Teaching and Learning Conceptions of First-Year Pre-Service Teachers

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Abstract
The purpose of this study was to determine the levels of teaching and learning conceptions of first-year pre-service teachers. A descriptive survey design was used. The participants consisted of 176 pre-service teachers of Gambaga College of Education, Ghana. The sample was conveniently selected. It was found that pre-service teachers preferred the constructivist conception of teaching and learning to the traditional conception. The mean score of constructivist conception was higher (M = 4.45, SD = 0.5) than the mean score of the traditional conception (M = 3.57, SD = 0.65), t (175) = 16.7, p < 0.05. However, teaching and learning conceptions did not differ based on gender. Independent samples t-test results showed that, for constructivist conception, there was no significant difference between males and females. Also, for the traditional conception, there was no significant difference between males and females.

INTRODUCTION
The National Teacher Education Curriculum Framework (NTECF) of Ghana envisaged to develop teachers who will view learners as active constructors of knowledge and able to create learning contexts that are learner-centered and encourages learners to collaborate with others (NTECF, 2017). The NTECF (2017) further stated that improvement in the quality of education in Ghana will require competent teachers who are fully prepared to teach the school curricula when they take up their first post and among others, use a learner-centered pedagogy and an inclusive approach. This goal will not be achieved if pre-service teachers do not adopt the right conceptions of teaching and learning.

According to Aypay (2010), the teaching and learning processes are influenced by different cognitive variables and some of them include teaching and learning conceptions. Pre-service teachers join teacher education programs with their own ideas and conceptions about what it takes to be a successful teacher (Aktürk, 2012; Dejene, Bishaw, & Dagnew, 2018). According to Tillema (2000), teaching and learning conceptions is one of the most important variables affecting the decisions of teachers regarding classroom instruction.

Research has revealed that teachers’ understanding of students, their roles in teaching and learning process, their classroom practices, and their approaches to teaching and learning are shaped with the educational philosophy they adopt (Baş & Şentürk, 2019). Again, research suggests that teachers’ beliefs drive instructional practices (Pajares, 1992). Msendekwa (2015) cited Hart (2002) that in order to change classroom teaching practices, teachers’ pedagogical beliefs should be considered.

According to Pajares (1992), knowledge of the belief structures of teachers and prospective teachers is crucial in improving their education and professional readiness. Uzuntiryaki and Boz (2007) are of the view that these beliefs which are related to teaching and learning affect how prospective teachers learn, how they interpret pedagogical knowledge, how they conceptualize instructional tasks, their teaching decisions, as well as their classroom practices (as cited in Canan & Fatma, 2016). It is really
important for teachers and pre-service teachers to recognize their conceptions about teaching and learning before beginning their professional lives (Bilgin, 2016; Kaleli, 2020). This will help the adopt constructivist teaching approaches to foster and improve learning.

As new approaches have emerged in the field of education in recent years, a transition from traditional teaching approach to constructivist approach has been very important and thereby, important steps have been taken in transferring from teacher-oriented to student-oriented approach (An & Mindrila, 2020; Bilgin, 2016). A better understanding of student-teachers’ beliefs about teaching and learning has been considered as a valuable tool for improving effectiveness of teacher education in general and student’s learning in particular (Aktürk, 2012; Dejene, Bishaw, & Dagne, 2018). Again, Dejene, Bishaw and Dagne (2018) stated that knowledge about student-teachers’ beliefs and belief systems are considered as pre-requisite for better understanding of both student-teachers’ learning processes and their later behavior in classroom settings as professional teachers.

Dejene, Bishaw and Dagne (2018) cited Koballa, Graber, Coleman, and Kemp (2000) that identifying and assessing pre-service teachers and their ideas in relation to classroom practices is an important function of every teacher education program. Knowledge about their students’ conceptions of teaching and learning can be used to better facilitate learning and professional development.

