

Prospective Teachers' Attitudes towards Social and Environmental Aspects of Education for Sustainable Development

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This study was carried out to assess the impact of demographic variables on prospective teachers' attitudes towards the social and environmental aspects of sustainable development. The sample consisted of 182 prospective teachers enrolled in the teacher education program from three public universities in Lahore. The self-developed scale 'Attitudes towards Sustainable Development' was employed to demonstrate the valid and reliable measures of social/cultural attitudes ($\alpha = .86$) and environmental attitudes ($\alpha = .85$). Results indicate that male prospective teachers held significantly more positive attitudes towards both the environmental and social aspects of sustainable development than did female teachers. Younger respondents and having a science background are associated with significantly more positive attitudes on both sub-scales. Respondents have significantly more positive attitudes if they have attended a specific course on education for sustainable development in the teacher education program than those who did not have awareness of such seminars and workshops.

Key words: social, environmental, sustainable development, prospective teachers, teacher education program.

The concept of sustainable development was originally identified in the document World Conservation Strategy (IUCN, 1980) and then strengthened by the report of the World Commission on Environment and Development (WCED, 1987). One of the first and generally used definitions is that anticipated by WCED (1987) "Sustainable development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs" (p.165). Though, different interest groups like educators, economists and politicians interpret it differently according to their context (Scott & Gough, 2003).

Society, environment and economy are the three main pillars of sustainable development. These three areas are interconnected through culture (UNESCO Education Sector, 2006). Sustainable development is an imperative aspect for enduring human welfare (European Commission, 2006). Freedom, solidarity, equality, tolerance, shared responsibility, and respect for nature are the core values of sustainable development (Leiserowitz, et al., 2006). The core value of Education for Sustainable Development (ESD) is equity, which may be intergenerational, social, gender, between man and nature or among communities (Sleurs, 2008).

All members of society governmental and intergovernmental bodies, civil society, NGOs, and private sector are the stakeholders of sustainable development (UNESCO Education Sector, 2006) and everyone must contribute for it (European Commission, 2006). Education should play a key role in giving awareness to prepare the individuals and society to play their role effectively for sustainable development (Chhokar, Pandya & Raghunathan, 2002; UNESCO, 2011).

The ESD is an emerging area of the curriculum (Summers, Corney & Childs, 2004). It aims at developing perspectives, knowledge, skills and attitudes among the students to individually

and collectively participate in the informed decisions and practices, both at local and global level, that will improve the quality of their own and others today's life without affecting the quality of life in future (CEE, 1998; UNESCO, 2012). The ESD helps the members of society to deal effectively with the problems that are threatening the sustainability of the globe. It gives awareness to the individuals about the factors that impede or foster sustainable development (UNESCO, 2011).

Education for sustainable development is broader than environmental education. It also includes the socio-cultural and political issues like poverty, quality of life, equity and democracy. The ESD revolves around promoting some core values. Those of primary importance are; respect of others of present and future generations, respect for differences, respect for the environment and for the resources of the planet. Education enables us to understand each other and our environment, which provides a basis for developing the attitude of respect. It also helps us to adopt such behaviours and practices that result in leading a life without depriving others (UNESCO Education Sector, 2006).

The ESD should be a lifelong process for everyone, at every stage, and be achieved through formal and informal modes. It should be explicitly mentioned in the legislation and national education policy so that it can be implemented effectively (UNESCO, 2011). Adding simply a subject in the curriculum is not sufficient. Rather it should be an organizing principle of the curriculum. This requires reorientation of educational systems and reorganization of curricula (UNESCO Education Sector, 2006). Problem based learning is the appropriate methodology for teaching ESD (Steinemann, 2003). Research on ESD should be expanded to explore the effectiveness of alternative strategies of ESD at different levels of schooling (UNESCO, 2011).

There are five domains of ESD namely; knowledge of ESD, system thinking, emotions, ethics and values, and actions (Sleurs, 2008). Time and space dimensions (past, present and future; local and global) should be addressed in the knowledge domain. Different types of thinking, like anticipation and creativity with respect to different systems like economical, geographical, biological, social, psychological and political should be addressed. The systems should be interrelated to the time and space dimensions.

