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Implementation of Grade 8 Science Curriculum2012 in Bangladesh: Teachers Preparedness

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KEY WORDS

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ABSTRACT

A mixed method research design was employed to examine the measures undertaken by the Ministry of Education in Bangladesh to enhance the competencies of Science teachers to cope with the requirements of Science Curriculum 2012 at Grade 8. The population of this study was the Grade 8 Science teachers. Sample of the study included 320 survey teachers, 24 interview teachers and 48 teachers whose class activities were observed. Random sampling, stratified sampling and purposive sampling techniques were used. Survey questionnaire, semi-structured interview schedule and observation checklist were used to collect both qualitative and qualitative data. Survey data was analyzed by using SPSS 21.0 versions. Descriptive statistics and inferential statistics were used. Thematic categories for commonalities were used and coding was used. Triangulation was used to interpret both data. Measures undertaken by Ministry of Education were not successful. Teachers used lecture method in place of activity-based and student-centered approach. Teachers did not have sufficient understanding on Grade 8 Science curriculum objectives. Teachers were not aware about their responsibilities in curriculum implementation. Education Minstry of Bangladesh introduced National Curriculum 2012 at Grade 8 before teachers' preparedness. In-service training should be designed and conducted on the basis of teacher's needs

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Introduction

Bangladesh, a developing South Asian nation, is the eighth most populous country in the world. Education is the responsibility of the Government. Secondary education system follows 3 stages. These stages are junior secondary stage (Grades 6-8), secondary stage (Grades 9-10) and higher secondary stage (Grades 11-12). Students have to sit for a public examination at the end of every stage. Major advances have been achieved in the recent years in the provision to secondary education in Bangladesh. The success rate of this education, especially in school enrolment, reduction of gender parity and in public examination, is very much remarkable. But the standard of science education is not satisfactory. The situation of science education in secondary schools in Bangladesh is a big concern to all including government and the society at large. The alarming situation for Bangladesh is that students are significantly turning away from science education at secondary level, posing a challenge to country's development. BANBEIS (2014) showed that the ratio of science examinees in the Secondary School Certificate (SSC) examination decreased by 14 percent in the last 15 years. The Eminent scientists and science educators express their concern as science is losing its appeal in an alarming shift of choice. Inappropriate curriculum and textbooks, feeble teaching and assessment methods, lack of properly trained teachers and laboratory facilities, poor salaries of the teachers, and students' sliding interest were pointed out to be some of the main reasons for qualitative and quantitative decline of science education. An evaluation study of 1995 Science Curriculum revealed that teachers weren't aware of curriculum. Most of the teachers didn't use curriculum in classroom practice (NCTB, 2010). These findings indicated that 1995 Science curriculum was not implemented as it was intended.

Background of the Study

After 17 years, National Curriculum and Text Book revised the National Science Curriculum 1995 at Grade 8 and introduced the Science Curriculum 2012 in 2013. A significant shift took place in the Science Curriculum 2012 at Grade 8 in the areas of contents, pedagogy and assessment (Hossain, 2015). Labane (2009) defined curriculum implementation as the task of translating the curriculum document into the operating curriculum by the combined efforts of the students, teachers and others concerned. The teacher has a key role in the implementation of a curriculum innovation in the classroom. Putting a new curriculum into practice requires teachers to learn new roles. According to Fullan (2007), this requires a change in their beliefs, teaching approach and use of materials. Research indicates that teachers require a thorough understanding of the meaning of educational change before there is an acceptance and adoption of new program and approaches. Curriculum change requires in-

school management teams, principals and boards of management to lead the implementation of change in the school as an organization. In the case of science curriculum, the implementation function involves, helping teachers to use curriculum effectively by holding workshops and orientation courses, improving the provision of laboratories and equipment, introducing more appropriate form of examination for students who had completed the course. In implementation stage, teachers deliver the curriculum in actual classroom setting. Brain, Reid and Boys (2006) agree that the success of any education policy depends on how the practitioners, namely the teachers, accept the mandated policy and adopt the desired practices.

