl (2009) draw attention to the fact that students are interested and optimistic about the future, for instance, in technology as an important part of social development. In reality, however, the students' interest in these questions is not being met in their education. Aikenhead (2006) as well as Roberts (2007) open up for a humanities perspective in natural science teaching. In a similar way, educational foci draw attention to natural science per se and construct a more outward citizen perspective. Clark and Illman (2001) claim that it is of interest for natural science content to be appropriately illuminated, such as in terms of different social contexts. Vikström (2005) demonstrates in a study how teachers use ecological issues to provide students the possibilities of enhancing the meaning of sustainable development. Swedish syllabi and course plans include similar contents that concern education about the environment. For instance, it is a requirement in all teaching that certain overall perspectives on ethics, health or the environment are discussed.

In terms of higher education, Jonsson (2007) has examined in what way pre-service teachers understand the meaning of sustainable development and how it can be materialised in education. He (Jonsson, 2007) means that the pre-service teachers' perceptions of the term sustainable development can be described in varying complexity. Some statements are categorised as action-oriented, such as waste separation and developing new technology, while others are categorised as content-related normative, which is expressed in comments where natural resources are included in a future perspective. In his study, the pre-service teachers

also expressed their perception of what is unfair or just. When Jonsson (2007) followed five pre-service teachers in their teaching of the world's water supply, he found that four of them structured the topic in a linear form based on the water supply problem in which each subsequent part had the water cycle as its primary focus. The fifth pre-service teacher organised the topic using an integrative, complex approach where different perspectives were given space in relation to a context. According to Jonsson (2007), the factors that affect the possibility of a more integrated teaching are, among others things, how pre-service teachers perceive the entirety of the contents in relation to their students. In turn, the whole is not defined by its parts, but from the relations between them.

In current Swedish educational policies, subject identity is being strengthened through new guidelines. There is, however, an ongoing discussion whether these can be seen as objectives in themselves or as fundamentals which are a basis for school activities (Swedish Government Official Reports, 2007). Also, the term 'sustainable development' is included in the Swedish Higher Education Act. Strengthening subject roles seems to draw on the belief that, if students are provided with and learn subject matter in separate subjects, they are able to integrate specific subject-related knowledge. So, what are the consequences of giving students the possibility of meeting central aims on sustainable development?

The empirical study

In an empirical study, we tried to explore emergent patterns relative to teachers' perceptions of water and justice. As discussed above, water and justice can be perceived as naturally disparate. In traditional interpretations and, at first sight, water as content is included in the sphere of natural sciences whereas justice is a part of social sciences. How do teachers perceive this relation? Are there, for instance, justice aspects in water content, and are there aspects of water in justice? Can views of sustainable development be discerned in teachers' perceptions of the two issues? If there is an internal relation, this gives rise to questions of consequences for teaching. Are there other ways that could make students find such a matter meaningful and engaging? If so, how are such points of contact to be found? Is there any, at all, relation between the two contents of water and justice?

The participants in the study were teachers from different levels in the educational system. In total, fifty-eight teachers who sometimes taught the topics of justice (33) and water (25) participated in the study. Through semi-structured interviews with the following categories of teachers, we tried to explore emergent patterns relative to their perceptions of water and justice.

The teachers were chosen on the basis of qualitative methodology aspects where the various participants represented different fields of teaching, values, gender, age and educational backgrounds. In the interviews regarding justice, four of the teachers taught students in the forms 4–6 and five taught in the forms 7–9. Among the older students, there were teachers representing natural sciences as well as the societal subjects. The main fields of the university teachers were economic history, chemistry, physics, hydrology, environmental knowledge, re-

ligion and zoology. The data material comprised transcribed interviews where the teachers' comments formed a basis for the analysis of the study. Furthermore, the essence of the interviews was thematised through work on the basis of the material as a whole: firstly, identifying similarities and differences in the interviews and, then, organising these similarities and differences into themes. The data material was described in qualitatively different categories using a phenomenographic research approach (Alexandersson, 1994, 1998; Johansson, 2009). In the analysis of the data, three major categories were identified: an internal perspective, a holistic perspective and a relational perspective.

The internal perspective

In the following excerpts of teacher perspectives, the knowledge matter of water is described as an internal perspective that is water per se becomes a natural demarcation through its focus on properties and its prevalence in nature. Here, we identify a focus in terms of traditional subject-specific objectives. We find that it is often primary school and secondary school teachers who emphasise the internal dimension. For instance, these teachers point out that the water molecule is a part of the matter with special polarity, which makes it extra important for the life processes of organisms and an important part of physical processes in different cycles of nature.

Well, it is the prerequisite of all life ... and has existed for a very, very long time on the Earth as a reaction medium for all life processes, and it is a limited amount of water that circulates in this system, so, my fascination is that a limited amount of matter can play this important part, millennium after millennium, be cleansed, destroyed, circulated ... the prerequisite for all life processes in your cells and in my cells, yeah, water solutions are a key (primary school).

They have to understand the structure of water, how it is formed and what properties of polarity it has, the positive and negative poles of the water molecules to understand how it works. Each and every water molecule can be part of an organic molecule ... come up with something, do something, start a degradation processes or something like that, add something and then change the behaviour of the molecules (secondary school).

These aspects can be related to previous discussions of how water is regarded in the sphere of natural science with its focus on specific parts (Östman, 1998; Roberts, 1998, 2007; Solomon, 1998). This aspect can also be related to the dimension of subjects or multi-disciplinarity (Sjöberg, 2005; Vikström, 2005; Nyberg, 2009).

What thoughts do teachers express about justice from an internal perspective? In the following (translated) quotations of teachers' comments, they assert that the knowledge matter of justice can also be regarded as an internal perspective; in other words, the teachers limit the term 'justice' by use of definitions and concrete examples.

Yeah, what does justice stand for? I was raised in the Marxist tradition so for me. Justice is to meet everyone's needs (secondary school).

Justice gives everybody the same opportunities and possibilities of expression, irrespective of their circumstances. That, I think, is justice (pre-school).

The aforementioned examples, justice for all or justice as an opportunity, can be related to the teachers' beliefs about what justice really is. Their beliefs are based on both an ideological standpoint and the individual's personal prerequisites and abilities. The teachers seem to regard justice as an object that can be defined. As with the internal dimension of water, there is a tendency that justice can be understood as a 'fact' in itself (Latour, 1987; Kolstö, 2006).

The holistic perspective

In the following comments, water is regarded from a holistic perspective. Water is related to humankind and its actions as well as something that raises different kinds of emotions that can be related to fascination, romance, religion, historical memories. Water is also associated with everyday life and with its focus on water as a solvent or conveyer and the consequences of such aspects. While these comments may focus on several different aspects, water is always an important part.

I love the ocean. I have always been drawn to water and currents. It unites the whole world, it seems ... it raises romantic feelings, sorrow and tragedies ... relatives have passed away in the sea ... The water I drink today could have been drunk by Cleopatra or anyone ... rain and solvent. I mean, I couldn't imagine anything more important for body and soul than water (secondary school).

There's also this religious dimension in one way or another ... Baptising, for example, yeah, water is part of religion (pre-school).

In the south of Sweden, the worst environmental water problem is, probably, the issue of water distribution where the same sewerage treatment plant is being used to pump both drinking water and waste water (university).

In these comments, water is being related to emotionally, as there are religious aspects and environmental consequences associated with humans' use of water. In this dimension, we see, in the light of what has been put forward, that the natural sciences raise other aspects than constitutions, principles and theories (Östman, 1998; Roberts, 1998; Solomon, 1998).

The knowledge matter of justice can also be viewed in the light of the holistic perspective. Justice is no longer the limit, but the teachers relate its contents to external phenomena.

But it has something to do with, or how shall I put this? How everything is united, how everything works, the universe and everything, I think (primary school).

I can see this very easily from a historical perspective where a term such as justice has changed over time, of course, but also have differences from culture to culture, from legal justice, of course, to some sort of social justice (secondary school).

In the aforementioned comments, the teachers express that justice can be seen in terms of a

normative values perspective and that it can also be related to historical and societal perspectives. Furthermore, the meaning of the definition changes in relation to the time period to which it is associated, so that the teachers move beyond the term. In a hypothetical teaching situation, the holistic perspective of both water and justice would provide a basis for discussions about the possibilities of supporting meaningful teaching and, in that way, contribute to students' interests in societal issues and standpoints (Kahne & Spurte, 2008). The prerequisites for an integrative understanding lie in the external dimension, as the contents are described from a holistic perspective (Clark & Illman, 2001). It should be noted that Roberts (2007) found two perspectives where the focus is on natural science per se, but there is also a more external citizen perspective that could be compared to the two aforementioned outlooks.

The relational perspective

We have studied the teachers' comments of the two contents separately. It is, however, particularly interesting to consider whether there is any common ground in the comments about the two contents since we have, until now, studied the comments about the separate contents. The following quotations show that the two contents, justice and water, are perceived as being related to each other.

It's like, I think, having empathy with people who have a hard time and suffer from water deficiency ... I think the basic thing in this is that you think that we, in the rich part of the world, can't sit and watch people go under in developing countries (university).

Yeah, I think very much in terms of, yeah, natural sciences, and it's all about natural resources and so on that I come to think of, and, I think, we have a demand for justice here ... (primary school)

It's very much about justice, distributing natural resources evenly ... (pre-school).

In the natural sciences, we have, for example ... you bring up the idea of the water cycle, that there's only a limited amount of all matter, and, there, resource distribution comes into the picture (secondary school).

In the quotations above, the teachers' comments about water and justice are from an integrative perspective. Also, we understand that these comments reflect a pedagogical dilemma when the teachers, for instance, refer to a demand for justice and the question of distribution with regard to the issues of water, the environment and natural resources. In one of the comments above, water and justice are clearly perceived as connected since water deficiency has been placed in a justice perspective. Therefore, the teacher has to relate to the two knowledge matters at the same time, which could be regarded as increasing the complexity. This is also found in more existential comments.

It's so we can keep it ... feel good and exist ... so I think everybody has the right to the quality of life (pre-school).

The complexity deepens even more as the pedagogue describes how the two contents emerge in an educational context. Here, learning objectives are expressed in more general terms.

It's so we can argue for things, to have some sort of a grip of what it's all about. You teach, so you can understand the world mainly so that you can handle it ... so you hope that this mindset will make you do the right thing (secondary school).

Yeah, the point of knowledge, I guess, is that it'll make you reflect about your own actions, that you can use your knowledge. I guess you need certain basic facts in order to draw conclusions and really be able to reflect if something is right (university).

In these comments, the teachers express the conflict inherent in the knowledge matter for water and justice when put in relation to the learner. As Lundegård and Wickman (2007) reason, this would be a relevant starting point for instruction that relates to the environment and thoughts about a sustainable society. The comments expressed can, thus, be understood as a dilemma for teachers when they consider knowledge matter as a starting point for students' positions or if they use values as an integrative beginning that includes knowledge matter (Sadler et al., 2006a, 2006b; Arnesen, 2008). The study of the content dimension of justice begins in the question of what relationships the different categories of teachers have towards the knowledge content of justice. The results point towards the fact that teachers' relation to justice can, on the one hand, be described as problematic and complex, but, on the other hand, as simple and taken for granted. Generally, it is difficult for teachers to view justice as something to relate to, so they might have difficulties in stating what is peripheral or central. The study shows that teachers find it hard to describe justice in scientific terms and explain how it can be structured in relation to teaching. Some of the examples regarding justice are related to practising religion, distributing resources and how to construct a fair society. Among the secondary school teachers, it is obvious that the respective examples are related to the respective subjects. In addition, the secondary school teachers believe, for instance, that issues about values will be discussed in natural sciences subjects, whereas the teachers of these subjects believe that this is a task for social scientists. The contents are regarded as something that is 'there', which has always been worked with and does not need any analysis. Newer aspects of justice are gradually added to the teaching. Thus, it is the ways of working that are superior when the teachers describe their teaching. The university lecturers' descriptions are somewhat different since they convey a connection between a deep knowledge of the subject and demonstrating different aspects of the term. However, all the teachers relate to justice at an overall societal and at an everyday level.

In the study of the content-related dimension of water, we also investigated how the different categories of teachers perceive water as a content of education. One motive for the subject of water occurring in education is that we all have a personal relationship to water. For instance, water is not only a necessary part of everyday life, but also an element we can experience as a beautiful dimension of nature or as a part of religious rites, such as in Christian baptism. Water, in education, is also regarded as a traditional subject matter whose properties

relate to biological, chemical, physical and natural processes. A third aspect is shown where the instruction begins with the environmental issues as a consequence of the human use of water. Here, discussions can be initiated regarding, for instance, water as an obvious resource in the industrialised world, but, in certain developing countries or with regard to distribution issues, water is a vitally important commodity in sustaining life. The fourth aspect can be understood in terms of water being limited for the existence of humans and other organisms in what we call the biosphere. Finally, the knowledge matter of water is perceived to contribute to the learners' ability to make their own decisions. This way of discussion by the teachers means that water becomes an essential incitement to problematising different aspects of teaching in order to give the learner the ability to develop a holistic view as well as an ability to position themselves. The result of the study shows that most of the teachers describe water from a significant subject perspective. However, the university teachers and the pre-school teachers differ from the others in that they tend to incorporate the starting point of the learner as a part of their own understanding of the knowledge matter of water.

Conclusion

In the study, we found some teachers clearly expressed a connection between water and justice. Thus, it seems that water and justice are two suitable examples for the problematisation of contents about sustainable development. From the teachers' perceptions, several dimensions are identifiable in the two knowledge matters of water and justice. The issues that seem to be central for the interviewed teachers are the traditional subject-specific objectives (internal dimension) and the socially humanistic objectives (holistic dimension) as well as the possibility of integrating the two (relational dimension). In the data, there is also a consensus with the modern educational research in civic and scientific disciplines, the results of which support the idea that students experience teaching as more meaningful when it touches upon overall issues such as democracy or ethics (Sadler et al., 2006a, 2006b). With regard to these aspects, the materialisation of education can also be enabled through a view of knowledge as constructive, contextual as well as functional. Therefore, we argue that, in order to conduct meaningful teaching about sustainable development, we need to ask ourselves whether an integrative view of knowledge is not a must in order to promote students' understanding and critical positioning.

In the introduction of this article, we demonstrate that the tendency in modern-day Sweden is directed towards a more subject-organised management of education. We ask ourselves the critical question whether subject-centred teaching solves the problem regarding educational contents, for instance, sustainable development, where an integrative view of knowledge among teachers seems to be a prerequisite. One hindrance for such education could be that teachers are limited to different foci: some have a narrow focus, others have more of a multidisciplinary perspective, and there are those that unite these two views. The different starting points partially emerge when teachers describe how they plan their teaching. Our understanding is that a knowledge-competent teacher with a holistic view (Jonsson, 2007)

can handle multidisciplinary complexity (Zeidler, Sadler, Simmons, & Howes, 2005; Popov, 2008). If that is so, the opposite would be found among teachers with an inverse focus, which would resemble a more subject-centred view. Most of the teachers' comments, however, can be understood as expressions of a sustainable perspective, that is, the perception that natural resources are limited and, in a justice perspective, poorly distributed among the population of the earth. In an educational context, this means that children/students need to be able to handle situations based on thoughts and standpoints that require knowledge. In this case, the two contents of water and justice can be described as contents that in combination can provide a more profound understanding of thoughts about sustainable development. Thus, the two contents of water and justice become central and can exemplify an understanding of a perspective of the term 'sustainable development' as well as make students debate, handle, reflect and draw conclusions. The teachers' expressions strive to encourage the learner to develop an understanding at a complex as well as at a general level. In the present study, it has been demonstrated that some teachers think in a more integrative way than others and are seemingly able to move beyond what could be perceived as the rhetoric behind sustainable development. This, however, is not enough. They could also create favourable conditions for conducting successful education for sustainable development. In the line with present-day educational policies in Sweden, a tendency towards a more closed and subject-centred discourse has been implemented (Skolverket, 2011), which could make conducting successful teaching about sustainable development even more problematic in the future. Consequently, this is in contrast to what we have found in this study as spontaneously integrative perspectives on a sustainable society from the two examples of water and justice, which was also identified in previous research of civic and socio-scientific disciplines.

