



Constructivism Approach by Applying Scaffolding, Collaborative and Cooperative Group Work in Teaching Citizen's Rights at Higher Secondary Level Students of Bangladesh

Dr. Gazi Ibrahim Al Mamun

Assistant Professor
Dept. of Political Science
Dhaka City College, Dhaka

ABSTRACT

This study has focused on the theory and practices of Citizen Rights (CR) and the Information section in Civics and Good Governance (CGG) classroom. In this study constructivist learning approach has been applied in the CR learning for improving the active participation of the students of higher secondary education in Bangladesh. As per the national curriculum of Bangladesh, the higher secondary education level has adopted a student-centered participatory learning approach for ensuring quality education and developing the creativity of students. However, the student-centered participatory system is questioned yet. In this fact, following constructivism theory, scaffolding, and collaborative and cooperative group learning strategies, lesson plans were equipped for the students of eleven grades in Bangladeshi college. In this context, after conducting the lessons this researcher prepared a summative assessment, where he found that the higher order and lower order thinking skills are enhanced among the student thanks to teaching by constructivist instructional strategies instead of mere lecture method in CGG class, and which teaching in CRs would bring about a revolutionary change in achieving active learning of the students. From this perspective, it is noticed that in colleges of Bangladesh for the effective accomplishment of the student-centered participatory method in the CGG context, proper training and motivation for teachers, a re-designed curriculum, and extended class size and time duration should be ensured, otherwise, the whole endeavor will fail.

Keywords: Constructivism, Participatory Method, Active learning, Collaborative and Cooperative Group Learning, Scaffolding, Higher Secondary Education.

1.0 Introduction

Learning is the lifelong process of bringing about a positive change of mind and society through the practice and various forms of experience (Schunk, 2012). In modern times, the learning approach has changed a lot (Jarvis, et al, 2003); where the modern approaches emphasize student-centric, teacher supportive active learning (Ertmer & Newby, 2013). Bangladesh is widely practiced teacher-centric traditional learning method institutionally (Sarkar, 2012; Sarkar & Chowdhury, 2018). However, the Government has emphasized the application of appropriate teaching-learning methods and training for teachers to achieve the SDGs goal inclusive and quality education (Sarkar & Chowdhury, 2018; Rahman, 2017). As part of studying, for ensuring quality education through developing a participatory class at a private college in Dhaka city, under constructivist learning theory, scaffolding, collaborative and cooperative group work which have been incorporated in teaching Citizen Right section of Civics and Good Governance (CGG) subject.

1.1 Background of the study

In Asian countries, like China, India, and Bangladesh the traditional lecture method is practiced in the teaching and learning process; where large size of the class in the huge number of students is learned in a classroom (Nargund-Joshi, Rogers & Akerson, 2011; Zhang et al., 2003 and Sarkar & Corrigan, 2013). In the large classrooms in every student are not attain or no need feel to attending in the class, for that active learning is not ensuring and the students are being assessed by the exam of the text-book oriented memorization, where daily classes assessment are absence (Holbrook, 2005; Sarkar & Chowdhury, 2018). In Bangladesh Education Policy 2000 has recommended, 40 students per class at the higher secondary level (MoE, 2000), but any college cannot maintain it properly, almost 100 overrun in per class in every college (Holbrook, 2005). Also, in classroom-based teaching-learning, teachers are not getting proper training or guideline to teach effectively and students cannot work in the learning process actively (Babu, 2016). Further, there have no strong mechanisms to ensure quality assurance; e.g., only small supervision unites of the National University has leaded quality supervision in over 2000 approved colleges (Rahman, et al, 2019). For that, the question is being still yet to ensuring quality education. In this perspective, the students do not get proper motivation, teaching, and learning in effective participation and collaboration in the higher secondary level class.

This researcher is working as a teacher, at present assistant professor, of Political Science at a private college in Dhaka city from 2015 to till now is continuing. In his CGG class of higher secondary level, almost 70-80 students are ordinarily attending, when he provided lecture conventionally on a particular topic and write the points of topic matter using the whiteboard. Like the other classes of the college, his class is not taken as per making the lesson plan and no assessment tasks are using in the class; where all tasks completing and controlling by himself. For that result, he noticed students feel bored to understand and learn about CGG's contents especially CR and law-related topics, which is why the class is not being effective sometimes. In addition, he noticed that, such teaching methods lead students to memorization and which acts as a barrier to the development of critical knowledge and presentation skills. So, the teaching method should be changed, where lessons will be taught through appropriate assessment and lesson plan-based participatory student-centered teaching methods. From this realization, he, like many of his colleagues, has devised lesson plans using the constructivist approach for participatory teaching so that students can learn suitability through their lessons.

2.0 Instructional Practice

2.0.1 Aiming Overview

The National Curriculum 2012 has articulated to support students' development in a balanced way and holistically to fulfill the demands of the 21st century. According to this curriculum, the subject name of 'Civics' has been moderated by the name of 'Civics and Good Governance'; where ICT-based governance is included with the previous syllabus, and there has emphasis active learning method for teaching on this curriculum (Hossain, 2015). Indeed, higher secondary education of Bangladesh has adopted a participatory learning approach to ensure quality education in the creative system; for which the students' participation, concentration, and teacher-learner relation must be participatory in the class (Ebrahim, 2017). So, the researcher aim is to develop a participatory class for quality learning in his Civics and Good Governance class through the scaffolding, collaborative and cooperative group works. For achieving this objective, these two theoretical ideas of constructivism with some tools of formative assessment have infused in his three lesson plans to teach citizen rights (CR) related topics so that difficult topics can be taught to the students and ensure active participation of them in the CGG class.

2.0.2 Changing Pattern and Rationality

Generally, the conventional lecture-based teaching, the tutor provides knowledge through a linearized way, there has a little bit of interaction and collaborative feedback between teachers and students (Huxham, 2005). Similarly, Albarrak et al. (2013) revealed that sometimes the students are boring for listening to the mere lecture; moreover, the irrelevant speech and over-presentation makes negativity in the mind of learners; which is adverse for student's academic getting and instructional environment. Likewise, the researcher's conventional class experience shows that students are annoyed sometimes to hear his only lecture and are not active in class because there is no assessment. In this perspective, he want to change this type of conventional lecture-based class through developing a participatory-based class using an active learning approach with a formative assessment so that can develop students' participation in the learning process and ensure quality instruction for them. Indeed, the participatory class is developed by different modern teaching-learning techniques (Hecht & Maass, 2008). For that reason, it is time to use scaffolding, collaborative-cooperative group work as a modern learning method. Therefore, modern methods should be applied to ensure active participation and effective learning of students in CGG classes of higher secondary level colleges.

2.0.3 Improving Pattern of Instruction

The participatory class is egalitarian, where teacher and student participation is equal (Bottomley & Denny, 2011). This approach removes students' learning-based concern, inertness, and deficiency through active participation, interaction, motivation, and collaborative-cooperative discussion, and makes a sustainable environment for confident development of them (Hecht & Maass, 2008). Here, the teachers work as a facilitator to use modern teaching techniques for driven the process of students' participation, activities, collaborative and cooperative group work, pair, peer feedback, and assessment task for active learning. At each stage of participatory classes created through modern learning methods such as scaffolding, collaborative and cooperative group work, both teachers and students have the opportunity to self-assessment. Such assessment and learning processes play a helpful role in enhancing the student's higher-level knowledge skills. Furthermore, such a learning method is conducive to the spread of quality education. But in addition to taking appropriate steps by the government to develop this system, it is necessary to formulate a proper mentality for teachers to adapt to the new method; so that teachers can get proper knowledge about the curriculum and perform lesson planning and evaluation using teaching-theory based theoretical ideas.

