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In-service teachers' perception towards Education for Sustainable Development (ESD) in Myanmar

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Abstract. This study was carried out to explore Myanmar lower secondary school teachers' perception on Education for Sustainable Development (ESD). The research focused on the teachers' level of ESD awareness and knowledge, their attitudes towards ESD, and their willingness to adopt ESD within their classroom setting and as well as their teaching skills. The sample consisted of 248 lower secondary school teachers of thirty schools in Sagaing Township, Myanmar. The Five-point Likert scale questionnaire was developed. Its reliability was measured by Cronbach's alpha. The results indicated that, in general, the teachers have positive attitude towards ESD and willingness to adopt ESD in their teaching subjects. However, the participants' level of awareness of ESD concepts is rather low and they do not understand ESD concept clearly. They do not have adequate teaching skills for integrating ESD concept into their teaching subjects. The findings also revealed that although there is no significant difference in the level of awareness and knowledge of ESD concept and attitude towards ESD, level of science teachers' teaching skills in integrating ESD into science topics is higher than that of other subject teachers, and a significant relationship exists in three variables: teachers' knowledge of ESD concept, attitude towards ESD and their teaching skills respectively. These findings might be useful as a baseline survey in implementing in-service science teacher training program integrated with ESD in Myanmar.

1. Introduction

The concept of sustainable development was described by the Brundtland Commission Report in 1987 [1] as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability is a paradigm for thinking about a future in which environmental, social and economic considerations are balanced in the pursuit of development and an improved quality of life. Sustainability is often thought of a long-term goal, while sustainable development refers to the many processes and pathways to achieve it. Education is essential to sustainable development. The education of today is crucial to enhancing the ability of the leaders and citizens of tomorrow to create solutions and find new paths to a batter, more sustainable future. The citizens of the world need to have the task of learning their way towards sustainability. Education is therefore central to learning and to a more sustainable future. Therefore, teachers need to understand the concept of ESD and be aware of the perspectives of ESD.

In 2005, the United Nations (UN) Decade of ESD was launched to enhance the role of education in promoting sustainable development. At the UN Conference on Sustainable Development in 2012, the

international community agreed to "promote education for sustainable development, and to integrate sustainable development more actively into education beyond the UN Decade of Education for Sustainable Development [2]. Education for Sustainable development (ESD) is a type of education that encourages students to become active citizens who have a role in transformation how our societies operate. Through ESD, children will be encouraged to see themselves as people who have an active role in shaping a better future. This goal of ESD is reflected in the subject matter, and in the way that ESD is taught [3] In order to practice such type of education in Myanmar, it is imperative to explore the current situation of teachers concerning with the themes of ESD in teaching and learning.

The purpose of the research is to explore the lower secondary school teachers' perception towards Education for Sustainable Development.

Research Questions

- At what level is the teachers' awareness and knowledge of the concept of Education for Sustainable Development and what is their attitude towards ESD?
- To what extent do the teachers possess the teaching skills in integrating ESD concept into the teaching subjects?
- Is there any difference in each variable among teachers who teach different subjects at the lower secondary level?

2. Methods

2.1. Method

Questionnaire Survey, quantitative method, was used.

2.2. Sample

The sample consisted of 248 lower secondary school teachers from 30 schools in Sagaing Township, Upper Myanmar.

2.3. Instrumentation

The previous researches on ESD concept and ESD knowledge and research projects on ESD practices were studied to obtain the required information and data for questionnaire items. Based on the previous studies, 60 questionnaire items were adopted and modified to find out the perception of lower secondary school teachers towards ESD. The items, measuring ESD awareness/ knowledge of teachers and their attitude towards ESD, were constructed by five Point Likert scale from strongly disagree (1) to strongly agree (5). The rating scale of teacher performance skills ranges from never (1) to always (5). The 60 items of teachers` perception towards ESD were designed to index three factors: awareness and knowledge of ESD, attitude towards ESD and teaching skills of integrating ESD concepts into the teaching topics. Principal axis factor analysis with varimax rotation was conducted to assess the factors that best fit the data [4] Based on the factor analysis, the first factor, awareness and knowledge of ESD concept, had strongly loaded on the 15 items. The second factor, attitude towards ESD, had its highest loading on the 20 items and the third factor, lower secondary teachers` teaching skills in integrating ESD concept into their teaching topics, loaded highly on 13 items. Table 1 displays the items and factor loading for the rotated factor, with loadings less than (.50) omitted to improve clarity. Therefore, in this research, lower secondary teachers` perception towards ESD was explained by a total of 48 items. To assess the internal consistency reliability of the items in each factor, Cronbach`s alphas were computed. The alpha value for the 15 items on awareness and knowledge of ESD was 0.84, which indicates that the items have good internal consistency reliability. Similarly, the alpha values for attitude scale (0.95) and the teaching skills (0.94) indicated good internal consistency.