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EDUCATORS' PROFESSIONAL AND PERSONAL GROWTH: A CASE STUDY OF EUROPEAN TEACHERS' IN-SERVICE TRAINING COURSES

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Abstract

In this paper, we consider the development of teachers' emotional skills by using arts and skills. In the theoretical background, we focus on the modern theories of motivation, learning and school culture and on cultural theories (Sapher & King, 1985) of school environments and views of learning. The main problem is to determine which skills the teachers can achieve during intensive training of emotional skills and arts. In the paper, we have used the course evaluations and post-evaluation material from one of the Comenius courses held in Cyprus in October 2008. The findings show that, in spite of the school culture, all the methods for teaching emotional skills can also be used for the personal and professional growth of teachers. Teachers' well-being and a positive school environment are essential in sustainable development and education.

Key words: *self-regulation, emotional skills, arts education, teachers' personal and professional growth, in-service training*

Introduction

The Comenius European In-Service Training Courses are organised as part of the European Union Life Long Learning (LLP) programme under the decentralised action. Before the courses are organised, they have to be developed in Comenius Multilateral projects (previously in Comenius 3.1. or 2.1.projects).

The Comenius programme focuses on all phases of education, from pre-school to primary and secondary schools. It is relevant for all members of the education community: pupils, teachers, local authorities and all the other educational staff along with parents' associations, non-government organisations, teacher training institutes and universities. The programme addresses issues strongly related to current discussions and developments in school policy, and the priorities are set annually.

The background of the European Courses in this research is the Comenius 3.1. Project on Group Dynamics and Social Skills in the Classroom (1999–2001). In this project, the innovative element was beginning the development of arts and skills methods that all educators could use in learning situations. The Finnish Centre for Health Promotion coordinated the project, and the partner institutions were Hogeschule of Jönköping in Sweden and the

University of Lüneburg in Germany. When the project was finished, the European Bridges Consultancy (EBC) from Finland began to organise Comenius European courses related to the aforementioned project in cooperation with educational institutions in different countries. By the beginning of the year 2012, the EBC has organised 30 courses, 12 of them before 2009 and 18 – after that. The total of 534 participants took the courses from 2002 till 2012. The European Union (EU) selected this project to present the European Comenius success stories in 2008.

The EBC has organised six different courses: (1) group dynamics and social skills in the classroom; (2) action methods improving motivation and quality in the learning environments; (3) stress management in the schools; (4) motivating and mentoring the novice teacher; (5) relationship and sexual education in the schools and (6) seeking excellence in teaching, learning and studying practices.

The Comenius courses are intensive and last a minimum of seven days. The courses are funded by grants, which the participants have applied for and received from their National Agencies for the LLP programme.

The course in this case study (N=11) was held in the Elia Holliday Village in the village of Latchi, Cyprus, in October 2008. The aims of the course were to create a 'laboratory situation' in which to study and observe the group process and cohesion during the course of one week and to learn how to improve the motivation in learning environments.

Theoretical background

The ability to monitor and reflect on emotions is part of emotional intelligence (Salovey, Bedell, Detweiler, & Mayer, 2004). Reflective thinking refers to the processes of analysing and making judgments about what has occurred. Dewey (1938/1997) suggests that reflective thinking is an active, persistent and careful consideration of a belief or a supposed form of knowledge, the rationale that support that knowledge and the further conclusions to which that knowledge leads. Learners are aware of and control their learning by actively participating in the reflection and assessment of what they know, what they need to know and the ways in which they bridge that gap during learning situations.

Learners are self-regulated to the degree that they are cognitively, motivationally and behaviorally active participants in their own learning processes (Zimmerman, 1990, 2000; Pintrich, 2000). Research has demonstrated that only a fraction of learners across a wide range of ages are self-regulated (Azevedo & Cromley, 2004). The rest lack the knowledge and skills they need to effectively manage their learning. It has been suggested that, although self-regulated learning is not spontaneously acquired, it may be shaped and developed through participation in the environments that provide learners with opportunities to be in control of their own learning (Zimmerman, 1990, 2000). According to Gardner (1993), intrapersonal intelligence is the key to self-knowledge, including access to feelings and the ability to discriminate among them and draw upon them to guide behavior.

The modern theory of motivation represented by Deci and Ryan (2000) indicate that 'tricks

and recipes' are not effective in the improvement of motivation, but, instead, a wide understanding of motivation, emotion, cognition and their relations can help. When educators are asked to describe the characteristics of the best teacher, the list is as follows: the best teacher is empathetic, has a good sense of humor, is inspired by his/her work, is a good listener, is ready to face the new, uses different teaching methods and has a strong knowledge of the subject and pedagogy. It is not difficult to imagine that this kind of educator knows how to motivate both students and him/herself to work. If we made a list of the opposite characteristics, we would get a picture of a control-oriented, authoritarian teacher whose main pedagogical aim was to keep the pupils silent so that he/she could pour ready-made thoughts into them.

The foundation of self-regulation and inner growth is built on three basic psychological needs: competence, relatedness and autonomy. All are essential for facilitating optimal functioning of the natural inclinations for growth and integration as well as constructive social development and personal well-being (Ryan & Deci, 2000). In control-oriented learning environments, where the pupils are passive recipients, these basic needs are neglected. If a pupil copies and memorises ready-made thoughts and solved problems, he/she will not develop or recognise his/her competences; if interaction in the classroom is forbidden, there is no feeling of relatedness, and, if independent thinking and choice making are restricted, the need for autonomy is neglected as well. It does not mean that the needs no longer exist; instead, they reveal themselves in restless behaviour, fatigue, concentration problems and daydreaming – all signs of unmotivated behaviour.

Research results have shown the effectiveness of teaching and teacher training approaches and learning environments that integrate subject-matter knowledge and self-regulation skills (Butler & Cartier, 2004; Schraw, Crippen, & Hartley, 2006). Therefore, educators and researchers believe that teachers' ability to cultivate learners who are self-regulated during learning is tied to teachers' own self-regulation. If teachers are incapable of self-regulating their own being and learning, they will have difficulty developing these capabilities in their students.

In recent years, developing more sustainable learning environments has become one of the global educational aims. The understanding of the concept of sustainability has been established; it consists of three dimensions: environmental protection, economic stability, social considerations and well-being (Steiner & Posh, 2006). Fleer's (2002) study also indicated that even the youngest children articulated a view about their environment featuring social issues. We believe that educational empowerment and sustainable changes in learning environments start from good team work where every person is respected and loved as an individual. Hopkins and McKeown (2002) emphasise that pre-service and in-service teacher training is essential in building new settings in the school curriculum and learning environment as well as in enhancing cooperation between communities in formal and informal learning.

According to Steiner and Posh (2006), interdisciplinary teaching does not focus primarily on detailed factual knowledge; rather, it focuses on the development of core competencies for solving different kinds of problems. Students' social competencies, such as effective communication, presentation skills and teamwork, frequently need to be improved. Moreover, such

methodological competencies as traditional project management techniques and more complex planning and decision-making methods need to be accomplished. Thus, students also 'learn how to learn', and this should be a fundamental goal of any education and certainly of education for sustainable development (White, 2001). Such an interdisciplinary approach that was present in this research setting calls for cooperation across different subjects, disciplines and pedagogical ways of thinking.

According to Saphier and King (1985), the cultural norms that affect the school environments' improvement are collegiality, experimentation, high expectations, trust and confidence. They also emphasise tangible support, reaching out to the knowledge bases, appreciation and recognition, caring, celebration and humour. Involvement in decision-making, protection of what is important, traditions, honest and open communication are also important factors in the educational setting. We agree that these are the main keys in building a socially sustainable and a positive school environment.

Consequently, programmes to enhance teachers' professional and personal growth should promote the self-regulation skills acquired in the pedagogical context. Such programmes should afford opportunities for developing practices associated with supporting self-regulation as well as developing knowledge and skills that will enhance teachers' selfregulation in their own learning and teaching (Randi & Corno, 2000; Randi, 2004).

However, studies have indicated that teachers come to any training programme with prior experiences, knowledge and perceptions about teaching and learning. These prior perceptions often serve as a lens through which the teachers view the new pedagogical knowledge being taught and the new processes of teaching and learning they encounter. Therefore, it is essential that teacher educators take these prior perceptions into account when processing the new learning outcomes (Pajares, 1992).

Study design

Aim and method of the study

The approach of this research is qualitative. The study addresses two research questions: *How can teachers' professional and personal growth be promoted?* and *What is the effect of the organised Comenius courses in different learning environments on such growth according to teachers' personal evaluations?*

In this study, the data was collected using open-ended questionnaires that do not have set answers, but rather have the respondents frame their own responses, following a course organised in October 2008 in Cyprus. The title of the course was "Action Methods Improving Motivation and Quality in the Learning Environments". The research material was collected from 11 teachers participating in this research who come from seven EU countries: Belgium (1); Denmark (1); Finland (2); France (1); Germany (2); Lithuania (2); Spain (1) and Sweden (1).

The eleven respondents consisted of nine females and two males. Half of the respondents

(six) were working in primary or secondary schools (one in special education) and the other half (five) in vocational and teacher training institutions. Three participants have worked fewer than ten years in their present job; four participants – 11–20 years; two participants – 16–20 years and two participants – 20–30 years. There were seven teachers, three headmasters or directors, one supervisor and one special education teacher.

The evaluation of the course was made in three parts. Before the course, the participants received a pre-evaluation form in which they were asked about their expectations from and goals for the course. At the end of the course, they filled in an evaluation form for the entire course, and, after six months, they received a post-evaluation form, in which they described the effect of the course on their school life and on themselves.

Thus, the collected data contains the participants' background information, their expectations from, needs for the course and the impact of the course. They were also asked about the effects of the course and their plans to use the learned tools and materials. Other questions were related to the effects of course experience on the pupils, the classroom, the entire school and the course participants as teachers and people. The research material was analysed by content analysis. In the content analysis of data, the phenomenographic analysis was carried out using the following procedure described by Marton (1994). As the writings of the teachers can be expressed in different units, such as individual sentences, several sentences together or complete paragraphs, text segments must be delimited flexibly rather than by means of a fixed analytic unit. The content analysis was made with a flexible coding to determine the different learning experiences people had and the different ways in which they would express the effects of the course. The categories do not exclude each other at the individual level. Instead, in the written responses individual teachers may have described several concepts. Phenomenography does not aim to discover different types of individuals, but rather different forms of understanding phenomena and the concepts that individuals express.

Accordingly, the unit of analysis was not identified on an individual basis in the first phase. All writings/open answers were handled as a whole to determine 'the most important pool of meanings' in their descriptions. As the focus is on teachers' conceptions of the most meaningful learning effects to promote their teaching, the first step of the analysis was to identify the passages that they discussed and what areas they found to be most important in their learning. The extracts were tagged with the themes of the teacher's personality, pedagogical issues and learning environment issues. After this phase, in the analysis of the data, the selected extracts were examined in greater detail. The writings were repeatedly read in order to determine the distinct ways in which the teachers described the most valuable learning experiences for their development. These areas could be classified into the categories of emotions, motivation and creativity. When two expressions included the same meaning, they were placed into the same category. After placing the extracts into the themed categories, the attributes and features of the categories were identified and compared in a detailed analysis.

Results

According to content analyses of the results of post-evaluation, the responses can be seen in Table 1.

Three themes were related to emotions, motivation and creativity. These themes are classified according to three different educational aspects: teachers' personality, pedagogical issues and environmental issues, including sustainable developmental issues. We can provide several main points clearly characterising the effect of the course on the teacher's personality, pedagogical issues, learning environment and sustainable issues as participant teachers have themselves described.

Table 1. The course effect on teachers' personality, pedagogical issues and learning environment in emotions, motivation and creativity categories

	Emotions	Motivation	Creativity
Teacher's personality	11/11 recognition of emotions; expression of emotions	11/11 efforts for active learning; different ways of working	7/11 increase in trying new methods
Pedagogical issues	8 /11 recognise the role of emotions in learning and teaching	9 /11 learning as fun leads to better results; change in teaching methods to motivate pupils	8/11 use new techniques; use art for better results; plan more creative lessons
Learning environment and sustainability issues	10/11 create a positive emotional working atmosphere	9/11 use different learning environments and nature to motivate pupils	5/1 use new tools to create a better classroom climate; introduce new, creative rituals in school

Questions about the effects were asked six months after the course. As the results show, the greatest effect was on the teacher's personality. On the other hand, the teacher's personality is the tool for his/her work, so the effect can also be seen in the teaching methods and in the learning environments and the issues of sustainable development.

I think this course developed my emotional intelligence. After this course, I recognise and identify my emotions much better; I understand the causes of my feelings and handle emotions in myself and in others. Now, I think more positively about myself and other people, I became more optimistic and empathetic. I talk less and listen more. I certainly will try to educate myself emotionally in the future (a female teacher, Lithuania).

Another teacher also noticed an increase in optimism and positive attitudes after the course.

For my personal life, I got an energy boost that lasted for a long time. When times were hard, I could remember how warm the group atmosphere was. I also try to implement the positive mentality in my personal life. In the course of the months, an e-mail conversation developed with two other participants, which also enriched my personal life (a female teacher, Belgium).

In this teacher's comments, we see a slightly different reaction to the course as she considers how her students will react.

I feel stronger! Before the course, I was persuaded that active learning methods were 'bliss' for our students who have difficulties with the traditional way of learning. The course has helped me to talk about these methods and insist on applying them (a female teacher, France).

Another teacher attributed the success of the programme to the setting and companionship that was felt among the teachers in the group.

Besides so much fun and a very meaningful week, I have so many happy memories. I got many new ideas on how to work. Most important was the feeling in the group. The teacher used the week in an excellent way to create security and harmony in the group. The discussions and practices we were doing had such a deep effect because of this group feeling. Now, when I plan my work in school and church, I have this fresh in my memory. Unfortunately, the circumstances are seldom so wonderful where I do my work (the conference was in sunny Cyprus, with good food and devoted and open-minded people) compared to the course situation (a male teacher, Sweden).

Finally, a teacher from Finland could immediately see the correlation between the workshop and her teaching situation at home.

I got more energy for myself and my work because of all those new things I learned in the course. I got more courage for my profession as a teacher because the positive support in our group was really amazing. I learned to read my pupils more effectively because I'm focused more on watching their motivation and their emotional state. I also pay more attention to my colleagues at work (a female teacher, Finland).

All of the teachers have used at least some of the methods and all of them have had positive experiences and results in using them. Teachers have been encouraged to use creative methods or at least to try something new and different.

My students liked the "Dream City" exercise very much. They really surprised me. For example, one boy who has serious problems with self-regulation, in the process, became a peacemaker in his group. It was a good experience for him, his group and me. After the art workshop, he said it was his best day in school ever. When we had reflection, I was surprised how children named and analysed their positive and negative feelings, what serious conclusions they had about emotions in themselves and others. I did not expect that 8- to 9-year-old children could have such a high-level ability to analyse their emotions (a female teacher, Lithuania).

This teacher has changed her curriculum based on what she learned in the programme.

I don't really teach grammar anymore. Instead, I let the students find grammatical structures by playing the games mentioned above (a female teacher, Denmark).