3.0 Learning Approach and Strategy

Learning theories analyze how learners imbibe, process, and keep in mind of knowledge while learning (Illeris, 2004). In that case, the theories of learning are applied in academic institutions wherein the learners and educators can get benefit to develop their knowledge and to design more effective learning through this learning process (Worham, 2003). The academic sector has three kinds of learning theories, cognitivism, behaviorism, and constructivism (Islam, 2019). In this case, in the researcher's CGG class has been infused constructivism approach with incorporated scaffolding, collaborative, and cooperative ideas as an active learning process.

3.1 Constructivism Approach

In 20 century's last two decades, constructivism has developed as one of the most influential theories to the learning world (Shapira-Lishchinsky, 2015); which is expressed through Piaget (1972), and Vygotsky's (1986) works of educational area (Angela, 2011). According to Piaget (1972), knowledge constructs through assimilation and accommodation (Angela, 2011), and Vygotsky considered that knowledge constructs individually through personal experience or to interact with one another experiences socially (Shapira-Lishchinsky, 2015). Moreover, main feature of constructivism is that on connecting current experience and prior experience to make new learning and knowledge, based on cooperation and collaboration with others (Angela, 2011). This approach focuses on the student-centered active learning process, not passive; where students construct their learning and knowledge to solve complicated problems through the scaffolding, cooperation, collaboration, interaction, or discussion with others and the teachers are to help students to be actively involved in the learning process (Copley, 1992). So the constructivist teaching approach is essentially an introspection of students into active participation in learning independently through teacher motivation.

3.1.0: Scaffolding: Overview and Critical Discussion

The scaffolding is a theoretical concept of constructivism, which focuses on teachers' exercise; the teachers provide assist for enhancing the learners' ability, in the same way, reduces assistance as improved the ability of learners (Raymond, 2000). As per Van de Pol et al (2010), the scaffolding is a dynamic process to an interaction between teachers and students; which they have seen through a model below.

According to the model, scaffolding has three common features are contingency, fading, and transfer of responsibility. Here, the teachers support students in the contingency process, and support is fading based on students' development, then students' responsibility gets increased through the transfer of responsibility for the development of the students (Van de Pol et al., 2010). So the scaffolding is a process which through teachers can support and assess students in various ways and students can develop through the teachers' supports to become an independent responsible person.

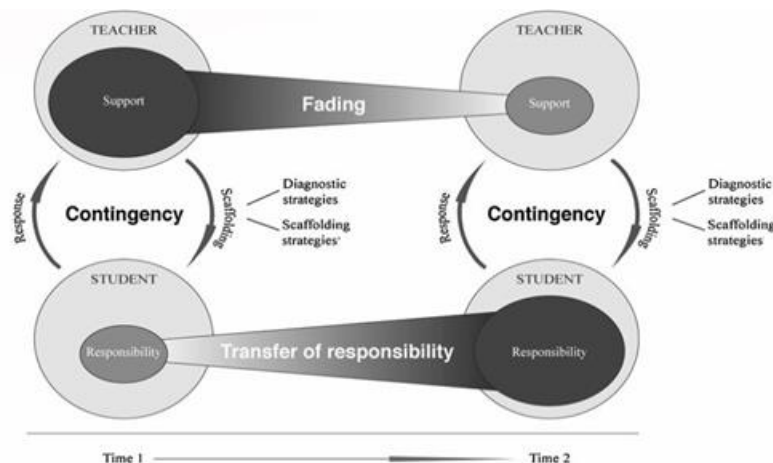


Figure 1. Conceptual model of scaffolding (Van de Pol et al, 2010)

Theorists have not been able to reach a consensus on the definition of scaffolding. Many theorists (e.g., Aukerman, 2007; Butler, 1998; Donahue & Lopez-Reyna, 1998) express that scaffolding means 'building materials'; that's a 'metaphorical' term in the educational arena (Wood, et al, 1976); which refers to the students' learning building. But each student's knowledge building process is different. Again, as Stone (1998) has seen it as a student-teacher interaction; similarly, Fisher and Frey (2007) describe it as a transfer of knowledge from teacher to student. Stone (1998), Van Geert & Steenbeek (2005), emphasizes teachers' support for scaffolding is essential; as per them, through this that the student becomes self-dependent. However, it cannot be said that the students will be as self-reliant only if the teacher provides support; although as per Belland (2017), the essence of scaffolding is the self-reliance of the student. Van de Pol, et al (2010) showed in their study that scaffolding is an effective method in learning, where teachers-students become active in learning using scaffolding techniques such as feedback, hints, instructing, explaining, modeling, questioning, etc. With this term Castagno-Dysart, et al (2019), points out that using these techniques students can be actively participating in the class. So the reviewing unfolds of scaffolding features and significance, which will serve as helpful to apply in the researcher's CGG class.

3.1.1: Rationale for Choosing this Idea

A large of studies argued that the lecture-based teacher-centered method incorporates highly minimum support, which is not very effective for students' learning outcomes (Kirschner, et al., 2006; Hung, 2011). In contrast, scaffolding is a problem-solving model, incorporates potential support as scaffolds for constructing knowledge and skill of learners (Hmelo-silver, et al., 2007; Kuhn, 2007). Scaffoldings' main goal is to reduce fears, upsets, or depression in the complicated task of students through the support as well as develop communication among teacher-students and construct self-reliant learners (Blumenfeld, 1992; Belland, 2017); which is highly needed for establishing the participatory class. Also, the part of citizen rights, law, or regulations of

the CGG is goodly learners' self-reliant activity matter; where the techniques of scaffolding as modeling, hints giving, explaining, etc are need for directing the class effectively. So scaffolding is the rationale for establishing a participatory and effective class.

3.2.0 Collaborative and Cooperative Group Work: Overview and Critical Discussion

In learning phenomenon, many define cooperative and collaborative terms separately, while others define it as one term. According to Dellenbourg (1999), cooperative and collaborative learning is a condition in which two or more people attempt to learn something together. However, there is a difference between the two; where collaborative learning is a common goal and learning through joint efforts (Chi & Wylie, 2014; Scardamalia & Bereiter, 2006; Dellenbourg, 1999; Roschelle & Teasley, 1995). In contrast, cooperative learning is the teaching of members of the same group through different goals and individual labor, so that each can support the other (Dellenbourg, 1999; Roschelle & Teasley, 1995). J. Clare (2015) has agreed with that view and has shown through a figure (Figure-2), cooperative and collaborative learning have different as group structure and task, but both are similar focus on mutual interaction and enhancing the social ability through group construction.

