Physical Education, Health and Social Sciences

https://journal-of-social-education.org

E-ISSN: 2958-5996

P-ISSN: 2958-5988

"Sustainable Development -a Point of Concern for Directorate of Professional Development Khyber Pakhtunkhwa"

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DOI: https://doi.org/10.63163/jpehss.v4i1.1251

Abstract

Education for sustainable development (ESD) provides crucial opportunities for each individual to change his/her knowledge, skills, values and attitude to make inform decisions about the complex issues of sustainability. ESD is an interdisciplinary and student-centered approach that enhances an individual pro-sustainability agenda in their organization and personal life. This study investigated in-service primary school teachers' knowledge of ESD. A quantitative research methodology was used. All the primary school teachers of district Malakand, Charsadda, Kohat and Haripur constitute the population of the study. Sample of the study comprised of 400 teachers from four districts of KP using proportionate convenience sampling technique. Data were collected through a literacy test based on 18 true/false statements. The data were analysed with the help of SPSS 21 using percentage, frequency, independent t-test and ANOVA. Findings of the study showed that most of the teachers had poor to mediocre level of knowledge about the three basic pillars of SD and their interrelationships. Similarly, a large number of teachers hold misconceptions about ESD as half of the teachers do not consider a culture of peace, humans' rights and equity, and culture diversities as essential elements of ESD. The result of the study revealed that the participants of the study have a relatively low level of knowledge of sustainability. They have an unclear perception of what SD is about.

Keywords: Sustainability, knowledge, primary education, education for sustainable development,

Introduction

The world is facing serious environmental, social and economic problems (Eli, et al., 2020). The global financial crisis, global warming, overuse of natural resources, water scarcity, pollution and habitat destruction are in the headlines of the 21st century (Davis, 2010). Human rights violations, racial and gender discrimination, an increase in infectious diseases such as the SARC, influenza, HIV Aids and corona viruses are also threatening the survival of the world community (Eli, et al., 2020). Similarly, the ever-increasing population and the uses of earth resources are beyond its carrying capacity to support humanity and other species (UNESCO, 2014). The Sustainable Development initiative (SD) is the result of all these challenges (Chinedu, Wan Mohamed, & Ajah, 2018), aiming to improv social onditions, solve ecological problems and reduce economic inequality (UNESCO, 2006). Sustainable development not only ensures the needs of the current generation but also of the future generation. Therefore, a holistic approach is recognised by the international community to address "all the three dimensions of SD as equally important and intertwined" (Eli, et al., 2020, p. 2). A change in human behaviour is required for this holistic

approach and education for sustainable development [ESD] is considered as a primary agent of transformation to change human behaviours towords the globe (UNESCO, 2014). According to UNESCO (2014), ESD is a transformative learning process that enable students to make informe decision about the sustainable issues and play an active role in the development of a sustainable world. Therefore, it is recognised that SD principles must be reoriented in current curriculam at all levels (UNESCO, 2012). For sucesful integration of SD principles in curriculum, teachers knowledge about these three dimenions of SD is vital as they are considered as a change agent (Adawiah & Esa, 2012).

The purpose of integrating ESD principles in curriculum is to foster sustainability knowledge, skills, values and attitude to fully understand the sustainabilty problems (Flogaiti, 2006). Such a knowledge is also required from teachers, who are practically involved in designing and implementing SD strategies in the schools. Jumani and Abbasi (2015), find that Pakistani pre-service and in-service teachers have very limited knowledge about all the dimensions of sustainability. This view point is also supported by Kalsoom, Qureshi and Khanam (2018) that pre-service teachers has very little understanding of sustainability A.ali et al, (2025). However, these findings were mostly about pre-service teachers and secondary school teachers and there is no emperical evidance about the primary school teachers understanding of the term SD or sustainability. Research shows that primary school teachers don't have adequate knowledge of SD or sustainabilty (Jucker, 2002; Karameris, Ragou, & Papanikolaou, 2006; Spiropoulou et al., 2007; Adawiah & Esa, 2012). Therefore, this study aim to invistigate primary school teachers understanding of the term Sd or sustainability.

Objective of the Study

The objectives of the study are:

- To explore in-service primary school teachers' knowledge of 'ESD'.
- To examine in-service primary school teachers' attitude towards 'ESD'.
- To identify the teaching strategies adopted by in-service primary school teachers regarding 'ESD'.

Research Question

- What are primary school teachers' levels of understandings/knowledge of SD?
- What are primary school teachers' attitudes towards ESD?
- What different strategies have been adopted by in service in the context of ESD?

