



Education for Sustainable Development: Liberation or Indoctrination? An Assessment of Faculty Members' Attitudes and Classroom Practices

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The purpose of this study was to investigate the attitudes and classroom practices of environmental science faculty members in Jordanian universities. Mix data collection methodology was employed to collect data in this study. In addition to the developed survey, several participants' interviews and classroom observations were conducted with selected participants. The results of this study indicated that environmental science faculty exhibited a moderate level of attitudes toward ESD. Although they demonstrated a strong preference for pedagogical approaches that were contrary to the basic tenets of indoctrination, they used teaching practices that hinged on indoctrination. The study suggested following several safeguards practices against indoctrination when adopting a committed approach to ESD. Another suggestion was for universities to offer special training courses and workshops for faculty members to enhance their pedagogical knowledge. In addition, the study suggested that universities encourage building learning communities between faculty members to advance their awareness, attitudes, and pedagogical knowledge that relate to ESD.

Key Words: sustainable development, education, environment, liberation, indoctrination, pedagogy

Introduction and Theoretical Framework

Sustainable development remains barely recognized as a significant social, economic, or environmental challenge for the whole world (Calder & Clugston, 2003). Sustainable development is defined as "the development that meets the generation's needs of the present without compromising the ability of future generations to meet their needs" (WCED, 1987, p. 43).

The relationship between education and sustainable development was first recognized on an international level at the 1972 Stockholm Conference on the Human Environment. Agenda 21 acknowledges that education is essential for making progress toward sustainable development: "Education, including formal education, public awareness and training, should be rec-

ognized as a process by which human beings and societies can reach their fullest potential. Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues” (UNCED, 1992, Chapter 36). In addition, the UN declared the period from 2005 to 2014 as a Decade of ESD aiming to provide an “opportunity for progressing towards implementing universal quality education that fosters the knowledge, skills, perspectives, and values that lead to a more sustainable future” (UNESCO, 2005, p. 2).

According to Mayo, Pace, and Zammit (2008), ESD is intended to develop a citizenry empowered to participate actively in the decision-making forums that determine its quality of life. They add, instead of being moulded into conforming as unthinking adults, who are susceptible to the whims of policy-makers, adult ESD learners are gradually changed into active political beings (Freire, 1970). This could help people reach the goals of sustainable development. In the same vein, Hansmann (2009) insists that if sustainability is to be achieved, sustainability learners do not only need to analyze and understand cognitively or scientifically what sustainability means when confronted with problems of the anthroposphere and natural systems. Sustainability-prone personal and social norms and values need to be imparted to enhance people’s motivation for engaging in sustainability-prone behaviors and making pro-sustainable decisions. These must be regarded as the central objectives of ESD.

While the education of the future generation demands an integration of sustainable development principles within the curricula, that incorporating faces many critiques (Cortese, 1999; McKeown, 2002). One of these critiques is the denial of the reflexivity and self-critique, which are central aspects of a socially-critical positioning in research and that is practiced in education for sustainability. This denial, however, contradicts with the principles of democratic and liberal education (Ashley, 2005; Fien, 2002).

There is a significant literature (Aldrich-Moodie & Kwong, 1997; Bonnett, 1999, 2000; Jickling & Spork, 1998; Storm, 1990) that has been critical of the tendency of environmental educators to proselytize on behalf of their subject or, more specifically perhaps, on behalf of the values position they hold. Critics have been concerned with questionable practices that range from the careless use of scientific evidence to plain indoctrination. In the same vein, most environmental educators (Ashley, 2005; Cortese, 1999; Hoepper, 1993; Fien, 2002; McKeown, 2002; Orr, 1992) emphasize that the education for sustainability seeks not to indoctrinate but to educate for a body politic comprised of ‘people able to act to maintain the best of what we have, to challenge the unsustainable, and to build the desirable’ (Hoepper, 1993, p. 36).

