Teachers’ perception and implementation of constructivist learning approaches: Focus on Ethiopian Institute of textile and fashion technology, Bahir Dar.

Lantbeye Wudneh Jemberie

Abstract: The main purpose of this study was to invigorate teachers' perception and implementation of constructivist learning approaches in Ethiopian Institute of Textile and Fashion design (EITEX, hereinafter), Bahir Dar University. The study focused on mostly noted constructivist learning and teaching methods particularly question-answer, individual-work and group-work methods. Also, the study invigorated teachers’ view on constructivist learning. To this study purpose descriptive survey design was employed. The study involved 82 randomly selected teachers who had been teaching second year and above in the three programs (Textile engineering, Garment Engineering and Leaser Technology programs) offered by Ethiopian Textile and Fashion Technology Institute of Bahir Dar university in 2019 academic year first semester. Questionnaire was used as data collection method. The questionnaire consisted of 18 items of which 10 measured teachers’ implementation of constructivism and eight measured teachers’ perception of constructivist learning and its methods. Data analysis was performed using SPSS 20. Results showed that around half of the teachers have positively perceived and implemented...
the mentioned methods in line with constructivism, while remaining teachers still implemented these methods as a traditional way of teaching. Moreover, teachers seemed more constructivists in perception and applying individual work method as compared to group-work activities. Teachers who participated in pedagogical workshops had positive perception and good implementation of constructivist learning compared to teachers who did not involve in pedagogical workshops. In conclusion, the present study findings would provide invaluable insights on teachers’ views and application of constructivist learning and teaching approaches in Ethiopian higher education institutions.

Subjects: Adult Education and Lifelong Learning; Education Studies; Higher Education; Open & Distance Education and eLearning; Research Methods in Education; Theories of Learning; Teachers& Teacher Education; Theory of Education; Classroom Practice; Curriculum Studies

Keywords: perception of constructivist learning; practice of constructivist learning approach; Ethiopian Institute of textile and fashion

1. Introduction
Education grips the process of the development and learning of the child on various dimensions facilitated by teacher and directed by curriculum. Effective education is a process where the teacher, children and the schools engaged and took part actively (Behar, 2014). However, our present education system emphasized on preparing students for tests, but not on cultivating students’ deep learning. This gap puts the whole education system in the midst of a crisis of quality-starting from primary schools to universities. Here, the central view is that our students are not learning as much as they ideally ought to since surface learning and rote memorization are overemphasized learning approaches almost at all levels. This is because of the fact that the traditional teaching approach (lecture method) has been commonly implemented by teachers in Ethiopian schools (primary to University) and merely rote memorization is still common approach of students’ learning that discourages students’ self-learning and creativity. The future trends in our education system will change the present scenario through applying the constructivist approaches of learning that emphasize on self-learning, learning by doing and creativity. Literature has showed that students instructed in constructivist approach had higher scores than the students who were exposed to conventional method of teaching.

In Ethiopia, current education system provides unique and standardized learning materials to all learners without considering their learning style, ability and other background differences thereby indicating traditional approach of learning and teaching. However, the traditional teaching and learning materials and strategies are beneficial to some students more than others (Franzoni & Assar, 2009). Since improving students’ learning outcome is a prime agenda of every school and university, it could be realized by shifting the focus of teaching learning process on concept development and deep understanding. Hence, need arises to adopt a new pedagogy which encourages the learner to construct a sense of her own self, the development of her autonomy, alongside her progress within the group for interpersonal growth. Constructivist pedagogy delivers learning activities meaningful to each learner so that the learner reflects, searches, uses her capacity for taking initiatives and for being creative. In constructivist pedagogy, learners have opportunity to arise their own understanding through interaction with their environment. The need for constructivist approach arises when behaviorism fall short of producing positive effects within the complex context of the classroom and left teachers feeling shortchanged and cheated by a system that placed the guilt for students’ failure to learn in their hands.

The government of Ethiopia especially Ministry of Education (MoE, hereinafter) has made series efforts, since the introduction of the first education sector development program (ESDP-II,
hereinafter) (Ministry of Education (MoE), 2003), to reconstruct and develop the education system. Following the introduction of ESDP-II, MoE designed a new curriculum based on philosophical perspectives of constructivism, although the involvement of experts and teachers in curriculum development was very limited. Given a new curriculum, teachers began teaching using this curriculum without adequate training about the philosophical and methodological underpinnings of constructivism. Since teachers had a long experience in behaviorist approaches of teaching and learning, transforming into constructivist teaching and learning approaches found to be great challenge in Ethiopian schools, institutions, colleges and universities. However, efforts are made to familiarize teachers with active and constructivist learning and teaching approaches in Ethiopian higher institutions by designing and implementing a Higher Diploma program. Constructivist way of learning and teaching requires sufficient resources assure students’ authentic learning. Accordingly, higher institutions in Ethiopia focused on developing new textbooks and building the required laboratories that could facilitate the implementation of constructivist methods teaching and learning.

In particular, EiTEX nowadays has laboratories for practical work that provide teachers with opportunities to utilize constructivist methods as much as possible. This institution has made series efforts to train teachers in the field of didactics and pedagogy by designing higher diploma program to boost learning achievement of students. The institute has a curriculum designed based on the perspective of constructivism that encourages students’ self-directed learning and learning by doing. Although EiTEX has made a series of efforts to capacitate teachers through in-service trainings, teachers in this institute are not well trained in constructivist pedagogy because the trainings prominently emphasized on teachers’ subject matter knowledge. Despite this fact, recently this institute, in collaboration with MoE, held lots of workshops and seminars to equip teachers with constructivist pedagogical skills. Nevertheless, the researcher (teacher in this institute) has observed some problems in application of constructivist instructional approaches because it is not easy to change one’s habits and long lasted experiences in behavioral approaches of teaching and learning in a limited time. It needs more time to change teachers’ view and practice from teacher-centeredness to student-centeredness (constructivist way of learning). As teachers in this institute used to teach in a teacher-centered manner for a long time, it would be hard for them to use constructivist way of learning in a proper way. Some of them may misinterpret the constructivist and active way of learning. In addition, some of the teachers dominate the class and do not allow students to actively participate in learning process. Moreover, the mechanism of constructive learning might not be clear for many teachers.