Teachers' conceptions of teaching and learning are defined by Chan and Elliott (2004) as “the beliefs held by teachers about their preferred ways of teaching and learning” (p. 819), and include what teaching and learning actually mean and teacher-pupil relationship. Teaching and learning conceptions are the preferences of teachers regarding the ways of teaching and learning (Chan & Elliott, 2004). Teaching-learning conceptions refer to the beliefs held by teachers about their own educational applications (Chan, 2003). Conceptions of teaching are defined by Ross (2017) as unarticulated composites of individual teachers’ assumptions, knowledge and beliefs about teaching and learning.

According to Mardiha and Alibakhshi (2020), the beliefs held by teachers about teaching and learning includes the meaning of teaching and learning and the roles played by teachers and students. There are two main opposite conceptions in teaching and learning, namely traditional conceptions and constructivist conceptions (Mardiha & Alibakhshi, 2020). According to Weinstein (2001), constructivism is an orientation to teaching and learning in which meaning and knowledge are collaboratively constructed by both teachers and students. Weinstein (2001) added that the main responsibility of the teacher in the classroom from constructivism perspective is to create an environment which maximizes the interaction between students and teachers and among students themselves.

Conceptions of teaching and learning can be seen as the beliefs about teaching that guide a teacher’s perception of a situation and shapes teachers’ actions (Dejene, Bishaw, & Dagne, 2018). According to Lee, Zhang, Song and Huang (2013), conceptions of teaching and learning reflect pedagogical beliefs and are categorized into knowledge transmission or knowledge construction. Lee et al (2013) added that although the reality might be complex and multifaceted, teachers with teacher-centered and content-oriented perspectives tend to adopt didactic teaching practices. In contrast, teachers with student-centered and learning-oriented perspectives tend to adopt constructivist teaching practices (Chai, Khine, & Teo, 2006) as cited in Lee et al (2013). Research suggests that individuals’ conceptions of teaching affect how they teach, which in turn can affect the learning of their students (Ross, 2017). According to Gao and Watkins, conceptions of teaching play a crucial role in improving the quality of education (as cited in Şahin & Deniz, 2016).

Gaining an insight into the learning and teaching conceptions held by teachers may well be of interest to both teachers and educational institutions (Mahasneh, 2018). However, much of teachers’ conceptions of teaching were inconsistent with a constructivist approach to teaching that many reformers advocate (Prawat, 1992). Dejene, Bishaw and Dagne (2018) cited Prawat (1992) that many teachers adopt a “transmission” approach to teaching and an “absorptionist,” passive view of
learning which is less likely to promote student understanding. This study therefore wants to investigate the teaching and learning conceptions of first-year pre-service teachers.

LITERATURE REVIEW

Conceptions of Teaching and Learning

Conceptions of teaching and learning refer to the beliefs held by teachers about their preferred ways of teaching and learning (Aypay, 2010). These include the meaning of teaching and learning and the roles of teacher and pupils (Chan & Elliott, 2004). Conceptions of teaching and learning comprise teachers’ personal definitions of teaching and learning as well as their beliefs about how these should be processed (Chan & Elliott, 2004). Chan and Elliott (2004) define teachers’ conceptions of teaching and learning as “the beliefs held by teachers about their preferred ways of teaching and learning” (p. 819).

According to Baş and Şentürk (2019), conception of teaching and learning can be considered as an umbrella concept that expresses teachers’ values, beliefs, attitudes, educational philosophy adopted, intentions and practices towards learning and teaching. Teaching and learning conceptions can be referred to as roles of teachers and students in teaching and learning process and teachers’ beliefs about their preferred ways of teaching and learning (Chan & Elliott, 2004). These beliefs include the meaning of teaching and learning, and the roles of teachers and students (Canan & Fatma, 2016). Teachers’ pedagogical beliefs vary along a continuum with knowledge transmission at one end and facilitating students’ knowledge construction in the learning process at the other end (Chan & Elliott, 2004). Teaching and learning conceptions are conceptualized under two conceptions based on different philosophical foundations (Chan, 2003; Chan & Elliott, 2004). There are two main opposite teaching and learning conceptions in education (Schunk, 2008). These two opposite conceptions are traditional and constructivist teaching and learning conceptions (Aypay, 2010; Chan & Elliott, 2004).