Furthermore the liberal ecocentric environmental educator, David Orr, argues that environmental education is more than merely values-laden. Indeed, Orr (1992) describes sustainability education as ‘unavoidably political’ and argues that environmental educators have to choose whether they want to ‘equip students morally and intellectually to be a part of the existing pattern of corporate-dominated resource flows and take part in reshaping these patterns towards greater sustainability?’ (pp. 145-146).

Because teachers are considered to be the cornerstones in preparing future generations, they can play a crucial role in altering students’ behaviors and attitudes toward ESD. The teacher must evaluate the different sources and arrive at a responsible philosophy for instructing students. Teachers must translate this philosophy into teaching strategies and materials designed for classroom instruction. Several decisions have to be made regarding: (1) how to teach students to develop their understanding of the concept of sustainable development; (2) how to instruct students to apply their definition of sustainable development to specific current circumstances; (3) how to instruct students to resolve issues involving conflicting interpreta-

tions of sustainable development. Due to that importance of investigating the way teachers teach about sustainable development, this study came to address that issue. Therefore, this study aims at investigating environmental science faculty members' attitudes and classroom practices with respect to ESD.

Statement of the Problem

Teachers can greatly influence their students' beliefs and attitudes with respect to ESD. Due to that importance, there is a need to provide an assessment for ESD in Jordanian universities. It is necessary to focus on environmental science faculty members' attitudes toward ESD and the depth and frequency that strategies for ESD were employed in conjunction with other curriculum responsibilities.

Research Questions

This study aimed to answer the following questions:

1. What are the attitudes of environmental science faculty members in Jordanian public universities toward education for sustainability?
2. To what extent do these faculty practice education for sustainability in the classrooms?

Significance of the Study

This study tried to assess faculty members' attitudes and classroom practices in public universities in Jordan regarding ESD. The study will help researchers and practitioners to determine the level of faculty members' awareness of ESD, their attitudes toward it, and their actual classroom practices. The results of this study may provide valuable insights for the preparation of future university faculty members as well as some prospective directions to the development of new, more practical approaches to ESD in national and international universities.

Research Methods and Procedures

Population and Sample

The target population for this study was all environmental science faculty members employed by public universities in Jordan. The sample of this study comprised of 65 environmental science faculty members who are employed by three public universities in Jordan for the second semester of the academic years 2007/2008. A total of 46 usable instruments were returned with a response rate of 70%. The sample distribution was 32 males (69.6%) and 14 females (30.4%). With regard to university affiliation of participants, there were 5 (10.9%) from Yarmouk University, 24 (52.2%) from the Hashemite University, and 17 (37.0%) from the University of Jordan. There were 16 (34.8%) associate professors, 21 (45.7%) assistant professors, and 9 (19.6%) instructors. There were 13 (28.3%) participants below 5 years of experience, 14 (30.4%) between 5-9 years of experience, 9 (16.6%) between 10-14 years of experience, and 10 (21.7%) 5 and above years of experience.

Research Context

The site of this study is Jordan. Jordan is a relatively small country situated at the junction of the Levantine and Arabian areas of the Middle East. Jordan occupies an area of approximately 96,188 square kilometers including the Dead Sea, making it similar in size to Austria or Portugal. However, Jordan's diverse terrain and landscape belie its actual size, demonstrating a variety usually found only in large countries.

Western Jordan has essentially a Mediterranean climate with a hot, dry summer, a cool, wet winter and two short transitional seasons. However, about 75% of the country can be described as having a desert climate with less than 200 mm. of rain annually. Jordan can be divided into three main geographic and climatic areas: the Jordan Valley, the Mountain Heights Plateau, and the eastern desert, or Badia region. This study took place in three big public universities in Jordan; University of Jordan, Yarmouk University, and Hashemite University. The three universities were traditional ones; with a high percentage of students (nearly 97,000) attending all three universities.