Literature review

Sustainable development [SD] is a holistic approach that ensure the need of the present generation without compromising on the need of the future generation. The Brundtland commission identified three basic elements of SD i.e. environmental, economic and social element (McKeown & Hopkins, 2010). Education is considered to be a game changer for sustainable development and was first introduce in Agenda 21 in UN conference on environment and development (UNESCO, 2011b). UNESCO, which has a leading role in the promotion of ESD established decade of ESD from 2005-14, aiming to empower every individual with knowledge, skills, values and attitude to make informed descions about a sustainable society (UNESCO, 2012a). Although ESD was introduced worldwide in 2004, still it is not reoriented in many curricula around the globe (Maidou, Plakitsi, & Polatoglou, 2019). The complex and diverse subject and, in addition, its interdisciplinary nature is the real challenge for many people. According to Mckeown (2014) "Reorienting education to address sustainability is a deep process that involves changes in programmes, practices, and policy, as well as awareness, knowledge, skills and values and acceptance of the sustainability paradigm. The reorienting process is a reflective process that takes

time, intentionality and effort to accomplish. Reorienting teacher education typically takes years of work in teacher education institutions to create deep and enduring changes"

To implement ESD in their classrooms, teachers must have knowledge of ESD and appropriate teaching techniques that addresses issues relating sustainability. According to Tuncer, et al. (2009), teachers requires ESD knowledge for teaching sustainability in their classroom A.ali et al, (2025), because lack of knowledge is a great obstacle in making inform decisions (Hart & Nolan, 1999). As all the three elements of sustainabilty are interrelated, therefore social and economic descions can cause environmental problems. According to Adawiah and Esa (2012), teachers have adequate knowledge of ESD but can't explain the interrelationship between the three elements of sustainability. While, Borg, Gericke, Höglund, and Bergman (2014), found that teachers are aware of the interrelationship of the three elements of Sustainability but do not have holistic understanding of the term. Similar finding were reported by many other studies that primary school teachers had inadequate knowledge of SD (Summers, Corner, & Childs, 2003; Summers & Childs, 2007).

Many researchers blieve that knowledge of sustainability does not lead to pro sustainability attitude (Cutter-Mackenzie & Smith, 2003; Stevenson, Schooling and Environmental/Sustainability Education: From Discourses of Policy and Practice to Discourses of Professional Learning, 2007; Kennelly, Taylor, & Maxwell, A student teacher's personal pathway to Education for Sustainability, 2008). However, Symons (2008) belives that knowledge of SD issues with appropriate teaching skills, values and attitude can enhance teachers' confidence and willingness to teach ESD in their classroom. Similarly, Biasutti and Frata (2017) and Cordina and Mifsud (2016) emphasis on teachers positive attitude toward ESD for teaching SD issues in their classroom. As school education is based on fact based knowledge, discusses moral and value based issues as well as life style issues, therefore it is essential that teachers have very positive attitude toward these issues (Bursjoo, 2011; Sund & Wickman, 2008; Gan & Gal, 2016). Chunteng (2004), found a very positive attitude of primary school teachers toward ESD but lack of knowledge was effecting this attitude negatively.

The knowledge and practices of an appropriate teaching technique ca also enhance their attitude toward ESD (Maidou et al., 2019). The participatory teaching approaches are considered to be more effective in imparting knowledge, skills, values and attitude regarding ESD in their classroom (Duhn, 2012; Schusler & Krasny, 2008). Similarly, Summers, Corner, and Childs (2003), found that for effective teaching of ESD teachers needs both content and padogogicla knowledge. The researchers are agrred that participatory teaching approaches are the most effective techniques for teaching ESD (Maidou et al., 2019). Because these method not only change students behaviours but also relate them to both knowledge and process and enable the learner to think (Biasutti, 2015).

ESD is an ongoing process and students of primary education face first the sustainabilty issues (Duhn, 2012), therfore it is important that primary school teachers have adequate knowledge of these issues and adopted appropriate teaching technique to empower the learnes with sustainability knowledge, skills, values and attitude to make informe decission to preserve the planet earth (Roth, GoulartK, & Plakitsi, 2013).

Methodology of the study

Teachers, knowledge of ESD is important, as their teaching depends entirely on their knowledge. Therefore, a descriptive quantitative research design was adopted to investigate in-service primary school teachers' knowledge and attitude toward ESD and the techniques they adopted to addresses the sustainability issues in their classroom.