Previous studies have showed that the teachers did not have sufficient pedagogical knowledge (Mansory & Karlsson, 2005), classroom practice was not basically different from traditional approach (teacher-centered) (Asrat, 2017), and viewed constructivist teaching approach burdens them with more workload and requires additional effort (Solomon & Endalew, 2015). These studies highlighted the prevailing gaps in teachers’ perception and implementation of constructivist approaches of learning and teaching. However, the studies did not address teachers’ perception of constructivist learning in relation to authenticity of learning task, metacognition, cooperative learning, knowledge construction, individual and group work, and question-answer methods. Also, the studies did not invigorate teachers’ implementation of question-answer, individual work and group work methods that are mostly noted as constructivist instructional strategies. Moreover, the previous studies focused on primary and secondary education levels by neglecting tertiary education. There was very little research that investigated the status of active and constructive learning in Ethiopian higher institutions including Ethiopian Institute of Textile and Fashion Technology, Bahia Dar University. Thus, the main purpose of this study was to invigorate teachers’ perception and implementation of constructivist learning approaches, particularly question-answer, individual-work and group-work methods in Ethiopian Institute of Textile and Fashion design (EiTEX), Bahir Dar University. To this study purpose, the researcher established two basic research questions.
(1) How do teachers perceive constructivist learning, question-answer, group and individual work considering constructivist way of learning?

(2) To what extent do teachers use question-answer, group and individual work vis-à-vis constructivist way of learning?

2. Literature review

2.1. Conceptualizing constructivist learning

Constructivism as one of the modern learning theories first coined by Piaget and later developed by Vygotsky. Piaget is a renowned proponent of cognitive constructivism, while Vygotsky is a renowned proponent of social constructivism (Prawat, 2008). This learning theory is based on the notion that students actively construct knowledge that calls for a “dramatic lessening of reliance on a didactic, textbook-based, transmission of knowledge approach to teaching and learning in the classroom” (Prawat, 2008, p. 182). Constructivists view learning as the result of mental construction so that “learning takes place when new information is built upon and added onto an individual's current structure of knowledge, understanding and skills” (Pritchard, 2009, p. 17). This theory argues that the children can learn best when they actively construct their own understanding.

In Piaget’s view, the development of knowledge is a constructive process that emphasized the child’s active role in the construction of knowledge. According to Piaget, “knowledge is constructed through a process of active exchange between the individual and his or her environment”. Carpendale et al. also noted that Piaget’s constructivist theory is essentially a theory of dynamic self-organization, which is rooted in biological functioning, with cognitive development representing the extension and continuation of this process of biological self-organization to a new level of functioning. This process of cognitive development results in the construction of increasingly advanced forms of thinking that Piaget described as progressing through a series of stages. For Piaget, learning is a process of adjustment to environmental influences through two basic processes (assimilation and accommodation) which form this process of adjustment (Pritchard, 2009).

In this view, external experiences can have an impact on what is already known thereby a new experience can either add to and reinforce the existing knowledge or contradict existing knowledge. According to Piaget, assimilation is the process whereby “new knowledge is incorporated into existing mental structures”, whereas accommodation is the process whereby “mental structures have to be altered in order to cope with the new experience which has contradicted the existing model” (Pritchard, 2009, p. 20).

However, Piaget’s cognitive constructivist theory has been criticized for neglecting the importance of social factors and language in development. Moreover, it is generally assumed that he took a strictly individualistic perspective on development that assumed a growing child as a “lone scientist” (Pritchard, 2009, p. 24), which distressed the role of social factors in child’s learning. In response to this, Vygotsky coined social constructivism as learning theory that assumed the importance of social factors in child’s learning and development. In Vygotsky’s social constructivist theory, emphasis is placed upon interaction between the learner and others. In this regard, the dimension of social interaction is crucial to the social constructivists that give a high priority to language in the process of intellectual development and learning (Pritchard, 2009). Pritchard noted that social constructivism acknowledges dialogue as a vehicle by which ideas are considered, shared and developed, thereby any social interaction with anybody at all may well lead to learning. Here, the teacher has the role of stimulating dialogue and maintaining its momentum through engaging groups and individuals in dialogue and supporting the development of their understanding in a planned manner. According to Vygotsky, this role of a teacher is called scaffolding (ibid). To clearly understand scaffolding as the teacher’s role, Vygotsky established the notion of a zone of proximal development (ZPD, hereinafter). ZPD is a theoretical space of understanding which is just above the level of understanding of a given individual and it is the area of understanding into
which a learner will move next. In ZPD, a learner is able to work effectively with support of knowledgeable others and the process of learning involves moving into and across the zone and looking forward to the next level of understanding (ibid). This process of learning takes place with scaffolding.