Instrumentation

The scales and items used in the instrument were developed by the researchers after a thorough review of the literature especially related to the environmental sciences, environmental awareness, and sustainable development. A demographic section was included to provide a description of the sample used in the study. These demographic variables included gender, university affiliation, academic rank, and years of academic experience. The face and content validity of the instrument was evaluated by an expert panel comprised of university faculty members, environmental professionals, and pro-environment organizations. The instrument was field tested with 19 environmental science university instructors from various public universities who were not included in the final sample of the study. Changes indicated by the validation panel and field test were incorporated in the instrument development. The final instrument was named "the ESD Questionnaire" (ESDQ) and is comprised of two separate scales and 30 items (See Appendix A).

The first scale is the attitudes toward ESD with 10 items such as "I am encouraged to teach about environmental sustainable development in my courses" and "it is important for university instructors to have teaching skills related to education for environmental sustainable development". These items were rated using a five point Likert-type scale scored as follows: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree. The second scale is the classroom practices with 20 items such as "during class sessions, I present students with stories related to the environment" and "I design classes that clarify the environmental standards followed by the government". These items were rated as follows: 1 (always), 2 (seldom), and 3 (never). The scales of the instrument exhibited acceptable internal consistency coefficients of (0.89) for the attitudes toward ESD related to the environment, and (0.93) for the classroom practices scale.

Data Collection

Both quantitative and qualitative data collection strategies were employed to collect data in this study. In addition to participants' responses on the ESDQ survey, several semi-structured interviews (Bogdan & Biklen, 1998) around ESD were also conducted with two participants. The semi structured interviews provided an opportunity to get comparable data across participants (Bogdan & Biklen, 1998). All interviews were recorded and transcribed for in-depth

analysis. In addition to interviews, researchers conducted over 10 classroom observations in both professors' classes to better understand their enactment of ESD. According to Bogdan & Biklen (1998), non-participant observation consists of observing the activities, people and physical aspects of the situation being studied.

At the beginning of the study, the researchers contacted each university participating in the study to gain their permission to conduct the study. Once permission was granted, all environmental science faculty members employed by the universities under study were contacted in person and by telephone toward the end of the second semester of the academic year 2007/2008. Before handing the ESDQ instrument, the researchers explained to participants the purpose of the study and encouraged them to read the statements carefully before ticking the appropriate choice. The participants were also ensured confidentiality and anonymity. Finally, instruments were collected within a two-week time-frame.

Data Analysis

Data collection and analysis occurred simultaneously throughout the study. For the quantitative part of the study, SPSS version 16.0 software was utilized to get the required statistical indices. However, for the qualitative data, all interviews were transcribed and analyzed (Emerson, Fretz & Shaw, 1995). In reviewing interviews transcripts, we identified patterns or themes emerging from the data (Berg, 1995) and organized them into broad categories such as contradictions, beliefs. We carefully cross-checked the themes that emerged from each subject's transcripts to enable ourselves to link related data from different interviewees. Then themes were grouped and marked or labeled with accompanying interpretive notes. As far as the analysis stage of data gathered through observations, from the field notes we focused on the observation notes of our visits to each participant's classroom. We integrated these observation notes on the activities, events and features of the physical setting with information drawn from the interviews and the conversations with the subjects.

Results of the Study

The quantitative data collected from all participants were analyzed using SPSS-version 16.0. Prior to analysis, descriptive statistics of all variables in the study were examined using frequencies, the minimum and maximum values for each variable were examined for the accuracy of data entry by inspecting out of range values, which did not show any outliers. Missing subjects were not detected either. The qualitative data were analyzed to extract general themes from both participants' interviews and observations.

Faculty Members' Attitudes toward Education for Sustainability

The analysis of the survey items found that the overall mean score for all items was 3.31, indicating moderate attitudes of faculty members toward ESD (Table 1). Of all items, seven exhibited high mean values above 3.50 indicating high favorable attitude toward the item content; two items exhibited moderate mean values, while one item exhibited weak mean value of 2.20.