Most of the teachers have been able to disseminate the methods to the entire school, but two

of them reported that it had not been possible. One teacher said she waits and hopes that her colleagues will observe and notice what she does and, thus, become interested in the new methods, while another said that only two from his 58 colleagues have become interested and started to use the methods whereas the others think they are a waste of time. The other nine teachers had better experiences; in any case, the school culture and the support and attitude of the headmaster also play an important role in the dissemination of new ideas.

The classroom climate has improved. The children beg and want me to do the exercises with them. My experience also meant some benefit for the school since I practised several exercises at the Open Door Day in November. I worked with pupils I usually don't teach, and they were enthusiastic about the exercises. Moreover, many colleagues watched me that day and are also copying the exercises now (a female teacher, Germany).

Right after the course, all of the participants were willing to share the experience with somebody, mostly with their colleagues, headmasters, school parents and friends, but also with the other schools in their region. The post-evaluation answers indicate that this has actually happened, and, at its best, the participation of one teacher may indeed benefit the entire school community.

Conclusions and discussion

The evaluation of the effects of the training course for teachers' personality and professional life indicates that, in a one-week intensive European training, it is possible:

- to make changes in teaching methods;
- to develop emotional intelligence;
- to improve creativity;
- to improve sustainable development through education.

The study not only proves that the learned methods support sustainability, but also confirms the premise that staff development can build teachers' emotional health and support of one another as well as encourage students' creativity, their ideas and choices. Together these elements contribute to a positive emotional climate in schools that ultimately enriches communities and the world.

Dissemination is essential in the EU-funded programmes; it is an integral part of the entire project and should be implemented on an ongoing basis. In this case study project, the partners who created the course shared their expertise and methods, and, from this source, the pilot training course was developed. Sustainability is the capacity of the project to continue its existence and function beyond the end of the funded period (Bienzle, 2010). The process is still ongoing, and, as long as there are applicants to the course, it is also possible to apply for funding and continue organising it.

The methods that were used in Finland were the bases of the European courses after the project. Since there have already been 30 courses organised and the participants came from 31 countries, this widespread use of the methods indicates ways of exploitation of the results,

which is part of the dissemination.

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PRE-SERVICE PHYSICAL EDUCATION TEACHERS' KNOWLEDGE OF APPROPRIATE INSTRUCTIONAL PRACTICES IN SECONDARY SCHOOL PHYSICAL EDUCATION

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Abstract

Secondary school can serve as a time for youth to prepare themselves for the 'real world', and physical education can play an important role in this preparation. Yet in the past, secondary school physical education has not been very effective in preparing youth for life after secondary school. One area to help improve secondary school physical education is in the preparation of pre-service physical education teachers. It is during the preparation of pre-service physical education teachers that they will be taught and trained regarding appropriate instructional practices in secondary school physical education. The National Association of Sport and Physical Education created a document regarding appropriate educational practices in secondary school physical education. For this study, a survey was adapted from the National Association of Sport and Physical Education appropriate instructional practice document. Three hundred and thirteen pre-service physical education teachers from seven institutions of higher education throughout the United States were surveyed regarding their knowledge of appropriate instructional practices in secondary school physical education. It was found that pre-service physical education teachers inappropriately answered six of the 18 survey statements (33%) regarding appropriate instructional practices in secondary school physical education. When pre-service physical education teachers graduate and expose secondary school pupils to appropriate practices, there is a better chance the pupils will be prepared for the 'real world'.

Key words: *pre-service physical education teachers, instructional practices, secondary school physical education*

Introduction

For youth, the secondary school experience serves as a leaping off point into full-fledged adulthood. Many youths are seeking more independence from their parents and families, looking forward to attending college or starting a career (Rollins, 1999). For these reasons

and many others, secondary school pupils want their secondary school education to be meaningful and to better prepare them for life after school (Petersen, 1998). Therefore, teachers educating secondary school pupils need help in preparing the latter for the 'real world'. Secondary school physical education programmes have the opportunity to help pupils achieve individual success, physical fitness, exploration, self-testing, monitoring, continued physical skill development, wellness concepts, choice and preparation for a lifetime of physical activity (Pangrazi, 2003). Pangrazi (2003) continues by saying that "the high school years should be a time of mastery ... depth of learning, performance, and competency should be key outcomes. A key measure of accomplishment would be that pupils could interface into an adult setting and feel comfortable" (p. 114).

Literature has revealed that secondary school physical education has fallen short in helping secondary school pupils prepare for life after secondary school (Ennis, 1995). Literature indicates that, for secondary school physical education to be relevant for youth, the curriculum and the opportunity for the youth to choose the activities they participate in can strongly impact their attitudes towards being physically active later in life (Smith & St. Pierre, 2009). Other research in the literature looked at the physical education curriculum in an urban secondary school physical education programme and the influence it had on secondary school pupils' non-compliant behaviour during physical education classes. In this study, it was discovered that pupils did not participate in class activities, sat in the bleachers during activities, would roam around the gymnasium, walk around the track, slowly retrieve a ball or just not dress for class activities. The other important aspect in secondary school physical education affecting pupils is having the chance to help decide the types of activities they participate in during class time. It was concluded that secondary school physical education teachers need to make changes in the curriculum that pupils will find relevant. The best way to do this is getting pupils' input in the types of activities they will participate in for the purpose of exposing pupils to lifelong physical education, such as swimming, golf and tennis (Ennis, 1995).

Courturier, Chepko and Coughlin (2005) studied primary and secondary school pupils' responses to their physical education classes. Pupils were surveyed regarding many aspects of their physical education experience, including course curriculum. Some of their responses were, "*I would like to be able to pick my own activities*", "*I would like to be able to tell the teacher the activities I would like to do*", "*I would like to choose what group of students I participate with*" and "*I would like to be able to work at my own pace*".

In general, secondary school physical education has been portrayed in a negative light. To a certain point, secondary school physical education teachers are adding to this negative experience for pupils in regards to their participation in physical education and in physical activity later in life, thus affecting their health throughout their lives.

One way to positively promote secondary school physical education is in the preparation of pre-service physical education teachers. It is during the pre-service physical education teachers' studies that they are taught proper instructional methods of how to create unit/lesson plans, give appropriate feedback, organisational methods, such as creating and execut-

ing classroom management and practical experiences, such as the practicum and students' teaching experiences. With this stated, pre-service physical education teacher educators have a great responsibility in preparing pre-service teachers for their first years of teaching secondary school physical education classes.

It may be asked why pre-service physical education teachers' educators have such a great responsibility in preparing novice teachers for their first years of teaching. Research suggests that pre-service physical education teachers begin their training with well-formed beliefs about teaching, developed through many years of schooling (Placek, Dodds, Doolittle, Portman, Ratliffe, & Pinkham, 1995). However, many of the pre-service physical education teachers have been exposed to inappropriate instructional practices while they were pupils themselves in secondary school. Two examples of inappropriate instructional practices pupils may have been exposed to were having captains pick teams in front of the whole class or having pupils do strenuous exercises as punishment for bad behaviour during a lesson. These examples and others are some types of inappropriate instructional practices pre-service teachers may bring with them when they enter their university study courses.

One tool pre-service physical education teachers' educators can use is the document titled "Appropriate Instructional Practice Guidelines for High School Physical Education" published in 2009 by the National Association for Sport and Physical Education (NASPE, 2009). One of the main purposes of the document is to "address key aspects of instructional strategies and practices that are essential to delivery of quality physical education to adolescents and young adults" (p. 3). Another purpose of this document is to provide specific guidelines that identify practices that are in the best interest of secondary school pupils. This document was written for physical education teachers along with parents and school administrators. It is a logical starting point for educating pre-service physical education teachers regarding appropriate instructional practices in secondary school physical education (Barney & Strand, 2008). For this reason, the purpose of this study was to gain knowledge of what pre-service physical education teachers currently know regarding appropriate instructional practices in secondary physical education.

Methods

Participants

Participants for this study were 313 pre-service physical education teachers (161 males and 162 females) from seven universities, three located in the south and four located west of the Rocky Mountains. These participants were all enrolled in the Introduction to Physical Education course, or one similar to it, at their respective universities. This particular population was utilised for this study as the Introduction to Physical Education course is typically one of the first courses pre-service physical education teachers take as they begin their sequence of study. Prior to this course pupils have not generally been exposed to appropriate instructional practices in physical education which could affect their understanding regarding the appro-

priate or inappropriate teaching techniques in secondary school physical education.

Instrumentation

For this study, the researchers utilised a survey that was created and used from another study investigating secondary school pupils' knowledge of appropriate instructional practices in secondary school physical education (Barney & Strand, 2008). The High School Physical Education Appropriate Practice Survey (HSPEAPS) is an 18-statement survey constructed to measure appropriate and inappropriate instructional practices in secondary school physical education. The HSPEAPS is constructed of four general areas: 1) curriculum; 2) learning environment; 3) instructional strategies and 4) assessment. Five statements referring to curriculum, four to the learning environment, five to instructional strategies and four to assessment, for a total of 18 statements on the survey.

Procedures

For this study, the researchers contacted pre-service physical education teacher training and education faculty at seven different higher education institutions. A total of seven pre-service physical education teachers' training and education faculty members (six males and one female), averaging ten years in higher education experience, agreed to have their students voluntarily participate in this study. The researchers contacted each faculty member by phone and explained the purpose and procedures of the study. Students not voluntarily participating in the study were assured that non-participation or withdrawal from this study would not negatively affect their mark in their Introduction to Physical Education class or class standing. After the surveys were completed, the faculty member mailed the surveys back to the researchers. Results for this study are reported as percentages. The university Institutional Review Board (IRB) granted approval to conduct this study.

Results

For the results of this study, the four general areas from the survey will be discussed.

Curriculum

The curriculum data had one statement (statement five) that was inappropriately answered by both male and female pre-service physical education teachers. It states: *The fitness component of secondary school physical education should consist of mass exercise following a designated leader.* For this statement, 63% of the male pre-service physical education teachers felt this is an appropriate instructional practice, and 45% of the female pre-service physical education teachers felt the same.

When looking at the institutional data, four institutions (institutions two, three, six and seven) felt that the fitness component of secondary school physical education should consist

of mass exercise following a designated leader was appropriate.

Learning environment

The data from statements regarding the learning environment found one statement (statement seven) that was inappropriately answered by pre-service physical education teachers. It states: *One method for teachers to implement social interaction among pupils is to let them randomly select teams for activities.* For this statement, 61% of the male pre-service physical education teachers and 53% of the female pre-service physical education teachers inappropriately answered this statement.

For the institutions, four of the seven institutions inappropriately answered statement seven. Institution two (76%), institution three (65%), institution six (71%) and institution seven (62%) felt this practice was appropriate for secondary school physical education. Interestingly, institution four (46%) and institution five (42%) also felt this practice was appropriate.

Instructional strategies

Data from the instructional strategies statements identified one statement that was inappropriately answered by pre-service physical education teachers. Statement 12 states: *Teachers should have students warm-up on their own before the class activities begin.* The data reveals that 51% of the male pre-service physical education teachers inappropriately answered this statement.

One institution also inappropriately answered statement 12. Pre-service physical education teachers from institution two (52%) inappropriately answered the statement.

Assessment

An assessment statement that was inappropriately answered by pre-service physical education teachers states: *Part of a student's mark should be based on attendance, dressing for activity and compliance to classroom rules.* The data showed that 90% of the male pre-service physical education teachers and 93% of the female pre-service physical education teachers inappropriately answered this statement. For statement 18, which states: *Because secondary school students are more skilled, tests should be based on a summative (final) evaluation for each unit during the term,* 60% of the male pre-service physical education teachers and 54% of the female pre-service physical education teachers provided inappropriate answers.

Finally, the data for the assessment statements found three statements inappropriately answered. For statement 15, one institution (institution two) inappropriately answered this statement (52%). It states: *Because of secondary school students' level of skills, general feedback is all that is needed for students regarding performance in class.* A second statement that was inappropriately answered by all seven institutions was statement 17, which states: *Part of a student's mark should be based on attendance, dressing for activity and compliance to classroom rules.* The percentage of incorrect answers ranges from 78% to 100%. The third statement that

was inappropriately answered by the institutions was statement 18, which states: *Because secondary school students are more skilled, tests should be based on a summative (final) evaluation for each unit during the term.* Five institutions (two, three, five, six and seven) inappropriately answered this statement. The range of percentages that were inappropriately answered was from 53% to 78%.

Discussion

The purpose of this study was to gain knowledge of what pre-service physical education teachers know regarding appropriate instructional practices in secondary school physical education. The findings indicate that pre-service physical education teachers tended to correctly identify appropriate instructional practices in secondary school physical education. Yet, there are a couple of topics from the data that should be addressed.

One of the first items pre-service physical education teachers inappropriately answered dealt with the fitness component of secondary school physical education consisting of mass exercises following a designated leader. For many years, physical education teachers have used this method of teaching a fitness component. Whatever the fitness component is being taught, it should provide a focus for fitness activities. When teaching a certain activity, this should provide the physical educator with an opportunity to teach and emphasise the fitness component that can be gained when using the particular skill (NASPE, 2009).

Another point to be addressed from statement seven claims: *One method for teachers to implement social interaction among students is to let students randomly select teams for activities.* Hastie (2003) has developed a novel method of selecting teams. He (Hastie, 2003) suggests that captains are selected, who then, in private, select even teams. However, a key aspect of this format is that the captain themselves are assigned to teams through a lottery; that is, when the captains select the original teams, they themselves do not know which of those teams they will become a member of. This method of team selection tends not to embarrass pupils. Additionally, other scholars have made similar suggestions when putting pupils on teams or in groups (Rink, 2002; Darst & Pangrazi, 2009).

Another point of discussion deals with primarily grading a student-based on their attendance, dressing for activity and compliance to classroom rules. The researchers were surprised to find that over 90% of both male and female pre-service physical education teachers and over 78% of the pre-service physical education teachers from the seven institutions inappropriately answered this statement. Barney and Strand (2008) commented that there is a certain mindset among pre-service physical education teachers' educators, that this is the primary way a learner can earn a passing mark in a physical education class. This belief is easy to understand, as for many years pre-service physical education teachers' educators have used this specific criterion to grade pupils. Due to this practice, the practicality of physical education classes has and is being questioned by parents and administrators. Miller (2002) states that basing marks on dress, attendance and effort undermines physical education and the true purpose of a physical education class. Pre-service physical education teachers' educators need

to explore a variety of assessment techniques to analyse pupils' understanding of their learning in physical education lessons (Barney & Strand, 2006).

One last point of discussion is a majority of the male (60%) and female (54%) pre-service physical education teachers felt that secondary school pupils are more skilled in class activities, thus tests should be based on a summative (final) evaluation for each unit during the term. Also, five institutions (two, three, six and seven) inappropriately answered this statement (ranging between 53% to 78%). There is nothing wrong with summative assessments; however, formative assessments have been found to be beneficial for pupils' learning. Miller (2006) stated that formative assessments allow the teacher the opportunity to diagnose learning problems and prescribe the necessary changes for the pupil. Miller (2006) continues by stating that "formative assessments can serve to motivate pupils to achieve the learning goals" (p. 82). Using formative assessments is one method secondary school physical education teachers can use in providing a positive and successful experience for the pupil. Pangrazi (2004) has said physical education teachers must provide a positive learning experience that encourages repetition and refinement. This allows opportunities to succeed in the learning process, doing the work it takes to become more skilled.