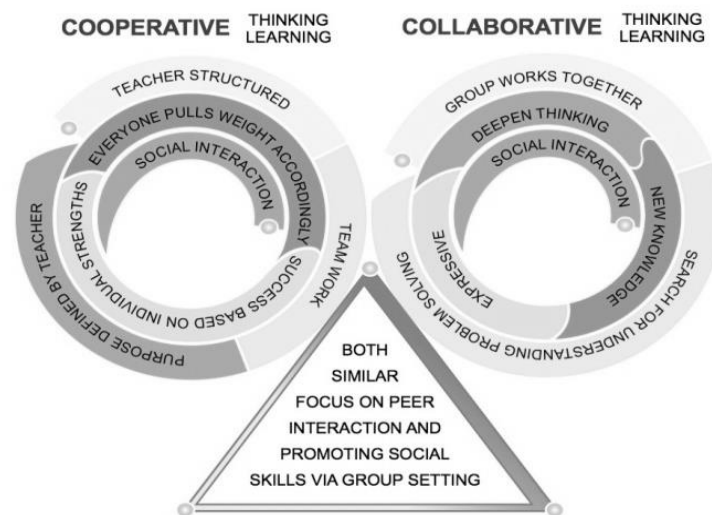


Figure 2. Concept framework of cooperative and collaborative learning (Clare, 2011)

In cooperative and collaborative learning, although some studies have a debate whether a pair is a group or not (e.g. Moreland, 2010; Williams, 2010), many studies (e.g. Dellenbourg, 1999; Iiskala et al., 2011; Schoor, et al., 2015) have recognized that the pair and small group are working as the group in cooperative and collaborative learning. So, it says that every interactive group either collaborative or cooperative. Schoor, et al. (2015) argued that group interaction is occurred among either parent-child or teacher-student in socially. In this case, the collaborative and cooperative group is not entirely separate term; since there is no universally accepted umbrella term for both concepts, that's why it is presented together as one term (p.98).

Many works of literature support that, in present, collaborative and cooperative learning plays a vital role in pedagogical exercise in educational institutions (Slavin et al., 2003; Baines et al, 2007; Schoor, et al., 2015); where that group work can be created positive feedback on the student's academic and social life (O'Donnell & King, 1999; Slavin et al., 2003). However, many researchers presented argue in their studies that, the group work must be good-quality; where group work will be well-prepared and related to curriculum, interaction occurs among students-students and teachers, appreciation and inspiration based training to the teacher for driven group work in the classroom, and also the willingness of student need to group success (Banies, et al., 2003; Blatchford, et al., 2003; Slavin, et al., 2003). Moreover, there is large literature argue that group support and concepts analyzing within the group develop higher-level thinking skills among learners as analyzing, communicating, value-creating, information retention, deepened learning and helps to promote a positive attitude toward the subject matter (Gokhale, 1995; Banies, et al., 2003; Oakley et al., 2004). However, from my own experience, any conflict within the group or dominating tendency can spoil the positive side of collaborative and cooperative group works. This is conformed Beebe and Masterson (2003) mentioned that conflict, dominating tendency, one-person responsibility, and lack of consent within group members are creating obstacles of group works. So, it is explicit from reviewing, collaborative and cooperative group learning method is very significant to participatory and quality education, but using it must be pay heed to the obstacles of group work, so that collaborative and cooperative is effective.

3.2.1: Rationale for Choosing this Idea

Collaborative and cooperative learning strategy is widely used in teaching social science and language classes for most effectiveness (Oxford, 1997); because it is self-regulated learning wherein learners can gather knowledge properly by sharing, caring and feedback to solving complex tasks easily (Schoor, 2015). Moreover, group work identifies the individual weakness, develop accountability and flexibility, create interaction to a better future with one another through tolerance and trust (Jonson et al. 2007, Burcu, 2019); which are common need to participatory CR class of CGG. Besides, the engagement and communication skill of teachers and students are increasing through collaborative and cooperative group work, which constructs the

higher-order thinking and encouraged common target achievement of pupils (Dyson & Grineski, 2001). Group learning inspires proper inter-group contest while accomplishing many benefits of collaboration and cooperation, which builds equalization to the participatory competition. Therefore, this method will help assemble participatory student-centered class for effective learning in teaching CR of CGG class as students will be involved in willingly and they do spread out the knowledge level.

4.0 Lesson Plan

A lesson plan is the outline of the teacher for directing certain topics, it contains objectives of learning, the strategy of achievement of objectives, and a procedure for measuring what extent the objectives achieved (Cox, 2019). As per Hunter (1982), Barroso & Pon (2004) has presented six essential components for an effective lesson plan: warm-up, introduction, presentation, practice, evaluation (assessment), and application. De facto, every teacher should be followed these for making effective a lesson plan.

As a teacher, the researcher has prepared three lesson plans on the part of 'Citizen Right' of CGG subject for intermediate (XI class) students. Each lesson plan timeline is 45 minutes, which is divided into three parts- beginning, development, and ending. The lesson plan has infused two methods 'scaffolding, and collaborative and cooperative group work' of the constructivist learning theory; under these methods, he has used various techniques like hints giving, modeling, VIPP cards, questioning, etc. Moreover, he used various formative assessment tools for assessing students' higher-order thinking (HOTS) and lower-order thinking skill (LOTS). The effectiveness of a lesson plan depends on the sequential framework, for that the lesson plans below he has followed Gagne's nine events like gaining attention, objectives sharing, recalling, contents explaining, guidance, assessing, and enhancing retention (Gagne & Memory, 1978). Moreover, these lesson plans will examine and analyze how effective the constructivist theory and its' ideas are in participatory class.

4.0.1: Lesson Plan-1

| Date: 24.02.2020 Subject: Civics and Good Governance Topic: Concept and classification of Citizen's Rights Class: Higher Secondary Level (XI) Class Duration: 45 Minutes | | | | | |
|---|------------------------|---|--|---|--|
| Learning Objectives: By the end of the session, learners will be able to <ul style="list-style-type: none"> ▪ Explain the concept of citizen's rights ▪ Describe the classification of citizen's rights | | | | | |
| Lesson Outline | | | | | |
| Steps (Time) | Activity | Theoretical idea | Instrument | Assessment (Formative) | |
| Beginning (10 min) | Attention span | Starting the class through greeting with students | Having a well-being exchange with the students. Asking their health and mental condition. | Oral speech | Socratic assessment tool is using where teachers engaged in whole class through exchange well-being with students. |
| | Indicative step | <ul style="list-style-type: none"> ▪ Announcing the lesson's topic and contents ▪ Introducing the learning objectives of the session | Instructing tools of scaffolding has been used for imitating the contents and objectives of the lesson to the students. | Whiteboard, Marker Laptop, Video-link, Projector | |
| | Incentive step | <ul style="list-style-type: none"> ▪ Asking students about the citizen rights concepts, wherein create recall in prior knowledge. ▪ Showing a You-tube video about the definition and characteristics of citizen rights; wherein students can incorporate with prior and new knowledge. | <ul style="list-style-type: none"> ▪ For creating stimulation of knowledge giving hints used under scaffolding. ▪ For generating self idea and concept of students through using visualization of scaffolding. | | A quick quiz question has been used to check students' understanding and level. |