Table 1. Means and standard deviations for the attitudes of faculty members toward the education for sustainability

Items	Means	Standard Deviations
Item 1	3.83	.67
Item 2	3.80	.83
Item 3	3.78	.72
Item 4	3.09	.93
Item 5	3.61	.90
Item 6	2.20	.71
Item 7	3.65	.64
Item 8	2.54	.83
Item 9	3.02	.97
Item 10	3.59	.71
Average	3.31	.29

Faculty Members' Classroom Practices of Education for Sustainability

The analysis of the second section of the survey found that the overall mean score for all items was 1.85, indicating seldom practice of ESD in classroom (Table, 2). As shown in Table 2, Items 10, 11, 12, 13, 14, 15, 16 indicated “never” practice of ESD inside the classroom, where items 1, 2, 3, 4, 5, 6, 7, 8, 9, 17, 18, 19, 20 indicated a seldom practice of ESD inside the classroom.

Discussion

The purpose of the study was to assess environmental science faculty members' attitudes and classroom practices with respect to ESD. A descriptive approach that required the use of a survey was selected for the study. The data from each section of the survey were carefully analyzed and tabulated for displaying means and standards deviations of each item.

ESD: Faculty's Attitudes and Classroom Practices

Section one of the survey focused on faculty members' attitudes toward ESD. The section consisted of 10 statements. Participants were asked to respond to each statement by selecting one of five likert style responses: strongly agree, agree, undecided, disagree, and strongly disagree. As indicated in the results' section, the overall mean value of the faculty's attitudes was 3.31, signifying moderate attitudes toward ESD. The analysis of each item in this section provides more insight about their attitudes. In general, their responses on the first item indicate that they have strong attitudes toward ESD with a mean value of 3.83. In addition, as appeared from their responses on item 5, they strongly believe that each faculty should have sufficient

Table 2. Means and standard deviations for the classroom practice of the education for sustainability

Items	Means	Standard Deviations
Item 1	1.28	.50
Item 2	1.78	.51
Item 3	1.22	.46
Item 4	1.67	.56
Item 5	1.46	.54
Item 6	1.84	.60
Item 7	1.70	.55
Item 8	1.65	.56
Item 9	1.96	.72
Item 10	2.11	.56
Item 11	2.64	.64
Item 12	2.54	.69
Item 13	2.62	.65
Item 14	2.69	.46
Item 15	2.56	.58
Item 16	2.20	.66
Item 17	1.37	.57
Item 18	1.48	.50
Item 19	1.09	.28
Item 20	1.15	.36
Average	1.85	.19

pedagogical skills to educate for sustainable development with a mean value of 3.61. Furthermore, their responses on items 3 and 7 with mean values of 3.78 and 3.65 respectively, which may indicate that they hold an anti-indoctrination belief with respect to ESD. They strongly believe on giving their students opportunities to develop their own understanding about the concept of ESD. To achieve that goal, they expose their students to the multiple perspectives available around the various environmental issues. That anti-indoctrination belief was also verified by participants' responses on item 6 that declares the acceptance of faculty members to use multiple ways to influence their students' environmental beliefs and attitudes.

These conclusions were echoed during our interviews and classroom observations with our participants. Professors believe that their students need to have sufficient environmental

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content knowledge in order to be environmentally literate and make informed and sustainable environmental decisions.

I believe that my students need to know lost of environmental content knowledge in order to be environmentally aware ... therefore, I mainly focus on teaching them content in order to be technically component. (Samer, personal interview)

Each professor argued that providing students with basic environmental knowledge *may* allow them to think about solving environmental problems themselves. Both professors also explained that prompting students to consider possible solutions to environmental problems was not part of their responsibilities:

You [the interviewer] might have a certain point of view but I think it is better to let them [the students] figure it out by themselves and search for the solution instead of dragging them to the solution that you want. (Ala'a, personal interview)

Both professors emphasized the need to provide their students with basic environmental knowledge, yet they recognized that they largely omitted other aspects of the ESD triad (economy and society):