Compassion, empathy and feelings of connectedness play a motivational role for ESD. Values, beliefs, attitudes, and assumption guide our thinking and actions and hence are very important. All the domains merge to produce individual, class/school level, local and global actions necessary for successful implementation of ESD (Sleurs, 2008).

Positive attitudes towards sustainable development are more important than knowledge about and behaviours reflecting sustainable development (Michalos, Creech, McDonald & Kahlke, 2009). Attitudes comprise beliefs, feelings, values and dispositions to act in a particular way (Sleurs, 2008). This involves evaluating an object, behaviour or quality as good or bad based upon abstract values (Leiserowitz, Kates & Parris, 2006) of ESD.

Elementary and secondary teachers are the most important human resource for promoting ESD. Unfortunately they are not capable of doing this, as their pre-service training is not sufficient for providing the necessary skills in this regard. ESD should be included not only in pre-service programs, but also promoted through in service programs and seminars designed for ESD. It should also be reflected in co-curricular activities (UNESCO, 2011).

It is important to develop awareness among teachers about the pedagogies and practices that can promote ESD in schools. These are to take action willingly, to understand the teacher's role, to develop students as future leaders, to understand the connection between global and local events and to recognize the cause and effect relationship of the events affecting globe (UNESCO, 2011). It was found that awareness of ESD was improved among the lecturers when the concept of ESD was introduced in the teacher education program curriculum (Down, 2007). The competencies that are required to be developed among teachers are; how to introduce ESD across the curriculum, the ability to convince students about ESD, the ability to design situations for students in which they can understand ESD, and the ability to present examples for application of ESD in daily life (UNESCO, 2011).

Various countries have initiated the steps for ESD. For example, the Sultan Hassanali Bolkiah Institute of Education (SHBIE) of Brunei Darussalam targeted pre-service and in-service teachers receiving training for primary, secondary and early childhood level and teachers receiving technical and vocational education and training (TVET). These teachers were trained for sustainable development so that they could reorganize the curriculum and incorporate the related themes of sustainable development in the curricula (UNESCO, 2011). ESD has been introduced in some developed areas of the world like England and Wales, mainly through the subjects of science, geography and citizenship (Summers et al., 2004). There are working groups of ESD in many countries like Brunei Darussalam Indonesia, Malaysia, Philippines and Timor-Leste (UNESCO, 2011).

In Pakistan, the International Union for Conservation of Nature Pakistan (IUCNP) in collaboration with UNESCO, launched the decade of ESD (DESD) in 2005. The ESD toolkit, a pioneer document in national language, was also published jointly by UNESCO Pakistan and IUCN Pakistan (Education, Communication & Knowledge Management Group, IUCNP and UNESCO, Pakistan, 2005; IUCN and UNESCO, 2007). In January 2006, a workshop was conducted focusing on ESD and the National Curriculum. The Communication and Education for Sustainable Development (CESD) Forum was also developed and operationalized to promote ESD in Pakistan (IUCN and UNESCO, 2007).

Keeping in view the importance of the subject, the present study was designed to investigate prospective teachers' attitudes towards social and environmental aspects of education for sustainable development during a teacher education program. The objective was to investigate the impact of demographic variables on respondents' attitudes, and was guided by the following research hypotheses.

Research Hypotheses

There will be a significant difference between male and female prospective teachers' attitudes towards the social and environmental aspects of education for sustainable development.

There will be a significant difference in prospective teachers' attitudes towards the social and environmental aspects of sustainable development among different age groups.

There will be significant differences in prospective teachers' attitudes towards the social and environmental aspects of sustainable development among different teacher education programs.

There will be a significant difference in prospective teachers' attitudes towards the social and environmental aspects of sustainable development among Arts and Science background students.

There will be a significant difference in prospective teachers' awareness towards the social and environmental aspects of sustainable development by crediting course work and attending a workshop.

Research design

This study was preceded by descriptive research. Survey data were collected through purposive sampling from three public universities of the Lahore. Only education disciplines were targeted for this research.

Method

Sample

Data were collected from (n=20, male) and (n=162, female) prospective teachers enrolled in the different teacher education programs, B.Ed Hons (n = 19), B.Ed. (n = 41), and M.A (n = 100), at three public universities. The majority of respondents (n=96) belong to the younger age group (17-20) and rest of the participants (n=86) were in the older group (21-23). Most of the participants (n=150) had Bachelors of Arts (B.A.) and the rest (n=32) had Bachelors in Science Education (B.SEd). A majority of the respondents (n= 122) had awareness of sustainable development through workshops and seminars, and the others (n=60) had attended a course.

