

Status and Challenges of implementing Biology Curriculum at Secondary level in Bangladesh

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Abstract

National Curriculum and Textbook Board (NCTB) developed the existing secondary Biology curriculum in 2012. However, teaching learning in the secondary Biology classroom remains same. This article investigates to find out how teachers are implementing Biology science curriculum in the classroom, what challenges they faced and how they overcome those challenges. The approach of the study is qualitative and it was conducted with four teachers from four schools selected by convenience sampling. Data has been collected from selected teachers through lesson observation, semi-structured interview and focus group discussion. Collected data were analyzed thematically. The finding reflects that teachers are providing adequate emphasis to implement Biology curriculum at the secondary level in Bangladesh. They are facing several challenges to implement the curriculum that includes teacher's lack of knowledge about learner centered teaching learning approach, thought provoking and creative work, hands on activities etc. The findings of this study have implications for practicing secondary Biology teachers, trainers, training planner, curriculum developer to rethink and redesign the existing approaches in their initiatives both for curriculum development and implementation.

Keywords: *Secondary Biology curriculum, Curriculum implementation.*

1. Introduction

Biology is the study of evolves, survives and changes of lives. It gives knowledge about the interaction of cells with organs and organisms, environment and ecosystem (Postlethwait & Hopson, 2009). The main focus of Biology education at the secondary level in Bangladesh is to get theoretical and practical knowledge from life and nature. The existing curriculum is developed based on 'National Education Policy 2010' and the main focus of this policy is to create scientifically literate citizen so that they can know themselves and the nature around them and able to conserve it (NCTB, 2012). In this succession an opportunity has been created at the curriculum for secondary level students to know the biological world with greater interest regarding human being along with environmental issues. At the same time, scope has been created to use new technologies for innovating new knowledge that will contribute in the development of the country and can achieve the practical skills of solving problem.

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2. Problem Statement

Curriculum implementation is one of the most important functions of a school and without any doubt, the most important person in implementing the curriculum is the teacher. However, our experiences from the direct observation of secondary Biology classes, we found that the teaching learning at the secondary Biology classes remained almost same with a little variation. Moreover, after developing existing curriculum by our National Curriculum and Textbook Board (NCTB) no research has been conducted yet in Bangladesh regarding the implementation status of secondary Biology curriculum. The curriculum developer, training planner, trainers, heads of institutions and practicing Biology teachers will then be able to find better ways to design and implement a suitable Biology curriculum at the secondary level.

3. Purpose and research questions of the study

The purpose of the study is to explore the implementation status of secondary Biology curriculum, its challenges of implementation faced by the teachers in their teaching practice and ways of overcome those challenges.

To address the research purpose, this research set the following research questions:

1. How secondary Biology teachers are implementing the existing Biology science curriculum in their classroom practice?
2. What challenges are secondary Biology teachers facing in their implementation?
3. How do secondary Biology teachers overcome those challenges?

4. Theoretical Framework

The “Shikkhok Shikkhakrom Nirdeshika-2016” for secondary Biology teachers was developed by NCTB which clearly mentioned thirteen themes as the focus of existing secondary Biology curriculum. These themes are as follows:

- Focus on Basic knowledge and interrelation among different branches in Biology
- Emphasis on learner centered teaching learning approach
- Emphasis to use real life examples
- Emphasis to use different activities
- Recommendation to use low cost teaching aids
- Emphasis to use thought provoking and creative work
- Recommendation to use real life observation
- Recommendation to use ICT
- Emphasis to combine theory and practical work
- Emphasis on conducting hands on activities
- Emphasis on included lesson outcomes in each chapter
- Emphasis on performing different type of assessments
- Emphasis on conducting class for 50 minutes

This article considered these thirteen themes as the theoretical framework for analyzing the implementation status and its challenges by secondary Biology teacher in the classroom.