...I believe that this class has a place in the curriculum ...in which the [students] get the chance to learn the technical environmental knowledge. Thus the focus of this class is on the technical stuff even if it is the least important. (Samer, personal interview)

The professors were comfortable presenting what they understood to be “objective facts” that describe “the way things are”. Thus they understood their reliance on presenting “objective” “facts” to be an approach to preclude indoctrination and not influencing their students’ decisions, which contradicts with the values of democratic and liberal education. It is interesting to note that faculty’s anti-indoctrination beliefs were not echoed inside their classrooms. The analysis of their responses on some items of the classroom practices indicated that they employed several pedagogical approaches to influence their students’ environmental beliefs. Their answers of “Always” on items 1, 3, 5, 19, 20 demonstrated their use of indoctrinating pedagogical practices.

Furthermore, our classroom observations showed that professors do not practice their beliefs inside the classroom; they do not give students room to reflect on their learning and try to influence their students’ choices. The mismatch between faculty’s anti-indoctrinating beliefs and their indoctrinating teaching practices, with respect to ESD, is critical and demands further analysis of the construct of teachers’ beliefs. Many science educators stress the influence of teachers’ beliefs on their teaching practices (Haney, Czerniak, & Lumpe, 1996; Pajares, 1992). Furthermore, studies emphasize the influence of teachers’ beliefs about students on the sort of the instructional strategies that teachers use (Hamrlich, 1997; Laplante, 1997). Moreover, several researches imply that the relationship between beliefs and practice is dynamic, but experiences may interfere with that relationship (Bullough & Baughman, 1997; Richardson, 1996).

Gess-Newsome (1999) believes that teacher's beliefs act as gatekeepers in the processing of new knowledge, allowing some information to become part of existing mental constructs, which reinforces previous beliefs; or discarding information that does not fit precisely with previously held conceptions. The different paths that new information and experiences can take leads to actions that are sometimes consistent with beliefs and other times inconsistent (Berliner, Carter & Doyle, as cited in Waggett, 1999, p. 5).

Researchers emphasize that understanding teachers' beliefs is difficult because individuals are reluctant to describe their beliefs precisely. Indeed, some studies underscore large discrepancy between teachers' espoused beliefs and their observed practice (Calderhead, 1996). That discrepancy is also mentioned by (Pajares, 1992). He argues that what teachers say may or may not be reflective of their true beliefs; it may be a reflection of what they believe is appropriate to say, or what the teacher would hope for. Consequently beliefs cannot be directly measured or observed, they must be inferred from a combination of what teachers "say, intend, and do" within the context of their work settings (Pajares, 1992).

Returning to the results of this study, the mismatch that found between faculty members' beliefs about ESD and their observed classroom practices could be attributed to several factors. One of these factors is their lack of pedagogical knowledge as they graduated from a pure science and environment schools. Haberman (1991) supports this explanation, he argues that teachers tend to use the pedagogy that they were taught by during their school years or what Haberman (1991) called the pedagogy of poverty, when they lack a newer pedagogy. This kind of pedagogy is characterized by teacher-controlled activities such as giving information, tests, directions, and grades; monitoring seat work; settling disputes; and reviewing tests and homework. It also includes a set of beliefs, such as "teachers are in charge and responsible" that often run counter to those that support critical science pedagogy.

Research literature has widely shown that teachers hold strong orientations and beliefs about teaching before they come to university. In order to enable prospective teachers to begin teaching using new pedagogical approaches as opposed to using primarily didactic approaches, and in order to help them develop their skills and practice in this approach, these prior teaching orientations need to be addressed, reflected on, and challenged (Friedrichsen & Dana, 2003; Gess-Newsome, 1999).

Another reason of the mismatch between these faculty beliefs and their classroom practices is the lack of teaching community that supports their pedagogical knowledge. In discussing the relationship between the teaching communities and ESD, some educators argue that sustainable development will be impossible to achieve without communities that enable individuals to be aware of their connections, both locally and globally (Lincoln, 1999).

