How to Change University Faculty Members’ Attitudes and Behavior in the Context of Education for Sustainable Development

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It is commonly assumed that attitudes and behaviors need to be modified to secure a sustainable future. This article examines insights from the social sciences in this extensive field. It first evaluates college faculty attitudes and classroom practices with respect to education for sustainable development (ESD) using a survey designed for that purpose. Results of the study indicate that college faculty exhibited a moderate level of attitudes toward ESD. Although they showed a strong preference for pedagogical approaches that were contrary to the basic tenets of indoctrination, they used teaching practices that hinged on indoctrination. That mismatch between faculty attitudes and behavior was carefully highlighted and discussed by taking account of the personal, physical, social, and institutional contexts that shape and constrain their choices. The study suggested following several safeguards practices against indoctrination when adopting a committed approach to ESD, offering special training courses for college faculty to enhance their pedagogical knowledge, and building learning communities between college faculty to advance their awareness, attitudes, and pedagogical knowledge that relates to ESD.

INTRODUCTION AND THEORETICAL FRAMEWORK

Many educators argue that preparing scientifically literate citizens should be the ultimate goal of instruction at schools, colleges, and universities. They believe that scientific literacy enables people to take right decisions to solve their future socioeconomic problems (Colucci-Gray, Camino, Barbiero, & Gray, 2006), such as shortage in quality food, water, and air. However, many researchers argue that most social and economic issues have a major environmental dimension (Fien, 1993; Cortese, 1999; Hares, Eskonheimo, Myllyntaus, & Luukkanen, 2005). They argue that good citizenship requires a familiarity with the social
and economic processes that accompany most environmental issues and some understanding of how the scientific method works (Schneider, 1997; Brickhouse & Kittleson, 2006). Environmental literacy should therefore be a major task for schools and universities in the future (David, 1974; Orr, 1992; Brennan, 1994; Bowersons, 1996; Hsu & Roth, 1998; Colucci-Gray et al., 2006).

Education for sustainable development (ESD) is recognized as the most promising approach to increase environmental literacy and awareness, and to produce a logical knowledge base on which people can make intelligent decisions to protect the environment (Desinger, 1982; Fien, 1993; Orr, 1992; UNCED, 1992). ESD attempts to prepare future environmental citizens (Fien, 1993; Cortese, 1999, 2001; Sterling, 2001) by focusing on providing students with broad and diverse sources of knowledge. More importantly, the goals of ESD are for students to develop a deep concern about the welfare of the planet, its ecosystems, its cultures, and its people.

While the education of the future generation rests in the hands of educators, college faculty are seen to play a vital role in enacting ESD in university students. However, the need to move citizens toward considerations of sustainability is in direct contrast with the fear of many college faculty, who feel strongly that they should try to avoid influencing students’ attitudes toward the environment, or imposing any kind of pro-environmental agenda upon their students (Cotton, 2006). Although ESD calls for a “radical transformation” in students’ understandings, perspectives and values with particular care in understanding the results of their personal and collective actions, many suggest that environmental educators must be clear to act as environmental educators, not advocates (Mappin & Johnson, 2005).

In the same vein, most environmental educators (Ashley, 2005; Cortese, 1999; Fien, 2002; Hoepper, 1993; McKeown, 2002; Orr, 1992) emphasize that 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” (Hoepper, 1993, p. 36).

College faculty attitudes and behaviors toward ESD can greatly affect their implicit perceptions, plans, and actions in the classroom (Pajares, 1992). Therefore, college faculty must evaluate their attitudes and practices with respect to ESD and arrive at a responsible philosophy for instructing students. They must translate their philosophy into teaching strategies and materials designed for classroom instruction. Thus, several decisions have to be made by college faculty regarding how to teach students to develop their understanding of the concept of sustainable development, how to instruct students to apply their definition of sustainable development to specific current circumstances, and how to instruct students to resolve issues involving conflicting interpretations of sustainable development.