5. Methodology

The study is designed based on three research questions which focus on exploring status of secondary Biology curriculum implementation, level of challenges and ways of overcomes. To explore all of these phenomenons a qualitative research design was selected as Creswell (2015) asserted that qualitative research is most suitable for exploring the problem and developing a detailed understanding of any central phenomena. Four schools were selected conveniently from Dhaka city considering both high and low achiever schools. Four secondary Biology teachers were selected from each school and three secondary Biology classes of each teacher were observed. Data have been collected through lesson observation, semi-structured interview and focus group discussion with four selected teachers. Data were analyzed thematically to address the answer of these research questions.

6. Results and Discussions

The results and relevant discussions of this article are divided into three sub-sections. These are the implementation status of existing secondary Biology curriculum; implementing challenges faced by secondary Biology teachers and ways of overcoming those challenges.

A. The implementation status of existing Biology curriculum focuses on current practice

The following table presents the implementation status of existing Biology curriculum at current practice. The data in the table is derived from the understanding of the lesson observations of the selected secondary Biology teachers.

Table-1: The implementation status of existing secondary Biology curriculum by teachers

SL	Theme	Emphasized to Implement curriculum in the classroom	Not Emphasized to Implement curriculum in the classroom
		(N = No of observed Class)	
01	Focus on Basic knowledge and interrelation among different branches in Biology	12	00
02	Emphasis on learner centered teaching learning approach	03	09
03	Emphasis on using real life examples	12	00
04	Emphasis on using different activities	03	09
05	Recommendation to use low cost teaching aids	00	12
06	Emphasis to use thought provoking and creative work	06	06

07	Recommendation to use real life observation	00	12
08	Recommendation to use ICT	03	09
09	Emphasis to combine theory and practical work	03	09
10	Emphasis on conducting hands on activities	03	09
11	Emphasis to included lesson outcomes in each chapter	12	0
12	Emphasis on performing different type of assessments	12	0
13	Emphasis on conducting class for 50 minutes	6	6

The following sections discuss implementation status of the secondary Biology curriculum based on the lesson observation and teacher's interview.

• Focus on Basic knowledge and interrelation among different branches in Biology

This data from the lesson observation and teacher interview elicits that secondary biology teacher do not face any specific challenges about focusing basic knowledge and interrelate among different branches in biology in their practice because of deep subject knowledge and prior preparation. According to the teacher B,

...the basic knowledge of the existing secondary Biology curriculum is easy to understand and present. The new concepts in the curriculum are not difficult to teach. We can easily present the inter relation of different concept within this curriculum to make it understandable for our students...

This finding is consistent with the earlier research of Subramaniam (2014) that the importance of subject knowledge in the preparation of teaching activities is clearly recognized. Secondary Biology teachers with adequate subject knowledge are able to give emphasis on both basic biology and their interrelation with different branches of biology. It does indicate proper implementation of curriculum.

• Emphasis on learner centered teaching learning approach

This study reveals that secondary Biology teachers have lack of knowledge about learner centered teaching learning approach. According to teacher C, "most of the time we have to provide lecture to clear the concept...".

This finding is consistent with Çimer (2012). Teachers may not be able to implement curriculum focus due to lack of adequate knowledge about learner centered teaching learning approach. It does indicate not adequate emphasis on implementation of curriculum.

• Emphasis to use real life examples

This study also discloses that secondary Biology teachers are using real life examples in their practice which bring positive impact on learners learning. It helps student to become an active learner. According to teacher A:

...the content of Biology curriculum is mostly related with plants and animals. It is therefore easy for biology teacher to link the content of the textbook with the real life...we therefore easily provide real life examples in Biology class...

This finding is consistent with the earlier research that the teacher should promote experiences that require students to become active learners (Çimer, 2012). Teachers are therefore involving students in active learning by implementing real life examples in their practice. This is one of the main goals of our curriculum and it does indicate proper implementation of curriculum focus.

• **Emphasis to use different activities**

It is also found that secondary Biology teachers mostly use lecture and less use different activities in their practice as suggested by curriculum. According to Teacher B:

...in Biology class we need a lot of pictures drawing on the blackboard and explain. After drawing we mainly explain the content and do not need to use different types of activities...