Traditional Conception

The traditional teaching-learning conception, also referred to teacher-centered instruction sees learning as getting information from teachers and textbooks, considering the teacher as transmitter of knowledge as well as students as recipients of knowledge (Chan & Elliott, 2004). Traditional conception in teaching utilizes teacher-centered teaching strategies. According to Igwebuike, Okandjeji and Ekwevugbe (2012), the traditional teaching-learning conception places much emphasis on teaching as transmission of corpus of knowledge from authoritative sources like teachers and textbooks to students as recipients of information (as cited in Bas, 2016). According to Ozden, students are expected to get all the information presented without questioning (as cited in Bas, 2016). Learning is considered as remembering and memorizing (Engin & Daşdemir, 2015). Cheng, Chan, Tang and Cheng (2009) put forward that those teachers who adopt this approach place themselves at the center of the teaching and learning process, and mostly use traditional teaching methods in the classroom which might include some enforcement and punishment.

Participation of students in the teaching and learning process is very limited; they are not allowed to direct the teaching and learning process by themselves (Bas, 2016; Gagnon & Collay, 2001). In the traditional teaching and learning conception, students are seen to be passive individuals in the classroom. Teacher-student interaction is limited and teaching is one-way from teachers to students and includes the use of teacher-centered teaching strategies (Baş & Şentürk, 2019). Students’ interests, skills, abilities, cognitive, affective behaviors are ignored (Baş & Şentürk, 2019). This approach includes activities that will force students to memorize the subject. The teacher is the only authority in the knowledge transmission and students are seen as passive recipients of knowledge, and emphasis is particularly on the acquisition of information from teachers and textbooks in this approach (Brooks & Brooks, 1999; Schunk, 2012). According to Jonassen (2009), students are not
allowed to express their views on concepts, interpretation of the subject matter is offered by the teacher.

**Constructivist Conception**

Constructivist conception of teaching is founded on Piaget’s and Vygotsky’s theories. These theorists emphasize the importance of experience and active participation of individuals in the learning process and in the construction of knowledge (Aypay, 2010). Constructivist conception uses student-centered teaching strategies which help students to develop critical thinking and collaboration skills. Also, learning takes place in environments where students participate actively (Aypay, 2010; Chan & Elliott, 2004; Cheng et al., 2009).

According to Vavrus, Thomas and Bartlett (2011), a learner-centered approach is grounded in constructivist theory which posits that learning requires each learner to construct his/her own understanding by tying new information to prior experiences. It assumes that knowledge emerges through interactions and experiences among learners and through reflection on the learner’s own ideas (as cited in Msenekwa, 2015). Constructivists argue that knowledge is not passively received from the world, from others, or from authoritative sources. Rather, all knowledge is created as individuals adapt to and make sense of their experiential worlds (MacLellan & Soden, 2007).

Social interaction, as conceptualized by Vygotsky, insists that learning occurs as children work in small groups to solve problems. When students work in small groups, they cooperate in many ways and students have a lot to offer one another (Powell & Kalina, 2009). By discussing problems in a group, internalization of knowledge occurs for each individual at a different rate according to their own experience (Vygotsky, 1978). Social constructivism includes interaction with peers and tutors (Reed, Smith & Sherratt, 2008).