Due to the importance of college faculty attitudes and behavior toward ESD, this study came to investigate environmental college faculty attitudes and classroom practices in the university setting. The study tried to answer the following questions:

1. What are the attitudes of Jordanian environmental college faculty toward ESD?
2. To what extent do these faculty practice ESD in their teaching?
3. What is the magnitude of relationship between their attitudes and classroom practice?

METHODOLOGY

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.

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 Education for Sustainable Development Questionnaire” (ESDQ) and is comprised of two separate scales and 30 items (see Appendix).

The first scale is the attitudes toward ESD with 10 items that were rated using a Likert-type scale ranging 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 rated as follows: 1 (always), 2 (rare), and 3 (never). The scales of the instrument exhibited acceptable internal consistency coefficients of .89 for the attitudes toward education for sustainable development related to the environment, and .93 for the classroom practices.

Data Collection

The researchers contacted each university participating in the study to gain their permission to conduct the study. Once permission was granted, all environmental college faculty 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 out 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.

RESULTS

Data collected from all participants were analyzed using SPSS-version 11.5. 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.

Results of Research Question One

Research question one was to determine the attitudes of environmental science faculty members toward ESD. Means and standard
deviations were used to accomplish this question. As shown in Table 1, the overall mean score for all items was 3.31, indicating moderate attitudes of faculty members toward ESD related to the environment. Of all items, seven exhibited high mean values above 3.50 indicating high favorable attitude toward that item; two items exhibited moderate mean values, while one item exhibited weak mean value of 2.20.

Results of Research Question Two

Research question two was to determine the extent to which environmental college faculty practice ESD in their classrooms. Means and standard deviations were also used to accomplish this question. As shown in Table 2, the overall mean score for all items was 1.85, indicating rare practice of ESD in classroom. Items 10, 11, 12, 13, 14, 15, and 16 indicated “never” practiced ESD inside the classroom, whereas items 1, 2, 3, 4, 5, 6, 7, 8, 9, 17, 18, 19, and 20 indicated a rare practice of ESD inside the classroom.

Results of Research Question Three

Research question three was to determine the relationship between attitudes and classroom practice of environmental college faculty. This question was accomplished using the Pearson Product Moment correlation coefficient \( r \). The interpretation of the correlation coefficients was based on the following set of descriptors: .70 or higher—very strong relationship; .50 to .69—substantial relationship; .30 to .49—moderate relationship; .10 to .29—low relationship; and .09 or lower—negligible relationship (Davis, 1971).

The means of respondents’ scores on faculty attitudes were correlated with the means of respondents’ scores on classroom practice. Table 3 illustrates that the correlation between faculty attitudes and classroom practice is moderate, positive, and significant at the .01 level.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Means and standard deviations faculty attitudes toward ESD</th>
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<tbody>
<tr>
<td>Item number</td>
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<tr>
<td>1</td>
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<thead>
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<th>Means and standard deviations for the classroom practice of ESD</th>
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<td>Mean</td>
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<td>Average</td>
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<tr>
<th>Table 3</th>
<th>Correlations between faculty attitudes and classroom practice</th>
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<td>Pearson’s ( r )</td>
<td>Significance</td>
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<td>Professional environment</td>
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**Correlation is significant at the .01 level (2-tailed).
The purpose of this study was to assess the attitudes and classroom practices of environmental college faculty in Jordanian universities as they related 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

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 member should have sufficient 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, showed 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 diverse environmental issues. That anti-indoctrination belief was also verified by participants’ responses on item 6, which declares the acceptance of faculty to use multiple ways to influence their students’ environmental beliefs and attitudes.

It is interesting to note that faculty’s anti-indoctrination beliefs were not matched with their classroom practices. The analysis of their responses on some items of the classroom practices showed that they employed several pedagogical approaches to influence their students’ environmental beliefs. Their answers of “Always” on items 1, 3, 5, 19, and 20 demonstrated their use of indoctrinating pedagogical practices.