Conclusions

Why is it so important that pre-service physical education teachers know and understand what instructional practices are appropriate and inappropriate to use and implement in their teaching of secondary school physical education? When pre-service physical education teachers are aware of appropriate instructional practices in secondary school physical education, the beneficiaries of appropriate instructional practices will be the pupils. After leaving secondary school, youngsters will be going into the 'real world'. Teachers exposing their pupils to appropriate curriculum, providing an appropriate learning environment, teaching appropriate instructional strategies and giving appropriate assessments will help pupils interface to an adult setting successfully and comfortably. Pre-service physical education teachers' preparation faculty have to be vigilant in their preparation of pre-service physical education teachers to educate, train and demonstrate what practices are appropriate for secondary school physical education. As stated previously, many pre-service physical education teachers enter their university with many years of exposure to inappropriate practices in physical education. Thus, in their minds, many of those inappropriate instructional practices they have been exposed to are considered the right or correct way of teaching physical education. As pre-service physical education teachers become in-service teachers at secondary school, they have a great opportunity to affect pupils' attitudes in a positive direction. When these secondary school pupils mature, they will assume the role of a voter, a parent, a school board member and a politician, making important decisions concerning physical education in schools (Aicinena, 1991). For this reason, pre-service physical education teachers that become secondary school physical education teachers need to seriously think about the importance of their classes being guided by appropriate instructional practices (Barney & Strand, 2008).

Another conclusion from this study that has application to other fields in teacher education and education in general is the importance of exposing pre-service teachers to appropriate instructional practices in the classroom. Even though the context of this study was in physical education, teacher educators in other fields need to be mindful of their preparation of pre-service teachers. As previously stated, novice teachers will teach their classes how they were taught as pupils. In many cases, the instructional practices were not appropriate. For this reason, pre-service teachers' educators need to properly demonstrate and explain appropriate instructional practices that should be used in the classroom.

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THE PRAXIS OF MENTORING: POWER, ORGANISING AND EMANCIPATION

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Abstract

The purpose of this article is twofold: first, to juxtapose the praxis of mentoring with its domination and, second, to examine the praxis of mentoring. The rationale of the inquiry is based on social reconstructivist principles, recognising that relational structures and human experiences are both productive and reproductive in nature and in effect. The inquiry has pedagogical implications for institutional practices in education and political implications for individual voluntary versus institutional organising. It is potentially counter-hegemonic against the discourse of globalisation inevitability. Overall, the paper investigates the development and socialisation of human agency in institutional and social associations in which the praxis of mentoring intervenes.

Key words: *mentoring, praxis, teacher education, pedagogy, faculty organising*

Introduction

The Freirean pedagogy of the oppressed, a method of structural analyses of power, agency, social relations and human conditions (Freire, 1970) in educational institutions, guides the discussion of mentoring.

Mentoring is an anthropological phenomenon in which people are engaged in a teaching and learning relationship that is similar to an apprenticeship. Mentoring has been practised through religious teachings and the traditional ritual of oral transmission of knowledge. Furthermore, mentoring is identified as a “salient concept” (Lea, 2011, p. 260), as it is ambiguous and not yet institutionally defined as a concept. Therefore, this investigation can potentially identify an overarching theme or themes by which people organise their universe of being and along which their consciousness is sensitised and in/action is motivated (Freire, 1970).

The author argues for the need for dissent in higher education to counter hegemony and structural domination in light of the political and pedagogical critiques and power analyses in relational associations and institutionalised organisations. Particularly, the analyses in this paper call for the mentoring practice to be reconceptualised in a critical theoretical perspective. Merging the concepts of mentoring and critical pedagogy as one has the potential to transform praxis across academic disciplines and interpersonal and institutional relations. To address the need to reconceptualise the mentoring practice specifically, the discussion

includes critiques on mentoring reviewed in the literature, analyses the hegemony that structures the formation of mentoring and its human conditions and examines the constraints of teachers and institutional contradictions in education. Furthermore, to radicalise mentoring, a praxis of mentoring is proposed using theoretical examples from Freire's pedagogy of the oppressed (Freire, 1970), Alinsky's community organising principles (Alinsky, 1971), the revolutionary experiences recounted in Guevara's and Castro's narratives (Guevara, 2003, 2007; Beto, 2006; Castro, 2006).

Critiques of mentoring practices

Mentoring has enchanted many believers, sponsors, participants and practitioners despite the haze that enshrouds its authentic nature (Schein, 1978; Speizer, 1981; Jacobi, 1991). Although the definition of mentoring is still unclear in the literature, according to Colley's (2003) investigations, mentoring in the form of educational and interventional programmes is widely accepted and gains popularity with invested labour, management costs and even institutional funding. However, the significance of mentoring has yet to be attested through systematic documentation. Lea (2011) observes a clear absence of a natural unobtrusive research approach, and the empirical research approach is often adopted with the experimental design of control of variables. The research literature on mentoring is mainly experimentally designed tests and measurements of the effects of pre-programmed practices. They characteristically comprise artificially matching the dyad of the mentor and the mentee, who are a selected few so called proteges or those who need intervention. Lea (2011) believes, contrary to what empirical research can afford, the investigation of mentoring should call for an alternative. The foremost issue is to understand the contexts in which such an association occurs (Lea, 2011). Giroux (1985) has called for intellectualisation of the teaching profession in the institutional structure; this paper, to follow Giroux's example, besides examining the contexts of the profession, will discuss teachers' development in relation to mentoring in educational institutions in the hope to contextualise the need to radicalise not only the intellectuals, but also the mentors.

The teaching profession

The teaching profession has often been considered noble, as its reward is expected to be intrinsic rather than extrinsic. In that sense, Freire critiques the anti-intellectual perception against the teaching profession, as it is thought to be involved in low skill labour with low economic value; the associated expectation of teachers to behave like cuddling mothers contributes to class and gender prejudices. College graduates from the arts and humanities disciplines are among the lowest earners. The anti-intellectual perception against teachers' competence persists, and teachers' voices are often marginalised. One example of this negative perception is systems that base teachers' accountability on students' performances on high-stakes examinations and subject teachers to carrot-or-stick incentives. The prescribed professional profile

reveals an array of contradictions in the institutional management, sociocultural expectations and the criticism/critiques of the field of teacher preparation. In addition, the constant trivialisation and fragmentation of teachers' time and labour define their professionalism as a ministerial procedure. It is reported that "... teachers are exposed to virtually permanent tensions from a number of sources – such as discipline and relations with students; the not-always-realistic expectations of principals, parents and students; and the workload" (Semeniuk & Worrall, 2000, p. 408). Thus, teachers, deprived of an identity, bearing competence and agency, are perceived as anti-intellectual and authority dependent. There is little wonder that educational reform initiatives often exclude teachers from dialogues on reform. The exclusion of teachers' voices implicates the cultural perception that teachers are unimportant in making decisions to sustain the vitality of an institution and incapable of changing structures. Hence, teachers' subjectivities are easily overwritten in the making of policy.

Teachers' professional lives in educational institutions are a rich text of struggles and identity politics, intertwined with assertions or exercises of agency in which the praxis of mentoring awaits discovery. In other words, while scrutinizing teachers' competence, it is necessary to interrogate the human conditions by which our consciousness, humanity and relational associations develop (Clandinin & Connelly, 1998; Freire, 1998; Nieto, 2003). The experiences of tension, antagonism and suspicion/negation of one's competence are the common narratives of teachers. Semeniuk and Worrall's (2000) teachers' narratives reveal that teachers build lives and careers in the entrenchments of institutions and struggle against the fragmented existence afforded by the institutions. Semeniuk and Worrall (2000) found that "professional development is hampered [further] by the drain placed on teachers' bodies and minds. The tacit assumption that teachers are lifelong learners is thus undermined by the nature of teachers' work" (p. 423).

The teachers' experiences in the instituted mentoring programmes further complicated their teaching lives. They asked, "How can mentoring even begin to alleviate any of these problems?" In their narratives, teachers expressed that they grew professionally and personally in spite of the institutions and the supposedly functioning mentoring programmes. However, teachers have struggled within the institution, in that many self-doubts arise and even suspicions in reaction to institutional pressures and managerial postures opposed to teachers' work. Similarly, Colley (2003), examining mentoring within institutions, urges that the colonial culture embedded in the context first needs to be interrogated, as it conflicts with the interests of the disaffected youth. She (Colley, 2003) found institutionalised mentoring was construed as a form of intervention. Goals to change and modify behaviours manifest as correctional methods, and the results are neither preventive nor advocative; instead, the process has punitive and harmful outcomes. Mentees can easily become victims in a monolithic institution despite their proclaimed good intentions. Without interrogating the dominant narrative of mentoring, the problems are left intact; the mentee's humanity, however, is easily fragmented, and victimisation is internalised.

In light of the complex intersections of the teaching profession and institutional penchants

for programming in the global context, investigations of mentoring in human development implicate necessary interrogations of the dominant narratives of mentoring in institutions, as Semeniuk and Worrall (2000) and Colley (2003) suggest. The organisation or formation of mentors' and mentees' associations is profoundly contextually and socially motivated and calls for, therefore, an organisational analysis to identify the shaping conditions of such associations. The teachers' narratives confirm that it is imperative to examine the institutional construction of oppression in relation to the development of competence and agency in the teaching profession.

Globalisation and institutionalising epistemology

To understand issues pertaining to this topic, the discussion on mentoring will turn to globalisation and the actors enlisted as well as spaces of teaching and institutions dominated by the discourse and persuasion of neoliberalism.

Globalisation has manifested through imperialist conquests by which colonial channels have crossed geopolitical borders. Recently, globalisation has transformed into the ideology of neoliberalism. Kellner (1997) generalises several facets of globalisation that have evolved and affected structural integrations/assimilations, transcending the political cultural lines of epistemology into an economical domination in practice and in living spaces.

[s]ome people see globalization as increasing the homogeneity of societies, whereas others see it as increasing the hybridization of cultures and diversity. For still others, globalization is an evolving operation of power by multinational corporations and state power, or the linchpin for environmental action, democratization, and humanization. Some see the concept of globalization as a contemporary ruse to describe the effects of imperialism or modernization; some claim that modernization would open a new "globalization age" that differs from the "modern age" ... (Kellner, 1997, p. 365).

The list above may not be exhaustive. Cognizant of globalisation as a historical effect from the imperialist past or a break from the previous epoch into the next, Kellner (1997) reiterates, "capitalist relations of production still structure most social orders and the hegemony of capital is still the structuring force of most dimensions of social life" (p. 31). This definition means that the language of the market dominates the overall political discourse on ways of organising labour, resources, the educational curriculum, issues of urbanisation, wages, employment, patterns of migration and policies regarding borders, drug trafficking routes, crime, violence, turf or survival wars and other related topics. Congruent with Colley's (2003) position on institutionalised educational practices, specifically on mentoring, the underpinnings of inquiries in Marxist critical theories are potentially counter hegemonic to the massive drowning out of voices and agency by the waves of global markets. Following the framework of global structural integration, the discussion of institutionalised educational practices continues.

Neoliberalism conceives of humans as products to supply to the global market to generate capital and profit for multinational corporations. This process demands the internationalisation of curricula in educational institutions to mould generations of labour forces for corpo-

rate job descriptions. The slogan of going global and acting local propagates a mass system of schooling that should overcome restrictions of time and space to meet cost-efficient labour supplies (Schofer & Meyer, 2005). A model of banking education has become ever more popular and corporate-friendly. Mentoring and active critical education are positioned in direct contradiction to the neoliberal corporate labour model of education. The en masse model, by which a monologue is delivered from the podium, dictates social relations and authority from a top-down directed voice. The rapid development of online courses in institutional education is observed; the model has fuelled the growth of for-profit colleges, which receive a large quantity of federal student loan money, but produce the largest number of dropouts.

Schofer and Meyer (2005) have found a world-society model of epistemology adopted in higher education and university expansion. The researchers cite European higher education as an example of the merging of domestic and global developments. The “European Higher Education Area” per se was created to establish “common educational definitions, credentials, and standards” (Schofer & Meyer, 2005, p. 917) in Europe. The plan is a highway created to channel “flows of students, academic subjects, research agendas, and certified personnel [which] are [is] now treated as routine” (Schofer & Meyer, 2005, p. 917). Levin’s (2006) survey confirms the result that “educational erosion” has ensued, as evidenced by more programmes being eliminated, increases in class sizes, and “faculty interactions with students” (p. 76) being reduced.

Globalisation and neoliberalism compel the work of faculty to be more profit-conscious by maintaining competitive institutional production and perpetuating institutional dominance in the limited global market. The institutional agendas to internationalise and globalise education have not only economic implications, but also social relational impacts. There is evidence that, as globalisation intensifies, corporate interests become political interests, while, as Levin (2006) observes, intellectuals are diminished and subordinated to the administrative managerial ranks. Schofer and Meyer (2005) observe that an antagonistic relation manifests through increasing faculty self-allegiance in higher education. The faculty self-allegiance is motivated to maintain the self-determination of meaning and value. Under the capitalist arrangement of labour, a suppressed faculty agency with conceived antagonism signifies a struggle for intellectual autonomy and political dissent to reclaim humanity. In the economic systems of the means of production and their relation to humans, according to Alinsky (1971), the relation between labour and capital has been historically antagonistic; the owners of capital are “enemies” (p. 135) of their workers. In sum, as Kellner (1997), Schofer and Meyer (2005) and Levin (2006) critique neoliberalism as the dominant ideology premised on massive production and maximising profit turns land into factories, communities into market and skilled or unskilled labour into slaves. Neoliberalism feeds the hunger of the minds by announcing. Before addressing how the praxis of mentoring is transformative in life narratives, the following discussion will distinguish various types of teaching to deconstruct the institutionalised mentoring programmes.

Deconstructing mentoring

According to Semeniuk and Worrall's (2000) work on teacher development and mentoring, the dominant narratives of mentoring have yet to be challenged. The common assumption is "the belief that mentoring is a set of identifiable skills which can be taught to one group, the mentors, in order to assist a second group, the protégés" (Semeniuk & Worrall, 2000, p. 410). Mentoring has been largely implemented in the mode of skill transmission through explicit instructions in universities and public schools in the United States and Great Britain (Colley, 2003). Mentoring is also implemented through venues of formal institutional functions. Brown, Davis and McClendon (1999) identify several aspects that are commonly practised, but are confused with mentoring and in need of demystification. They note that a mentor is not a role or title given to a person arbitrarily from an institutional point of view, and it is not an institutional obligation, such as programme advising, serving on a dissertation committee or providing advice for tenure reviews.

Regarding the transmission of skills, Alinsky's (1971) experience from an organisational point of view is that organising human relations with all their contextual factors exceeds the limited number of pages that an operational manual can contain. Most mentoring programmes, however, are created for skill-based and isolated scenarios, including recruitment, training, workshops and one-to-one consultations. Alinsky (1971) related his experience of educating new community organisers. "The qualities we were trying to develop in organisers in the years of attempting to train them included some qualities that in all probability cannot be taught" (Alinsky, 1971, p. 71). He explains further through the following analogy:

If one thinks of an organizer as a highly imaginative and creative architect and engineer then the best we have been able to train on the job were skilled plumbers, electricians, and carpenters, all essential to the building and maintenance of their community structure but incapable of going elsewhere to design and execute a new structure in a new community (Alinsky, 1971, p. 65–65).

Creative and self-organising aspects are often addressed in the organising principles of Alinsky (1969, 1971). Barkham (2005) affirms that "the mentee is by no means a passive receiver; if mentoring is successful, it is usually mentee initiated" (p. 342). According to Brown et al. (1999), a common, yet stereotypical practice is the insistence on pairing mentors with mentees of the same race or gender. This practice may appear as a golden rule initially; however, grouping by simplistic race, culture and gender categories is illogical and potentially borders on cultural isolationism.