The scaffolding can be presented in many ways: through discussion – a good socially constructive approach; through the provision of materials – perhaps supplying practical apparatus to help in the solution of simple problems in arithmetic; or by designing tasks which match and give help appropriate to the individual – a list of words given to help in the process of completing an exercise designed to assist understanding, or a list of reminders concerning the process of undertaking the task in question; a writing frame to support a particular style of written piece … (Pritchard, 2009, p. 25)

In the same vein, Loyens et al. (2009) explained constructivist learning by four characteristics: knowledge construction, cooperative learning, meta-cognition and authentic learning task. Firstly, authentic learning task—students solve the problems which are relevant to their real-life situation. Secondly, cooperative learning—collaboration and interaction with others influence learner construct new knowledge. In relation to this, Vygotsky argued that knowledge is constructed through interaction with others in society. In Vygotsky’s view, ZPD is the important factor in human being that cause in an individual to construct new knowledge with some help of others. When knowledge is in the ZPD of an individual it is just above the understanding level of that individual and an individual needs support (scaffolding according to Vygotsky) to construct his or her knowledge and develop understanding. Teacher or other fellow of student performs the role of helper in this case (ibid). So, teacher’s central task is to structure learning environment and maximize the learning outcomes of students which is in the ZPD of students. Thirdly, meta-cognition—the students acquire new knowledge through self-regulating processes which includes goal setting, self-regulation and self-assessment, where they become responsible for their own learning. Finally, knowledge construction—learner himself constructs knowledge by discovering, where pre-knowledge plays an important role.

On the other hand, Schunk (2012) argued, based on Piaget’s cognitive constructivism, that knowledge is constructed inside an individual and it is not an external phenomenon to be achieved. Boghossian (2006) also contended that the human mind does not copy the reality from outside instead it constructs the reality, thereby what is knowledge for one may not be knowledge for other. Another author also claimed that, in Piaget’s view, the knowledge is presented in the form of schema (thinking) in mind and schema is constructed in mind based on pre-knowledge of an individual (Yilmaz, 2011). In Piaget’s perspective, a child passes through certain stages and cognitive development occurs by equilibration (balancing knowledge for child) of assimilation (new knowledge comes to schema, but with conflict) and accommodation (new knowledge is associated and accepted to schema) (Powell & Kalina, 2009; Schunk, 2012). Literature has showed that there are two perspectives to constructivism: cognitive or individual constructivism and social constructivism (Olsen, 2000; Powell & Kalina, 2009). In this view, constructivists believed that knowledge is constructed either by individually working or in group working, Piaget’s cognitive constructivism is commonly noted as individual constructivism that mainly focuses on how an individual constructs knowledge by him/herself through working individually and cognitively. From this view, individual work is assumed as a constructivist learning method. On the other hand, Vygotsky’s theory of social constructivism acknowledges individual’s social interaction with the society, where culture and language are the key elements of interaction, as a key tool for learning. In this view, group work is assumed as a constructivist learning method in the school environment. Both of the methods (individual and group work) are achieved and enhanced by another method of question-answer (ibid). In constructivist learning environment, students actively participate in learning process, connect their real-life experiences with knowledge and through problem posing change their conceptual understanding (Uredi, 2013). Moreover, cooperative learning, discovery learning and inquiry teaching are among the methods
used in constructivist learning environment (Schunk, 2012). These constructivist learning methods are the major instructional methods that teachers in Ethiopian schools and higher institutions, including EiTEX, have used since 2003 to teach the curriculum designed based on constructivist perspective.

2.2. Question-answer method

Inquiry teaching is based on Socratic teaching methods, where a teacher guides the process by asking general principles and applies them to a new situation (ibid; Baviskar et al., 2009; Powell & Kalina, 2009). The process of asking gradually goes from known to “misleading question” and “question a prediction made without enough information” (Schunk, 2012, p. 286). This approach is useful for testing hypothesis, making prediction and differentiating necessary from sufficient conditions. In addition to one-to-one interaction, question-answer method is helpful for small group interaction with teacher. Teacher in this case should have sufficient knowledge how to answer questions in a way that conforms to students’ level of thinking. Similarly, student should have basic knowledge of what to discuss in this process. Change (2009) contended that challenging question-answer instructional method is powerful tool for teaching that reveals and leads to new knowledge.

Questioning is important for learning and teaching, but it mainly depends on teacher how he/she formulates the questions. Question-answer method has beneficial effect on students’ learning if a teacher uses it by considering the following conditions. First, a teacher should provide a hint for student what to learn. Secondly, it should affect students who learnt and how much they learnt. Finally, a teacher should consider wait time according to different situations (Mauigoa-Tekene, 2006). According to (Black et al 2003), wait time in question-answer method gives each student the opportunity to actively participate in learning process and answer for the posed question. Conversely, in traditional teaching, teachers use question-answer method to evaluate students’ level of learning achievement but not to foster their deep learning (Kawalkar & Vijapurkar, 2011).

2.3. Group work method

Group work method rooted in cooperative learning approach is a constructivist way of learning that emanates from Vygotsky’s social constructivist learning theory (Powell & Kalina, 2009). According to Vygotsky, social interaction and collaboration are the main factors for construction of knowledge (ibid). Schunk (2012) also explained that the group work is mostly used constructivist method that aims at developing student ability to work collaboratively. Schunk further noted some points of consideration while using cooperative learning. For example, cooperative learning method is applicable for tasks that will be time-consuming for one person. Task should have parts and everyone in the group has to complete a task and finally merge their results. In this context, group members should strive to work well to develop and practice cooperative skills. The teachers need to check whether or not each group has reasonable result of success in their work. Also, a learning group needs the guidance to understand what to achieve and how to behave while working together. Finally, each member of the group should be accountable in group working (ibid). On the other hand, Schreiber and Valle (2013) pinpointed that in constructivist group-work method a teacher carefully assigns five to seven members without switching groups. They also suggested that the group members should be as diverse as possible, grades of the members should depend on the activities they perform in the group, members should be tested individually as well as in group, and all group members should be assigned in a single project to perform in group collectively. According to Schunk (2012), there are two methods mostly used in cooperative learning as a group-work: jigsaw and student-teams-achievement-divisions (STAD, hereinafter). Jigsaw method is important when the topic has many subparts. Firstly, each group takes one part and then the group members exchange with other group members and describe their own parts in new group. Here everyone has a responsibility of explaining own part and understanding others’ parts. STAD is better when a topic has clear answers and results. However, members of the group work together while they are tested individually and then, teacher will add each individual member’s score to the whole group.
This will motivate every individual member to achieve high score for his/her group by responding correctly and winning the competition (ibid).