According to Sariono (2013), the most important factor in the implementation of curriculum is the readiness of the implementers of the curriculum. No matter how good the curriculum used, it depends on the readiness of teachers to implement them (Febriya & Nuryono, 2014). Teachers' competence is the most important component in the implementation of the National curriculum 2012. Ummah (2013) argued that the competence is a set of knowledge, skills, and behaviors that teachers should have, internalize, control and realize in carrying out their professional duties shown from their work. Ifiok (2005) also observed that lack of subject based-qualified teachers hampers curriculum implementation. He also showed that the perception of teachers for effective teaching of any subject depends to a large extent on the teachers' understanding of the nature of the subject matter and that perception of proper teaching is a consequence of a teacher being able to pass-on the content of the subject matter. Kennedy (1990) emphasizes that, teachers can be a powerful positive force for change but only if they are given the resources and support which will enable them to carry out implementation effectively. Rahman and Begum (2012) showed that teachers are facing problems in explaining the science content, in providing reallife examples in linking the principles of science with real life examples and, in providing current ideas regarding science content. Therefore, teachers' readiness is very important before introducing any educational change. The Ministry of Education in Bangladesh arranged two in-service trainings, one was Curriculum Dissemination Training (CDT) and other was Practical Science Teaching (PST) training, for enhancing teachers' competences to cope with the requirement of National Curriculum 2012.

Objectives of the Study

The specific objectives of this study were to-

1. examine the measures undertaken to enhance the competencies of science teachers to cope with the requirements of Science Curriculum 2012 at Grade 8
2. assess the science teachers in terms of their classroom performance in contrast to the requirements of Science Curriculum 2012 at Grade 8

Research Methodology

This study employed a mixed method approach because of the nature of the research problem. This approach could facilitate the triangulation of data, which was used to verify and cross-check the research findings in order to achieve greater validity and reliability. A mixed-method approach provides rich and comprehensive data, because data from one source could enhance, elaborate or complement data from the other (or another) source (Creswell, 2005). Biesta (2012) explains that a qualitative-quantitative research design helps "to generate interpretive understanding that is giving an account of why people act as they act, where quantitative information can be added to deepen the interpretation and provide a more robust confirmation of the understandings acquired through the collection of qualitative data" (p. 149).

Population and unit of the study

The population of this study was the Grade 8 Science teachers. The study unit was the Grade 8 Science teachers under the selected schools only. Secondary schools were identified in terms of their locations and financial types. In terms of location, schools were classified as rural schools and urban schools. On the other hand, in terms of financial status, schools were classified as Govt. schools. MPO schools (Govt. aided) and Self-Financed (SF) schools.

Sampling techniques and sample size

For Survey

Random sampling technique and stratified sampling techniques were used. For quantitative data, all schools delivering Grade 8 science in Bangladesh were considered. Out of 64 districts, 32 districts were selected by using simple random sampling techniques and 10 schools were selected from each of 32 districts by using stratified random sampling techniques. 320 survey teachers were selected from 20449 Science teachers in Bangladesh (Banbeis, 2015) by using the statistical formula.

For Interview

A purposive sampling technique was employed in selecting teachers for interview. 24 Science teachers who used to teach at Grade 8 were interviewed from 24 schools. 24 schools were selected from 8 districts under 8 divisions taking 3 schools from every district by keeping existing rural and urban schools ratio.

Class activity observation

A purposive sampling technique was employed in selecting teachers for observing their class activities. 48 class activities of Grade 8 science teachers were observed. 6 classes from 8 districts under 8 divisions were observed.

Instruments for data collection

Survey questionnaire and semi-structure interview schedule were used for quantitative and qualitative data respectively. Observation checklist was used for class observation.

Validation of instruments

Instruments' were reviewed by three science curriculum experts who developed Grade 8 science curriculum. The instruments were pre-tested by Grade 8 science teachers. The piloting of the questionnaires helped to check the clarity of the questionnaire items, instructions and layout and also to gain feedback on the validity of the questionnaire items. Piloting helped in removing ambiguities and difficulties in wording of the questionnaire and also helped to identify omissions, redundant and irrelevant items. The pilot study suggested that that the questionnaire required (on average) 50 to 60 minutes for completion. The study also recommended to exclude some sub-questions of main questions. In addition, instructions needed to be provided with an example of how to respond. Furthermore, the layout of the questionnaire was revised in terms of ensuring consistency of font size and box size. The study further showed that the levels of questionnaire language for some questions were found not suitable for teachers.