2.4. Procedure

The previous studies on ESD concept and ESD knowledge, and research projects on ESD practices were studied to obtain the required information and data for constructing questionnaire items. After

constructing questionnaire, a cover letter and questionnaire were distributed to the teachers who expressed interest to participate. In this research, 248 lower secondary school teachers from 30 schools in Sagaing Township, voluntarily participated. In analyzing the data obtained from the 48 items completed by the participants, descriptive statistics, and independent samples *t* test and Pearson`s correlation was used.

Table 1. Factor Loading of Items of In-service Teachers` Perception towards ESD.

Items (N = 248)	*Factor 1 (ESD Knowledge)*	*Factor 2 (ESD Attitude)*	*Factor 3 (ESD Teaching Sills)*
ESD;			
1. leads to intra-national and international agreement.	.678		
2. encourages individuals to consider ancestral sustainable practices as examples to follow.	.621		
3. fosters environmentally responsible attitudes and behaviours.	.620		
4. is mostly teaching about the natural surroundings.	.598		
5. entails learners to forecast possible futures based on different scenarios.	.590		
6. considers environmental damage to be reversible.	.586		
7. promotes values like solidarity, equality, democracy, respect, tolerance, and social justice.	.577		
8. is interdisciplinary: All disciplines can contribute to ESD.	.551		
9. associates the ecological, social, cultural and economic dimensions.	.529		
10. incorporates local, national and global dimension in the study of an issue.	.521		
11. encourages learners to look at the roots of an issue before taking action.	.513		
12. promotes relations and interdependencies.			
13. is mainly about teaching information about sustainable development.	.508		
14. techniques of dumping garbage	.502		
15. growing plants in their community.		.832	
16. how they can take part in the eradication of pollution from the society		.820	
17. the importance of trees and plants for human survival.		.815	
18. prevention of harmful disease		.812	
19. proper use of water		.812	
20. keeping clean their surroundings.		.808	
21. developing a sense of responsible citizenship in my students		.806	
22. health and hygiene		.793	
23. disaster prevention		.778	
24. peace and harmony		.750	
25. low cost sources of production of electricity like solar energy		.732	
26. global warming and its prevention		.702	
27. preservation of cultural heritage		.691	
28. conservation of electricity and energy		.688	
29. history of our national heroes and their achievements		.688	
30. acceptance of cultural diversity		.681	
31. environmental awareness through seminar/ workshops/ symposium every year		.637	
32. recycling processes		.625	
33. poverty reduction strategies		.599	
34. Promoting healthy lifestyles		.535	
35. Encouraging students to take their own decisions			.857
36. Promoting a sense of community within your classroom			.853
37. Promoting values of peace, solidarity, and mutual respect			.840
38. Promoting respect towards all living creatures			.835
39. Using various interaction patterns to promote good listening and expression skills.			.834
40. Prompting creativity in fulfilling a task and accepting various possible conclusions			.832
41. Using group work as a teaching and learning strategy			.771
42. Involving students in ESD activities			
43. Making pupils probe an idea before accepting or discarding it			.754
44. Role modelling for pro environmental behaviour and sustainable practices			.753
			.729
			.728

Items (N = 248)	*Factor 1 (ESD Knowledge)*	*Factor 2 (ESD Attitude)*	*Factor 3 (ESD Teaching Sills)*
45. Giving pupils the possibility to evaluate and solve any dispute risen while at school			.697
46. Guiding discovery-based learning through investigation			.665
47. Using role-play to encourage understanding of different points of view			.589
48. Holding debate and discussion sessions			.558

3. Results and Discussion

The data on the lower secondary teachers` awareness and knowledge of Education for Sustainable Development, their attitude towards ESD and their teaching skills integrating ESD concept into their teaching subjects were presented.