The imposition of roles and formalised statuses of mentors or mentees as institutional functions depersonalises people involved in a relationship inclined to be intrinsic and organic in its inception. An institutional voice of authority interferes with independent judgment in giving or receiving advice (Raabe & Beehr, 2003), which is based on mutual trust, respect, confidentiality, empathy, appreciation and intellectual affinity in identity. Attempts to institutionalise mentoring have had to follow internal common structures to function around

“routines, rules, norms, and structures” (Torres, 2002, p. 371) and to maintain predictability. Similarly, mentoring programmes can inform a mentor’s behaviour on the surface, which the mentee can mimic. The tacit knowledge of deep structures falls outside the realm of institutional accountability, regularity and predictability en masse. Meaningful mentoring has a receptive and sustaining influence on the mentee’s growth through life, rather than encouraging the mastery of specific skills on a timeline.

The idea of mentor originates in Homer’s *Odyssey*; a man named Mentor is entrusted by Odysseus to guide his son during his absence. Thus, a mentor is in place of/like a parent. The literature obscures the word ‘mentor’ in semantics. A mentor is like a nurturer, counsellor, coach, teacher, a role model, a professional colleague, a friend, a sponsor, a protector, an advocate and so on (Schein, 1978; Speizer, 1981; Kram, 1985; Andrews, 1987; Neal, 1992; Caldwell & Carter, 1993; Barrett, 2000; Roberts, 2000; Beyene, Anglin, Sanchez, & Ballou, 2002; Tang & Choi, 2005; Cobb et al., 2006; Paglis, Green, & Bauer, 2006).

Finding it problematic that the investigation has been on an ever-expanding turf and the claim in a mentor becomes inflated to be superhuman-like, the author proposes to test the logic of the definitions provided in the literature: *If it is true that a mentor is like a teacher, then is a teacher a mentor?* If a mentor is like a counsellor, is a counsellor a mentor? Through Plato’s epistemological model of inquiry that distinguishes appearance from reality, we know that the impersonators of Elvis Presley are not the same as the King of Rock ‘n’ Roll. The mentor’s true nature and the praxis of mentoring have yet to be discovered amidst the ambiguity of semantics. Plato’s epistemology is a philosophical announcement on changing realities and worldviews: through his epistemological inquiries on seeing and the mind itself, seeing the light in its deep structure is derived from struggles against and liberations from hegemony. In addition, Lea (2011) proposes Freire’s pedagogy of the oppressed (Freire 1970) as a theoretical lens to analyse the development of a critical consciousness. Hence, seeing the light involves the development of a critical consciousness to distinguish the realities that are projected as shadows or distorted due to asymmetrical power structures, superstitions or fear.

Human development undergoes rites of passage of cultural and discernible changes. Beyond universal biological maturation people grow through experiences and awaken consciousness when they see themselves and their world through the critical distance of multiple perspectives (Freire, 1998). Hence, a mentor mirrors a historical possibility for the mentee. The connection represents a sense of historicity through the distance the mentor has travelled and struggled, and the novice mentee will also travel to grow. Mentors are predecessors in history, particularly to the mentees. According to Barrett (2000), we can find “examples of mentor and mentee [that] include Freud and Jung, Lorenzo de Medici and Michelangelo, Hayden and Beethoven, Boas and Mead, and Sartre and de Beauvoir” (p. 33). It is also well-known that Socrates was both a mentor and a teacher to Plato. According to Plato’s allegory of the cave, the man who returns to the cave to share the truths/experiences of seeing the light is enlightened. Plato (2009) discusses truth and ethics:

the prison-house is the world of sight ... in the world of knowledge the idea of good ap-

pears last of all and is seen only with an effort; and, when seen, is also inferred to be the universal author of all things beautiful and right, parent of light and of the lord of light in this visible world, and the immediate source of reason and truth in the intellectual; and that this is the power upon which he who would act rationally, either in public or private life, must have his eye fixed (p. 159).

Teaching people to free themselves from “the prison-house” is the mentor’s ethical obligation; however, the act of teaching is not without political consequences, as such teaching is subversive and threatening to hegemony. Influenced by the example of Socrates’ life, Plato’s allegory thus describes the risk of teaching to assist people’s liberation:

and if any one tried to loose another and lead him up to the light, let them only catch the offender, and they would put him to death.

No question, he said (Plato, 2009, p. 159).

It is said that those who are bold possess genius, power and magic and dare to speak truth to power, as many critical theorists, scholars, practitioners and activists attempt to do. These great minds have continual contact and daily interactions with people from all walks of life and include learners, cynics or even idealists of all kinds. To mentor is to organise power through relationships, and, by mentoring, one comes to confront him/herself by one’s own praxis of coherence, not only discourse.

Organising tactics and organising power

Maybe all men and women ponder the meaning of life; but some, for good historical reasons, are driven to ponder it more urgently than others (Eagleton, 2007, as cited in Kreber, 2010, p. 18).

Not by chance or by selection, the relationship between the mentor and the mentee is a matter of organising when timing and location intersect and merge. Readiness is crucial for bringing the two dimensions in communion within the temporal and spatial continuum. This concept is similar to the common expression ‘being at the right place at the right time’, which captures the convergence of historical events and kindred spirits. Organising grows from the grass roots among discontented people, the oppressed and agents of change.

Alinsky (1971) confirms that “change comes from power, and power comes from organisation. In order to act, people must get together. [Hence] power is the reason for being of organizations” (p. 113). To organise mentoring is to organise the power of change, however latent, that flows as life streams in the mentor and the mentee. It is natural and common in political and social life for people to band together for shared interests, agreement or common life experiences, even in situations of deprivation. Alinsky (1971) elaborates as follows:

When people agree on certain religious ideas and want the power to propagate their faith, they organize and call it a church. When people agree on certain political ideas and want the power to put them into practice, they organize and call it a political party. The same

reason holds across the board. Power and organization are one and the same (p. 113).

Power and organising are complementary, as critical consciousness has its history. People's clarity on the absolute necessity of change builds up over and converges the course of the journey that people decide to take. Conscious people see their historical possibility in events and the manifested "correlation of forces in the world, will determine the mode of action" (Guevara, 2003, p. 75), such as, for instance, its size or form that bonds the complements.

The organisation of power affords a location, a space and an advantageous position from which to confront the obese machinery of hegemony. The Cuban revolutionary experience offers historical testimony on organising forms and the advantages of tactics in a guerilla fight against a well-equipped and trained army. Castro explained the main reason for the Cubans' victory in the Bay of Pigs invasion by the United States and in leading the Cuban revolution "irregular warfare cannot be fought with conventional troops. They're only good for parades. We made an irregular warfare and triumphed over traditional warfare" (Stone, 2004).

Guevara (2007) warns of engaging power in a small size, that a disciplined, vigilant and developed critical consciousness is necessary for the struggles to be fluid and ever responsive. During the Cuban revolutionary war against the Batista army, the organisation of guerillas was small. Its revolution's success came from the emphasis on the guerillas' clarity concerning the reason for fighting and a reasoned lucid militancy on how to fight and persevere (Beto, 2006; Castro, 2006, 2010; Guevara, 2007).

Mentoring practice shares conceptual similarities in organising a rebel army and community organising. Mentoring is a voluntary form of organisation. The particularities of this organisation discussed above include tactical values of size, location and available resources that provide space for dialogues, for resistance and for reclaiming power and humanity. The praxis of mentoring that transforms people's life narratives engages the novice in deliberate perspectives of consideration, construction and deconstruction of power through action. The organising of mentoring conceptually resembles the organising tactics used to counter a larger enemy and is similar to the example of conducting guerrilla warfare in the jungle of hegemony. In our era dominated by the totalising neoliberal economic occupation of land and markets, the struggles we face are urgent and have shifted from "the political terrain to the terrain of mobilisation ... in the streets, in the universities, the factories, in the fields of the world where each one of us reproduces this battle, fights it and wins it or loses it" (Marcos, 2008).

The praxis of mentoring: Humanisation, consciousness and the solidarity of struggle

[T]o be a good liberating educator, you need above all to have faith in human beings. You need to love. You must be convinced that the fundamental effort of education is to help with the liberation of people, never their domestication. You must be convinced that when people reflect on their domination they begin a first step in changing their relationship to the world (Freire, 1971, p. 62).

According to Issa's (2007) study of mobilisation in Brazil's landless rural workers' movement, the authentic transformation of identity combines the practices for political socialisation with the development of relationships. Organising power for mobilisation first needs to reclaim people's humanity to counter hegemony, as people's humanity endures the foremost assault from oppression and injustice. Hence, the task of the pedagogy of the oppressed is humanisation (Freire, 1970) as the prime motivation for people to free themselves by breaking out of a history of dehumanisation and internalised oppression. The mentor and his/her humanity mirror who and what the mentee will aspire to become. The inherent motivation for struggles is psychological and emotional for one to conspire for humanisation, as in mentoring, community organising, labour worker mobilising or political revolution, albeit in its tactical organising form. Guevara (2007) had dared yet almost struggled to utter "[a]t the risk of sounding ridiculous, let me say that, the true revolutionary is guided by great feelings of love" (p. 225). The mentorship evolves owing to the feelings of love. The mentor and the mentee organise themselves for a shared narrative of struggle, idealism and the necessity to survive, to continue to fight, to triumph and to humanise their world (Guevara, 2007).

Freire's theory of conscientisation to raise critical consciousness comprises a complex array of social cognitive activities. In the abstract form of theory – action – reflection, the praxis of mentoring engages the participants in reflection and action by which the mentor and the mentee form a front of solidarity in their political destiny. Grounded in the solidarity of multiplicity, mentoring is structured pedagogically through dialogues to influence and assist the mentee's act of transformation. The mentor/mentee connection helps to humanise people's worlds through relationships; mentoring also awakens the mentee's world consciousness. Alinsky (1971) noted that the conscious awakening of the relationship between the self and the world is existentially significant, as people experience themselves as the organisers of relations, power and actions. Hence, mentoring is a direct contradiction to a universe of silence, apathy, passivity and inaction. Alinsky (1971) has likened this awakening of consciousness to rousing waves and breaking silence in the oppressive sea of the existential "quiet desperation" (p. 116).

Mentoring is the praxis of solidarity in which the personal and the social dimensions merge. While the former refers to the personally active practice of theory – action – reflection, the latter involves a dialectical engagement of the mentor and the mentee confronting shared human conditions, knowing that to struggle is necessary and to survive is interdependent. By participating in or witnessing acts of resistance, the mentee vicariously experiences a taste of freedom and power in sharing and investing in emotional labour and costs. Simultaneously, the mentor and the mentee share similar agency at a crucial point in time.

Liberation, agency and humanism are the manifestations of solidarity that social reformers, "organic intellectuals" (Gramsci, 2010, p. 5) and the oppressed come to share. Guevara (2003) proposed "[However], where do we find the great [teachers/mentors]?" (p. 75). He (Guevara, 2003) declared that "like any other human being, they are the product[s] of history" (p. 75). Great mentors or community organisers, regardless of whether their roles merge, will

travel and forge their own paths, and they will learn the praxis. In the case of mentoring, in its own globalised neoliberal context, struggle itself is the greatest teacher for understanding the need to organise, connect and educate.

Mentoring is a response to the conditions of domination against the hegemonic narrative of globalisation. Through organising, agency and solidarity are awakened with respect to power, identity and world humanisation. Hence, the praxis of mentoring is pedagogical, and its organisation implicates organic constructions of power and space against totalising acts of neoliberal annihilation. Solidarity does not merely serve good intentions and is not simply “a matter of wishing success to the victims of aggression” (Guevara, 2003, p. 75). For revolutionary or transformative ideas to survive, in this case, the mentor and the mentee are to share each other’s fate and learn the art of resistance and struggle. By journeying or fulfilling a shared destiny for emancipation and resistance against global fragmentation and neoliberal disintegration, the torch of idealism will change hands between kindred spirits.

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ENVIRONMENTAL EDUCATION DEVELOPMENT IN MALTA: A CONTEXTUAL STUDY OF THE EVENTS THAT HAVE SHAPED THE DEVELOPMENT OF ENVIRONMENTAL EDUCATION IN MALTA

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Abstract

This paper discusses the historic development of environmental education in Malta and identifies environmental non-governmental organisations as the main promoters of environmental education in Malta. Environmental awareness started to increase as a response to major environmental issues on the island, but was a long affair, hindered in its development by a number of factors, including the governments' non-committal policy, the colonial mentality and the highly competitive educational system. European Union accession had a positive impact on the development mainly due to the imposed requirements. Subsequent governments have realised the importance of environmental education as an effective solution to ensure environmental sustainability. Nonetheless, as environmental education goals take a long time to be achieved, the lack of short-term achievements may be somewhat hindering its development. A context-based environmental education development model was designed to illustrate the complex relations identified in the study. The study suggests a commitment towards locally produced materials, genuine environmental non-governmental organisations and funding up of a co-ordinating centre for the promotion of environmental education at all academic levels.

Key words: *historical events, sustainable development, environmental education*

Introduction

Small islands tend to be very vulnerable to environmental degradation, as people strive for a better quality of life by focusing on improving their social and economic conditions and disregarding the environment (Ventura, 1994). Environmental degradation is very apparent in small islands like Malta mostly due to the lack of space and resources and also due to the pressures exerted by a population which tends to be in a process of development. Sustainable development is crucial for all countries and, even more so, in small islands like Malta due to the limited resource base and high population density.

The beginnings: Environmental education (EE) and local non-governmental organisations (NGOs)

The first response to a global effort to improve the environment came from various NGOs, including Nature Trust and Birdlife. These NGOs organised activities, such as campaigns and seminars, and published leaflets, magazines and articles in newspapers to increase public awareness (Pace, 1995). The beginnings of EE in the Maltese islands can also be traced back to NGOs. The first two environmental NGOs (The Maltese Ornithological Society and the Society for the Study and Conservation of Nature) were set up in 1962. Human persecution of particular species is a common occurrence in the islands. Bird shooting and trapping are common pastimes for a number of Maltese males, while children capture tadpoles, frogs, chameleons and hedgehogs from the countryside. In response to these activities, a number of interested individuals (mostly biology and science teachers) came together and set up the first local environmental NGOs with the main aim of increasing public awareness about particular species which have been persecuted locally.

The governments' commitment towards the environment improved consistently after the island applied for the European Union (EU) membership in 1990. The Environmental Protection Act (one of the first environmental laws of the country) was passed in 1992. Eventually, a number of other laws were passed, but the government lost the election in 1996, and the bird hunting laws were again watered down by the opposition.

Nonetheless, Malta eventually became a full EU member on 1 May 2004, after a very close referendum. The country has now adopted the majority of the EU environmental laws although it has a special number of derogations due to its particular geography. A derogation means that Malta would not apply a law or part of it. For instance, under the EU law, hunting in spring is normally prohibited so that birds can be protected during migration. In Malta, the two main species that are hunted are turtledoves and quails. Malta will continue to allow hunting for these two species in spring.

NGOs have now become very active in the formal sector and organise environmental campaigns aimed at school children. They also supply teaching resources and promotional material to the schools and teachers. Some NGOs have even organised courses for teachers to equip them with the skills required to organise EE activities.

Formal education: An introduction

Malta's state school sector is influenced, to a large extent, by the British educational system, owing to its colonial past. The educational system is divided into three main sections:

- primary education (from age five to eleven);
- secondary education (from age eleven to sixteen);
- tertiary education (16+).

Schooling is compulsory from age 5 to 16 and kindergarten classes are provided from the age of free. In the primary and secondary sectors, there are state, church and private schools.

About 30% of all students attend the non-state sector schools (Sultana, 1995). Church schools are substantially subsidised by the government, and the tuition is free. Malta used to rely on English based GCEs ordinary levels and advanced levels, but, eventually, a national system called Matriculation Secondary Education Certificate (MATSEC) came into place in 1992 and replaced the English examinations. The MATSEC system includes Ordinary levels and Advanced levels, and a new level in between the two termed the Intermediate level. Nevertheless, a large number of resources in schools, such as textbooks, are still British-based. After two years, students sit for 'Matriculation' MATSEC examinations at intermediate and advanced levels at the sixth form. The MATSEC examinations enable successful students to move on to tertiary education.