Rate of return of survey questionnaire

The return rate of survey questionnaire was 94.38%. The missing questionnaires were all belonged to rural teachers.

Data analyses

The survey questionnaire generated a large amount of quantitative data. Spreadsheets were developed using statistical package for social science (SPSS) version 21. The quantitative data was classified and tabulated according to the theme approach as drawn from the objectives of the study. The quantitative analysis focused on providing descriptive statistics and establishing statistically significant relationships between the variables.

Data interpretation

Triangulation techniques were used to combine all sorts of data using thematic approach.

Findings

In survey questionnaire, a set of ten statements was used, one set for Curriculum Dissemination Training (CDT)and one set for Practical Science Teaching (PST) training based on the intentions of these trainings. The intentions of in-service trainings were found consistent with the intended Science Curriculum 2012 at Grade 8. Five-point Likert Scale was used with five possible responses. These were 'strongly agree (SA)', 'Agree (A)', 'No opinion (NO)', 'Disagree (D)', and 'Strongly disagree (SD). The scores for these five possible responses were 5 for SA, 4 for A, 3 for NO, 2 for D and 1 for SD. Hence, mean score above 3 indicates positive response in favor of the statements where 5 beings the strongest agreement. On the other hand, mean score below 3 expresses negative response against the statements where 1 being the strongest disagreement. Responses are presented in four consecutive tables (1 to 5) in terms of frequency, mean and standard deviation. Independent-samples t-test and ANOVA were used at the .05 level of significance. The t-test was used to compare the opinion of rural and urban teachers in order to determine either teacher's opinion was statistically significant (S) or statistically insignificant (NS) between their mean scores. On the other hand, ANOVA was used to compare the opinion of Govt., MPO and SF teachers in order to determine either teachers' opinion were statistically Significant (S) or statistically Not-Significant (NS) between their mean scores.

Table 1
Rural and Urban Teachers' Opinions about CDT Training

Sl.	Statement	Teacher		Teacher's view			
				Mean	Std. D	Sig. (2-tailed)	Remarks
1.	I understood the aims & objectives of the grade 8 science	Rural Urban	114 71	4.43 4.58	.515 .552	0.067	NS
2.	I understood the changes made in grade 8 science curriculum	Rural Urban	114 71	4.32 4.46	.658 .605	0.148	NS
3.	I learned strategies of science classroom management	Rural Urban	114 71	4.39 4.59	.542 .523	0.013	S
4.	I achieved hands-on experiences on student-centered teaching-learning strategies	Rural Urban	114 70	4.49 4.67	.584 .557	0.040	S
5.	I achieved practical experiences on the usage of investigating	Rural Urban	113 71	4.26 4.42	.704 .750	0.131	NS

	learning strategies						
6.	I understood the importance of field visit by students for learning	Rural	114	4.18	.673	0.128	NS
		Urban	71	4.34	.653		
7.	I learned to develop learning outcome-based lesson plan and its strategy	Rural	114	4.39	.659	0.043	S
		Urban	70	4.59	.625		
8.	I understood the strategies of using course work and its record keeping in continuous assessment	Rural	114	4.25	.673	0.003	S
		Urban	71	4.55	.650		
9.	I understood the strategies for assessing student's behavior and values and its record keeping	Rural	114	4.25	.649	0.067	NS
		Urban	71	4.45	.789		
10.	I learned the techniques for preparing students annual performance report	Rural	114	4.22	.675	0.014	NS
		Urban	71	4.48	.714		

Table 1 represents the opinions of the rural and urban teachers' opinion about their learning from curriculum dissemination training. This table shows that the mean scores of all ten statements appears above 4.0 which indicate that teachers from both rural and urban areas teachers were confident regarding their learning from curriculum dissemination training and hold positive views about this training. This table also reveals that rural and urban teachers differ significantly (S) as p was found less than .05 (i.e., $p < .05$) for four items 3, 4, 7, 8 and 10 in terms of their mean rating. This indicates that rural and urban teachers express different opinion about their leaning on items 3, 4, 7, 8 and 10 in terms of their mean rating. On the other hand, opinion of rural and urban teachers' opinion was found to be statistically Not-significant (NS) as p is greater than .05 (i.e., $p > .05$) for rest of the items i.e., for items 1,2,5,6 and 9 in terms of their mean rating.