3.1. Lower secondary teachers` awareness and knowledge of Education for Sustainable Development

Among 248 of lower secondary teachers, all of them expressed their understanding of the aspects of ESD.

Table 2. Lower secondary teachers` awareness/ knowledge about aspects of ESD.

Items (N=248)	*M*	*SD*	*Undecided (%)*
ESD;			
1. leads to intra-national and international agreement.	3.85	.579	17.7%
2. encourages individuals to consider ancestral sustainable practices as examples to follow.	3.86	.677	8.4%
3. fosters environmentally responsible attitudes and behaviours.	3.97	.517	8.4%
4. is mostly teaching about the natural surroundings.	3.75	.717	10.8%
5. entails learners to forecast possible futures based on different scenarios.	3.94	.577	11.6%
6. considers environmental damage to be reversible.	4.04	.364	4.4%
7. promotes values like solidarity, equality, democracy, respect, tolerance, and social justice.	4.03	.526	3.2%
8. is interdisciplinary: All disciplines can contribute to ESD.	3.96	.634	10%
9. associates the ecological, social, cultural and economic dimensions.	4.08	.567	7.2%
10. incorporates local, national and global dimension in the study of an issue.	3.95	.482	8.8%
11. encourages learners to look at the roots of an issue before taking action.	4.04	.438	4.8%
12. promotes relations and interdependencies.	4.03	.471	4.4%
13. is mainly about teaching information about sustainable development.	3.94	.550	10.4%

Table 2 presents the teachers` awareness and knowledge related to the environmental, social/ cultural and economic aspects of ESD. In this result, the mean scores which are greater than 4 in five items show that the lower secondary teachers` knowledge on some aspects of ESD is at somewhat level, in particular, the teachers perceive that ESD promotes ecological, social and cultural values like solidarity, equality, democracy, respect, tolerance, and social justice and interdependences. They also understand that ESD encourages learners to look at the roots of an issue before taking action and that ESD considers environmental damage to be reversible. On the other hand, nearly one fifth of the participants (17.7%) were not be able to decide on that ESD leads to intra-national and international agreement and over 10% of the participants gave the response as ‘undecided’ regarding to such ESD aspects: ESD entails learners to forecast possible futures based on different scenarios; ESD is mostly teaching about natural surrounding and information about sustainable development. These results clearly show that lower

secondary teachers participated in this study demonstrate their incomplete understanding of ESD concept. Having 10% of participants who could not decide whether all disciplines can contribute to ESD, highlights the teachers` low level of knowledge about ESD concept.

3.2. Lower secondary teachers` attitude towards Education for Sustainable Development

On the items what topics or areas teachers want to teach, all of 248 teachers responded as shown in Table 3. The mean scores of all items are greater than 4. Therefore, all of the participants have positive attitude towards ESD and they have willingness to teach ESD to their students.

Table 3. Lower secondary teachers` attitude towards ESD.

Items (N = 248) *Topic which the teachers want to teach-*	*M*	*SD*	*Undecided (%)*
1. techniques of dumping garbage	4.40	.515	1.2%
2. growing plants in their community.	4.35	.494	.8%
3. how they can take part in the eradication of pollution from the society	4.32	.511	.8%
4. the importance of trees and plants for human survival.	4.32	.505	.8%
5. prevention of harmful disease	4.37	.517	.4%
6. proper use of water	4.30	.508	2.4%
7. keeping clean their surroundings.	4.41	.508	.8%
8. developing a sense of responsible citizenship in my students	4.33	.488	.8%
9. health and hygiene	4.37	.516	.4%
10. disaster prevention	4.30	.502	2%
11. peace and harmony	4.21	.517	2.8%
12. low cost sources of production of electricity like solar energy	4.23	.496	2%
13. global warming and its prevention	4.21	.509	3.6%
14. preservation of cultural heritage	4.28	.509	2%
15. conservation of electricity and energy	4.21	.475	2%
16. history of our national heroes and their achievements	4.27	.551	1.6%
17. acceptance of cultural diversity	4.14	.465	3.6%
18. environmental awareness through seminar/ workshops/ symposium every year	4.14	.531	6%
19. recycling processes poverty reduction strategies	4.19	.537	4.4%
20. poverty reduction strategies	4.17	.532	6%

3.3. Lower secondary teachers` teaching skills in integrating ESD into their teaching subjects

Regarding to the items of how teachers use the teaching techniques or behave in their classroom, 228 teachers completely responded as follows in table 4.