Key features of the Maltese educational system which may have an effect on the provision of EE include:

1. an overwhelming reliance on the United Kingdom for educational models, textbooks and expertise (Sultana, 1999);
2. a centralised state education system that is constrained by bureaucracy and practices, such as the appointment to positions of responsibility on the basis of seniority and not on qualifications and merit (Darmanin, 1990; Wain, 1991; Farrugia, 1992; Fenech, 1994);
3. a private school system, consisting of independent and church schools that cater for approximately 30% of the total students' population and that have intensified intra and inter school streaming (Sultana, 1995), increased the culture of competitive achievement (Wain, 1995), and that direct the best human and material resources to the best achievers rather than to those most in need (Mifsud, 1993).

Formal education: Colonial issues

In the eighties, the formal education sector started to give some importance to the study of the environment and other conservation issues. Nevertheless, the development in this direction was hindered, particularly due to our colonial past. Malta's strategic position in the Mediterranean, in between Europe and Africa, made it a perfect stronghold for consecutive colonisers. Malta was colonised by the Phoenicians, the Romans, the Arabs, the Angevins, the Aragonese, the Knights of Saint John and the British. The country gained its independence from the United Kingdom in 1964, and, in 1974, it became a republic with its own president.

The Maltese people seem to have a problem, realising they own the island itself and, therefore, its environment. Maltese homes are kept flawlessly clean, but, in the outside, the environment trash can be found everywhere. The Maltese native language is thought and understood by everyone, but English speaking is still considered to be upper class. Boissevain (1990), who has studied the Maltese social culture for over forty years, argues that generally the Maltese believe that, if something is foreign, it is better. The Maltese manifest pride in their homes, but not in their land or language. In Malta, it is usually held that the views of persons who occupy superior positions should not be questioned (Boissevain, 1990). This tradition is still thriving

nowadays, and some Maltese people do not answer or challenge their superiors. One reason is that one day these same superiors will be interviewing the children of their employees for a job.

Tied with the colonial past issue is the problem of transferability of practice. Good practice in one country does not imply that it will be positively transferred to another country with equally encouraging results. The whole Maltese educational system and textbooks have been adopted and transferred from our last colonisers, and our system still shows the vestiges of the British educational system.

EE at primary level

In 1982, nature studies, geography, history and civics were put together under the title of social studies in order to provide some form of EE over the last four years of the primary period (Ventura, 1993). At primary level, pupils are expected to achieve good formation in character and scientific knowledge in the environmental field, so that they realise that they should appreciate and safeguard our habitat (Ministry of Education, 1989).

Nevertheless, it seems difficult to achieve any form of success with EE programmes in the Maltese islands (Ventura, 1994). This is owing to a number of reasons, including the lack of teacher preparation, the lack of resources, intense streaming and selective examinations that exclude the non-examinable components of the curriculum (Ventura, 1994). Not much progress has been registered in this regard; unpublished research (Mifsud, 2004) shows that most EE programmes in Malta are hindered by the same reasons prevalent in the 1994 study. Some of these constraints have also been reported by other studies (Ham & Sewing, 1987; Samuel, 1993; Sussman, 1999).

There were three main projects that furthered EE in primary schools in Malta in the early nineties. First, there was a UNESCO funded Environmental Education Programme (EEP) run by the Faculty of Education of the University of Malta. The EEP aimed at producing a teacher's manual with practical suggestions on how to infuse EE into primary school subjects as a cross-curricular theme to bring about social change. The project was reasonably successful in generating a new approach to EE in schools based on interdisciplinarity. EE was not presented as a subject, but as a process to be infused in all curricular subjects, and it is still viewed as a cross-curricular theme nowadays. In 1993, the Science Centre of the Education Division inaugurated the second initiative by publishing its teacher's manual on the implementation of EE in the curriculum. The publication was distributed to all teachers with the intention that they would implement its suggestions in their schemes of work, but no monitoring and evaluation of the implementation were initiated, mainly due to lack of funding. The third project was an NGO initiative called 'Dinja Wahda' (One World) which was run by Birdlife, Malta. It is an award scheme, involving 14 different activities, and was accepted and adopted by more than 50% of the Maltese primary schools (Grima, 1996). The first edition of Dinja Wahda was carried out in the school year 1994–1995. Since then, there were subsequent editions in the school years 1999/2000, 2001/2002, 2003/2004 and 2005/2006. The intrinsic value of Dinja

Wahda is in its environmental message. However, the initiative also carries a competitive element where schools earn points for every activity they accomplish, and it must be noted that in some schools this has become the overriding aim of Dinja Wahda.

One of the latest EE developments in the primary sector is the initiation of the EkoSkola (Local Eco-School initiative) programme. It is an innovative programme in Malta, as it involves collaboration between an NGO (Nature Trust) and the government. This is an international EE programme in which about three million children from about 13 thousand schools located in 33 different countries participate. The programme encourages the participation of children in decision-making, planning and implementation of environmental activities with the aim of improving the quality of life in their school and community. The EkoSkola programme was developed in 1994 by the Foundation for Environmental Education (FEE) and seeks to raise environmental awareness and to promote sustainable development at a local level in the classroom and, in the wider community, through the implementation of the United Nations' Local Agenda 21. Nature Trust (Malta), in collaboration with the government, introduced the programme in Malta in 2002 as a pilot project.

From what has been achieved up to now, it seems that EkoSkola is encouraging the holistic development of Maltese schools and opening up innovative collaborative strategies with Local Councils (Mifsud, 2004). Nonetheless, through personal observation as a teaching practice tutor, I have noted that some schools seem to be more interested in gaining points for certification rather than raising the intrinsic value of environmental stewardship in the whole school community.

EE at secondary level

The present curriculum, published in 1999, has been a step in the right direction with the inclusion of environmental studies at secondary level ('O' level). This non-compulsory subject includes sections on management of resources, ecosystems, human population, pollution, climate and geology. One concern brought about by this subject is that it takes a local viewpoint to global problems and solutions. A second concern is that the subject is now examinable. Parents are, now, seeing the subject as important not due to value development, but as it can add a certificate to their children's already long list. The dominant educational ideology sees the school as preparing youth for a job to work, and certification, therefore, is highly regarded from a very early age. Environmental studies are included in a central part of the secondary level curriculum which is common to all schools and through all stages at this level (Ministry of Education, 1990). Therefore, students use this subject to gain another qualification simply by memorising facts, as it is considered to be a 'soft' option. In fact, 94.8% of those opting for environmental studies got a passmark in 2007 (MATSEC, 2008a).

Opportunities to infuse EE into other subjects at secondary school, especially the sciences, but it is up to the individual teacher to carry them out. Integrated science exposes students to issues of waste management, renewable energy, pollution and biodiversity. All these topics are treated in more detail, at a later stage, in their respective subjects, such as biology, chem-

istry and physics. The incorporation of environmental issues in the science curriculum can increase the relevance of science to students (Brody, 1994).

EE can be infused into the rest of the curriculum to expose students to an array of environmental issues. Numerical problems in mathematics can utilise environmental statistics and trends, while essays in languages can cover current environmental issues. The opportunities are there, and the new curriculum proposes measures, such as interdisciplinarity, the development of critical thinking, participatory skills and a learner-oriented pedagogy (Ministry of Education, 1999). Nonetheless, consultation with schools and teachers mainly occurred after the first version of the curriculum was drafted by government officials and university lecturers. This factor, probably, reduces the relevance and sense of ownership of the curriculum on the teachers' part. It is up to the individual teachers to make the difficult decision to include EE or not, bearing in mind the considerable stress caused by the still prevalent examination mentality and lack of timetable time.

EE at post-secondary level

The post-secondary curriculum emphasises that education, at this level, should instil a sense of responsibility towards the environment. Students are also expected to achieve environmental awareness, which is respect for one's common habitat on whose well-being our very existence depends (Ministry of Education, 1991). During 1989, the University of Malta introduced "Systems of Knowledge" – an intermediate examinable subject intended to broaden the traditional disciplines that youth study for their advanced levels. This is an obligatory entry requirement for all undergraduate courses at the University of Malta. The syllabus comprises a number of study areas, including one concerning the environment. This part discusses some concepts of the quality of life and the environment, the basis of pro-environmental action and the principles of sustainability (MATSEC, 2008b). "Systems of Knowledge" has created a lot of controversy in the Maltese islands due to its being obligatory for entry to university (D'Amato, 1992), and there is still discussion to remove "Systems of Knowledge" as an obligatory entry requirement (MATSEC, 2006). However, Ventura considers that the course has increased students' awareness of the human and natural environment as the former are exposed to a number of environmental issues (Ventura, 1994). Nevertheless, it is an assumption not based on any form of research. The MATSEC review committee believes that the course helps students improve their cognitive and practical problem-solving abilities and is in line with current educational trends, emphasising pragmatic problem-solving approaches (MATSEC, 2006). Nonetheless, as students approach this examination as a hurdle, the main approach adopted by some students is to memorise facts and recycle them in examination papers.

In 1992, environmental science was introduced at the intermediate level for post-secondary students. The syllabus includes sections on the atmosphere and atmospheric pollution, water and water pollution, ecology, conservation biology, agriculture, exploitation of natural resources, solid and liquid waste disposal. This subject does not only limit itself to the science of the environment, but also has sections that specifically deal with the social and eco-

conomic associations of the environment. The syllabus makes an effort to take a holistic view of sustainable development by combining aspects from the natural, social and economic fields. Nevertheless, most of the emphasis is on the scientific aspect of the subject, as the examination has normally been biased towards this area, presumably as scientific knowledge is easier to assess than value development.

Teaching and EE

The majority of schools, especially the government schools, advocate the 'job slots' view or a neoclassical view of education. The system tends to domesticate pupils to the teachers' demands and keeps them competing against each other for teacher and school recognition. The traditional pedagogy prevalent in the government's schools is the one in which pupils are prepared for examinations. While the pupils are merely absorbing this information to regurgitate it in the exam paper, the teacher is, here, seen as the provider of information. Unfortunately, teachers' success is also attached to the percentage pass rate of pupils in the examination. In this scenario, fieldtrips, experiential and participative pedagogy, which are much advocated by EE texts, are viewed as a waste of time. Pace (1995) argues that it is only the individual teacher's interest and concern about the environment that ensures the integration of environmental issues in daily teaching, whatever EE policy adopted.

Some teachers spend a large part of their time in drilling exercises and in working out papers with students, at the expense of value development and skill acquisition. They effectively become promoters of this educational ideology, as every statement they make in a classroom is value-laden and connected with ideas about the purpose of education and life (Lawton, 1989).

The government responds: In the 1990s

The growing concern about the blatant urban sprawl and the changing environment of the Maltese islands led to the enactment of the Environmental Protection Act in 1990 and the subsequent publication of the Malta Structure Plan (MSP), which covers a period of twenty years up to the year 2010 and is concerned with resource creation, management and protection. The MSP has more than three hundred policy statements which address sustainable development. Four policies are particularly related to EE are the following:

- actively promote educational programmes aimed at creating positive patterns of behaviour of individuals, groups and of society as a whole towards the environment;
- establish a resource centre for EE, in conjunction with the department of education and the government's environment agency, whose function will be (1) to keep the Maltese public adequately informed about environmental matters; (2) encourage and promote the establishment of field centres by recognised educational institutions and of interpretative visitor centres associated with conservation areas, pro-

vided that these are set up in harmony with existing policies and regulations; (3) encourage and promote public and private research on the environment and on environmental problems, in conjunction with the appropriate government agencies, and to disseminate it widely (Ministry for Development of Infrastructure, 1990).

These objectives are mainly concerned with informal EE. The Maltese government seems to be well-disposed to EE in achieving environmental policy objectives, as it does fund EE projects. On closer scrutiny, however, one finds that most of these projects have short-term goals and are ideal for promoting the government's image. Lack of clear national policy on EE has resulted in a waste of human resources and the shelving of long-term EE initiatives, including the National Environmental Education Strategy (NEES) (Pace, 2002). The NEES was the outcome of the second training workshop on EE in Malta, called "In Today's Education, Tomorrow's Environment". The NEES was an attempt to develop a central infrastructure that co-ordinates EE initiatives (NEES, 1995). From the beginning, the NEES had little political support and insufficient funding. The plan was to deliver a list of guidelines and suggestions for the promotion of sustainability. The government, though, seems to prefer funding plans with short-term goals, such as cleanup campaigns (Pace, 2002).

Focus on one study of local EE development

Pace (1995, 1997) argues that there are three major phases in the evolution of EE initiatives in the Maltese islands:

1. awareness phase (1960s–1970s) characterised by irregular activities, mainly organised by NGOs, aimed at raising public awareness and shaping public opinion to improve the state of the Maltese environment;
2. fragmentary phase (1980s–early 1990s) characterised by the 'institutionalisation' of EE when a variety of actors assumed responsibility for EE, but failed to co-ordinate initiatives;
3. co-ordinated phase (from mid 1990s), involving the setting up of the NEES and characterised by a nation-wide co-ordinated activities and making the best use of available resources.

The first two phases are fairly straightforward and illustrate the first attempts at EE by environmental NGOs followed by the second phase of formal institutions that gather momentum in administering EE courses, most of which were more concerned with imparting environmental knowledge. The third phase is, probably, an idealistic assumption and has yet to start. Much work is still duplicated, mostly as the NEES did not receive adequate government support; consequently, the co-ordinated phase is still in its infancy (Pace, 1995). As a matter of fact, the third phase has never lifted off due to a number of reasons. Firstly, due to the change in the government, two years after the origin of the NEES, a number of government education officials were changed or transferred, and contacts and discussions had to be started again. Secondly, due to the rivalry and mutual exclusion from projects between the Faculty of Edu-

cation of the University of Malta and the Division of Education of the Government of Malta. One explanation for this is that small states cannot offer a wide range of promotion prospects to positions of greater responsibility as these are limited in number (Farrugia, 1991). In addition, competition for scarce resources, such as status and material rewards, make collaboration rather more difficult than in larger social units.

Nevertheless, environmental activities in schools and the community have increased, particularly due to an increment in school participation in EU funded educational projects and through the work of environmental NGOs.

Latest developments

The latest developments with regard to EE in the Maltese islands are the formation of the Maltese Association of Environmental Educators (MAEE), which was formed in April 2002, the formation of the Centre for Environmental Education Research (CEER) in 2004, the launching of the Young Reporters for the Environment (YRE) programme in 2008 and the introduction of the first masters in education for sustainable development at the University of Malta in 2011. The MAEE is a non-profit organisation of teachers, students, community educators and volunteers working in the field of EE. The main goal of MAEE is to promote EE and support the work of environmental educators. In particular, it aims to encourage the development and dissemination of EE in Malta, to promote research in EE and disseminate its results in the educational community. It, presently, comprises about 28 members, but has never, actually, started working owing to the other pressures on the committee members. The CEER was set up in 2004 with the intention of acting as a centre of excellence for EE research in the Mediterranean. It has been promised funds and a building, but, as yet, these have not been forthcoming, mainly due to the 'bureaucratic government system' which is prevalent on the island. Nonetheless, the CEER has now managed to launch the first masters in education for sustainable development in Malta. This three-year course targets teachers and education experts and aims to provide different perspectives of sustainable development, derived from the interaction of different environmental, societal and economic concerns (CEER, 2011).

YRE, a secondary school programme run by the FEE has been launched in the Maltese islands in 2008. About eight schools have confirmed participation up till now. YRE is a continuation of the Ekoskola programme and stimulates students to become involved in environmental journalism. However, it is relatively too early to assess or analyse the effectiveness of the programme at this stage.