Table 2
Govt. MPO and SF Teachers' Opinions on CDT Training

Sl.	Statement	Teacher	Teacher's view				
			Mean		Std.	Sig.	Remarks
1.	I understood the aims & objectives of the grade 8 science	Govt. MPO FS	24 154 7	4.54 4.47 4.57	.588 .526 .535	.773	NS
2.	I understood the changes made in grade 8 science curriculum	Govt. MPO FS	24 154 7	4.38 4.38 4.43	.576 .658 .535	.978	NS
3.	I learned strategies of science classroom management	Govt. MPO FS	24 151 7	4.63 4.44 4.43	.576 .537 .535	.311	NS
4.	I achieved hands-on experiences on student-centered teaching-learning strategies	Govt. MPO FS	24 154 6	4.79 4.52 4.67	.415 .597 .516	.090	NS
5.	I achieved practical experiences on the usage of investigating learning strategies	Govt. MPO FS	24 153 7	4.25 4.33 4.43	.897 .706 .535	.823	NS
6.	I understood the importance of field visit by students for learning	Govt. MPO FS	24 154 7	4.42 4.22 4.14	.654 .669 .690	.379	NS
7.	I learned to develop learning outcome-based lesson plan and its strategy	Govt. MPO FS	23 154 7	4.65 4.43 4.57	.573 .665 .535	.279	NS
8..	I understood the strategies of course work for marking scheme and for record keeping	Govt. MPO FS	24 154 7	4.67 4.31 4.43	.482 .700 .535	.056	NS
9.	I understood the strategies for assessing student's behavior and values and its record keeping	Govt. MPO FS	24 154 7	4.38 4.32 4.43	.770 .711 .535	.873	NS
10.	I learned the techniques for preparing students annual performance report	Govt. MPO FS	24 154 7	4.50 4.29 4.43	.590 .721 .535	.348	NS

Table 2 represents the opinions of the Govt., MPO and FS teachers about their learning from curriculum dissemination training. As shown in the table1, means scores of all ten statements appears above 4.0 which indicated that Govt., MPO and SF teachers were confident on their learning from curriculum dissemination training and hold positive views about this

training. This table also reveals that Govt., MPO and SF teachers did not differ significantly as p is greater than .05 (p>.05) for all of the ten items in terms of teachers' mean rating. From tables 1 and 2, it appears that although rural and urban teachers express difference of opinions in some areas about their learning from in-service training but all Govt., MPO and SF teachers didn't express difference of opinions.

Table 3
Rural and Urban Teachers' Opinion on PST Training

Sl.	Statement Teacher's view	Teachers		Teacher's view			
				Mean	Std. D	Sig.	Remarks
1.	I understood the objectives of the Grade 8 science	Rural	145	4.59	.494	.038	S
		Urban	77	4.73	.448		
2.	I understood the new changes made in Science curriculum	Rural	143	4.37	.624	.019	S
		Urban	77	4.57	.548		
3.	I learned the strategies of Science practical teaching	Rural	146	4.56	.551	.023	S
		Urban	76	4.74	.526		
4.	I learned concept change model	Rural	144	4.23	.697	.285	NS
		Urban	77	4.34	.754		
5.	I learned constructivist teaching learning approach	Rural	144	4.22	.684	.051	NS
		Urban	76	4.41	.636		
6.	I learned the demonstration-based learning approach	Rural	146	4.55	.512	.072	NS
		Urban	76	4.68	.496		
7.	I learned the investigation teaching- learning approach	Rural	144	4.27	.712	.005	S
		Urban	77	4.55	.640		
8.	I learned to make low cost no cost learning aids	Rural	146	4.62	.565	.307	NS
		Urban	76	4.71	.690		
9.	I learned to collect and preserve learning aids	Rural	146	4.60	.546	.176	NS
		Urban	77	4.70	.563		
10.	I learned the use of learning outcomes in preparing lesson plan	Rural	145	4.56	.512	.402	NS
		Urban	77	4.62	.608		