Table 4. Lower secondary teachers` teaching skills in integrating ESD concept into their teaching subjects.

Items (N =228)		*M*	*SD*	*Seldom (%)*	*Never (%)*
1.	Promoting healthy lifestyles	4.47	.821	6%	0%
2.	Encouraging students to take their own decisions	4.22	.888	5.2%	0%
3.	Promoting a sense of community within your classroom	4.39	.856	6%	0%
4.	Promoting values of peace, solidarity, and mutual respect	4.17	.911	6.4%	0%
5.	Promoting respect towards all living creatures	4.35	.880	5.6%	.4%
6.	Using various interaction patterns to promote good listening and expression skills.	4.20	.896	4.4%	.4%
7.	Prompting creativity in fulfilling a task and accepting various possible conclusions	3.99	.912	6%	.4%
8.	Using group work as a teaching and learning strategy	3.87	.848	7.2%	0%
9.	Involving students in ESD activities	4.11	.879	4.8%	0%
10.	Making pupils probe an idea before accepting or discarding it	3.77	1.011	8%	2%
11.	Role modelling for pro environmental behaviour and sustainable practices	3.64	1.021	12%	2%
12.	Giving pupils the possibility to evaluate and solve any dispute risen while at school	3.54	.959	10.8%	1.6%
13.	Guiding discovery-based learning through investigation	3.71	.903	7.6%	.4%
14.	Using role-play to encourage understanding of different points of view	2.99	.847	18.9%	4.8%
15.	Holding debate and discussion sessions	3.30	.801	10.4%	4%

Despite being positive attitude towards ESD, the teachers` teaching skills to integrate ESD concept into their teaching subjects are not at satisfactory level as shown in Table 4. Nearly one fifth of the participants (18.9%) seldom use role-play technique and 4.8%, never use it. Similarly, there are over 10% of the participants who mostly never use debate and discussion technique and give pupils the possibility to evaluate and solve any dispute risen at school guided and 12% of the participants rarely use role modelling of pro environmental behavior and sustainable development, and 2% never use it.

3.4. Teachers` perception towards Education for Sustainable Development in terms of Teaching Subjects

The differences of how the teachers perceive the concept of ESD, having their willingness to teach ESD themes and their teaching skills in accordance with their teaching subjects are presented. According to Table 5, science teachers use more teaching techniques than the teachers who teach other subjects at the lower secondary level.

Table 5. Teachers` perception towards ESD in terms of their teaching subjects.

Variables	*Teaching Subject*	*N*	*M*	*SD*	*t* (*df* = 246)	*Sig(2-tailed)*	*MD*
Knowledge	Science	113	3.97	.315	.816	.415	.03
	Other	130	3.94	.335			
Attitude	Science	113	4.29	.349	.814	.416	.04
	Other	130	4.25	.395			
Teaching Skill	Science	113	4.00	.599	2.09*	.039	.17
	Other	130	3.83	.699			

*p < 0.5

3.5. Relationship of ESD knowledge, ESD attitude and ESD teaching skills with each other

As in Table 6, the results show that there are statistically significant positive relationships among the variables; knowledge, attitudes and teaching skills in which the relationship between attitudes and teaching skills is the weakest.

Table 6. Relationship among variables related with ESD.