Instrument Construction

After reading the extensive literature review, an instrument 'Attitude towards Sustainable Development' was designed to determine the prospective teachers' attitudes towards the social and

environmental aspects of education for sustainable development (Summers et al., 2004; UNESCO, 2011; Summers et al. 2004; Michalos, et al., 2009; Leiserowitz et al., 2006; Sleurs, 2008). Responses to closed questions were collected on a 5-point Likert scale and converted into a numerical scale (*Strongly agree*=5, *Agree*=4, *Uncertain*=3, *Disagree*=2, *strongly disagree*=1). Frequency distribution, mean scores, and standard deviation of each variable were calculated to inspect the data structure and its statistical applications and implications.

Principal component factor analysis was initially performed in turn on the full number of 25 items making up the two hypothesized subscales of social and environmental aspect of sustainable development. Factor analysis was followed by an oblique rotation of the factor axes as it is commonly known that if more than one factor is present, these factors are likely to be correlated in psychological research (Youngman, 1979; Norusis, 1990).

First subscale: prospective teachers' attitudes towards the social/cultural aspect of sustainable development

A factor analysis of the identified fourteen items making up this scale was confirmed as a single subscale accounting for 36.59 % of the total item variance. The items and their factor loadings appear in Table 1. A scale made by totaling the scores on each of the fourteen items has a high Cronbach Alpha reliability of .86.

This subscale expresses the attitude of prospective teachers to preserve the social and cultural values like, human rights, betterment of society, elimination of gender discrimination, cultural norms, poverty reduction strategies, cultural preservation strategies, peace and harmony, trade rules, conflict resolution, cultural diversity, health and hygiene and prevention of harmful disease, historical importance and sense of responsible citizenship. The subscale validates the choice of items purported to measure prospective teachers' beliefs regarding the social aspect of sustainable development derived from the international literature. All items have loadings above 0.3, which indicates good validity of the scale.

Second Subscale: Prospective teachers' attitudes towards the environmental aspect of sustainable development

A factor analysis of the identified eleven items making up this scale was confirmed as a single factor accounting for 40.44% of the total item variance. The items and their factor loadings appear in Table 2. A scale made by totaling the scores on each of the eleven items has a high Cronbach Alpha reliability of .85 (n=182).

This subscale expresses the attitudes of prospective teachers' about environmental aspects of sustainable development to protect the environmental values like proper use of water, global warming prevention, conservation of energy, low cost of electricity sources, recycling process, techniques of dumping garbage, eradication of pollution, the importance of trees and plants and their significance in community, keep clean surroundings and awareness through seminars and workshops. The subscale validates the choice of items purported to measure the *environmental aspect of sustainable development* derived from the international literature. All items have high loadings above 0.5 which indicates the good validity of the scale.

Procedure

The questionnaire was self-administered after the researchers handed it out. It took 20 minutes to complete the questionnaire, so all prospective teachers completed it during their regular class time. Participants were informed about the confidentiality of the data and their anonymous identity to participate in this study. Total (n=182) prospective teachers participated in this research and completed the survey. Statements in the questionnaire were self-explanatory; however researcher was there for clarifications if the need arose. Respondents also filled in demographic information before completing the questionnaire.

Data analysis

The *t*-test was used to determine the significant differences between the mean scores of males and female teachers; age group (17-20) and (21-23); qualification B.A. and B.Sc.; Source of ESD awareness (seminar/workshop or course). Analysis of variance (SPSS ANOVA) was also used to see the difference among different education programs.

Table 1: Factor Loading of Items of Prospective Teachers' Attitudes towards Social /Cultural aspect of ESD (N = 182)