Many researchers highlight the importance of learning communities in fostering learning, understanding, and behavior (Astin, 1993; Tinto, 1997). In fact, many researchers believe that learning communities represent an intentional departure from many traditional practices in higher education (Laufgraben & Shapiro, 2004; Smith, MacGregor, Matthews, & Gabelnick, 2004).

There are several advantages of building learning communities for sustainable development in higher education. According to Moore and Oliver (2003) some of these advantages are encouraging and facilitating the sharing of ideas, dialogue, and discussion between individuals, focusing on following up on plans and problems and in visioning the future, and planning for their own survival and sustainability (Cortese, 1999; Filho, 1999). Further analysis of the items that demonstrated faculty members' classroom activities indicates that these faculty have seldom employed democratic classroom teaching practices. Items 6, 7, 8, and 16 represent that conclusion. While they seldom used democratic teaching practices, they never

touched related environmental issues that involve the government. Items 11, 12, 13, 14, 15, and 16 support that conclusion. Responses of these participants on these items signify their unwillingness to involve their students in the political issues. These conclusion also seen during our classroom observations as professors rarely allow discussion inside the classroom and use all their class time to present their content knowledge and views on solving environmental problems.

In addition to that, professors' did not establish a democratic atmosphere inside their classroom. This conclusion was clearly observed inside their classroom as they try not to touch or critique governmental decisions with respect to environment. Their responses on items 11 and 15 of the survey, which concerned about encouraging students to pressure their government to apply the global environmental treaties, indicate that 65.2% and 59% respectively, never encouraged their students to pressure their government to apply the global environmental treaties. This suggested that participants believed that politicizing their students is inappropriate and their students should stay far from political issues.

When we inquired about the reason of such a practice, one of the professors argued that they don't like to be perceived to be against the government or they are trying to push for certain political agenda.

... I try to make my students aware of the environmental problem...I don't like to criticize the government in order not to be perceived as I am pushing for some agenda. I am here just to make them aware of the problems. (Samer, personal interview)

...I think my role is strictly content and in that way my students can trust what they hear from me, I don't want to be accused that I am trying to obtain some political objectives when I address the political issues inside the classroom. (Ala'a, personal interview)

According to Herremans & Reid (2002), not addressing the political side while discussing environmental issues contradicts with the principles of ESD as political issues form a main component of the discussion of sustainability. Additionally, their responses to item 14 indicated that 67.4% of them never instructed their students that it is the responsibility of the individual to criticize the government with respect to its environmental position. The data suggested that participants believed the well being of a free society is not nurtured through constructive criticism rather than contrived cover-up in issues involving politics.

The situation of the undemocratic teaching practices that these faculty exhibited can be attributed, in part, to their short experience with democracy. Comparing to other world democracies, the democracy of Jordan is still new. Due to its recent establishment in 1988, the people of Jordan and including faculty members have not experienced their complete democratic values such as criticizing the government. Therefore, participants of this study appeared to be still operating from their undemocratic (Indoctrinating) teaching values that were clearly reflected in their teaching practices.

To better understand the notion of indoctrination, one should first know the meaning of the concept itself. Huttunen (2003) defines indoctrination as an unethical influence of students in a teaching situation. He also mention that indoctrination is used to refer to inculcation of concepts, attitudes, beliefs and theories and thus by-passing students' free and uncritical deliberation of ideas. Indoctrination involves neglecting an important viewpoint in such a discussion (Siegel, 1991). In contrast, the concept of Education refers to a positive and concerns

about considering multiple perspectives and opposing viewpoints in studying such a phenomena (Bell, 2004). According to Rawls (as cited in Bell, 2004, p. 39) the purpose of education in democratic societies is to prepare students for citizenship in a society of free and equal citizens, each with the capacity to form, revise and pursue their own doctrines, and the ability to live by principles of justice appropriate for such a society.