Constructivism is a learning approach in which students acquire the necessary knowledge on their own, as part of active learning that the teacher establishes and under the guidance of the teacher, and in which they construct and interpret this knowledge based on their previous experiences (Doğanay & Sarı, 2012). Constructivist conception emphasizes creating active learning environments that support critical thinking, research and cooperation (Chan & Elliott, 2004). The teacher serves as a guide who helps students in the construction of knowledge as active participants of the learning process. Constructivist teaching-learning process reveals that knowledge cannot be seen as independent from the individual, so meanings belonging to the individual cannot be transferred to others (Phillips & Soltis, 2004). Teachers are active facilitators and organizers of the teaching and learning process (Chan & Elliott, 2004), while students are in an active role of getting, explaining, and constructing knowledge (Baş, 2014; 2016). A key feature of constructivist learning is not to get and accept knowledge given, but to infer meaning from the shared knowledge (Driscoll, 2000). According to constructivist conception, information cannot be identified to be independent from the individual (Bilgin, 2016).

In student-centered teaching, learning takes place in a reflective and interactive process in which teachers play a guiding role (Cheng et al., 2009). The teacher is only a mediator between the student and the learning material, to help the students construct the knowledge. According to Brooks and Brooks (1999), constructivist teachers recognize and promote the students’ autonomy and initiative, ensuring that they think freely, communicate with each other, act inquisitively by asking open-ended questions, construct links relating to the content, and create metaphors (as cited in Canan & Fatma, 2016). The learners integrate what they have just learnt with their gains from previous experiences to create meaning (Canan & Fatma, 2016). A constructivist view of teaching and learning sees learning as a process of knowledge construction, and the teacher’s role as a facilitator of such learning (Dejene, Bishaw, & Dagnew, 2018).
Constructivist frameworks of learning have become significant in most pedagogical decisions across different levels of education (Mensah, 2015). According to Crotty (as cited in Mensah, 2015), the constructivist paradigm posits that all knowledge and meaning are contingent upon human practices and experiences. Piaget believed that to understand the nature of knowledge, “we must study its formation rather than examining only the end product” (as cited in Gordon, 2008). Piaget’s developmental theory demonstrates that the way in which one arrives at knowledge is equally as important as the final result (Gordon, 2008).

According to Ertmer and Newby (2008), constructivists do not share with cognitivists and behaviorists the belief that knowledge is mind-independent and can be “mapped” onto a learner. Constructivists do not deny the existence of the real world but contend that what we know of the world stems from our own interpretations of our experiences (Ertmer & Newby, 2008).

According to Freire, knowledge is attained when people come together to exchange ideas, articulate their problems from their own perspectives, and construct meanings that make sense to them (as cited in Gordon, 2008). Ertmer and Newby (2008) are of the view that humans create meaning as opposed to acquiring it and that since there are many possible meanings to glean from any experience, we cannot achieve a predetermined, “correct” meaning. Ertmer and Newby (2008) added that learners do not transfer knowledge from the external world into their memories; rather they build personal interpretations of the world based on individual experiences and interactions. The internal representation of knowledge is constantly open to change; there is not an objective reality that learners strive to know.

According to Bednar, Cunningham, Duffy and Perry (1991), knowledge emerges in contexts within which it is relevant. Therefore, in order to understand that learning has taken place within an individual, the actual experience must be examined (as cited in Ertmer & Newby, 2008). If learning is decontextualized, there is little hope for transfer to occur (Ertmer & Newby, 2008). Constructivist view does not accept the assumption that learning can be identified independent of the content and the context of learning (Bednar et al., 1991). Knowledge is not abstract but is linked to the context under study and to the experiences that the participants bring to the context. Ertmer and Newby (2008) added that learners should be encouraged to construct their own understandings and then validate, through social negotiation. Constructivists believe that what is deemed knowledge is always informed by a particular perspective and shaped by a specific ideological stance (Gordon, 2008). Gaining knowledge is a process of inquiry and creation, an active and restless process that human beings undertake to make sense of themselves, the world, and the relationships between the two (Gordon, 2008). Again, according to Gordon (2008), a constructivist approach to education is one in which learners actively create, interpret, and reorganize knowledge in individual ways. Windschitl, opined that intellectual transformations occur when students reconcile formal instructional experiences with their existing knowledge, with the cultural and social contexts in which ideas occur (as cited in Gordon, 2008).