Items	Factor loading	Item-Total Correlation	Mean	SD
I would teach my students about :				
1. human rights and their respect in society	0.65	0.55	2.41	0.70
2. betterment of the society	0.57	0.47	2.55	0.72
3. elimination of gender discrimination in society through some valid examples	0.48	0.41	2.01	0.81
4. norms, culture and values of the society.	0.71	0.61	3.63	0.79
5. poverty reduction strategies	0.58	0.51	2.82	0.86
6. preservation of cultural heritage	0.67	0.57	2.84	0.78
7. peace and harmony	0.77	0.67	2.55	0.78
8. fair concepts of trade and law	0.36	0.24	3.81	0.75
9. eradication of conflict in the society	0.36	0.33	3.08	0.79
10. acceptance of cultural diversity	0.45	0.37	2.23	0.82
11. health and hygiene	0.62	0.54	2.79	0.92
12. prevention of harmful disease	0.72	0.62	2.91	0.98
13. history of our national heroes and their achievements	0.70	0.60	2.62	0.90
14. development a sense of responsible citizenship in my students	0.72	0.61	2.58	0.80

Table 2: Factor Loading of Items of Prospective Teachers' Attitudes towards Environmental component of ESD ($N = 182$)

Items	Factor loading	Item-Total Correlation	Mean	SD
I would teach my students about:				
1. proper use of water	0.51	0.41	2.63	0.78
2. global warming and its prevention	0.62	0.52	2.92	0.92
3. conservation of electricity and energy	0.65	0.56	3.74	0.79
4. low cost sources of production of electricity like solar energy	0.58	0.49	2.83	0.93
5. recycling processes	0.63	0.53	2.81	0.86
6. techniques of dumping garbage	0.57	0.47	2.89	0.92
7. how they can take part in the eradication of pollution from the society	0.63	0.53	2.81	0.89
8. the importance of trees and plants for human survival	0.72	0.62	2.50	0.80
9. to grow plants in their community	0.73	0.63	2.70	0.83
10. to keep clean their surrounding	0.71	0.60	2.55	0.92
11. environmental awareness through seminar/ workshops/ symposium every year	0.62	0.52	2.98	1.01

Table 3

Effect of Teacher's Gender on Social and Environment Factors Related to Sustainable Development Measures ($N = 182$)

Variables	Male Teachers ($n = 20$)		Female Teachers ($n = 162$)		t (180)	CI		Cohen's d
	M	SD	M	SD		UL	LL	
Social factor	28.0	6.83	24.4	6.69	2.24*	6.69	.42	.76
Environmental factor	22.5	6.34	18.9	5.99	2.56*	.82	6.34	.71

* $p < 0.5$

Table 4

Effect of Age on Social and Environment Factors Related to Sustainable Development ($N = 182$)

Variables	17-20 years ($n = 96$)		21- 23 years ($n = 86$)		t (180)	CI		Cohen's d
	M	SD	M	SD		UL	LL	
Social factor	25.58	6.62	24.00	6.90	1.58*	3.56	-.39	.21
Environmental factor	20.27	5.78	18.38	6.36	2.09*	3.66	.12	.26

 $p < 0.5$

Results

The following tables present data on education for sustainable development measured in terms of *Social and Environmental aspect of sustainable development* between different kinds of prospective teachers.

Table 3 shows that male prospective teachers had more positive attitudes about social and environmental aspects of sustainable development than their females counterparts. Both gender differences show a medium effect size (Cohen, 1988).

Table 4 describes that younger age group of prospective teachers (17-20 years) held more positive attitudes regarding the environmental aspects of sustainable development than the elder age group. This difference has a small effect size.

Table 5 explain that prospective teachers enrolled in B.Ed program had more positive attitudes towards social aspect of sustainable development than prospective teachers enrolled in B.Ed (Hons) and M.A. education program. On the other hand, prospective teachers enrolled in the B.Ed Hons held significantly more optimistic attitudes towards the protection of environment

than prospective teachers enrolled in B.Ed and M.A. Education program.

Table 6 shows that Prospective teachers with science (Bachelor of Science, Education) background had more positive attitudes towards the social and environmental aspects of sustainable development than prospective teachers with Arts (Bachelor of Arts) background qualification. Both differences have large effect sizes.