Variables(N=248)	*ESD Knowledge*	*ESD Attitude*	*ESD Teaching Skill*
ESD Knowledge	1	r = .442**	r = .321**
ESD Attitude	r = .442**	1	r = .221**
ESD Teaching Skill	r = .321**	r = .221**	1

**Correlation is significant at the 0.01 level (2- tailed).

This study reveals that the lower secondary school teachers` knowledge about ESD concept is generally good. The teachers` knowledge of ESD might be related to the nature of the middle school curriculum (Lower Secondary Level) in Myanmar. At the middle school level in Myanmar, students have to learn six subjects; Myanmar Language, English, Mathematics, Science, Geography and History. Geography and History are in the domain of Social studies. They also have to learn the subjects like Life Skills, Moral and Civics, Arts, Music and Physical Education as co-curriculum subjects. Environmental Education and Education for Sustainable Development are already offered in these subjects, especially, in Science and Geography subjects. This might be the fact that the lower secondary teachers` knowledge on some aspects of ESD concept is at a certain level. In Myanmar, every middle school teacher who teaches any subject has to teach co-curriculum subjects occasionally. Through these activities, the teachers become unconsciously knowledgeable about some aspects of ESD. In the Science curriculum from Grade Five to Grade Eight, every Grade`s text material prescribes Earth and Space (Environment Preservation). This section includes environmental problems, the current states of the environment due to the respective problem, environmental degradation, and consequence of the problems, and the environmental conservation of the earth, etc. The science teachers, therefore, might use more teaching approaches related to ESD concepts rather than the other teachers do.

Another aim of the research was to explore whether there is a relationship among lower secondary teachers` knowledge of ESD, their attitudes towards ESD and their teaching skills in integrating ESD concept into their teaching. Results show that there is a significant relationship among these variables respectively even though weak relationship between attitude and behavior exists. These results suggest that the teachers who are more knowledgeable about ESD concept are more likely to use teaching techniques for ESD. In contrast, the study of Cordina and Misfud [5] resulted in no relationship between primary educators` knowledge and their teaching skills to implement ESD.

On the other hand, the results of the lower secondary teachers` high positive attitude towards ESD, despite having low level of knowledge about ESD concept, express the teachers` willingness to teach ESD concept related to their teaching. However, with respect to the teachers` teaching skills, the results show that lower secondary teachers need to be trained in using teaching techniques for ESD. In particular, such techniques as role-play, discovery-based learning, group work, discussion and modelling could be rarely used in their teaching. One of the skills that ESD develops is the ability to communicate orally and in writing. Discussion gives students opportunities to develop oral communication skills [1]. The teachers participated in this study could not give students such opportunities. Similarly, being weak in using group work and discovery-based learning tends to the students have less opportunity to develop the ability to work together with others, and to think critically and develop scientific thinking.

4. Conclusion

The aim of this study was to explore the lower secondary teachers` perception towards ESD. The results showed that the teachers` perception towards ESD is generally good. However, the ability of their use of teaching techniques to integrate ESD concept into the teaching subjects needs to be improved. Sustainable development encompasses environment, economics, and society. Therefore, people need basic knowledge from the natural sciences, social sciences, and humanities to understand the principles of sustainable development, how they can be implemented, the values involved, and ramifications of their implementation. ESD is more than a knowledge base related to environment, economy, and society. It addresses learning skills, perspectives, and values that guide and motivate people to seek sustainable livelihoods, and live in a sustainable manner involving the study of local and global issues. All of the teachers are collectively responsible for ESD. In order to address ESD, the teachers need to be fully prepared. This will be more easily achieved by teachers if, in addition to having positive attitude towards ESD, they fully understand various aspects of ESD concept and possess teaching skills in integrating ESD concept in their teaching subjects. In conclusion, this research might be useful as a baseline survey for further research projects to implement ESD through in-service teachers in Myanmar.

5. References

[1] UNESCO 2012 *Education for sustainable development: Sourcebook* Paris: UNESCO
[2] UNESCO 2014 *Roadmap for Implementing the Global action Programme on Education for Sustainable Development* Paris: UNESCO
[3] Henderson R 2009 *Education for sustainable development: Teacher training manual* Port Vila-Vanuatu: Live & Learn Environmental Education
[4] Morgan G A, Leech N L, Gloeckner G W and Barrett K C 2013 *IBM SPSS for Introductory statistics: Use and interpretation.* (5thed.) New York: Routledge, Taylor and Francis Group
[5] Cordina M and Mifsud M C 2016 A quantitative study of Maltese primary school teachers and their perceptions towards education for sustainable development *US-China Education Review B* **6** 6 329-349

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