Population of the study

All the primary school teachers of district Malakand, Haripur, Charsadda and Kohat of KP, Pakistan constitute the population of the study. The defined population was a total of 10905 primary school teachers [E&SE, 2019). It is represented in table 1.

Table 1

Population description

Name of District	Teachers		Total
	Male	Female	
Malakand	1304	892	2196
Charsadda	2,200	1,568	3,768
Haripur	1,306	1,163	2,469
Kohat	1438	1034	2472
Total	6,248	4,657	10,905

Sample of the study

Sample of the study was selected using proportionate convenience sampling technique and 95% confidance level and 5% confidence interval. A total of 400 respondents were calculated to be the sample of the study. To get a representative sample, a propotional representation was adopted i.e 57% for male and 43% for female teachers. It is represented in table 2.

Table 2

Sample Representation

Name of District	**Teachers**		**Total**
	Male	Female	
Malakand	48	33	81
Charsadda	80	57	137
Haripur	53	38	91
Kohat	48	43	91
Total	229	171	400

Instrumentation

The data were collected through an ESD literacy test developed by Michalos, Creech, McDonald, & Kahlke (2009). Permission was sought and was granted by Heather Creech, the program director. The test consist of four parts, part A is about the demographic information of respondents, while, part B consist of 18 true/false statements to measure respondents knowledge of ESD. Part C is consit of an attitude scale based on 15, five point likert scale questions ranging from strongly disagrred to strongly agreed. In part D, a separate question was asked to get teachers responses on

the most frequently used teaching strategies in the context of ESD ranking from most frequently used strategy (1) to least frequently used strategy (5).

Content Validity

After the adoption, the literacy test was discussed with the experts in the field for content validity. Based on their seggestions some questions were modified. Details of the questionnaire is given in table 3.

Reliability of the Questionnaire

Table 3

Scale name	Number of Sub-scale	Range
ESD literacy test	3	18
Attitude scale	3	15
Frequently used strategies	0	01

After modification the questionnaire was field tested with 41 teachers and the result was used for reliability purpose. The internal consistency approch was used to determine the reliabilty of the questionnaire using SPSS version 21. Reliability value of the literacy test is presented in table 4.

Table 4

Reliability coefficient of the questionnaire

	Reliability Coefficient	Dimensions
ESD Litercy Test	.908	3
ESD Attitude Scale	.839	3

Results & Discussion

Teachers' Demographic Characteristics

The analysis shows that 57.25 % respondents were male, while, 42.75 were female. 28% of the respondents have ages between 20 and 30, 72 have 30 and above. Similarly, the data reveals that 51% respondent possess a degree equal to bachelor degree followed by Master degree (42.5%). The data also revealed that 5.75% of respondents possess an MPhil degree in different academic disciplines. The data also show that most (57%) of the respondents were veteran teachers having more than 10 years of teaching experience, while 25.25% had teaching experience between 6 to 10 and 17.75% had teaching experience between 1 to 5 years (see the following figure 1).

Teachers Knowledge of Social Sustainability

The social aspect of sustainable development was consisting of seven true false statements. The average number of correct answers to 7 social knowledge statement were 198.7 (49.6%) and