Table 3 represents the rural and urban teachers' opinions about their learning from practical science. As shown in table 3, mean scores of all ten statements appears above 4.0 which indicate that for both rural and urban teachers were confident on their learning from PST training and hold positive views about this training. This table also reveals that rural and urban teachers' opinion differ statistically significant as p is found less than .05 (i.e., p< .05) for four items 1, 2, 3 and 7 in terms of their mean rating. These indicate that rural and urban teachers expressed difference of opinion about their leaning mentioned in the items 1, 2, 3 and 7. On the other hand, opinion of rural and urban teachers don't differ significantly as p is found greater

than .05 (i.e., p>.05) for rest of the items. These also indicate that govt., MPO and SF teachers' opinion about their learning on the areas mentioned in items 4, 5, 6, 8, 9 and 10 do not differ significantly in terms of their mean rating.

Table 4

Govt. MPO and SF Teachers' Opinions on PST Training

Sl.	Statement Teacher's view	Teacher		Mean	Std. D	Sig.	Remarks
1.	I understood the objectives of the Grade 8 science	Govt.	23	4.70	.470	.645	NS
		MPO	185	4.62	.486		
		FS	14	4.71	.469		
2.	I understood the changes made in Grade 8 science curriculum	Govt.	23	4.52	.511	.534	NS
		MPO	183	4.42	.623		
		FS	14	4.57	.514		
3.	I learned the strategies of science practical teaching	Govt.	23	4.78	.422	.253	NS
		MPO	185	4.61	.531		
		FS	14	4.50	.855		
4.	I learned the concept change model	Govt.	23	4.35	.775	.828	NS
		MPO	184	4.26	.683		
		FS	14	4.21	1.051		
5.	I understood the constructivist teaching learning approach	Govt.	22	4.27	.703	.919	NS
		MPO	184	4.28	.683		
		FS	14	4.36	.497		
6.	I learned the demonstration-based learning approach	Govt.	23	4.78	.422	.099	NS
		MPO	185	4.59	.515		
		FS	14	4.43	.514		
7.	I learned the investigation teaching-learning approach	Govt.	23	4.48	.511	.662	NS
		MPO	184	4.35	.731		
		FS	14	4.43	.514		
8.	I learned to make low cost no cost learning aids	Govt.	23	4.83	.388	.146	NS
		MPO	185	4.65	.600		
		FS	14	4.43	.852		
9.	I learned to collect and preserve learning aids	Govt.	23	4.74	.449	.587	NS
		MPO	186	4.62	.568		
		FS	14	4.57	.514		
10.	I learned the use of learning outcomes in preparing lesson plan	Govt.	23	4.52	.665	.855	NS
		MPO	185	4.59	.536		
		FS	14	4.57	.514		

Table 4 represents the opinions of Govt. MPO and SF teachers about their learning from practical science teaching training. As shown in the table 4, mean scores of all ten statements appear above 4.0 which indicated that both govt., MPO and SF teachers were confident on their learning from PST training and hold positive views about this training. This table also reveals

that govt., MPO and SF teachers do not differ statistically significantly as p is found greater than .05 (p>.05) for all of the ten items in terms of teachers' mean rating.

All interviewed teachers, irrespective of their locations and types, failed to explain the new inclusions and changes that occurred in the National Curriculum 2012 at Grade 8 Science. These teachers failed to explain the aim and objectives of Grade 8 Science. Teachers' admitted that they learnt question-answer techniques, brain storming, group work, pair work, individual work, demonstration method from in-service trainings. Respondents recognized their limitations in using some other teaching learning strategies like investigation, project-based learning, social constructivism, practical science teaching and concept development model. Teachers also recognized of having difficulties in understating the new assessment system. Around one third respondent told that they did not get this training. They were using their own assessment system. These teachers also complained that all teachers did not get in-service trainings. The training manual contents and its explanation were not satisfactory. Training class was not appropriate for conduction training. Training class size was very large (1:53).