The mismatch between faculty’s anti-indoctrinating attitudes and their indoctrinating teaching practices, with respect to ESD, is critical and demands further analysis of the constructs of attitudes and behavior. According to Pajares (1992), teachers’ attitudes may not match their practice. What they say may or may not be reflective of their true attitudes; it may be a reflection of what they believe is appropriate to say, or what the teacher would hope for. A recent example of the mismatch between attitudes and practice is the reaction of the international community to the Kyoto Protocol. Despite the positive attitudes of several countries to the Kyoto Protocol, it is difficult to get it enacted, monitored, or enforced. That indicates that attitudes are not the sole, or the primary, influence on behavior. Thus, positive attitudes toward ESD of participants in this study will be more successful if other behavioral factors in addition to their personal factors are addressed (Stern, 2000).

Factors Affect the Association Between Attitudes and Behavior

A host of researchers indicate that several factors influence the strength of association between attitudes and behavior (Guagnano, Stern, & Dietz, 1995; Schultz & Oskamp, 1996; Sheeran, 2002; Stern, 2000). These factors are related to two general causes of behavior, personal and contextual factors. The following sections discuss these factors in detail.

Personal Factors

A powerful personal factor that influences whether participants in this study acted on their intention is habit (Dahlstrand & Biel, 1997; Webb & Sheeran, 2003). They may have a
positive attitude not to indoctrinate their students but their personal habit of teaching further influences their behaviors. According to Verplanken and Aarts (1999) habits can be defined as “learned sequences of acts that have become automatic responses to specific cues, and are functional in obtaining certain goals or end-states” (p. 104). Thus, the first feature of habits is that they have a history of repetition. The more frequently we perform a behavior, the more likely it becomes habitual.

However, it is not the recurrence of a behavior per se that constitutes a habit. Rather, a habit is created by frequently and satisfactorily pairing the execution of an act in response to a specific cue (e.g., Hull, 1943). Encountering such a cue thus automatically triggers the habitual response. In other words, whereas new behavior may follow from conscious decision-making, the formation of a habit implies the delegation of control over the behavior to the environment (Bargh & Gollwitzer, 1994; Verplanken & Aarts, 1999). For example, a person might discover that taking the 8:10 a.m. bus gives him the best connection to his new job. Once he has satisfactorily practiced this connection, an association is created between a particular cue (8:00 a.m.) and a particular behavior (going to the bus stop). If the goal of going to work is activated, encountering that cue will automatically trigger the behavior. No conscious decision-making is needed anymore: A habit has been born.

It is important to note that for faculty to act in opposition to their ingrained habits (indoctrinating teaching practices) is much more effortful than performing a novel behavior and unfortunately, this is the situation for many, if not most, environmentally relevant behavior changes. Although most habits are, in principle, controllable (e.g., by deliberate thinking), it often appears difficult to overrule strong habits (Aarts & Dijksterhuis, 2000; Heckhausen & Beckmann, 1990; Verplanken & Faes, 1999). However, we assume that increasing faculty awareness of non-indoctrinating teaching practices would help them challenge their indoctrinating teaching habits. Carefully designed ESD programs could potentially influence the effectiveness of attitude change by developing strategies to assist and support faculty to change their teaching habits. ESD training workshops on how to teach ESD content is an example of such programs. These ESD courses can help college faculty develop professionally, reflect on their teaching practices, and offer them new pedagogical approaches that develop students’ critical-thinking and decision-making skills (Friedrichsen & Dana, 2003; Gess-Newsome, 1999).

It is important to note that offering such training courses to college faculty will help them migrate from adopting the rational information deficit model of teaching to another holistic model that addresses all facets of ESD (environment, economy, and society). Burgess, Harrison, & Filius (1998) argue that the “information deficit model” that assumes that offering environmental information to learners will not lead to people making the link between policy and action. Providing information to learners may in some circumstances influence their attitudes on some environmental issues, but “often has little or no impact on their behavior” (McKenzie-Mohr, 2000, p. 543). Attitudes themselves are influenced by a variety of social, political, and cultural factors aside from information provision.