Summary and conclusion

EE in Malta has started off with environmental NGOs, mainly in response to the major environmental issues on the island. The awareness raising campaign was a very long affair, hindered in its development by a number of factors that contributed to the slow growth of EE in the islands. These factors include the bird hunters' NGOs, the government's non-committal

policy, the colonial mentality and the highly competitive educational system.

In the formal education sector, one of the major problems is the dominant educational ideology that suppresses creativity and rewards rehearsed words in examinations. This ideology mostly values good marks in examinations, and, therefore, most school activities get sacrificed to make way for exam drills. Individual teachers with an interest in the environment may attempt EE in their school, but, collectively, teachers are hampered with little timetable time and lack of locally produced resources. Some materials currently used in schools were produced for use in other countries, and their transferability into the local context should be cautiously studied. EE courses at university level increase teachers' understanding, but, presently, such courses are relatively few. Environmental NGOs are doing a good job in disseminating information and creating projects, but require more funding, while the hunting NGOs are creating ambiguity.

The situation started to improve mainly in response to the requirements imposed on the country by the EU accession. The government is now realising that EE is an effective and long-term solution to ensure environmental sustainability. Many government officials speak of their commitment to sustainability, but their concern is mainly with short-term goals. The issue here is that EE goals take a long time to be achieved. This, probably, downgrades the financial backing from policy makers, as was the case with a number of programmes and initiatives, such as the NEES and the CEER. Figure 1 illustrates graphically the various factors and processes that have hindered or helped the development of EE in Malta.

All the main factors that were discovered to have had an effect on the development of EE in Malta have been incorporated into the model illustrated in Figure 1. In addition, in the pursuit of keeping the model as simple as possible, minor areas and other factors which this study identified as being of relative or minor importance were not integrated. This model is not being proposed with the assumption of being generalised to other geographical locations. It is being presented as a model for the 'particular' not for the 'general'. This line of thought is supported by Courtenay-Hall and Rogers (2002) when they state that "in sum, modelling research that aims at maximum generalizability while failing to appreciate the particularity of practical knowledge will miss much of what is significant in understanding education" (p. 287).

In the model, a number of factors have a direct influence on EE development (for instance, environmental NGOs, EU accession), other factors have a direct influence on public awareness (for instance, overt environmental issues, environmental NGOs), and one factor has been identified as having a direct influence on politics (EU accession).

The model acknowledges a direct link between the driving forces identified and local EE development; nonetheless, the effect of these factors on the actual development of EE is mediated through a number of barriers (shaded grey in the model) identified through the contextual study. These barriers appear to decrease the potential of the driving factors that facilitate EE development. They include politics, the colonial mentality, bird hunters' NGOs and the highly competitive educational system. The 'Politics' and the 'Colonial mentality' barriers are

thought to be the main hindrances to the evolution of local EE.

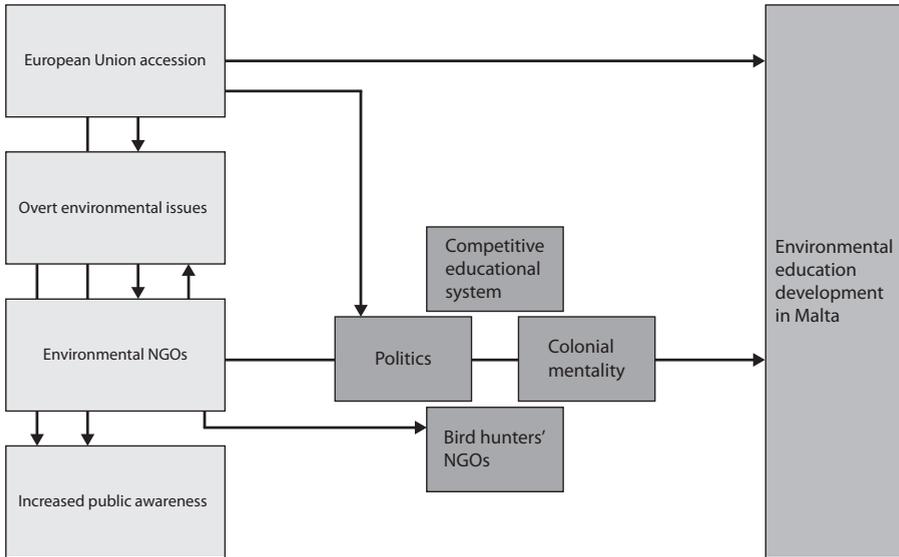


Figure 1. Driving forces and barriers in the development of environmental education in Malta

The arrows in Figure 1 indicate how the various factors influence each other and how they influence the development of EE in Malta. The model is broadly self-explanatory and depicts the complex and evolving relationship between politics, the Maltese mentality, environmental NGOs and local EE development. EU accession and public awareness have a direct link between them, but other possible indirect linkages may exist. The model acknowledges that EU accession had a direct effect on EE development and, also, influenced politics directly. This model indicates that the relation is indeed multifaceted and acknowledges the fact that EE development was also mediated and influenced by public awareness and overt environmental issues, which, in turn, were influenced by EU accession and environmental NGOs. This reciprocal dimension indicates that the model includes communal elements rather than only individualistic ones.

The way forward

The findings from this study have shed light on the effectiveness or otherwise of historical and current EE driving forces and barriers in EE development. The importance of environmental NGOs and EU accession as having a direct influence on EE development and the effect of overt environmental issues as factors that have a direct influence on public awareness have been underscored. The contextual study has also highlighted a number of important barriers that have hindered the evolution of local EE. These barriers include politics, the colonial mentality, bird hunters' NGOs and the highly competitive educational system.

Some of the barriers that are not allowing the development of EE include political con-

cerns. These are directly related to the government, its institutions and the political parties. Political parties should actively aim to reduce the sense of futility by seeking young people's opinions through voluntary meetings, organised seminars and debates on current environmental issues, in which young people are heard and given centre stage. In the two-party game of Maltese politics, suggestions that may undermine the possibility of gaining political advantage may not be taken seriously. I believe that this is not the case here.

The main concern that has been indicated is the lack of textbooks on the Maltese environment. Rather than let authors try to make ends meet (Malta is a very limited market) and publish the books themselves (as the situation stands now), the government should actively commission authors to publish such books to fill in these lacunae.

NGOs, local policy makers and educators have to take these findings very seriously when devising new EE programmes. This is to ensure that such programmes lead to an effective positive development of EE. Researchers should start studying the effectiveness or otherwise of such programmes, so that maximum benefit is derived from the limited financial and human resources available. In this scenario, schools should be main stakeholders not only in terms of educational policies, but also in relation to environmental ones, both at the regional and national level.

Rather than fund and rely solely on NGOs to provide EE at the primary and secondary level, the government should infuse values and education for sustainability in the curriculum. This change needs to be accompanied by the actual removal of 11+ exams which have been identified through the contextual study as the main factor that reduces the possibility of EE in the classroom. Additionally, teachers need to be well-prepared for this change, and the Faculty of Education at the University of Malta has to respond by offering a much wider variety of units to equip teachers with the necessary skills to cope with this transformation. Practising teachers should also follow these units during in-service teacher training as part of their continuous professional development.

This research has done the groundwork for baseline indicators regarding EE development in Malta. The following areas of research have been highlighted through this study as warranting further investigation:

- comparative analyses between EE development in different countries;
- further development of the 'Driving Forces and Barriers in the Development of Environmental Education in Malta' model within other sectors of the Mediterranean region;
- the effectiveness of the current EE projects carried out by NGOs and other institutions;
- the effectiveness of various subjects and pedagogies, including environmental science, environmental studies, systems of knowledge and biology, at various school levels to bring about change in a local context.

This commitment would enable the implementation of EE programmes aimed at developing an environmental ethic that would make the Maltese people move towards a sustainable

society. It should empower citizens to participate in decision-making and management in sustainable development, which is one of the objectives of EE.

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PRE-SERVICE TEACHERS' USE OF IMAGES IN INTEGRATING ENVIRONMENTAL SUSTAINABILITY LESSONS

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Abstract

Environmental sustainability is a topic widely discussed in the field of science education, yet, few entities have committed to developing environmental sustainability education standards. The Washington State Department of Education has created K-12 Integrated Environmental and Sustainability Learning Standards (IESLS, 2009), which align with current research and practices in environmental and sustainability education. This study focuses on the perceptions of secondary pre-service teachers about the use of images to teach environmental sustainability topics integrated in their content area. The research explores the question what secondary pre-service teachers' perceptions of sustainability and using images to teach environmental sustainability topics in their content area are. The participants were comprised of secondary pre-service teachers enrolled in an instructional methodology course from a small university in the Pacific Northwestern United States. Teaching environmental sustainability and integrating lessons using images had a noticeable impact on pre-service teachers' perceived future teaching practices. Participants also changed beliefs over the course of the study about using images to teach environmental sustainability topics.

Key words: *environmental sustainability, environmental science education, integration, images, secondary pre-service teachers*

Introduction

Environmental sustainability (ES) is widely discussed in science education. However, the Washington State Department of Education in North America has actually made a commitment to the teaching and learning of sustainability in education through the development of specific learning standards. Washington State K-12 Integrated Environmental and Sustainability Learning Standards (IESLS, 2009) set a vision for how sustainability is to be an integral component in all subject areas, from social studies to science to physical education. In 1990, the Washington State Board of Education ruled ES was to be part of instruction at all levels,

K-12 (IESLS, 2009) and corresponding Grade Level Expectations (GLEs) were developed. Nationally, in 2008, the North American Association for Environmental Education (NAAEE) created sustainability learning standards together with the U.S. Partnership for Education for Sustainable Development (USPESD). Guidelines were included across the curriculum requiring environmental education (EE) instruction in grades K-12 (IESLS, 2009). The State of Washington in particular developed standards declaring ES to be integrated among all content areas.

Instruction about conservation, natural resources, and the environment shall be provided at all grade levels in an interdisciplinary manner through science, the social studies, the humanities, and other appropriate areas with an emphasis on solving the problems of human adaptation to the environment (IESLS, 2009, p. 2).

These state education standards, which align with current research and practices in environmental and sustainability education (SE), are making it feasible to be fully aligned with SE (Byrne, 2000; Bell & Morse, 2006; Manderson, 2006). Although EE is recognised among educators, a major problem is EE has never fully been integrated into the school curriculum (Palmer, 1998). Learning about ES in other subject areas through curricular integration may provide a vehicle for inclusion of this topic in K-12 education. One way of delivering environmental science may be through images. While a verbal explanation can provide valuable content about these topics, what is the impact when images are added? The internet offers teachers many visually motivating images. However, while teachers have an instant access to photos and graphics of environmental concerns, including readily available images of scientific phenomena, formal understanding of the use of images to enhance or facilitate knowledge is limited.

This study explores the perceptions of secondary pre-service teachers about the use of images to teach ES topics integrated in their content area. The questions driving this study are the following: 1) *What are secondary pre-service teachers' perceptions of teaching ES topics in their content area when connected to the Washington State K-12 Integrated Environmental and Sustainability Learning Standards (IESLS, 2009) and 2) How do using images in lessons effect pre-service teacher's decisions to integrate ES topics with lessons in their content area?*

The study begins by establishing a common language around the topics of ES, integrated curriculum and the use of images to support learning.

Images for instruction

The capacity for perceiving and recalling visual information is related to understanding abstract relationships through observation of diagrams and other visual representations (Tufte, 1983, 2006). The world perceived is made up of complex, interrelated collections of objects and backgrounds. However, few are able to completely assess all that is in an entire scene (Intraub & Bodamer, 1993). When observing a picture, the human eye typically perceives only a partial picture of the larger surroundings. Hochberg's (1978) theorised visual integra-

tion is based on the viewer's ability to understand pictorial displays. Since the eye can only focus on one area at a time, perception of the whole is attained by use of mental abstractions that translate and assimilate knowledge for future views of the visual world (Hochberg, 1978; Intraub & Bodamer, 1993).

Clark and Paivio (1991) used illustrations alongside instruction to help learners retain information by facilitating dual coding in a rich network of modality specific verbal and non-verbal representations. Dual coding is a cognitive method that provides more than one way to understand. For instance, dual coding can be experienced through observation and interpretation of pictures as well as verbal description, giving students greater options to recall information (Clark & Paivio, 1991; Mayer & Sims, 1994). The dual coding model typically describes relationships of a scientific system related to verbal explanations and visual animations through the use of more than one sensory modality. This model can construct visual images using verbal material and conversely can evoke verbal representations using visual material (Mayer & Sims, 1994).

Integrating environmental sustainability

Although integration has been vigorously pursued in both science and mathematics since the 1930s (McBride & Silverman, 1991), there has been a wide range of definitions for integration. Marsh (1993) suggests the various forms of curriculum integration can be placed on a scale, from 'discipline-based options' with separate subjects taught at different times to 'internal orientation' where students incorporate activities that are planned and implemented by both students and teachers. Integrated curriculum introduces students to the problems, issues and concerns of life as it is lived in the real world. Martin (1995) asserts integration allows curricula to educate through the experiences of diverse races, genders and classes, therefore, creating a place of meaning for each child. According to Beane (1997), the term 'curriculum integration' appeared in scholarly literature. However, the expression became confused with a constrained definition based around the correlation of thematic, teacher-driven curriculum (Beane, 1997). Hirst (1974) rationalised a subject-specific approach restricted students' thinking and development by making the process of learning artificial and alien compared with their life experiences.

SE offers a rich and meaningful context for using images for integration in teaching and learning of multiple disciplines. Nolet (2009) provides a definition where the interdisciplinary and holistic nature of sustainability lends itself to being integrated in the whole curriculum and not as a separate subject. Understanding integration requires acknowledgment that the curriculum is embedded in social and natural environments (Sobel, 1995). Integrative teaching practices connect current issues to the curriculum, drawing on historical situations and incorporating problem-solving skills with real world problems (Jacobs, 1989; Kirkby, O'Keefe, & Timberlake, 1995). These practices mirror the current global nature of society, considering consequences for not addressing the interdependence of society, economy and the natural world (Venville, Wallace, Rennie, & Malone, 2001). Hungerford (1998) argues for integrating

EE with other subjects, considering it a multidisciplinary and collaborative topic. Integrating environmental topics may also prove relevant when presented through multidisciplinary and experiential practice (Gruenewald, 2003).

A case study with pre-service teachers

The purpose of this descriptive case study is to uncover the perceptions of secondary pre-service teachers about the use of images to teach ES topics integrated in their content area. A descriptive case study approach is appropriate, as it is a bounded system, a ten-week secondary methods course where the interactions are completed within the site (Lincoln & Guba, 1985). All pre-service teachers enrolled in the course were seeking state certification to teach their subject at the secondary school level. Table 1 indicates the subject areas.

Table 1. Participants' undergraduate content areas

Subject area	Number of pre-service teachers per subject	Number of pre-service teachers interviewed
Art	1	0
Chemistry	1	1
History	5	1
Mathematics	1	1
Music	4	1
Languages/Spanish	1	0
Physical education	2	1
Religion	1	0

Participants

The participants were 16 secondary pre-service teachers enrolled in an instructional methods course from a small university in the Pacific Northwest. They were all undergraduate junior and senior secondary education students, eight males and eight females. All students were given a pre- and post-survey inquiring about their perceptions of sustainability as a topic to be integrated with their subject area.

Data sources and procedures

Data for this study came from three major sources: 1) a five-point Likert-scale questionnaire about pre-service teachers' attitudes towards sustainability, images and integrated teaching; 2) videotaped interviews from five participants following the integrated sustainability lessons; 3) artefacts, including journal reflections and lesson samples. All 16 secondary pre-service teachers were surveyed regarding their beliefs about the use of images and their perceptions of sustainability in a lesson directly related to their subject area. From the pool of 16 pre-service teachers, five were chosen from five separate subject areas to participate in one 30–40 minute structured one-on-one video-taped interview. Table 2 provides sample survey statements.