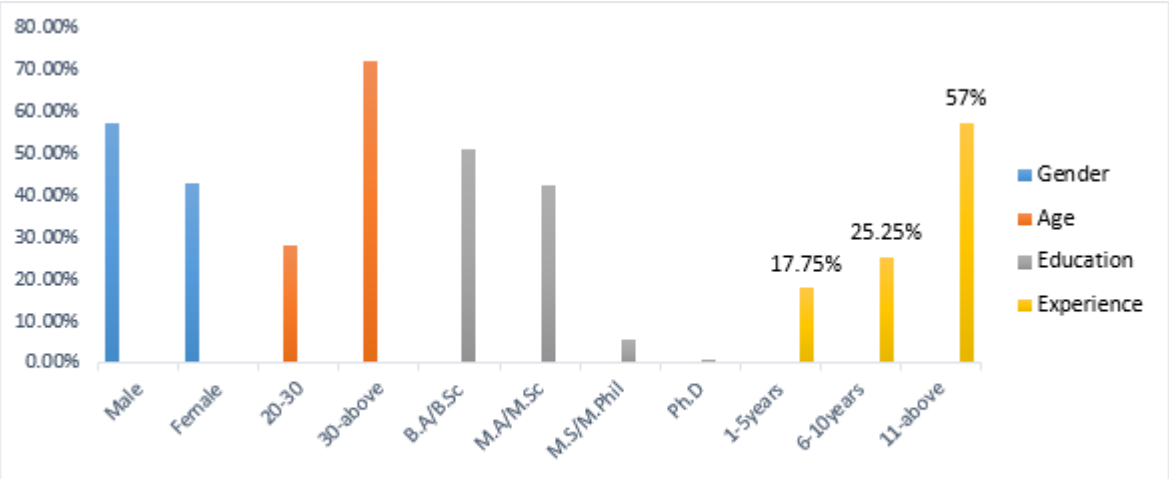

***Figure 1*: Demographic Characteristics of the Respondents**

wrong answers were 201.3 (50.4%) for primary school teachers. If the correct percentage of the subscale is more than 70%, it is taken to identify the adequate knowledge. Therefore, the analysis shows that primary school teachers have less than adequate knowledge of social sustainability (see table 5). The low number of correct answers about the first statement of social sustainability indicates that most of the teachers had poor to mediocre level of knowledge about the three basic pillars of SD and their interrelationships. Similarly, a large number of teachers hold misconceptions about ESD as 50% of the teachers did not consider a culture of peace, human rights, equity and culture diversity as essential elements of ESD. The result is presented in table 5.

Table 5

Frequency distribution about Social Sustainability

No.	Statement	Correct Response		no=400	Wrong Response	
		Frequency	%		Frequency	%
1	Economic development, social development and environmental protection are all necessary for sustainable development	189	47.3		211	52.8
2	Education for sustainable development emphasizes education for a culture of peace	213	53.3		187	46.8
3	Education for sustainable development emphasizes respect for human rights	208	52		192	48
4	Sustainable development has nothing to do with social justice.	182	45.5		218	54.5
5	Education for sustainable development emphasizes gender equality.	204	51		196	49
6	Corporate social responsibility is irrelevant to sustainable development.	180	45		220	55
7	Education for sustainable development supports cultural diversity.	215	53.3		185	46.8
	Average	**198.7**	**49.6**		**201.3**	**50.4**

Teachers Knowledge of Economic Sustainability

The environmental aspect of sustainable development was consisting of six true false statements. The average number of correct answers to 6 social knowledge statement were 191.83 (47.98%) and wrong (incorrect) answers were 208.16 (52.06%) for primary school teachers. The large number of incorrect answer reveals the inadequate knowledge of primary school teachers about environmental sustainability (see table 4.8). A majority of teachers (63.3%) believe that they cannot slow down the rate of climate change, similarly, 57.8% believe that there is no need to conserve fresh water as KP has plenty of it, indicating the misconception of primary school teachers about the environmental element of SD (see table 6).

Teachers Knowledge of Economic Sustainability

Knowledge about economic aspect of sustainable development was consisting of 5 true false statements. The average number of correct answers to 5 economic knowledge statements were 210.4 (52.62%) and wrong answers were 189.6 (47.44%) for primary school teachers. Although

Table 6

Frequency distribution about Environmental Sustainability

n=400

No.	Statement	Correct Response		Wrong Response	
		Frequency	%	Frequency	%
1	Sustainable consumption includes using goods and services in ways that minimize the use of natural resources and toxic chemicals, and reduces waste.	216	54	184	46
2	Education for sustainable development seeks to balance human and economic well-being with cultural traditions and respect for the earth's natural resources	198	49.5	202	50.5
3	We cannot slow the rate of climate change.	147	36.8	253	63.3
4	Conservation of fresh water is not a priority in KP because we have plenty.	169	42.3	231	57.8
5	Maintaining biodiversity—the number and variety of living organisms—is essential to the effective functioning of ecosystems.	240	60	160	40
6	It is useful to estimate the monetary value of the services that the ecosystem provides to us, such as neutralizing air pollutants or purifying water	181	45.3	219	54.8
	Average	**191.83**	**47.98**	**208.16**	**52.06**

the majority of the answers were correct still less than 70% indicate an inadequate knowledge of primary school teachers about economic aspect of sustainable development. However, 66.3% believe that Pakistan overall energy is improving and 59.5% believe that non-renewable resources should not be used faster than the rate at which we find substitutes that are renewable (table 7).