Is Education for Sustainable Development Indoctrination?

The educational practices, with respect to ESD that participants in this study revealed, appeared to be undemocratic and indoctrinating. Their practices also described as an 'ideological imposition' that 'translates into [either] outright proselytizing or gentler steering'. This type of education opposes the principles of liberal education (Orr, 1992; Scott, 2002). Scott (2002) explains that environmental educators have a responsibility to avoid indoctrination; indeed, he describes four kinds of responsibilities that environmental educators have along these lines such as (1) helping learners understand why the idea of sustainable development ought to be of interest to them, (2) helping learners gain multiple perspectives on issues from a range of cultural stances, (3) providing opportunities for an active consideration of issues through appropriate pedagogies, (4) helping learners understand what they are learning and its significance, and finally (5) encouraging learners to continue to think about what to do, individually and socially, and to keep their own and others' options open. However, Scott (2002) emphasizes that doing less than this seems neglectful but doing much more runs the risk of indoctrination.

Furthermore, to avoid the practice of indoctrination in teaching environmental issues, Fien (1993a) suggested important safeguards practices against indoctrination when adopting a committed approach to teaching. These practices are professionally-ethical, but committed, teaching approaches. Examples of these teaching practices are inquiry learning, logical and critical thinking, political literacy and action research, and community problem solving (Fien, 1993b). Furthermore, Fien (1995) provides some practical workshop processes through which principles for dealing ethically with values in the classroom may be identified, clarified and prioritized according to individual theories-in-use.

In conclusion, ESD seeks not to indoctrinate but to educate for a body politic comprised of 'people able to act to maintain the best of what we have, to challenge the unsustainable, and to build the desirable' (Hoepfer, 1993, p. 36). Even the liberal, ecocentric environmental educator, David Orr, argues that environmental education is more than merely values-laden. Indeed, Orr (1992) describes sustainability education as 'unavoidably political' and argues that environmental educators have to choose whether they want to 'equip students morally and intellectually to be a part of the existing pattern of corporate-dominated resource flows...[and] take part in reshaping these patterns towards greater sustainability?' (p. 145- 146).

Conclusions and Recommendations

According to the findings of this study, the position of academics toward ESD is supportive. Three conclusions derived through an analysis of the data and findings presented in this study. These conclusions are:

First Conclusion: Environmental science faculty members at Jordanian universities supported ESD in university classrooms. They believed that ESD was important and should be one of the objectives of any university course. They also demonstrated their strong support for using a variety of educational strategies for ESD in their classrooms.

Second Conclusion: Environmental science faculty members who participated in this study rejected employing anti-indoctrinating pedagogical practices in ESD. They strongly believed on giving their students opportunities to develop their own understanding about the concept of ESD.

Third Conclusion: Participants in this study showed a mismatch between their teaching beliefs and classroom practices with respect to ESD. Although they used teaching practices that hinged on indoctrination, they also demonstrated a strong preference for pedagogical approaches that were contrary to the basic tenets of indoctrination.

Recommendations

Based on the abovementioned conclusions, several recommendations can be offered to advance the ESD in Jordanian universities. One of these recommendations is for the universities to offer special training courses for their faculty members on what the notion of sustainable development means and why it is important to teach for it. Offering such courses will significantly contribute in increasing university faculty members' knowledge and awareness of the notion of ESD. In addition, offering training workshops for faculty members appears to be essential to update their knowledge on anti-indoctrinating pedagogical practices.

Another recommendation for Jordanian universities is to encourage building learning communities between university faculty members. Building such learning communities is important because they can significantly contribute in developing faculty members' awareness, attitudes, and pedagogical knowledge that relates to ESD. A final recommendation for future research would be replicating this study in a middle and high school contexts to see how schools' teachers views about ESD and compare them to those of university faculty that resulted in this study.