Furthermore, working collaboratively, in pairs or small groups, is Vygotsky's social constructive approach to learning strongly contended that knowledge is constructed through the interaction with others, i.e. teacher–student or student–student (Powell & Kalina, 2009; Pritchard, 2009; Tenenbaum et al., 2001). The converse of this learning approach is working in a silent classroom, where contact with others is discouraged. There are times when quiet individual working is useful and important, and teachers are able to describe times when a child should be encouraged to work quietly and alone. However, as a mainstay approach to teaching and learning, this would totally ignore all that we know about socially constructed learning (Pritchard, 2009). Vygotsky proposed ZPD as a learning zone a student can reach by knowledgeable others scaffolding. As stated above, scaffolding is the process of learning support by knowledgeable others (teacher, student or others) to help children construct their new knowledge. In this process, student is given a task to which he/she has some familiarity to perform with a support system from teacher. This support system helps a student to complete the task. Moreover, the students' cooperative learning is a suitable way of learning in social constructivism. Cooperative learning helps to construct new knowledge and develop clear understanding through social interaction. In conclusion, social constructivism is the base for group-working method.

2.4. Individual work method
Discovery learning takes place individually with aim of constructing knowledge for oneself. This learning approach emanates from Piaget's cognitive constructivism. This approach is also called as problem-solving, experimental and constructivist learning (Schunk, 2012). In discovery learning, students work out examples and solve problems to achieve their overall learning goal. So, discovery learning is a type of inductive reasoning and involves students in higher-level thinking, thereby learners not only acquire factual information but also develop their analytical skill (ibid; Yilmaz, 2011). Discovery learning is not letting students do what they want to do. Instead, teacher arranges the activities and students investigate and explore the situation through problem-solving. In addition, Mayer (2004) elaborated that guided discovery learning has positive and effective learning result than pure discovery learning. He studied students' learning results for discovery of programming language and discovery of conservation strategies, and found that guided discovery had better result compared to pure discovery. As individual work method is rooted in cognitive constructivist learning approach, Piaget proposed that four different stages of child's cognitive development where s/he will be ready for different levels of understanding and constructing knowledge (Powell & Kalina, 2009; Schunk, 2012). The first stage is sensorimotor stage that ranges from zero to 2 years. At this stage, a child can only sense physical tools and environment he or she is able to see. Second one is the preoperational stage that ranges from 2 to 7 years. At this stage, a child can develop his/her language skills, but still cannot grasp others' ideas and thoughts. The third stage is the concrete operational stage that ranges from seven to 11 years. At this stage, a child develops thinking skill and provides logical reasoning for their activities. The final stage is formal operational stage that ranges from the age of 11 to adulthood. At this stage, children develop high level and abstract thinking and they use these abstract thinking in problem-solving. In this perspective, a child or student passes through different cognitive development stages and become ready to construct their knowledge. Hence, teachers need to understand these stages of cognitive development and establish appropriate learning environment to help students construct adequate knowledge and skill (ibid). In conclusion, Piaget's individual or cognitive constructivism is the base for individual-work method.

3. Method

3.1. Research design
This study was based on quantitative research strategy that prominently employed questionnaire as data collection instrument and the data were analyzed numerically. As Bryman (2010) points
out, quantitative research is used when theory and concept are tested in a research. In addition, Cohen et al. (2010) contend that the quantitative approach to research deals with numbers and uses the tools like questionnaire and structured observation to collect data. Thus, the current study employed descriptive survey design.

3.2. Participants
This study was conducted in the Ethiopian Institute of Textile and Fashion design (EITEX), Bahir Dar University, Ethiopia in three programs teachers (Textile production, Leaser Technology and Fashion design) selected based on random sampling technique in each programs. As a rule of ethic in research, the researcher had informed the program heads of the institute and teachers by showing them a letter issued by the Institute scientific director. Similarly, the researcher informed them about the purpose of study by explaining them that it is research paper, but not for their evaluation. Teachers participated in pedagogical workshops, such as higher diploma program, for different durations were involved in the study. These workshops are designed for 1 year. Some teachers also attend short pedagogical training prepared by the Institute. Originally, 85 randomly selected teachers who had been teaching second year and above in the three programs (Textile engineering, Garment Engineering and Leaser Technology programs) offered by Ethiopian Textile and Fashion Technology Institute of Bahir Dar university in 2019 academic year first semester. Of these respondents, 82 teachers returned the filled-in questionnaire that resulted in 96.47% response rate. Finally, the data from 82 sample teachers were analyzed.

3.3. Questionnaire
Questionnaire was developed considering two theoretical areas (characteristics of constructivism and criteria of constructivist methods). To measure teachers’ perception of constructivist learning, the characteristics of constructivist learning through individual and group methods were adapted from Loyens et al. (2009). Accordingly, this study mainly focused on teachers’ perception of authentic learning task, cooperative learning, metacognition and knowledge construction. Likewise, criteria of constructivist methods were adapted from Baviskar et al. (2009). This consisted of eliciting prior knowledge, creating cognitive dissonance, application of knowledge with feedback and reflection on learning. The questionnaire consisted of 18 items of which 10 measured teachers’ implementation of constructivist methods and eight measured teachers’ perception of constructivist learning and its methods. Questionnaires were distributed to teachers, which are in the three programs. The data by questionnaires has been collected from 82 teachers. The researcher gave questionnaires to teachers personally in hand. Some teachers took the questionnaire with them and completed them on their own in their home which according to Cohen et al. (2010), is good for respondents to avoid potential pressure and answer the questions confidently without any influence of researcher. Questionnaire is useful to obtain the factual information from people about an issue and better to be of different types (Cohen et al., 2010). So, different types of questions were used in questionnaire in order to find out views of teachers about question-answer, individual and group working methods considering constructivism. The researcher has used dichotomous types of questions with yes and no answers. Additionally, multiple-choice questions where respondent could select one or more than one answer are used. Moreover, 5-point Likert scales were used in questions to find out teachers’ level of agreement with the given statements. In order to find out the actual practice of question-answer, individual and group working methods based on constructivism.