Data from observed classes are shown in table 5. The classroom activities were classified by ten indicators as intended in Grade 8 Science Curriculum 2012 and were rated as 'Satisfactory', 'Need Improvement' and 'Not done'.

Table 5

Teachers-Students' Activities

Sl.	Indicators	Level of performance	Observed Classes in Schools				
			Rural (33) %	Urban (15) %	Govt. (5) %	MPO (39) %	SF (4) %
1.	Link students' prior knowledge to the content	Satisfactory	0	0	0	0	0
		Need improvement	12.1	13.3	20.0	2.6	0
		Not done	87.9	86.7	80.0	97.4	100.0
2.	Content explanation using real life examples	Satisfactory	0	0	0	0	0
		Need Improvement	9.1	20.0	20.0	5.1	0
		Not done	90.9	80.0	80.0	94.9	100.0
3.	Students do practical work	Satisfactory	3.0	0	0	0	0
		Need Improvement	15.1	6.7	0	5.1	0
		Not done	81.9	93.3	100.0	94.9	100.0
4.	Teacher demonstrate practical work	Satisfactory	0	0	0	0	0
		Need	12.1	26.7	20.0	17.9	0

		Improvement Not done	87.9	73.3	80.0	82.1	100.0
5.	Provide task to lower order thinking	Satisfactory	0	0	0	0	0
		Need Improvement	69.7	73.3	60.0	74.3	75.0
		Not done	30.3	26.7	40.0	25.7	25.0
6.	Provide task to higher order thinking	Satisfactory	0	0	0	0	0
		Need Improvement	0	0	0	0	0
		Not done	100.0	100.0	100.0	100.0	100.0
7.	Provide task or explain issue related to affective learning outcome	Satisfactory	0	0	0	0	0
		Need Improvement	0	0	0	0	0
		Not done	100.0	100.0	100.0	100.0	100.0
8.	Use of learning aids	Satisfactory	18.2	20.0	0	23.1	0
		Need Improvement	36.4	46.7	40.0	41.0	50.0
		Not done	45.4	33.3	60.0	33.3	50.0
9.	Interactions	Satisfactory	15.2	20.0	20.0	17.9	0
		Need Improvement	21.1	26.7	40.0	20.5	25.0
		Not done	63.7	53.3	40.0	61.6	75.0
10.	Continually assess students by using CA instruction	Satisfactory	0	0	0	0	0
		Need Improvement	0	0	0	0	0
		Not done	100.0	100.0	100.0	100.0	100.0

As seen in table 5, teachers failed to link students' prior knowledge and experiences with new content. Most of the teachers, 90.9% (30) of rural, 80.0% (12) of urban, 80.0% (4) of Govt., 94.9% (37) of MPO and 100.0% (4) of SF, were found explaining the content without linking it with real life situation. Teachers explained content exactly as it was in the textbook. As shown in the table, practical either done by students or demonstrated by teachers both was in severe gloomy state. Only 3.0% (1) of rural schools engaged students in practical work by meeting the level of expectation. Around three fourth observed teachers did not demonstrate practical work. Around two third teachers engaged students in group work with lower order thinking activities. No teacher engaged students in higher order thinking activities. Real life and new situation were not used. Students copied the answer from the textbook. Activities around 80.0% were inconsistent with learning outcomes. As shown in the table (5), some teachers, rural 18.2 % (6) rural, 20.0% (3) urban, 23.1% (9) MPO, used appropriate learning aids. These teachers used locally collected aids such as

flower, roots etc. No Govt. and SF teachers used appropriate learning materials. Around 40% observed teachers, irrespective of locations and types, did not use appropriate learning materials. In most cases, students kept silent and listened to teachers as passive learner. Teachers lecturing continuously and occasionally asked questions to student. Students never asked questions. Teachers did not use continuous assessment guidelines.