**Contextual Factors**

In addition to personal factors, several contextual factors are also influencing faculty pedagogy and contribute to the mismatch between their attitudes and behavior. Bullough and Baughan (1997) indicate that one of the most consistent findings in social sciences is the degree to which human behavior is influenced by its immediate physical and social context (Osborne, 1998).

The unsustainable contexts that surround these faculty do greatly influence their adoption of indoctrinative teaching practices. The demand of managerial work inside the university, their responsibility of teaching large class sizes, and preparing and publishing research in
prestigious journals are significant factors that contribute to increasing their workload and distracting them from developing and/or reflecting on their pedagogical skills.

One way to encourage faculty to reflect and adopt new pedagogical approaches is participation in learning communities between university faculty. In discussing the relationship between the teaching communities and ESD, some educators argue that ESD will be impossible to achieve without communities, which make individuals aware of their connections, both locally and globally (Lincoln, 1999).

Many researchers emphasize the importance of learning communities in fostering learning, understanding, and behavior (Astin, 1993; Tinto, 1997; Tinto, Goodsell-Love, & Russo, 1993) and reforming the university's ESD (Cortese, 1999; Filho, 1999; Sterling, 2001). Learning communities, however, represent an intentional departure from many traditional practices in higher education (Laufgraben & Shapiro, 2004; Smith, MacGregor, Matthews, & Galbenick, 2004).

Moore and Brooks (1997) mention several advantages of building learning communities for sustainable development in higher education, such as demonstrating a capacity for inclusiveness and empowerment, and encouraging and facilitating the sharing of ideas, dialogue, and discussion across a large part of the community.

Furthermore, Malnarich (2005) maintains that through the dialogue and discussion process between individuals in learning communities, they refine their pedagogy, improve their interpersonal communication skills, and articulate their individual concerns for community problems and how best to carry out successful projects to attain their objective of building a sustainable future (Cortese, 1999; Filho, 1999; McKeown, 2002).

Moreover, learning communities will increase faculty members' awareness and understanding of the notion of indoctrination and indoctrinative pedagogical practices. Learning communities will help faculty adopt the purpose of education in democratic societies, which revolves around preparing 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.

In addition, learning communities will help them avoid any unethical influence of their students' thinking, inculcating concepts, attitudes, beliefs, and theories, by-passing students' free and uncritical deliberation of ideas (Siegel, 1991).

Additionally, through participating in such learning communities, faculty members will have the opportunity to reflect on their responsibilities to avoid indoctrination (Orr, 1992; Scott, 2002). In this regard, Scott (2002) explains that environmental educators have a responsibility to avoid indoctrination; indeed, he describes five kinds of responsibilities that environmental educators have, 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.

REFERENCES


Appendix 1
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. If you have any questions, e-mail me at ahmadgablan@hotmail.com.

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. I present factual material on the myths about environment.
2. I explain the meaning of environmental meetings and conferences such as the Earth summit, signing environmental agreements...etc.
3. I teach about sustainability in the manner that emphasizes the positive features of our culture, religion, and beliefs.
4. 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. I advocate that every good citizen should act according to “think globally and behave locally” principle.
6. I teach my students to evaluate Jordanian administration against established environmental standards such as those of air and water quality international agreements.
7. I teach that democracy is the best system to vote for environmental agreements.
8. I assign my students to study existing environmental problems in the United States in light of the ideals of democracy.
9. I teach lessons that portray Jordanian high environmental standards.
10. I require students to memorize all or parts of international environmental agreements and incidences.
11. I encourage students to protest when their government refuses to comply with such an international environmental law.
12. I teach the truth regarding Jordan’s past (either good or past with regard to their environmental position).
13. I disclose serious flaws in Jordanian environmental policy.
14. 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. I encourage my students to demand our government to comply with the international environmental agreements.
16. I teach that there are occasions when a protest against the Government’s environmental decision can be defended as an appropriate democratic act.
17. I simultaneously promote pride as an Jordanian when my country leads and promote the international environmental meetings.
18. I provide students with encouragement to understand the details of national and international environmental agreements.
19. I encourage students to behave and act sustainably.
20. I encourage students to promote the environmental awareness of other citizens.