3.4. Data analysis
After data collection the researcher inserted raw data into a program called SPSS version 20, which was used to analyze and perform mathematical operation on data. Answers of all the questions were labeled by a code (number), which were easy to be analyzed. Tables were made based on the answers respondents had given in both numbers (frequency) and percentage. After preparing the tables for SPSS output, it was imported to MS-Word program.
4. FINDINGS

4.1. Demographic characteristics of the participants
Participants in this research were 82 teachers who taught Garment, Textile, Leaser Technology and other general courses for second year and above students. Data showed that majority (75.61%) of the participants were second degree holders in the fields of Textile engineering, Leaser Technology Fashion Technology and other general courses, while the remaining had first degree. The results also revealed that, from 57 sample teachers participated in pedagogical workshops, nearly half (49.12%) of them took part in pedagogical workshops for 1 year followed by those who took part for 6 months (21.05%). The remaining sample teachers’ participation in pedagogical workshops ranged from 3 weeks to 5 months. In general, majority of sample teachers (69.51%) involved in this study took part in pedagogical workshops regardless of time duration, while 30.49% of them never took part in any pedagogical workshops. This would have implication on teachers’ perception and implementation of constructivist learning and teaching approaches. Regarding age of the participants the data showed that majority (57.31%) of them had age less than or equal to 30 years, while 42.69% of them were above 30. Nearly half (45.21%) participants had teaching experience that ranged from two to 5 years, while very small number (1.22%) of them had teaching experience above 22 years. Moreover, the data showed that most teachers (78.04%) had been teaching on average more than 30 students in one class, while 21.96% of them taught in the classes that had on average less than 30 students in one class.

4.2. Teachers’ perception of constructivist learning, question-answer, individual work and group-work methods

4.2.1. Teachers’ perception of constructivist learning (Authenticity of learning task, metacognition, cooperative learning and knowledge construction)

**Authenticity of learning task in individual and group works:** Almost half (48.78%) of the teachers answered that task given to students individually should have close relationship with students’ real-life. While, the same percentage for group-work said that, the task should be from reference book (text-book) and its relationship with real-life is not so important (see Table 1). It indicates that in individual work method almost half of the teachers connect the task to students’ real-life. While, for group work method, very few teachers relate the task to students’ real-life.

**Metacognition and cooperative learning:** Considering self-regulation of the task, almost half (49%) of all the teachers answered that, when students complete their work, they themselves have to regulate their work. After regulating their work, students can interact with fellow students to complete the task (see Table 2). So, nearly half of all the teachers perceive that the students themselves should have control on their learning and they can interact socially with others too. This way of students’ learning is partly related to metacognition.

**Knowledge construction:** Regarding individual work, 85.36% teachers agreed that the knowledge is constructed by performing individual work activities, while 9.74% and 4.87% of them disagreed and remained neutral, respectively, with the statement. In relation to group-work, 95.11% of teachers agreed that the students can construct new knowledge by performing group work activities, while 3.64% and 1.21% of them, respectively, disagreed and remained neutral with the statement (see Table 3). It indicates that nearly all of the teachers believe that knowledge is constructed as a result of performing individual and group work activities.

4.3. Teachers’ perception of question-answer, individual work and group-work methods

Teachers’ perceptions about Question-answer method
Table 1. Relationship of task with student’s real-life

| What kind of relation should an individual and group work task have with students’ real-life? | Individual work | Group-work |
|---|---|---|
| Options | n | % | n | % |
| The task should have close relationship with real-life. | 40 | 48.78 | 24 | 29.26 |
| The task may or may not have relationship with real-life. | 15 | 18.29 | 18 | 21.95 |
| The task should be from the book and no matter if it has relationship with real-life or not. | 27 | 32.92 | 40 | 48.78 |
| Total | 82 | 100 | 82 | 100 |

Table 2. Regulation of student task

15. How should a student perform his individual task?

| Options | n | % |
|---|---|---|
| He should collaboratively work with fellow students and together complete the task. | 24 | 29 |
| He should individually complete his work without any interaction with others. | 18 | 22 |
| Student’s personal experience is important; he personally regulates the way he performs the task; still he may interact with fellow student to complete his individual task. | 40 | 49 |
| Total | 82 | 100 |

Table 3. Teachers’ view about knowledge construction

| By performing individual and group work activities students construct new knowledge. | Individual work | Group-work |
|---|---|---|
| Options | n | % | n | % |
| Strongly Disagree | 2 | 2.43 | 1 | 1.21 |
| Disagree | 6 | 7.31 | 2 | 2.43 |
| I do not know | 4 | 4.87 | 1 | 1.21 |
| Agree | 46 | 56.09 | 30 | 36.58 |
| Strongly Agree | 24 | 29.27 | 48 | 58.53 |
| Total | 82 | 100 | 82 | 100 |

Question-answer method is also checked for the criteria of constructivist method as it has been done for individual and group work methods.

4.3.1. Topics and result for question-answer method

Majority (89%) of the teachers agreed that the topic which is used in question and answer session should be related to the real-life of students. In addition, 89% of the teachers also agreed that, when implementing question-answer method, students should be able to express what they have learnt in question and answer session. However, 33% of teachers disagreed with the statement that, question-answer sessions should be challenging and related to the prior knowledge of the students (see Table 6). This indicates that most of the teachers seem to perceive based on their answers that what they ask in question-answer must be connected or have relevant connection with students’ real-life. Similarly, they thought that question-answer should be used in such a way that fosters students to express what they have learnt. Furthermore, most of the teachers (67%) believed that they ask questions that are challenging for students and related to their prior knowledge. These ways of teachers’ thinking fits into the criteria of constructivist method for question-answer method.
4.4. Teachers’ view about individual work and group work methods

In the following section four criteria of constructivist method, which are shown in literature review, are presented from teachers answers about individual and group working methods. Additionally, some other constructivist learning principles are presented.