Discussion of Findings

Science curriculum at Grade 8 was introduced in 2013. MoE of Bangladesh conducted two in-service trainings: 3 days for CDT and 5 days for PST. These two in-service trainings were arranged in 2014 and 2016 respectively. This study explored that, among the sampled teachers, 35.82% (134) and 23.79% (89) of research participants (374) did not get CDT and PST training respectively. These numbers were highest in rural schools (CDT 44.6% (92), PST 29% (60)) and SF schools (CDT 73% (19), PST 46% (12)).

MoE initiatives to prepare teachers to cope with the requirement of science curriculum at Grade 8 could not be identified as successful. As a result, Teachers' classroom performances in contrast with the demand of science curriculum were found unsatisfactory. Although survey and interview findings indicated that a student-centered learning cultures were prevailing in all Grade 8 science classes but classroom observation revealed that traditional teacher centric teaching practice were dominated in science classes which was a big challenge in implementing Grade 8 Science Curriculum. Classroom observation has been to evaluate the quality of teaching provided and the consistency between the curriculum plan and the actual delivery of the material by teachers. The purpose of looking at implementation is to see whether there is a mismatch between intention and strategies followed. Babu (2016) reported that, in reality, almost every teacher was unaware of the curriculum and did not have the TG. He further added that half of the teachers sampled reported not preparing for classes. He mentioned that Science teachers prepared classes by reading science textbook and they need to study the subject matter given in curriculum and teacher's guide (TG) carefully prior to conducting lesson. Sarkar (2012) revealed that teachers found difficulties in conceptualizing many of the curriculum-identified values and consequently, found it difficulties to find, develop and implement suitable teaching approach to promote the values. Students' involvements in hands-on learning and in practical activities as prescribed in the curriculum were found almost absent from the classroom teaching. Teachers spent most of their time in classroom by using traditional monotonous lecture. Most of the teachers read out from textbook in delivering their lessons. Science teachers do not help students to group discussion or individual work (BANBEIS,2016). Teachers are facing problems in explaining content & linking with real life (Rahman and

Begum,2012). Classroom teaching contributes nothing to develop creative thinking and critical thinking among students. Classroom teaching did not help to develop scientific attitudes and values among students. Class teaching did not reflect the Science Curriculum intentions. Teachers did not follow activity and participatory approach while giving instruction (Ashan,2009).

These situations were prevailing in almost all schools irrespective of their locations and financial types. Teachers' presentation skills and professional attributes were also found unsatisfactory. Effective science teaching practice in school is a must to ensure good science education (Babu 2016). He argued that according to ideal teaching learning methods of science, students are expected to think rationally and solve problems in their daily life through science education. Science Curriculum 2012 mentioned that science cannot be learnt solely by reading textbook; therefore, science teaching through 'learning by doing' is strongly emphasized (NCTB 2012). Most of the teacher did not engage students in hands-on activities. Teachers engaged students in group work with lower order thinking activities very similar to BANBEIS (2016) report stated that Science teachers do not help student to practice group discussion, group or individual work, activity and experiments. Inadequate and ineffective training can be a potential barrier to curriculum reform implementation. Teachers are not getting continuous and regular trainings. In most cases, training occurred only once. Hossain (2000) argued that secondary school teachers seldom receive recurrent training. In most cases, training in conducted on an irregular basis depending on when funds are available, rather than based on the needs of teachers (MoE, 2005).

Conclusion and Recommendation

Initiatives undertaken by the MoE were not sufficient and fruitful for teachers. Teachers had serious limitations in understanding Grade 8 Science curriculum and in applying its instructions in the learning process. Lecture being the principal method used in delivering lesson. Teaching practice indicated that teachers entered into the classrooms without adequate preparation. Most of them directly readout the contents from the textbooks and were hardly comfortable in delivering the lessons. MoE introduced National Curriculum 2012 at Grade 8 before teachers' preparedness. Teachers' readiness and school's preparation should be made before the implementation of new education program. Teachers should have regular in-service training opportunities. In-service training should be designed and conducted on the basis of teacher's needs. Inadequate and ineffective training can be a potential barrier to curriculum reform implementation. According to O'Sullivan (2002), in order to ensure successful and effective implementation, the professional support given to teachers need to be given careful consideration.

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