This approach is negative for active learning. This finding is consistent with the earlier research where the amounts of lecture time that can be devoted to instructor provided content coverage reduce the use of active learning strategies (Roberts, 2001). Secondary Biology teachers are therefore not implementing curriculum properly in case of using different activities in their classroom.

• **Recommendation to use low cost teaching aids**

This study reveals that there is serious lack of using low cost teaching aids in each institution. This finding is consistent with the earlier research that there is very less availability of low cost teaching materials in school for teaching biological science (Sivakumar, 2014). Teachers therefore may not be able to implement curriculum recommendation to use low cost teaching aids.

• **Emphasis to use thought provoking and creative work**

This study also discloses that secondary biology teachers have mixed concept about thought provoking and creative work. Also some of them do not know how to implement it. According to Teacher D:

...according to the Biology curriculum we have to conduct investigation. The opportunity to conduct investigation able the students to get involved in thought provoking and creative work...

The Teacher C also expressed that:

...in our Biology class, not much scope to use thought provoking and creative work as the subject is mostly memorization based...

This finding is consistent with the earlier research. According to Kinzie et al. (1993), teachers

are also facing dilemma about thought provoking and creative teaching. Their dilemma demonstrated in different ways in different cases. So focuses about thought provoking and creative work in implementing curriculum is in mixed way at secondary Biology classes.

• **Recommendation to use real life observation**

This study also discloses that secondary Biology teachers found reluctant to provide real life observation in their practice which oppose to its demand for specific topics. All of them mentioned about the negative attitude of the head of the institution and sometimes parents to make decision about field trip for biology class of this level. This finding is consistent with the earlier research that certain reasons including head teacher and parents' attitude make it difficult to plan for field trips (Cimer, 2012). Recommendation to use real life observation are not implementing properly.

• **Recommendation to use ICT**

This study also reveals secondary Biology teachers found reluctant in using ICT in their practice. This is mainly due to lack of computers/laptops, multimedia projectors as well as unstable power supply in their institutions to use ICT in classroom. This finding is consistent with other several researches where no access to the internet during the school day and lack of hardware were hampering technology (Peat & Fernandez, 2010). It indicates that recommendation for using ICT are not implementing adequately in secondary Biology classroom.

• **Emphasis to combine theory and practical work**

This study also discloses that lack of laboratory and laboratory apparatus allow teachers to be reluctant to combine theory with practical work in secondary Biology practice. This finding is consistent with the earlier research that the lack of laboratory resources as a barrier that has a negative effect on the implementation of the new science curriculum (Roberts & Reading, 2015). Secondary Biology teacher may not be able to combine theory and practical according to curriculum instruction due to these limitations.

• **Emphasis on conducting hands on activities**

The study finding also reflects that secondary Biology teachers are reluctant to give emphasis in conducting hands on activities in their practice. According to Teacher B:

...due to the duration of class time and number of students in one class, it is not possible to conduct hands on activities. We also have to conduct classes after classes that create difficulties for us to prepare for hands on activities for Biology class...

Similar finding are reported by Gregory & Di Trapani (2012) that secondary Biology teachers are not implementing curriculum properly to conduct hands on activities in their practice.

• **Emphasis to include lesson outcomes in each chapter**

It is found that all the teachers are using learning outcome in their prepared lesson plan. All

of them mentioned that the included lesson outcomes in each chapter make them easy to maintain focus of the lesson. This finding is consistent with Toman (2018) where learning outcomes help to focus on student centered learning procedure and linked between active learning. It is therefore a positive characteristic of our curriculum which is implemented by teachers properly.

• **Emphasis on performing different type of assessments**

The finding of the study reveals that all selected Biology teachers are using different types of assessments in their practice. It indicates that, teachers are performing different types of assessments according to curriculum instruction. Earlier research found that the purpose of assessment is to guide classroom and instruction and enhance student learning on day to day basis (Ozay & Ocak, 2009).