| | | | | | |
|----------------------|---------------------|--|---|--|--|
| Development (30 min) | Presentation | <ul style="list-style-type: none"> ▪ Shows a PP presentation using a multi-media projector about the classification of citizen's rights and define various rights of a citizen. ▪ The teacher will elaborate on every type of rights and students are to ask to recognize different types of rights. | There have used scaffolding of cooperative learning for idea sharing to a better understanding of learners. | Text Book, Laptop, Projector, VIPP cards, Board, Marker, Scotch tape | Observation and questioning have been used for testing the understanding level and knowledge level of learners. |
| | Activity | <ul style="list-style-type: none"> ▪ The teacher will draw a table to indicate the broad types of 'citizen's rights' and distribute some written VIPP cards (written about rights) for students and announce a hint that which rights are what type of rights. | <ul style="list-style-type: none"> ▪ The teacher as a facilitator provided hints and feedback for completing the VIPP process under scaffolding. | | |
| | Activity | <ul style="list-style-type: none"> ▪ Students will identify the type of rights and relate to the written board of broad types of rights; then they will attach every VIPP card to the bottom of indicating the broad types of rights of the board table. | <ul style="list-style-type: none"> ▪ Cooperative active learning through scaffolding; where the teacher work as a facilitator to cooperate students for sharing and matching the VIPP cards with board point. | | |
| | Evaluation | <ul style="list-style-type: none"> ▪ The teacher will ask students why these VIPP cards have set this column of the board table, students will analyze short and justify. | <ul style="list-style-type: none"> ▪ VIPP method and questioning tools in connection under cooperative learning of scaffolding; where develop and assemble new learning through the students' response and judgment. | | Gaddit tool has been used to take immediate feedback and response of students, by which to assess their understanding of learning. |
| Ending (5 min) | Recap | <ul style="list-style-type: none"> ▪ Teachers will reflect on the overall evaluation of class and summarize key points. ▪ Giving home tasks for the next day. | Summarizing the lesson and continuing the learning process. | Oral speech | |
| | Closing | <ul style="list-style-type: none"> ▪ The teacher will greet thanks for the session closing. ▪ Connection future lesson. | | | |

4.0.2: Lesson Plan-2

| | | | | | |
|--|------------------------|---|--|--|---|
| Date: 02.03.2020 Subject: Civics and Good Governance Topic: Concepts citizen's right to information, and act 2009 of Bangladesh Class: Higher Secondary Level (XI) Class Duration: 45 Minutes | | | | | |
| Learning Objectives: By the end of the session, learners will be able to <ul style="list-style-type: none"> ▪ Explain the concept of citizen's rights to information ▪ Learn about the RTI act, 2009 of Bangladesh | | | | | |
| Lesson Outline | | | | | |
| | Steps (Time) | Activity | Theoretical idea | Instrument | Assessment (Formative) |
| Beginning (7 min) | Attention span | Launching the class through welcoming with learners | Rapport building with students through sharing the idea of attending class. | Oral speech Whiteboard, Marker Laptop, Video-link Projector | Using socratic to interaction among teacher and students. |
| | Indicative step | The teacher will declare the learning topic and learning objectives of the session | Contents and objectives are declared as Giving hints for an extended discussion of class. | | |
| | Incentive step | <ul style="list-style-type: none"> ▪ The teacher will show a You-tube video about the concept and context of RTI ▪ Teacher will review short and take a reflection of students on watching the video | The constructivist idea for creating a theme in mind of the new learning of learners through sharing a video under visualizing scaffolding. | | |
| Development (33 min) | Presentation | <ul style="list-style-type: none"> ▪ Teacher will give a mini-lecture on introducing the citizen's right to information act, Bangladesh, 2009 through PPT using a projector. | Under instructional scaffolding, there have used visual presentations for connecting new knowledge to prior and develop understanding to learners. | Laptop, Projector | |
| | Activity | <ul style="list-style-type: none"> ▪ Teacher will divide into two/three groups of students as per their sitting, and provide a poster and marker for each group. Each group will respond to discuss one part/content of this act delivered in the textbook, e.g. group-A for accessible information, not access information, B for the method of claiming and providing information. ▪ Teacher will ask the students in all groups to discuss the responsible | <ul style="list-style-type: none"> ▪ For completing the group work, the teacher as a facilitator has instructed learners. ▪ Students are working in groups to sharpen their knowledge; where their motives and topics are common. ▪ Every student shares their idea to achieve their own goal as per instruction. | Oral speech, Poster, Marker, Scotch tape | Through poster presentation and value set up for collaborative and operative group work |

| | | | | | |
|-----------------------|--------------------------|--|---|-------------|--|
| | | <p>topic in the group and write the key points in the poster, and ask them to finish the group task within 10 minutes.</p> <ul style="list-style-type: none"> As per instruction, students will complete the task with understanding to make a report through a poster. | | | |
| | Activity | <ul style="list-style-type: none"> After the group task, two students from each group will present their responsible topic on the desk; in this case, if any question will have arisen in the topic presentation, the teacher and student will solve these collaboratively. | Students organize and explain the idea contingent on the understanding of concepts. | | |
| | Evaluation | <ul style="list-style-type: none"> Teacher will ask various questions to class about the RTI act, students answer questions by raising their hand arbitrarily. | Using questioning evaluate the cognitive learning of learners. | | Using Quiz questions to evaluate student's cognitive learning. |
| Ending (5 min) | Recap and Closing | <ul style="list-style-type: none"> Reviewing all session short. Announcing the next topic for learning. Good-bye greeting | Constructing the active learning process to summarize and review. | Oral speech | |

4.0.3: Lesson Plan-3

| | | | | |
|---|--|--|-------------------|---------------------------------------|
| Date: 09.03.2020 | | | | |
| Subject: Civics and Good Governance | | | | |
| Topic: Impact of RTI act on a citizen's life | | | | |
| Class: Higher Secondary Level (XI) | | | | |
| Class Duration: 45 Minutes | | | | |
| Learning Objectives: | | | | |
| By the end of the session, learners will be able to | | | | |
| <ul style="list-style-type: none"> Evaluate the impact of the RTI act for ensuring citizen rights Define the obstacle and overcoming way to implement RTI act | | | | |
| Lesson Outline | | | | |
| Steps (Time) | Activity | Theoretical idea | Instrument | Assessment (Formative) |
| Beginning (5 min) | <ul style="list-style-type: none"> Starting through the greeting sharing with students Introducing the topic and learning objectives | <ul style="list-style-type: none"> Concentrating students in the class. Motivation and instruction through relevant matters. | Oral speech | Self-assessment for mental attention. |