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Appendix A. ESD Questionnaire Survey

Dear Participant:

The enclosed survey deals with the attitudes and practices of environmental scientists regarding teaching for sustainable development. Information from the survey will be the core of this research. Your input is critical. I very much need your help in completing the survey. The survey should take you 15-20 minutes to complete.

Your return of the completed survey is voluntary and constitutes your sole consent to be a participant in the research project. In order to assure your privacy, the survey is not in any way coded to identify participants.

Section One: Demographic Information:

1. Gender
2. Academic degree
3. Academic field
4. University teaching experience

Section Two: Attitudes toward Teaching for Sustainability:

Please circle the appropriate response by using the following codes:

SA = Strongly Agree
A = Agree
U = Undecided
D = Disagree
SD = Strongly Disagree

1. SA A U D SD Teaching about Environment should be one of the objectives of every academic course.
2. SA A U D SD It is difficult to teach about Environment without indoctrinating students.
3. SA A U D SD The best approach to use when teaching about

- sustainability is to permit students to develop their own understanding of the concept after a thorough examination of all other related concepts.
4. SA A U D SD The sole responsibility for teaching about sustainability should be left to organizations other than schools.
 5. SA A U D SD Teaching about sustainability is important to Jordanian professors.
 6. SA A U D SD It is permissible for Jordanian university professors to use methods of indoctrination when engaging their students in an environmental study course.
 7. SA A U D SD The best approach for teaching about sustainability is to conduct lessons that permit students to openly discuss the concept.
 8. SA A U D SD Environmental Jordanian professors have been given adequate direction for teaching about sustainability.
 9. SA A U D SD Teaching about sustainability is too controversial a topic to be taught in an Jordanian university course.
 10. SA A U D SD Jordanian university professors would be more receptive to teaching about sustainability if they were provided more direction on the topic.

Section Three: Classroom Practices

Please respond to the following statements by circling the letter code of the corresponding choice you feel most accurately represents your teaching style:

F = frequently
S = seldom
N = never

1. F S N I present factual material on the myths about environment.
2. F S N I explain the meaning of environmental meetings and conferences such as the Earth summit, signing environmental agreements...etc
3. F S N I teach about sustainability in the manner that emphasizes the positive features of our culture, religion and beliefs.
4. F S N I encourage students to discuss the advantages and disadvantages of participation, protest, and voice their opinions when discussing the political process that deals with various environmental issues.
5. F S N I advocate that every good citizen should act according to “think globally and behave locally” principle.
6. F S N I teach my students to evaluate Jordanian administration against established environmental standards such as those of air and water quality international agreements.
7. F S N I teach that democracy is the best system to vote for environmental agreements.
8. F S N I assign my students to study existing environmental problems in the United States in light of the ideals of democracy.

ESD Liberation or Indoctrination

- | | | | |
|------|---|---|--|
| 9.F | S | N | I teach lessons that portray Jordanian high environmental standards |
| 10.F | S | N | I require students to memorize all or parts of international environmental agreements and incidences. |
| 11.F | S | N | I encourage students to protest when their government refuse to comply with such an international environmental law. |
| 12.F | S | N | I teach the truth regarding Jordan's past (either good or past with regard to their environmental position). |
| 13.F | S | N | I disclose serious flaws in Jordanian environmental policy. |
| 14.F | S | N | I instruct students that it is the responsibility of the individual to criticize the government when one is convinced the government is wrong with regard to its environmental position. |
| 15.F | S | N | I encourage my students to demand our government to comply with the international environmental agreements. |
| 16.F | S | N | I teach that there are occasions when a protest against the Government's environmental decision can be defended as appropriate democratic act. |
| 17.F | S | N | I simultaneously promote pride as an Jordanian when my country lead and promote the international environmental meetings. |
| 18.F | S | N | I provide students with encouragement to understand the details of national and international environmental agreements. |
| 19.F | S | N | I encourage students to behave and act sustainably. |
| 20.F | S | N | I encourage students to promote the environmental awareness of other citizens. |