4.4.1. Relationship between new and prior knowledge

Majority of the teachers (82.93%) seem to perceive according to their answers that, when students perform tasks individually, their prior-knowledge should have close relationship with new knowledge. While this percentage decreases to 69.52% in the case of group work; see Table 4. It indicates that, most of the teachers consider this constructivist method criterion for their teaching. Majority of the teachers give importance to relationship between prior and new knowledge in the case of individual work method. However, for group work method, the number of teachers is less as compared to individual work method who considers this relationship.

4.5. Teachers’ implementation of question-answer, individual-work and group-work methods

4.5.1. Implementation of question-answer method

From 13 teachers who have participated in pedagogical training workshops for less than or equal to 1 month, 7(54%) indicated that the students recall what they have learnt in previous lessons during the implementation of question and answer method. On the other hand, 5 (38 %) teachers, from those who participated for less than or equal to 1 month, reported that they have used question and answer method to assess their students’ prior knowledge about the topic.

In the same vein, from 45 teachers who participated in pedagogical training workshop for more than or equal to 2 months, 26(58%) teachers attested that they had used the question and answer method to assess students’ prior knowledge about the topic, while 14(31%) of them reported that this method was used to let students recall what they have learnt (see

| Table 4. Relationship between new and prior knowledge in learning |
|---------------------------------------------------------------|
| 27. Should there be any relationship between new and prior knowledge? |
| Options                                                      | Individual work | Group-work |
|                                                             | n   | %   | n   | %   |
| New knowledge should be totally new and not have any relationship with prior knowledge. | 14  | 17.07 | 25  | 30.48 |
| New knowledge should alter students’ prior knowledge.       | 68  | 82.93 | 57  | 69.52 |
| Total                                                       | 82  | 100  | 82  | 100  |

| Table 5. Result of learning in both individual and group work methods |
|-------------------------------------------------------------------------|
| 25. What will be the result when a student performs task by individual and group-work? |
| Options                                                                 | Pedagogy Training<1 month | Pedagogy Training≥2 months |
|                                                                      | Individual work | Group work | Individual work | Group work |
|                                                                      | n   | %   | n   | %   | n   | %   | n   | %   |
| Student will learn new knowledge to which he was not familiar before. | 3   | 38  | 11  | 50  | 5   | 8   | 33  | 23  |
| Student will alter his prior knowledge in the context of new knowledge | 5   | 62  | 10  | 50  | 10  | 16  | 67  | 34  |
| Total                                                                 | 8   | 100 | 21  | 100 | 24  | 100 | 57  | 100 |
In 4.5.2. **Implementation of individual and group work methods**

In all of the above tables the perceptions (based on answers for questionnaire) of all the teachers, regardless of the periods participated in pedagogical workshop were the same. However, there is some difference in the following section of the findings between the Teachers Participated in Pedagogical Workshops (TPPW) for more than or equal to 2 months and those who only participated for a month or shorter. Those teachers whose Participation in Pedagogical Workshops (PPW) is less than or equal to a month, 62% of them answered that, as a result of individual work method students will alter their prior knowledge in the context of new knowledge. While for group working this percentage decreased to 50%. However, those teachers whose PPW is more than or equal to 2 months, 67% of them said that student will alter their prior knowledge in the context of new knowledge while this percentage for group-work was 60; see Table 5. In conclusion, in this criterion teacher who participated in pedagogical workshop for more than 2 months is more likely to consider above criterion based on their answers as compare to those who participated less than 1 month or not at all.

Table 7). As a result, most of the teachers who participated in pedagogical workshops (TPPW) for more than 2 months implemented question-answer to assess students’ prior knowledge about new topic, which is one of the criteria of constructivist method. Conversely, most of the TPPW for less than 1 month implemented question-answer method for recalling students’ knowledge.
4.5.3. Teachers’ approaches to apply individual and group working methods

More than half (52.43%) of the teachers perceived that, during group work activities, the group as a whole should achieve the result. Likewise, 47.56% of sample teachers indicated that every member should be accountable and contribute to group work activity for achieving the result. Moreover, 59.75% of the teachers showed that the students have to regulate the work when they perform their individual work (see Figure 1 below). Cooperative learning, where every member of the group is accountable for achieving group working result is very essential in constructivism. However, less than half of the teachers believe they implement group working in such a way that every student have to be accounted for achieving group working result. Similarly, around half of the teachers thought they implement individual work method in such a way that students regulate their work and take the responsibility of their learning.

5. Discussion

5.1. Constructivist learning

As it is mentioned in literature review, learning will be constructivist when it has four characteristics: connection of learning task with real-life, cooperative learning, taking responsibility of learning by students themselves and knowledge construction by students. Firstly, findings from teachers’ answers illustrate that; almost half of the teachers relate the task with real-life when students are given individual work. However, nearly one fourth of them consider this tool of constructivism for students’ learning in group-work activity while one third of teachers actually implement this tool of constructivism in their teaching practices. It indicates that, some of the teachers think, what students learn in school is important for their real-life. They understand that, learning in the institute is what students have to implement in their life. So, some teachers relate what students learn in school with their daily life. It is done by either teachers compare or make a connection between learning task and facts used in real-life. This is what other studies indicate that, when students cannot learn the courses, it is because they do not relate the topics of courses to their real-life situation. Secondly, almost half of the teachers answered that, students have to regulate their learning by themselves and cooperation is also important for students to complete the task. This indicates that, half of the teachers give more responsibility to students in their learning. They perceive according to their answers to actively involve students in learning process. When students actively engage in their learning, they learn better and constructively. Similarly, it is one of the purposes of MoE to promote active learning in Ethiopia education system. MoE has explicitly stated in its strategic plan that, students should be actively involved in their learning in
order to implement skills and knowledge they acquired in their life practically (Ministry of Education (MoE), 2010). Finally, nearly all of the teachers believe that knowledge is constructed in-group and individual working while they give more preference to group working as compared to individual work. By knowledge construction teachers might mean knowledge gain because when student could express what they learnt, teachers think students constructed knowledge. Teachers perceive based on their answers that, students learn and construct knowledge when they teach. Learning is constructivist if there is more opportunity for students to learn (Baviskar et al., 2009).