Table 7

Frequency Distribution about Economic Sustainability

n=400

No.	Statement	Correct Response		Wrong Response	
		Frequency	%	Frequency	%
1	Pakistan's overall energy is improving.	265	66.3	135	33.8
2	Helping people out of poverty in Pakistan is an essential condition for Pakistan to become a sustainable country.	187	46.8	213	53.3
3	Non-renewable resources should not be used faster than the rate at which we find substitutes that are renewable.	237	59.3	163	40.8
4	Sustainable development is as much about the children in the future as it is about what we need today.	181	45.3	219	54.8
5	Sustainable development does not require that businesses to behave responsibly	182	45.5	218	54.5
	Average	**210.4**	**52.64**	**189.6**	**47.44**

Teachers attitude towards ESD

The primary school teachers' responses on attitude scale were coded for analysis, 1 as a very negative attitude towards ESD and 5 as a very positive attitude towards ESD. Composite ESD attitudes were calculated and higher composite scores indicated that a respondent held more pro-sustainability attitudes. The average mean score on social aspect of SD 4.24 and Standard deviation .651 indicate that primary school teachers had a very positive attitude towards social aspect of SD and ESD. Similarly the mean score 4.03 with SD .771 on environmental aspect and 4.02 with .774 on economic aspect reveled the pro-sustainability attitude of primary school teachers. It is shown in figure 2.

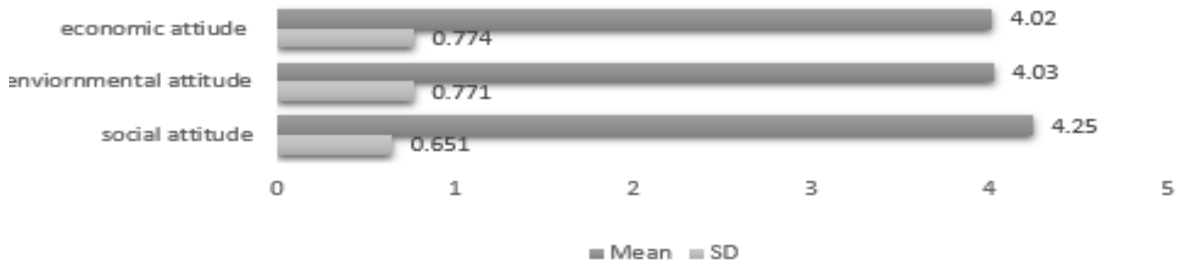

Figure 2 mean and standard deviation on attitudescale

Commonly Used Teaching Strategies for ESD

Teachers were asked to ranked the three most frequently used teaching technique used for teaching ESD in their classes. 46.25% (n=185) of teachers identified that they used lecture as most frequently teaching strategy in their classroom, 20.5% (n=82) used group discussion, 10.75% (n=43) used role playing and 10.25% (n=41) story telling as their most frequently used teaching strategy in their classrooms regarding SD. Only 6.25% (n=25) used field trip and 3.75% (n=15) uses games as their most frequently used strategy in their classrooms. A high number of teachers ranked lecture (82.25%), group discussion (64%) and storytelling (43%) as their three most frequently used teaching strategies regarding SD. the result is presented in figure 3.