Table 2. Sample Likert-scale survey statements from the case study

Beliefs about images	Environmental sustainability
Images are important to making sense of things	ES is a topic I consider to be part of my subject area
<i>Role of images</i> Images are necessary for teaching in my subject area	<i>Ease of teaching ES</i> Teaching issues of sustainability in my subject would not be difficult
	<i>Impact of ES images on teaching</i> Images of sustainability issues will enhance my teaching and student learning

After completion of the survey, the students were assigned the task of choosing images to include in an integrated lesson combining the ES standards with standards in their secondary subject areas as well as those of another classmate. Table 3 depicts integrated topics. For the lesson presentations, the pre-service teachers were asked to specifically choose environmental images according to these criteria: 1) appropriate content and context; 2) ability to encourage causal reasoning; 3) scientific and historical integrity of the image source itself. After presenting the integrated lesson to their classmates, participants were asked to provide a one to two page journal reflection on the process of creating the integrated lesson, choosing the images and the likelihood of using this lesson and creating similar integrated lessons in their own classroom.

Table 3. Secondary subject lessons integrated with sustainability factors

Secondary subjects	Sustainability factor
Art and languages/Spanish	Recycling trash in Spain into artistic creations for decorative purposes
Chemistry and music	Chemical make-up of instruments recycled into useful objects
History and physical education (1)	Historic look at local environmental issues combined with a bike tour
History and physical education (2)	Impact of baseball field installation on local environmental concerns
History and mathematics	Correlation between population and resource exploitation in the Pacific Northwest
History and music	Effects of the industrial revolution on art, music, the environment and society
Mathematics and music	Music genres encouraging environmental awareness while graphing trends in sustainability
Religion and music	Connecting key spiritual concepts via musical expression to themes of sustainability

Surveys. In the first week of the 10-week secondary methods course, pre-service teachers were given a five-point Likert-scale pre-survey containing twenty-five questions – twenty scaled and five open-ended. The questions covered beliefs about using images in teaching, the role of choosing and viewing images in lesson presentations and how images may influence integrated ES lessons. A post-questionnaire was distributed to the participants two days following in-class presentations of integrated lessons using images.

Pre-service teachers' responses to the pre- and post-surveys were based on pre-service teachers' beliefs about sustainability, perceptions of their ability to teach ES topics, the ability to integrate ES with their subject area and the value of images for teaching integrated ES lessons. To maintain reliability considering the participants' wide variety of content areas, all participants were asked the same questions relating to images and ES in both surveys. The survey contained 25 scaled and five open-ended items related to images and ES. Of these, five scaled and one open-ended item were chosen to best represent the themes of this study.

Journal reflections. Reflective practice, as described by Dewey (1902), is an endeavour that is essential to critical thinking. Rogers (2001) offers four criteria for reflective practice: 1) as a form of meaning-making; 2) systematic, rigorous and disciplined thinking; 3) in interaction with others; 4) an attitude of value for personal and intellectual growth in oneself and others. These criteria were encouraged in this study, as a minimum of three journal responses were used to reflect on questions posed about the meaning of the activity undertaken both personally and in a collaborative community of pre-service teachers. The researcher provided questions for reflection such as: *How did adding images impact the integration of sustainability in your lessons?* These reflections were collected and searched for themes of meaning.

Interview responses. From among the 16 secondary pre-service teachers, five were purposefully chosen from a variety of subject areas for one-on-one interviews (Table 1). The purpose of both the reflective journaling and one-on-one interviews was to get at the participants' thinking about ES as related to their content and the use of images to express those thoughts. Each videotaped interview followed the researcher-scripted protocol and lasted for approximately 30 minutes. Interview transcripts were typed and coded searching for themes in the data.

Lesson samples. The pre-service teachers were assigned a lesson planning assignment over a three-week period. The instructor presented an exemplar lesson that included discussion about integration techniques and criteria for choosing preferred images. Resources distributed by the researcher/instructor for preparation of the lessons included a Washington State Integrated Environmental Sustainability Learning Standards (IESLS, 2009) document, assignment parameters (one integrated lesson plan, a minimum of five images, guidelines for choosing images, a PowerPoint presentation and one-page reflection) and the university departmental lesson plan templates. After discussion regarding each of these pieces, each pre-service teacher was paired with another in a different content area (for instance, mathematics with music or history with science). The students' pairs were assigned to create a sustainability lesson using the state standards combined with their two content disciplines. These submitted final lessons were used to inform the themes of this study.

Study implementation

This study took place during the autumn 2012 quarter in a general secondary methods course at a small liberal arts college in the Pacific Northwest. Once Institutional Review Board approval was obtained, the students' views and perceptions regarding the inclusion of photographic images in an integrated lesson were explored. To meet the requirements for state

teaching certification, pre-service teachers are required to develop effective lesson plans, beginning with choosing objectives and appropriate assessments. They develop learning activities based on their content area selection, identify groupings of classroom students and plan how to make connections from classroom to the home. Once the lesson is given in a classroom, the pre-service teachers collect students' evidence, such as quizzes, drawings and reflections. These assessments were then analysed by the pre-service teachers for students' understanding of the learning objectives chosen for the lesson. The pre-service teachers used these analysed lesson components to plan follow-up lessons. Participants continued planning lessons in this method for their coursework with the addition of choosing images appropriate for an assigned integrated ES lesson (Table 3).

Case study findings

The pre-service teachers reviewed the Washington State K-12 Integrated Environmental Sustainability Education Standards (IESLS, 2009). Although they were familiar with state standards and objectives in their major content area such as mathematics or history, they were surprised to learn of this additional integrated standard. The State of Washington standards document explains that the "Integrated Environmental and Sustainability Education Learning Standard is distinct unto itself, they are interrelated and ideally would inform teaching and learning concurrently" (IESLS, 2009, p. 3). Though not widely integrated by classroom teachers, the topic of ES is advanced and typically supported by educators as well as a majority of the general population in the Pacific Northwest of the United States.

Pre-service teachers' beliefs about the role of images

People are bombarded with images of all kinds seen in homes, schools and even in their cars with smart phones. It is no wonder pre-service teachers reported images as important to their teaching. At the beginning of the study, the students indicated an overall belief about the importance of images and the role of images in instruction. As compared to later themes, a large majority of students began the study indicating their valuing images before as well as after the study. Responses for both pre- and post-survey question were consistently high concerning the overall importance of images to making sense of the world and for use in teaching (Table 4).

Table 4. Mean scores from pre-/post-survey questionnaire

Survey question topic	Pre-survey mean	Post-survey mean
Importance of images	4.40	5.00
Importance of images to teaching	3.75	4.70
ES part of content area	1.55	4.05
Ease of integrating ES into content area	1.55	4.40
Impact of ES images on teaching	1.55	3.75

Initial questions posed prior to discussion of images asked about levels of enjoyment from

viewing images and how important they are to making sense of the world. Following the experience of choosing images, the students said, “I believe more and more that images are a key in conveying messages where words fail” (Samantha, journal entry) and “I think [a picture] can engage people in a way simple words do not” (Karly, journal entry).

The next belief about using images for teaching to specific content areas was in response to the question: *Are images necessary for teaching in my subject area?* As a result of the project, many believed that images would be beneficial to their teaching practices. Stan reported, “Images are very powerful and help to cement the topics into student’s minds” (journal entry). In history, images were seen as bringing “a whole new level of understanding to historical events that would most likely seem dry and uninteresting otherwise” (John, journal entry). Elaine described images as “especially important when new information is presented or when a specific point is being made that is not something I have thought about before” (journal entry). Though images were initially reported as important, the degree of importance was raised through this experience (Table 4).

Defining sustainability. Although many students are aware of environmental issues and the term ‘sustainability’, the meaning is not easily explained. Sustainability is a broad construct (Nolet, 2009) with meaning varied in relation to context. In ecology, it is more closely related to maintaining a balance in an ecosystem. In a broader sense, it refers to the balance between systems, both human and, naturally, in the environment. In this study, the participants were asked about their definition of sustainability and the notion that ES could provide a meaningful context for integrated teaching and learning. “Pre-service teachers exhibited discomfort and some even grew frustrated when grappling with these questions” (the researchers’ journal entry). When answering the pre-survey question regarding the essence of the notion ‘sustainability’, most of the participants, in this study, could not give an accurate definition of sustainability, and, of those, a portion provided no answer at all. One participant said he was uncertain [about sustainability] and couldn’t “put words to it” (John, pre-survey response). Karly thought that “sustainability is the ability for something to remain”. Though the definition of sustainability is varied, it is generally accepted to include maintenance to keep a balanced level of resources and avoiding the depletion of natural resources.

Following the ES lesson presentation and a participant’s own study into the topic while searching for appropriate images, over eighty percent had a viable understanding of the concept. In an open-ended post-survey response, John described sustainability to be “how we use what we have and not waste what we have. We only have limited amounts of material on the earth. We as humans are pretty wasteful of that”. Other descriptions included:

Getting a good definition of sustainability down, that was, probably, the best part [of creating the integrated image lessons] for me. I sit there and say “okay, I need to do something on sustainability” but, really, what is it? It’s a political issue, it’s a social issue, but I didn’t really know [before this] what it means (Kelli, interview transcript), and ...

I’d define it as how we take care of our environment in order to last, continue to be available to us. The resources that we have, the stewardship that we have, what, basically,

we do in order to make sure that we still have the things in 50 years that we have today (Lindsay, post-survey response).

Teaching ES in various content areas. Currently, education is considered an integral component of sustainability (Onwueme & Borasi, 2007), yet the idea of ES as an integrated teaching and learning topic is uncommon. The greatest change in viewpoints among the participants in this study came when responding to queries about ES as a topic relating to their own subject area, ease of teaching ES and ES topics enhancing their teaching practices (Table 4). Initially, only a small portion of the participants believed ES could be taught within their content, and most believed it could not be part of their subject area. Change over the course of this study was influenced by several factors, including a better understanding of sustainability, integrating their subject content with a sustainability topic and purposefully choosing images to teach their lessons. After teaching the integrated lesson, nearly all participants expressed that not only did they see ES connections with mathematics, art and history, for instance, but found it easier to integrate than initially thought and found ES valuable to their content area. In music, for instance, Lindsay found that “the connection [between music and sustainability] gave very pronounced focus for the lesson” (post-survey response). Related to integrating sustainability with history, John reported:

I never really associated environmental sustainability with history before, as far as teaching is concerned. It intrigued me, and I realised that it actually matches quite well, thinking about the subject that I would already be teaching but have those issues in them and pulling it so that students are aware that what they are doing has to do with environmental sustainability. In other words, it's already there, just identifying it and studying it consciously. So, thinking about that was interesting (journal entry).

Teaching ES with mathematics was seen as having a high value for Kevin.

Looking back on it now, this is, probably, the best lesson I've put together [...] like, all of a sudden, it wasn't just a math standard how you are going to teach, like a lecture with a worksheet, it's, like, don't do any of that because now it's going to be about sustainability and the environment and how are you going to work those together. And then, all of sudden, I was, like, Oh, a project sounds fun or some research, and we are going to change it up ... this is going to be fun! I think a lot of us in the class, too, were like, I want to teach this lesson. I'm going to save this and one day teach it (journal entry).

Valuing the integration of sustainability and other secondary subject content and using appropriate images to teach those concepts was seen as a way to deepen students' thinking. “Integration of multiple subject areas [such as art or foreign languages] in lesson planning is an excellent way to broaden students' minds and teach more material outside of the core curriculum” (Karly, journal entry). Andrew believed that “integrating the sustainability standards for environmental content with historical content was, actually, not difficult. It is fairly easy to demonstrate environmental destruction that human beings have caused when about any aspect of history is considered” (post-survey response).

Impact of images for future environmental sustainability teaching practices

The direction for SE involves training teachers to understand a changing world in the larger context of where one's teaching and learning is located (Darling-Hammond, Banks, Zumwalt, Gomez, Sherin, & Griesdorn, 2005). How will lessons using images of ES affect future teaching practices? Participants were asked whether images about sustainability issues would enhance future teaching practices. Using images to teach ES in their content area had a great impact on pre-service teachers. After completing the lesson, the majority showed a marked change on the survey responses in journal reflections and one-on-one interviews regarding the use of images to integrate sustainability topics with their subjects (Table 4). "This lesson took quite a bit of creativity and effort, I feel it was well worth it with the dynamic lesson plan created, and I will definitely be employing this integration technique [for choosing images] in my future lessons whenever and wherever possible" (Conner, journal entry).

I absolutely will use [images]. For many students, history is not relevant or interesting, and I now see that images can change that. They can either make or break a history lesson. And whether using pictures or media, I think [images] will play a huge role in my lesson planning, the units I give (John, journal entry).

Though many see sustainability as a segment of science and not a novelty combination for teaching an integrated lesson, adding images as a result of this study was deemed invaluable.

I think integrating images into my subjects is important, especially since the forces that my students will be studying are not really able to be captured on camera. For chemistry, images of models or diagrammes portraying chemical principles are necessary because reactions occur at the nanolevel. For physics, I will need images picturing effects of certain forces or diagrams of different mechanical systems to help the students understand the material. ... Regardless of what I am teaching, I will want to use images, not just for the students who are visual learners, but for all students because pictures will help them start to construct mechanisms in their minds or difficult concepts (Lindsay, interview transcript).

Crafting lessons to encourage interest in sustainability topics impacts future attitudes and practices of both students and teachers. "Finding images that catch the viewers' attention makes them ask questions and establishes an emotional connection, students are even more interested in participating in the lesson" (Karly, interview transcript).

Conclusions

This study surveyed pre-service teachers' perceptions of ES topics as well as beliefs about future teaching practices using images to teach ES topics. Pre-service teachers' definitions of sustainability revealed a lack of initial understanding and ability to explain its purpose in education. After the creation of an integrated lesson, most participants came to understand sustainability in terms of not wasting what we have, recognising limited resources and the responsibility as stewards of the earth. When queried concerning their beliefs about images,

they indicated positive attitudes toward using images for teaching in a variety of content areas. Most of the pre-service teachers indicated they would definitely integrate ES lessons similar to those created for this study with their various subject area content and were eager to do so. Pre-service teachers considered images important, engaging, powerful and ultimately valuable to future teaching practices.

Teaching ES in integrating lessons using images had a noticeable impact on pre-service teachers' perceived future teaching practices. The criteria for choosing images impacted their decision to use those pictures of ES to teach integrated lessons, as evidenced in increased survey responses. Though initially, few participants believed ES standards aligned with their content area, after preparing and presenting the integrated lessons, the vast majority found connections giving a pronounced focus to their lessons, making it easy to demonstrate environmental damage in connection to topics found in mathematics, history, art, among others. The majority of participants also changed beliefs over the course of the study about using images to teach ES topics. While preparing the lessons took time and energy, many believe images added to ES lessons create dynamic lessons preparing their students for higher-order thinking as well as making emotional connections to the subject.

The process of choosing images for some participants came after choosing the topics for integration while other participants chose the ES images first and then connected those to a specific standard within their subject area. Both approaches showed many benefits as well as pointed to some difficulties depending on the subjects being integrated. Since novice teachers lack experience teaching ES, they need practical examples that provide a vehicle to present an integrative lesson into their own teaching practices and content areas. Using images of ES while integrating lessons aid these teaching practices.

Preparing for and becoming a teacher includes understanding the place in which one lives. Educating about ES prepares people to sustain the cultural and ecological components of the places they inhabit (Darling-Hammond et al., 2005; Hungerford, 2010). Further research is needed to determine if pre-service teachers are communicating awareness of these environmental issues as in-service practitioners to their own elementary students. Following these 16 pre-service elementary teachers into their teaching experiences could provide rich data and insight to address this question.

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