| | | | | | |
|-----------------------------|--------------------------|---|--|---|---|
| | Incentive step | Reviewing and recall to prior class and incorporate new session goals | Coordination to new and prior learning. | | Using quiz type questions. |
| Development (35 min) | Presentation | Sharing a video on the context and necessity of access to information and the teacher will give video reviewing lectures on the importance and impact of RTI on citizen life. | Interaction build up and knowledge development for learners through using a video as scaffolding. | Laptop, Projector Oral speech | |
| | Activity | <ul style="list-style-type: none"> ▪ Teacher will ask the students to write down the key points of RTI impact on citizen's life, the basis on video and lecture. ▪ Then the teacher divided into two broad groups of all students and every group sharing they are written collaboratively. ▪ One member of each group will present their key points of finding from their group work. ▪ The teacher will review and reflect on the group presentation. | <ul style="list-style-type: none"> ▪ For identifying the understanding level and directing further work instruction to learners. ▪ Reciprocal understanding and problem-solving activities through collaborative and cooperative group work within the learners. | Oral speech, Poster, Marker, Scotch tape | Group activity through poster-presentation to the understanding level measurement of learners to use peer and teacher feedback. |
| | Activity | <ul style="list-style-type: none"> ▪ As per the successive discussion, the Teacher will discuss the challenges of implementing RTI according to the textbook. ▪ After that Teacher will give to group task to identify the overcoming way of challenges; ▪ The basis of group discussion, each group will make a poster on challenges and overcoming the way of RTI act. ▪ One/two members of each group will present the poster at the desk. | Giving feedback and through the reciprocal teaching for development students' performance. Organize analyzing and the experimental capacity of learners through cooperative group tasks. | | |
| | Evaluation | Teacher will ask the question randomly. | Using questioning scaffolding to assess the learners | Oral speech | Using the questioning for evaluating the students' knowledge and understanding level |
| Ending (5 min) | Recap and Closing | Reviewing and rethinking, and Good-bye. | Repetition in mind under scaffolding for generating a new idea | | |

4.0.4: Reflection of Lesson Plan and Teaching

In the first lesson plan, the researcher taught to teach citizens' right concepts and classification. In this term, he used the scaffolding of constructivism for generating ideas and knowledge about citizen rights to students. Here, there have used various tools under scaffolding like instructing, giving hints, and cooperative learning to achieve his goals. The instructing tool is used for imitating the contents and objectives of learning among his students. Hints giving tool is used for connecting within new and prior knowledge because the students had a little bit idea for studied slightly of the similar topics at the junior secondary level. Towards the beginning, he showed a You-Tube video CR's concepts so that creates learning stimulation and attraction among students and gets inspiration to learn about the topic and attend classes. The visualization is to helps learners learn complicated matters and constructs imagination of knowledge (Edelson, 2001). As a facilitator, the researcher cooperates with students and sharing ideas with a better understanding of them through showed a PPT presentation visualizing. For activities he used the VIPP method of operative learning, where students identify the category of CR through cooperative analyzing; here he frequently feedback to students so that they construct proper knowledge in attainably.

The second and third lesson plan has been made on the topic of the citizen's RTI concepts, RTI act 2009 of Bangladesh, the impacts of this act and challenges and solving facts to implementation of this act. The researcher role is to teach students these topics. For that, he used instructional scaffolding, collaborative and cooperative group work methods. To encourage the students and also attention to learning he showed a video from YouTube so that visualizing can inner mind stimulation to the learning of learners. To given tasks through the collaborative and cooperative learning process, he divided students into various groups, and distributes various sections of the RTI act among the group. In collaborative and cooperative learning, the students support one other to achieve common goals collaboratively and share ideas to complete the task cooperatively (Palmer, Peters & Streetman, 2018). Moreover, he guides students to their task completing properly, each student participates spontaneously, which is highly needed to participatory class. After completing group-tasks to check higher-order thinking (HOTS) student presents group tasks through a poster presentation. He proceeded to reflect in feedback and discussed cooperatively to rectify the mistakes after every presentation. At the ending, the researcher reviews the key point of the whole session to recall and retention. In the third lesson plan, he has used questioning and poster presentation tools to assess students' understanding level and take notes to better future learning.

4.1 Theoretical Discussion on Assessment Task of Lesson Plan

In the educational context, the concept of assessment is used as evaluation, measurement, testing, and examination (Malakolunthu & Hoon, 2010). Assessment Reform Group (1999) points out that, assessment is the process of determining the value of what extent students learned, how, and what have to learn; which is used by students and their tutors. Stiggins and Chappuis (2005) support and reveal that assessment is the method of learners' learning evidence for determining educational achievement. In that term, teachers commonly use two types of assessment; summative and formative. Here, formative assessment is engaged in collecting information on learners' improvement during instruction, whereas summative is used to measure students' level of knowledge at the end of the academic phase (Dixon & Worrell, 2014). Black and William (2010) argued that formative assessment is related to students and teacher in the classroom; focuses on students' learning goal and further improvement of performance. Dixon and Worrell, (2014) support this argument and clarify that the purpose of formative assessment is to improve teaching and learning in non-grade determinate ways during the session.

Formative assessment has a variety of tools for assessing in a daily session. In my lesson plan has used socratic, gaddit, quiz, questioning, poster-presentation, and peer-feedback as formative assessment tools to constructively assess each student's task in the class; through which their level of learning (higher-order and lower-order thinking) and understanding can be measured. It can be seen that using these tools has helped them to be more participatory in class. Moreover, gaddit is one to one assessment for using to get immediate response and test of understanding level, secretive has been used to brainstorming and build rapport with students, quiz and questioning is using for frequented response and test of the understanding level of students (Bharti, 2015); also through the poster-presentation have been peer feedback and assessing students and teachers understanding and knowledge (chan, 2009). Moreover, the researcher has designed the assessment task of lesson plans incorporated convergent and divergent task and Bloom's taxonomy (Anderson, et al, 2001) of higher-order thinking skills (HOTS) and lower-order thinking skills (LOTS); which showed through a table below.

| Bloom's Taxonomy | Assessment task | Convergent or Divergent | Assessment tools |
|---------------------------------|---------------------------------------|--|----------------------------|
| Create Evaluate Analyze | Why it is this kind of citizen right? | Divergent (because the idea has been reflected) | Poster-Presentation |
| HOTS | | | |
| Apply Understand Remember | Which rights is what citizen right? | Convergent (because facts arising in the brain) | Quiz question by VIPP card |
| | | | LOTS |

However, personal influence, partial biases and misunderstanding should be avoided in the formative assessment (Alam & Aktar, 2019). The researcher has paid heed to that in his assessment task in the classroom.

4.2 Anticipated Challenges and Probable Solutions

Conducting learning sessions based on knowledge and lesson planning is a challenge for any teacher; if it is based on a new approach then it becomes a bigger challenge (Fatimah, 2013). In this context, it is very challenging to introduce participatory classes by creating lesson plans under the new

constructivist approach. For this, the researcher has to confront some challenges as an instructor in using a new approach-based lesson plan. Firstly, it will be difficult for using the new method, where our teacher is not used to that type of class and my students are not ever facing this type of class and assessment strategies. Tapan (2010) reported that most classrooms are used chalk-duster-based lecture pedagogy still yet. Many colleagues of the researcher will think that a huge time is ruined by taking the lesson plan-based class, which is an obstacle to completing the syllabus; also, it is difficult to complete a lesson plan in such short time class duration. Secondly, the scaffolding, collaborative and cooperative group work used in a large class is very difficult, because the teacher has to bear maximum time to manage students and the problem of making groups among a large number of students. Thirdly, there has a lack of motivation and support from higher authorities and a lack of training of teachers for taking the lesson plan-based class; which is why behalf of the researcher will be tough to continue this type of class regularly. Fourthly, getting students accustomed to such new classes will be a big challenge; because they may not feel comfortable with the new. Also, the apprehension of irregular attendance of students in the new method is a big challenge; since this method is used to ensure participatory learning, its success also depends on student presence in the class.