In conclusion, considering four characteristics of constructivism, nearly half of all the teachers say they consider criteria and tools of constructivism for their teaching. However, not more than one fourth of all the teachers implement and consider characteristics of constructivist learning in their teaching practices. This implies that, though around half of the teachers believe to implement constructivist way of learning in their teaching, but they do not implement as much as they perceive. The reason behind the difference between their view and practices might be lack of enough resources in their schools. For example, teachers and students use only blackboard, chalk, book and notebook in their classes. Conversely, constructivist-learning environment need enough resources which are needed for practical work to enhance students’ learning (Baviskar et al., 2009).

5.2. Individual and group work methods

Individual and group working methods are seen considering four criteria of constructivist method. Firstly, there should be connection between prior and new knowledge. This is one of the criteria of constructivist method that, new knowledge has to be connected to students’ prior knowledge. Similarly, it is very important for student to relate new knowledge with prior-knowledge when she/he learns the courses. Teachers have to equally consider this constructivist criterion for both individual and group-work methods. However, findings from questionnaire as well as classroom observations indicate that, many of the teachers implement individual work method more constructivist in the field of making connection between prior and new knowledge as compare to group work method.

Secondly, conceptual changes i.e. alter prior-knowledge in the context of new knowledge. This is also an essential criterion for constructivist method. According to constructivism, knowledge cannot be constructed in the form of totally new phenomenon instead; it should have some relation with the prior knowledge of the learner. Only relation is not as effective if there is no alteration in prior knowledge. This criterion is important in all the subjects. Additionally, both of the teachers’ categories (TPPW≤ 1 month and Pedagogy Training≥ 2 months) value more for individual work method as compared to group work activity considering constructivist method criterion (altering prior knowledge in the context of new knowledge).

Thirdly, assessing students’ prior knowledge, most of the teachers (48% and 40% for often and always, respectively) assess students’ prior knowledge in both individual and group working methods. This idea is supported by Black et al. (2003) who write that formative assessment has to be done in teaching. Formative assessment is assessment for learning, i.e. assessment done, for example, to find out how much students know about the topic, which is going to be taught (ibid). Findings from questionnaires show that, before teachers start new lesson or giving new topic to students they firstly understand students’ prior knowledge about new topic. However, only 35% of the teachers implemented the above criterion in their teaching practices according to my observations.

Findings indicate that, most of the teachers think by implementing group working method students will be more able to express what they learn as compared to applying individual work method. The result of findings which indicate that students learn better in the group activities as compare to individual working is supported by another study conducted by Kirschner et al. (2009). They argue based on cognitive load theory, which says, working memory of an individual can process four plus minus one instructions of a task at a time where the instructions of the task are...
interrelated to each other. So, complex task in-group work is learnt better because the instructions of the task are distributed among many individuals’ working memories to work on, and task is learnt by group members easily (ibid). This is what the teachers in the researcher’s study may perceive and believe. Teachers in the researcher’s study might not have the knowledge of cognitive load theory, but their perception is same as it is considered based on cognitive load theory. However, they do not consider the type of task whether to be simple or complex for group work activities. They prefer the group working activities as compare to individual work.

In conclusion, considering four criteria of constructivist methods, teachers tend to perceive individual work constructivist than group work to students in the fields of connecting students’ prior knowledge with their new knowledge, and think that, “prior knowledge will be altered in the context of new knowledge”. Conversely, teachers do not concentrate more on above two criteria for group work.

Lastly, majority of the teachers are constructivist for fourth criterion, i.e., assessing students' prior knowledge for both individual and group working methods but their teaching practices are not in line with how they think.

To reflect, there is a contradiction between teachers’ views and theory of constructivism. According to teachers’ views they consider most of the constructivist method’s criteria for individual work method, but learning occurs better in-group work method. In Ethiopian context, especially in the Ethiopian Institute of Textile and Fashion Technology (EITEX) context, this conflict might be because of not enough time and resources with students to perform task individually as homework. Similarly, constructivist individual work activity needs enough resources like work shop materials like pattern paper sewing threads and library like for lesser technology programs or any other source of information (Baviskar et al., 2009). Conversely, though teachers do not consider and implement criteria of constructivist method in-group work as compare to individual work method still students can learn better by group work method. In this case, the reason might be better interaction and sharing views among students for an issue. Also, in this case, there is no matter of time and many resources as compare to individual work activity. In-group work activity students perform their task through interaction among each other immediately during lesson session. They exchange their thoughts and experiences with each other. Consequently, students are able to express what they learn in-group work activity as compare to individual work activity.

5.3. Question-answer

Similar to individual and group working methods question-answer can also be used by teachers as a constructivist method for learning. Opposite to individual and group working methods, most of the teachers use question-answer as a constructivist method. Majority of the teachers agreed that, what we ask in question-answer is related to the students’ real life, which is one of the criteria of constructivism, but they do not wait for students’ answer. What teachers say and what they apply in real teaching are different. Teachers claim that they ask in question-answer what is challenging and related to prior knowledge of the students.