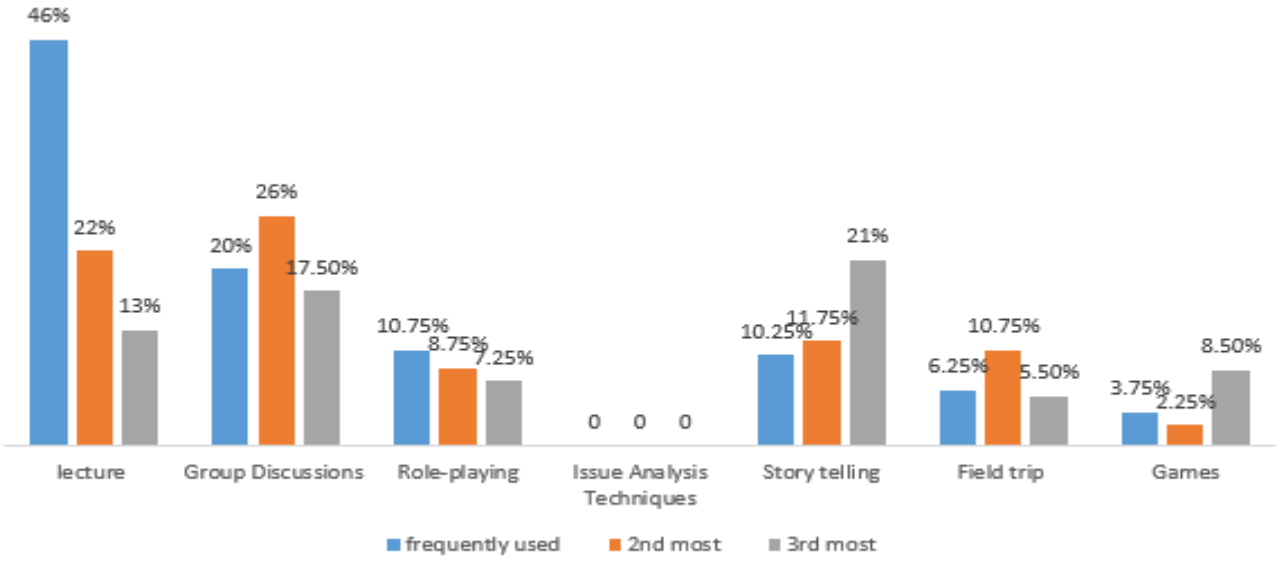

Figure 3: Percentage of Most Frequently Used Teaching Strategies

Discussion

Teachers Knowledge of ESD

Demographic information about the teachers was obtained from the literacy test, comprising gender, age, education and job experience. Graph 1 shows the descriptive characteristics of participant teachers. Most of the participants were male primary school teachers, similarly, most of them were above 30 years of age and majority of the respondents had more than ten years of a teaching experience A.ali et al, (2025).

The low number of correct answers about all the aspects of sustainability indicates that most of the teachers had poor to mediocre level of knowledge/understanding about the three basic pillars of SD and their interrelationships. Similarly, a large number of teachers hold misconceptions about ESD as half of the teachers did not consider a culture of peace, humans' rights, equity and culture diversities as essential elements of ESD and SD. Similarly, the respondents believe that they cannot slow down the rate of climate change and that there is no need to conserve fresh water as KP has plenty of it. According to Tuncer, et al., (2009), to teach the students about SD and ESD, the teachers need adequate knowledge of environmental issues and their interrelationship with ESD. The low number of correct responses may reproduce the fact that most of the respondents had never received environmental education or ESD training in their formal education programs (Maidou, Plakitsi, & Polatoglou, 2019). This is understandable since ESD is not part of the teacher education curriculum in Pakistan. According to Kalsoom et al, (2018), "ESD has not been addressed in key documents of teacher education in Pakistan" (p. 29). Similarly in a recent study Durrani, Malik,and Jumani (2019) found that the three pillars of SD are not aligned in elementary teachers program which was developed in 2012. According to Jumani and Abbasi (2015), ESD is missing in Pakistani teacher education and that Pakistani teachers have inadequate knowledge of ESD.

The analysis reveals that despite of inadequate knowledge of SD and ESD teachers' of primary schools had a very positive attitude towards SD, which is very important for effective teaching of ESD in classroom and for the creation of sustainable society (Kennelly, Taylor, & Maxwell, A Student Teacher's Personal Pathway to Education for Sustainability, 2008; Stevenson, Schooling and Environmental/Sustainability Education: From Discourses of Policy and Practice to Discourses of Professional Learning, 2007; Manning, 2009). According to Gayford and Dillon (1995), there is no clear linear relationship between knowledge and attitude. Similarly, Dillon

and Gayford (1997, p.284) states that teacher positive attitude "cannot be treated as though they arise from a common, shared base, but rather that the range of influences on the public in general are likely to be reflected within this sub-group". In term of SD, social norms play an important role in shaping peoples attitude and work as an agent of transformation.

A high number of teachers ranked lecture (82.25%), group discussion (64%) and storytelling (43%) as their three most frequently used teaching strategies regarding SD. 26% ranked role playing and 22% field trip among the three most frequently used teaching strategies. It indicates that primary school teachers are not aware of the fact that ESD need specific teaching strategies i.e. student centerd or participatory (Rieckmann, 2018). These participatory approches are considered to empower students with knowledge, skills, values and attiude to make inform decisions for a sustainable socity. (Maidou, et al., 2019).

Conclusion

The result of the study shows that the participants of the study have a relatively low level of knowledge of sustainability. They have an unclear perception of what SD is about. However, they believe that sustainability principles should be integrated in primary education curriculum. Despite of low level of understanding the primary school teachers have a very pro-sustainability attitude. Lecture is a dominant teaching strategy in primary education beside some participative strategies. However, they believe that sustainability is an important issue and, therefore they need to be trained in ESD, which will affect their ability to educate their students. To prepare in-service teachers for their challenging job of enhancing learners critical thinking, democratic citizenship, they need support in the form of professional development training.

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