• **Emphasis on conducting class for 50 minutes**

This study also discloses that secondary Biology teacher supports class of 50 minutes duration but they all are not implementing this curriculum recommendation. According to Teacher A:

...class duration is basically depending on school schedule. It is not in our hand. Our head teacher mainly decides the time of the classes. A class of 50 minutes helps us to conduct all activity properly...

Moreover, Teacher D mentioned that:

...our school follows the time suggested by curriculum, so we conduct Biology class for 50 Minutes which is helpful...

The finding is consistent with the earlier research where shows that appropriate class duration help to conduct biology class with large classes and little time for planning, they may be forced to turn to predesigned curricula (Lazarowitz & Penso, 1992). Curriculum instruction is therefore not implemented properly.

B. Challenges faced by secondary Biology teachers in terms of implementing the curriculum

The followings are the challenges faced by secondary Biology teachers to implement the curriculum in their actual practice. These findings are derived from the semi-structured interview and focus group discussion of teachers.

- lack of knowledge about learner centered teaching learning approach
- Parents non-cooperative attitude about different activities as they like to resist for most of the changes
- Lack of low cost teaching aids
- Lack of knowledge about thought provoking and creative work
- Political unstable situation, institutional apathy
- Lack of computers, multimedia; power supply problem

- Lack of laboratory and laboratory apparatus
- Lack of knowledge about hands on activities
- Excessive class load as well as topic load as they have to take classes for their non-background area

C. Ways of overcoming in implementing secondary Biology curriculum

The following are some important aspects suggested by participating secondary Biology teachers that will help to overcome the challenges to implement curriculum in their practice. These are:

- Arrange regular in-house training for sharing curriculum understanding and to provide teachers with appropriate knowledge on learner centered pedagogy
- Create suitable environment for teaching with adequate laboratory space and equipment
- Arrange teaching learning events in outside the classroom as demanded by curriculum
- Arrange in-house training to develop skills among teachers about to prepare low cost apparatus and offer hands on activities in the classroom
- Arrange motivational program for parents by heads of institution to familiar them with the curricular issue during the parents meeting
- Ensure institutional support for arranging multimedia and computers, backup power supply, training on ICT
- Arrange adequate laboratory space and laboratory apparatus by institution
- Institution support by heads of the institutions to give emphasis to reduce class load and topic load for Biology teachers

7. Implications and Conclusions

The findings of the study have implications for practicing secondary Biology teachers, head of the institutions, trainer, training planner, authority for curriculum dissemination and as well as curriculum developer.

- The findings of the study reveal that the practicing secondary Biology teachers do not emphasize adequately to implement the focus of the curriculum. This finding may therefore help practicing secondary Biology teacher to be more careful about to design their lesson with greater emphasis on curriculum focus.
- The findings also reveal that practicing secondary Biology teachers face challenges in terms of infrastructural support as well as class duration. The findings may guide the heads to support for infrastructural emergencies, adequate space for laboratory, facilities and equipment for laboratory, ICT facilities and as well as to redesign school schedule followed by NCTB instruction. The findings may also guide heads to arrange in-house training sessions for sharing curriculum understanding among practicing teachers. Furthermore, the findings will help the heads to understand the need to discuss about curriculum change and new pattern of implications at parents meeting.

- The findings also reveal that teachers are not well informed about the focus of the curriculum this may guide trainer, training planner and authority for the curriculum dissemination to rethink about the design of the professional development program. This may help practicing secondary Biology teachers for better understanding about learner centered teaching learning approach and designing hands on activities in their practice.
- The findings may also guide curriculum developer to provide explicit guidelines to bring all stakeholders at the same understanding about any innovation in the curriculum.

Finally the intended, implemented and attained are three major levels of a curriculum. Curriculum implementation plays a vital role to link between curriculum intension and its attainment by students. Teachers are therefore the play maker to implement the curriculum. Moreover, teachers get support to understand and implement the curriculum from different agencies both from schools and government projects. It is therefore great emergency to realize the challenges of implementing the secondary Biology curriculum by each of its stakeholders and arrange necessary steps to overcome teacher's challenges to implement curriculum for betterment of student's learning and education system.

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