Considering criteria of constructivist method, majority of the teachers do agree that, in the result of question-answer session students should be able to express what they have learnt from question-answer. Most of the teachers implement question-answer method in their teaching in order to determine students’ misconceptions about an issue. This is in the form of a debate or explanation. Additionally, nearly half of the teachers whose PPW is more than 2 months use question-answer as a tool for assessing students’ prior knowledge. However, only 38% of teachers whose PPW is less than or equal to 1 month implement question-answer to assess students’ prior knowledge. So based on teachers’ answers, teachers who attended pedagogical workshops for more than 2 months are seemed to be more constructivist in question-answer method as compared to those who attended pedagogical workshops for less than 1 month. When teachers were asked about why they implement question-answer method in their teaching, the response was different according to their participation in pedagogical
workshops. Teachers who participated in pedagogical workshops longer perceived to use question-answer for assessing students’ prior-knowledge, which is one of the criteria of constructivist method. However, those teachers who did not participated on pedagogical workshop or participated for a short time perceived to use question-answer for recalling students’ prior knowledge, which is not in line with constructivism. So, pedagogical workshops are also useful and help teachers understand and apply teaching methods more constructivist as compare to the teachers they did not participate in pedagogical workshops.

Although some of the constructivist method criteria are considered and implemented by teachers, it still cannot be said that teachers use these methods as constructivist method. According to Baviskar et al. (2009), a method will be constructivist when all four criteria of constructivist method simultaneously applied and seen in the method. So, considering all four criteria of constructivist method, findings show that there is very little chance for teachers to simultaneously consider all constructivist method criteria in any of the three mentioned methods because, a teacher might consider one or two criteria and may not consider three or two others.

Overall, findings show that there is a big difference between what teachers perceive about constructivist learning and their teaching practices. It implies that, learning environment in the EiTEX is still traditional. According to Schunk (2012), traditional classroom is the one in which focus is on basic skills, teacher find correct answer for question and, assessment is separated from teaching and generally done by test. Findings from classroom observation indicate that, in EiTEX classroom teachers take the responsibility of transferring knowledge by focusing on facts. Similarly, teacher is a good teacher who can solve any type of problems in the classroom. In the researcher's point of view, to have constructivist learning in the EiTEX, firstly teachers have to be theoretically aware of constructivist way of learning. Secondly, learning environment has to be changed from traditional to constructivist. Nowadays, nearly all teachers can have access to Teacher Training College (TTC) where they can get theoretical information about constructivist learning. Likewise, the most important for constructivist learning is that teachers implement constructivist way of learning in their teaching practices. It can be done when students take the responsibility of their learning and they are given more opportunity to actively involve in their learning process through interaction with other student in the class.

6. Conclusion
This study investigated the teachers’ perception and implementation of question-answer, individual and group working methods considering constructivism when teaching in the three first degree programs of Ethiopian Institute of Textile and Fashion Technology (EiTEX). The teachers varied in terms of participation in pedagogical workshops. There were still some differences in their views about mentioned constructivist learning methods, although most of them had similar perception and implementation of these methods. The average number of the teachers perceived the question-answer, individual and group working methods in line with constructivism, though their implementation of these methods was not as much according to constructivism as they think of. However, teachers implement most of the constructivist criteria for individual work method as compared to group work. Clearly put, more than half percent of the teachers had a good trend in connecting the topic to the students’ real-life situations in individual work activities, while only 30% of the teachers had attempted to connect the topic to students’ real-life situation in group work activities. The study also showed that the teachers mostly used the constructivist learning method criteria to select learning activities while teaching through individual work methods, although they had some limitations to do so while selecting group work activities. Accordingly, 85% of the teachers had a good trend of connecting new knowledge of the students with their prior knowledge when they engage in individual work learning activities, although 67% of them had such a trend when the students engage in group works.
In some areas of learning, teachers who had taken pedagogical training for more than 2 months seem to be more constructivists in their views and implementing the mentioned methods as compared to those who took pedagogical training for less than 1 month. In this regard, around 65% of teachers who had more than 2 months of pedagogical training claimed that the students should alter their prior knowledge in the context of new knowledge, while around 55% of teachers who had taken pedagogical training for less than 1 month agreed with the idea. Based on this finding, it seems possible to infer that the teachers who participated longer in pedagogical training workshops have better perception of question-answer, individual and group work methods in conformity with assumptions of constructivism. To conclude, the teaching and learning in EITEX was neither fully based on the principles and assumptions of constructivism nor three mentioned methods are completely perceived and implemented as constructivist methods considering constructivist method criteria. Teachers’ views are varied for different aspects of constructivism. Teachers mostly consider constructivist method’s criteria for individual work method as compare to group-work method. For further studies the researcher suggests to investigate the learning outcomes and effectiveness of question-answer, individual and group work methods vis-à-vis constructivist criteria.

7. Limitations
The findings of this study will enlighten teachers’ views and application of constructivist learning and teaching methods, especially question-answer, individual work and group work methods, vis-à-vis Piaget’s cognitive constructivism and Vygotsky’s social constructivism. However, this has two limitations. First, the current study was completely descriptive survey that assessed teachers’ application of constructivist methods using self-reported questionnaire. This study did not examine the contribution of constructivist methods to students’ learning outcomes. Therefore, the future researcher should investigate the contribution of constructivist methods as compared to traditional methods using experimental research designs. Second, this study used only quantitative data. As learning and teaching variables are not easily quantifiable, using mixed data (quantitative and qualitative) may provide more clear insight about teachers’ perception and implementation of constructivist approaches of learning and teaching.

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Author details
Lantbeye Wudneh Jemberie
E-mail: lanteweudd@gmail.com
1 Ethiopian Institute of Textile and Fashion Technology, Bahir Dar University and PhD Candidate at Bahir Dar University, Ethiopia.

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