It is explicitly seen that to establish students-centered instead of teacher-centered learning for should be coordination between teacher and student because it is a new process for them. Moreover, the authority of the institution should be cordial and flexible to change the conventional method of teaching, so that when the new method class starts, it continues. The lesson plan is essential to ensuring effective class and quality education (UNESCO, 2006). For that, proper training for teachers, a re-designed curriculum, and extended class time duration should be ensured, as well as the emphasis on teachers' motivation for using lesson plan-based, student-centered classes. Babu (2016) suggested that the increase in teacher facilities can help to ensure students' active participation. So teachers' facilities should be increased, and the principal should properly monitoring students' learning time so that the students and teachers can get motivation in the learning process.

5.0 Conclusion

Learning is essential for managing human innate life; where the new method helps people adapt to innovation (Merriam & Bierema, 2013). Indeed, the learning approaches are an integral segment to practice in the teaching-learning arena; where the constructivist learning approaches can the transformation of existing knowledge into higher-order thinking in a participatory way (Mascolo, 2009). The constructivist approach focuses on student-centered learning rather than teacher-centered learning. The student-centered method develops effective learning for students through the use of various active participatory methods (e.g. scaffolding, collaborative and cooperative group learning, problem-based learning, etc.) in and beyond the classroom. In fact, the researcher's intention was to develop participatory classrooms using scaffolding, collaborative and cooperative group work under the constructivist approach as well as to help ensure effective quality education for higher secondary level students of his college. For that, he used this kind of approach in the citizens' rights classes of CGG. In addition, these methods are highly practical and reflective, so the students did not rely on the memorization process. Through collaborative and cooperative group work, students got support from the teacher and their peers; during the time of activities students communicated with one another in interaction. Students used VIPP cards and posters with the help of teachers on the basis of scaffolding for solving complex issues in CGG class, and by sharing the ideas of collaborative groups; they were able to prove their self-reliance and activism in learning. Indeed, both student and teacher were directed toward active participation in the plenary theoretical approach. Through using formative assessment tasks students were able to learn citizen rights and RTI Act effectively.

Using a new approach to student-centered participatory teaching has created a positive impact on teaching-learning. By using scaffolding tools, involving students in collaborative and cooperative tasks, and taking the formative assessment during class researcher has observed a positive change in students and him. Based on the strategies of the constructivist learning theory, he has taught three lessons on citizens' rights in CGG class; where after the lesson he found that it is possible to teach citizens' rights and RTI Act by using the constructivist theory. The techniques and tools used in his class were able to attract students to the class and as a result, they were able to teach themselves as active students. However, the researcher has faced many challenges in managing the whole process, which had been anticipated for him; such as a lack of proper inspiration and cooperation from peers, short class duration, etc. But his effort can also be a guide for many who want to build a philosophy of effective teaching through participatory means. Originally, this student-centered participatory approach was entirely new to teaching citizen rights; which was effective in activating students in education. So, it can be said that such a teaching process reveals the direction of the quality of active learning.

References

-
- Alam, M. J. and Aktar, T. (2019). Assessment Challenges & Impact of Formative Portfolio Assessment (FPA) on EFL Learners' Writing Performance: A Case Study on the Preparatory English Language Course. *English Language Teaching; 12 (7)*, 161-172. <https://doi.org/10.5539/elt.v12n7p161>
- Albarrak, A., Mohammed, R., Abal Hassan, M., Nasser K. & Almutairi, N., Academic satisfaction among traditional and problem based learning medical students: A comparative study. *Saudi Med J (2013), Vol. 34 (11)*: 1179-1188. www.smj.org.sa
- Anderson, L., Krathwohl, D., & Bloom, B. (ed.). (2001). *A taxonomy for learning, teaching, and assessing : a revision of Bloom's taxonomy of educational objectives*. Longman, Inc.
- Angela, T. (2011). A constructivist approach to new media: An opportunity to improve social studies didactics. *Procedia Social and Behavioral Sciences 11 (2011)* 185–189.
- <https://doi.org/10.1016/j.sbspro.2011.01.058>

- Assessment Reform Group. (1999). *Assessment for learning: Beyond the black box*. [Brochure]. Retrieved from https://www.nuffieldfoundation.org/sites/default/files/files/beyond_blackbox.pdf
- Aukerman, M. S. (2007). When reading it wrong is getting it right: Shared evaluation pedagogy among struggling fifth grade readers. *Research in the Teaching of English*, 42, (56–103).
- Babu, R. (2016). Teaching Science in Bangladesh: Expectation versus Reality. *Journal of Education and Learning*, 10 (3), 244-254. <https://pdfs.semanticscholar.org/bcc1/dfea22faf19cdc70baef10900ed153edb772.pdf>
- Baines, E., Blatchford, P. & Chowne, A. (2007). Improving the effectiveness of collaborative group work in primary schools: effects on science attainment. *British Educational Research Journal*, 33 (5):663–680. DOI: 10.1080/01411920701582231
- Barroso, K. & Pon, S. (2004). *Effective Lesson Planning*. American Institute for Research (AIR): Sacramento, CA. Retrieved from https://lincs.ed.gov/sites/default/files/8_TEAL_Lesson_Planning.pdf
- Beebe, S. A., & Masterson, J. T. (2003). *Communicating in small groups*. Pearson Education Inc. Boston: Massachusetts.
- Begum, M. & Farooqui, S. (2008). School Based Assessment: Will it Really Change the Education Scenario in Bangladesh?. *International Education Studies*, Vol. 1, No. 2
- Bharti, P. (2015, January 18), [13 Tools Teachers Would Love For Formative Assessments](https://edtechreview.in/trends-insights/insights/1766-tools-teachers-woul) [Blog post]. Retrieved from <https://edtechreview.in/trends-insights/insights/1766-tools-teachers-woul>
- Black, P., & Wiliam, D. (2010). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan*, 92(1), 81–90. doi:10.1177/003172171009200119.
- Blatchford, P., Kutnick, P., Baines, E. & Galton, M. (2003). Toward a social pedagogy of classroom group work. *International Journal of Educational Research*, 39, (153–172). DOI: 10.1016/S0883-0355(03)000788
- Blumenfeld, P. C. (1992). Classroom learning and motivation: Clarifying and expanding goal theory. *Journal of Education Psychology*, 84(3), 272-281. <https://doi.org/10.1037/0022-0663.84.3.272>
- Bottomley, S. & Denny, P. (2011). A Participatory Learning Approach to Biochemistry Using Student Authored and Evaluated Multiple-choice Questions. *Biochemistry and Molecular Biology Education*. Vol. 39, No. 5, pp. 352–361. DOI 10.1002/bmb.20526
- Burcu, O. (2019). Refocusing group work on collaborative learning and diversifying assessments in political science departments. *European Political Science (2020) 19*:140–157. <https://doi.org/10.1057/s41304-019-00212-6>
- Butler, D. L. (1998). In search of the architect of learning: A commentary on scaffolding as a metaphor for instructional interactions. *Journal of Learning Disabilities*, 31, 374–385. doi: 10.1177/002221949803100407.
- Chan C. (2009). Assessment: Poster. Assessment Resources@HKU, University of Hong Kong. Retrieved from <http://ar.cetl.hku.hk>
- Chi, M. T. H., & Wylie, R. (2014). The ICAP Framework: Linking cognitive engagement to active learning outcomes. *Educational Psychologist*, 49, (219–243). <http://dx.doi.org/10.1080/00461520.2014.965823>
- Castagno-Dysart, D., Matera, M. & Traver, J. (2019). The importance of instructional scaffolding. *Teacher Magazine*. Retrieved from <https://www.teachermagazine.com.au/articles/the-importance-of-instructional-scaffolding>
- Dillenbourg, P. (1999). What do you mean by ‘collaborative learning’? In P. Dillenbourg (Ed.), *Collaborative learning* (pp. 1–19). Oxford, England: Elsevier. hal 00190240
- Dixson, D. D. & Worrell, F. C. (2016). Formative and Summative Assessment in the Classroom. *Theory Into Practice*, 55:2, 153-159. DOI: 10.1080/00405841.2016.1148989
- Donahue, M. L., & Lopez-Reyna, N. A. (1998). Conversational maxims and scaffolded learning in children with learning disabilities: Is the flying buttress a better metaphor? *Journal of Learning Disabilities*, 31, (398–403). DOI: [10.1177/002221949803100409](https://doi.org/10.1177/002221949803100409)
- Dyson, B., & Grineski, S. (2001). Using cooperative learning structures in physical education. *Journal of Physical Education, Recreation & Dance*, 72(2), 28-31. <https://doi.org/10.1080/07303084.2001.10605831>
- Chowdhury, R. and Sarkar, M. (2018). Education in Bangladesh: Changing Contexts and Emerging Realities. In R. Chowdhury et al. (eds.), *Engaging in Educational Research* (pp. 1-18). Singapore: Springer Nature Singapore Pte Ltd. DOI: 10.1007/978-981-13-0708-9_1.