Table 5 Program wise Social and Environmental factors difference between and within groups

Factors	Source of variation	SS	df	MS	F
Social	Between group	294.5	2	147.26	3.93
	Within group	5876.2	157	37.43	
	Total	6170.7	159		
Environmental factor	Between group	365.8	2	182.9	6.00
	Within group	4816.1	158	30.48	
	Total	5181.9	160		

Table 6
Effect of Educational Qualification on Social and Environmental Factors of Sustainable Development Measures

Variables	B.A (n=150)		B.Sc (n= 17)		<i>t</i> (180)	CI		Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		<i>UL</i>	<i>LL</i>	
Social factor	24.33	6.32	30.06	8.40	-3.43*	-9.05	-2.44	.81
Environmental factor	18.78	5.82	24.12	7.05	-3.51*	-10.16	-1.33	.83

* $p < 0.5$

Table 7
Effect of Medium of Awareness on Social and Environmental Factors of Sustainable Development Measures

Variables	SD awareness through Course (n= 60)		SD awareness through Seminar/workshop (n=122)		<i>t</i> (180)	CI		Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		<i>UL</i>	<i>LL</i>	
Social factor	26.43	8.18	24.05	5.86	2.25*	-2.33	-8.35	.24
Environmental factor	20.69	7.44	18.68	5.23	2.10*	-1.62	-9.06	.27

* $p < 0.5$

Table 7 shows that respondents who were taught a course on sustainable development held significantly more positive attitudes towards the social and environmental aspects of ESD than those who had awareness through a seminar/ workshop. The two differences have small effect sizes.

Discussion

Education for sustainable development is one of the important issues for Pakistan. This study revealed that male prospective teachers held significantly more positive attitudes towards the social and environmental aspects of sustainable development than did female teachers. This finding of the current research is consistent with the previous study conducted by Shaikat, Abiodullah and Rashid, (2011). They reported that male prospective teachers have more general knowledge about their surroundings, more social interaction and they spend more time in social activities than female teachers. Male teachers tend to be more involved in voluntary activities that can bring about a change in society. As Fliegenschnee and Schelakovsky (1998) and Lehmann (1999) stated, female teachers tend to have less extensive knowledge about environmental issues than male teachers.

Another finding of the study that respondents in the young age group held more positive attitudes towards the environmental aspect of sustainable development than the older group. Similarly, those enrolled in the B.Ed program held significantly more positive attitudes towards the social aspect of sustainable development. This could be due to the course of teaching of social studies which was introduced to the B.Ed program to make them aware about the social issues of the society and their role as social change agent to alleviate them. The reason behind the B.ED Honours students' more positive attitudes towards environmental sustainable development could be due to being taught a full course of science teaching with project based assignments. These results are in line of Michalos et al. (2009) that age and grade will positively correlated with knowledge and attitude of young students at college level.

Prospective teachers with a science background showed significantly more positive attitudes toward the social and environmental aspects of sustainable development as compared to those who were in the Arts/humanities group. The positive attitudes

of those with a science background could be because they are accustomed to closely observing physical phenomenon and tend to be involved in discovery learning and problem solving tasks. This finding is consistent with the previous research study conducted by Kollmuss and Agyeman (2002). They found that direct experiences influence individuals' behaviour rather than indirect experiences. The greater knowledge and experience towards the environment will greatly influence the development of positive attitudes of individuals (Hines, Hungerford & Tomera, 1986).

Direct observation and hands-on learning play an important role in developing attitudes towards social action (Hines, Hungerford & Tomera, 1986). This study revealed similar finding that prospective teachers who were taught education for sustainable development as a separate subject demonstrated more positive attitudes towards the social and environmental aspects. Throughout the learning sessions about ESD, prospective teachers would have been instructed about the different concepts of sustainable development and given project based tasks to develop their responsible behaviour towards the betterment of the society.

Conclusions

The present study determined the prospective teachers' attitudes towards the social and environmental aspects of education for sustainable development. It concluded that male prospective teachers had more positive attitudes about social and environmental aspects of sustainable development than their female counterparts. Prospective teachers with younger age group and with science (Bachelor of Science, Education) background held more positive attitudes regarding sustainable development. Prospective teachers enrolled in B.Ed program had more positive attitudes towards social aspect of sustainable development and those who were enrolled in B.Ed Hons held significantly more optimistic attitudes towards the protection of environment.

Limitation and suggestions

The current study has some limitations. Sample size of this study was not adequate; only three public universities were approached from Lahore district, which limits the generalizability of the

findings. Another limitation of this study is that it was survey based only: it would be more valid to observe the actions of prospective teachers through observational study and to determine the gaps between their beliefs and actions towards education for sustainable development. However, such a comprehensive approach would be impractical in terms of personnel, funding and time spent. This study recommends introducing the course of sustainable development in teacher education program to develop positive attitudes of prospective teachers.

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