- Clare, J. (2015, March, 3). The Difference in Cooperative Learning & Collaborative Learning [Blog post]. Retrieved from <https://www.teacherswithapps.com/the-differences-in-cooperative-learning-collaborative-learning/>
- Copley, J. (1992). The Integration of Teacher Education and Technology: a Constructivist Model. In Carey, D. et al (Eds.), *Technology and Teacher Education*. Charlottesville, VA: AACE.
- Coupal, L. V. (2004). Constructivist learning theory and human capital theory: shifting political and educational frameworks for teachers' ICT professional development. *British Journal of Educational Technology*, Vol 35 No 5 2004 (pp.587–596). <https://doi.org/10.1111/j.0007-1013.2004.00415.x>
- Cox, J. (2020, February 11). Here's What You Need to Know About Lesson Plans [Blog post]. Retrieved from <https://www.thoughtco.com/what-is-a-lesson-plan-2081359>
- Dewey, J. (Ed). (2014). *Democracy and Education: An Introduction to the Philosophy of Education*. Read Book Ltd.
- Ertmer, P.A. & Newby, T.J. (2013). Behaviorism, Cognitivism, Constructivism: Comparing Critical Features from an Instructional Design Perspective. *Performance Improvement Quarterly*, 26(2): 43–71. DOI: 10.1002/piq.21143
- Ebrahim, T. (2017, December 7). Participatory teaching-learning in Bangladesh. *The Daily Sun*. Retrieved from <https://www.daily-sun.com/home/printnews/273544>
- Edelson, D. C. (2001). Learning-for-use: A framework for the design of technology-supported inquiry activities. *Journal of Research in Science Teaching*, 38, 355–385.
- Fisher, D., & Frey, N. (2007). *The formative assessment action plan*. Alexandria, VA: Association of Supervision and Curriculum Development.
- Fatimah, N. (2013). Challenges in Implementing Lesson Study at Higher Education. *SELT, 2013 Proceeding, Vol-1*. ISBN: 978-602-17017-1-3. Retrieved from <http://103.216.87.80/index.php/selt/article/view/6788/5327>
- Gagné, E. D., & Memory, D. (1978). Instructional events and comprehension: Generalization across passages. *Journal of Reading Behaviour*, 10(4), 321-325.
- Gokhale, A. A. (1995). Collaborative Learning Enhances Critical Thinking. *Journal of Technology Education*, 7: 22-30. <http://scholar.lib.vt.edu/ejournals/JTE/v7n1/gokhale.jte-v7n1.html>
- Harris KR and Graham S (1994) Constructivism: principles, paradigms, and integration. *Journal of Special Education* 56: 233-247. DOI: [10.1177/002246699402800301](https://doi.org/10.1177/002246699402800301)
- Hecht, K. M. & Maass, S. (2008). Teaching Participatory Design. In J. Simonsen, T. R. David Hakken (Eds), *Participatory Design Conference 2008* (pp. 166–169). Indiana, USA: Bloomington. <https://www.routledgehandbooks.com/doi/10.4324/9780203108543.ch3>
- Hmelo-Silver, C. E., Duncan, R. G., & Chinn, C. A. (2007). Scaffolding and achievement in problem-based and inquiry learning: A response to Kirschner, Sweller, and Clark (2006). *Educational Psychologist*, 42, 99–107. <https://doi.org/10.1080/00461520701263368>
- Holbrook, J. (2005). *Report on organizing the ROSE survey in Bangladesh*. Dhaka, Bangladesh: Secondary Education Sector Improvement Project (SESIP).
- Hossain, M. Z. (2015). National Curriculum 2012: Moving Towards the 21st Century. *Bangladesh Education Journal*. Vol. 14 (1). ISSN.1811-0762
- Hung, D. W. L. (1999). Activity, apprenticeship, and epistemological appropriation: Implications from the writings of Michael Polanyi. *Educational Psychologist*, 34, 193–205. https://doi.org/10.1207/s15326985ep3404_1
- Hunter, M. (1982). *Mastery teaching*. El Segundo, CA: TIP Publications.
- Huxham, M. (2005). Learning in lectures: Do 'interactive windows' help?. *Active Learning in Higher Education* 6,(1):17-31. DOI : 10.1177/1469787405049943
- Illeris, K. (2004). *The three dimensions of learning*. Malabar, Fla: Krieger Pub. Co. ISBN 9781575242583.
- Iiskala, T., Vauras, M., Lehtinen, E., & Salonen, P. (2011). Socially shared metacognition of dyads of pupils in collaborative mathematical problem-solving processes. *Learning and Instruction*, 21, 379–393. <http://dx.doi.org/10.1016/j.learninstruc.2010.05.002>
- Islam, M. R. (2019). A critical reflection of constructivist teaching in CLT at higher secondary education in Bangladesh. *i-manager's Journal on English Language Teaching*, Vol. 9 (4).
- Jarvis, P., Holford, J., & Griffin, C. (2003). *The Theory & Practice of Learning*. (2nd ed). Great Britain: Kogan Page.
- Johnson, D., Johnson, R. and Smith. K. (2007). The state of cooperative learning in post secondary and professional settings. *Educational Psychology Review* 19: 15–29. DOI 10.1007/s10648-006-9038-8

- Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist*, *41*(2), 75–86. http://doi.org/10.1207/s15326985ep4102_1.
- Kuhn, D. (2007). Is direct instruction an answer to the right question? *Educational Psychologist*, *42*(2), 109–113. <http://doi.org/10.1080/00461520701263376>.
- Malakolunthu, S. & Hoon, S. K. (2010). Teacher perspectives of school-based assessment in a secondary school in Kuala Lumpur. *Procedia Social and Behavioral Sciences*, *9* (2010) 1170–1176. doi:10.1016/j.sbspro.2010.12.302
- Merriam, S. B., & Bierema, L. L. (2013). *Adult learning: Linking theory and practice*. San Francisco, CA: John Wiley & Sons, Inc. ProQuest Ebook Central <https://ebookcentral.proquest.com>
- Moreland, R. L. (2010). Are dyads really groups?. *Small Group Research*, *41*, 251–267. <http://dx.doi.org/10.1177/1046496409358618>
- O'Donnell, A. & King, A. (Ed.). (1999). *Cognitive Perspectives on Peer Learning*. New York: Routledge. <https://doi.org/10.4324/9781410603715>
- Oxford, R. L. (1997). Cooperative Learning, Collaborative Learning, and Interaction: Three Communicative Strands in the Language Classroom. *The Modern Language Journal*, *81*, iv, (443-456). <https://doi.org/10.1111/j.1540-4781.1997.tb05510.x>
- Palmer, G., Peters, R. and Streetman, R. (2018). Cooperative Learning. In P. Lombardi. (Ed.), *Instructional Methods, Strategies and Technologies to Meet the Needs of All Learners* (pp. 121-146). Attribution-NonCommercial-ShareAlike CC BY-NC-SA 4.0.
- Retrieved from <https://granite.pressbooks.pub/teachingdiverselearners/>
- Park, J. T. (2012). *Teacher Change in Bangladesh: A Study of Teachers Adapting and Implementing Active Learning into their Practice* (Doctoral thesis, University of Toronto, Ontario, Canada). Retrieved from <http://hdl.handle.net/1807/34833>.
- Piaget, J. (1972). *The psychology of the child*. New York: Basic Books.
- Rahman, M. M. (2017, February, 25). Secondary education: A long way to go. *The Daily Star*. Retrieved from <https://www.thedailystar.net/education-employment/secondary-education>.
- Rahman, T., Nakata, S., Nagashima, Y., Rahman, M., Sharma, U., & Rahman, M. A. (2019). *Bangladesh Tertiary Education Sector Review*. In The World Bank. <https://doi.org/10.1596/31526>
- Raymond, E. (2000). Cognitive Characteristics. *Learners with Mild Disabilities* (pp. 169-201). Needham Heights, MA: Allyn & Bacon, A Pearson Education Company.
- Roschelle, J., & Teasley, S. D. (1995). The construction of shared knowledge in collaborative problem solving. In C. E. O'Malley (Ed.), *Computer-Supported Collaborative Learning* (pp.69-197). Berlin: Springer-Verlag. doi:10.1007/978-3-642-85098-1_5
- Sarkar, M. (2012). School science textbooks: A challenge for promoting scientific literacy in Bangladesh. In P. Chan (Ed.), *Asia pacific education: Diversity challenges and changes* (pp. 154–168). Melbourne, Australia: Monash University Publishing.
- Sarkar, M. and Corrigan, D. (2014). Bangladeshi Science Teachers' Perspectives of Scientific Literacy and Teaching Practices. *International Journal of Science and Mathematics Education*. 12: 1117Y1141
- Scardamalia, M., & Bereiter, C. (2006). Knowledge building: Theory, pedagogy, and technology. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (pp. 97–115). Cambridge, England: Cambridge University Press.
- <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.582.4312&rep=rep1&type=pdf>
- Schunk, D. H. (2012). *Learning theories: An educational perspective*. Boston, MA: Pearson Education.
- Sejzi, A. A. & Aris, B. (2012). Constructivist approach in virtual university, *Procedia Social and Behavioral Sciences* *56*: 426–431. www.sciencedirect.com
- Shapira-Lishchinsky, O. (2015). Simulation-based constructivist approach for education leaders. *Educational Management Administration & Leadership*. Vol. 43(6) 972–988. DOI: 10.1177/1741143214543203.
- Slavin, R., Hurley, E. A. & Chamberlain, A. (2003). Cooperative learning and achievement: theory and research. In W. M. Reynolds & G. M. Miller (Eds), *Handbook of psychology: educational psychology* (New York, Wiley), vol. 7, (pp. 177–198). <https://doi.org/10.1002/0471264385.wei0709>
- Stiggins, R., & Chappuis, J. (2005). Using student-involved classroom assessment to close achievement gap. *Theory and Practice*, *44*(1), 11-18. DOI: 10.1207/s15430421tip4401_3
- Stone, C. A. (1998). The metaphor of scaffolding: Its utility for the field of learning disabilities. *Journal of Learning Disabilities*, *31*(4), 344–364. <http://doi.org/10.1177/002221949803100404>.

- Tapan, M. S. M. (2010). Science education in Bangladesh. In Y.-J. Lee (Ed.), *World of science education: Science education research in Asia* (pp. 17–34). Rotterdam, Netherlands: Sense.
- UNESCO (2015). *Practical Tips for Teaching Large Classes*. UNESCO Asia and Pacific Regional Bureau of Education. Bangkok, Thailand. <https://www.eenet.org.uk/resources/docs/ilfe/generic/Sp2.pdf>
- Van de Pol, J., Volman, M., & Beishuizen, J. (2010). Scaffolding in teacher–student interaction: A decade of research. *Educational Psychology Review*, 22(3), 271–296. <http://doi.org/10.1007/s10648-010-9127-6>.
- Van Geert, P. and Steenbeek, H. (2005). The dynamics of scaffolding. *New Ideas in Psychology*, Vol 23, Issue3 (115-128). <https://doi.org/10.1016/j.newideapsych.2006.05.003>
- Vygotsky, L.S. (1978). *Mind in society— The development of higher psychological processes*. Cambridge: Harvard University Press.
- Webb, N. M., & Palincsar, A. S. (1996). Group processes in the classroom. In D. C. Berliner & R. C. Calfee (Eds.), *Handbook of educational psychology* (p. 841–873). Macmillan Library Reference USA; Prentice Hall International.
- Williams, K. D. (2010). Dyads can be groups (and often are). *Small Group Research*, 41, 268–274. doi: 10.1177/1046496409358619
- Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem-solving. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 17, 89–100. <https://doi.org/10.1111/j.1469-7610.1976.tb00381.x>
- Wortham, S. (2003). Learning in Education. *Encyclopedia of Cognitive Science*, 1:(563), 1079-1082. Retrieved from http://repository.upenn.edu/gse_pubs/82
- Zhang, B., Krajcik, J. S., Sutherland, L. M., Wang, L., Wu, J. & Qian, Y. (2003). Opportunities and challenges of China’s inquiry-based education reform in middle and high schools: Perspectives of science teachers and teacher educators. *International Journal of Science and Mathematics Education*, 1(4), 477–503. doi:10.1007/s10763-005-1517-8