Theoretical Framework

Constructivist learning is conceptualized differently by various theorists depending on whether the emphasis is on individual cognitive processes or the social co-construction of knowledge (Windschitl, 2002). Social constructivism is a branch of constructivist thought, developed by Lev Vygotsky, which holds that knowledge is individually constructed via one’s experiences (Schreiber & Valle, 2013). Cognitive constructivism is a system of explanations of how learners, as individuals, adapt and refine knowledge (Piaget, 1971). In this view, learners actively restructure knowledge in highly individual ways, basing fluid intellectual configurations on existing knowledge, formal instructional experiences, and a host of other influences that mediate understanding.

According to Brown, Collins and Duguid, cognitive constructivism posits that meaningful learning is rooted in and indexed by personal experience (cited in Windschitl, 2002). Cognitive constructivism
primarily describes how cognitive processes adhere to a system of explanations of how learners, as individuals, impose intellectual structure on their worlds (Piaget, 1971). Social constructivism emphasizes social processes and view knowledge as having both individual and social components and hold that these cannot be viewed as separate in any meaningful way (Windschitl, 2002). According to Wilson, whereas social constructivists see learning as increasing one's ability to participate with others in meaningful activity, cognitive constructivists focus on how individuals create more sophisticated mental representations and problem-solving abilities by using tools, information resources, and input from other individuals (as cited in Windschitl, 2002). According to Panofsky, John Steiner and Blackwell, whereas cognitive constructivism focuses on the internal structure of concepts, social constructivism focuses on the context of their acquisition (as cited in Windschitl, 2002). Vygotsky indicates that development cannot be separated from its social and cultural context. Vygotsky reiterates the fact that social interaction with cultural artifacts forms the most important part of learner’s psychological development (as cited in Shabani, Khatib & Ebadi, 2010).

According to Lourenco (2012), the main difference between cognitive and social constructivism is that cognitive constructivism stresses student’s autonomy in the social environment, whereas social constructivism emphasizes the impact of social and cultural influences on students, the ways their varied backgrounds and experiences shape students’ learning, and the ways students understand and interpret concepts (Schreiber & Valle, 2013). Vygotsky believed that learning does not just take place within the individual. He argued that learning is a social and collaborative activity where people create meaning through their interactions with one another. Instructors can harness the natural verbal energy of students to promote a critical discussion of course content, so that students can actively construct and internalize their own meanings of the concepts (Powell & Kalina, 2009). Social constructivism advocate for learning as experiencing, and emphasized the importance of creating a learning environment where students are active participants in the creation of their own knowledge (Schreiber & Valle, 2013).

According to Prawat (1992), constructivist teaching involves a change in teaching from a telling-listening relationship to a complex and interactive relationship where the students’ own efforts to understand are the focal point. The learning context is of critical importance in shaping knowledge. To maximize student involvement, instruction should be contextualized by presenting authentic tasks that are meaningful, relevant, and parallel to problems in the real world (Schreiber & Valle, 2013). Vygotsky’s (1978) concept of the “zone of proximal development” enables us to realize that human learning, development, and knowledge are all embedded in a particular social and cultural context in which people exist and grow (as cited in Gordon, 2008). The role of the constructivist instructor is illustrated in the concept of the zone of proximal development which is a metaphor meant to help explain the way that social and participatory learning takes place (Daniels, 2001).

Students can master concepts and skills they cannot master on their own with the help of instructors or more advanced peers. The instructor serves as the guide on the side, instead of the sage on the stage by helping to clarify concepts and aid in solving problems particular to individual and group needs (Schreiber & Valle, 2013). Zone of proximal development is the notion that developing mental functions must be fostered and assessed through collaborative activities in which learners participate in constructive tasks or problem solving, with the assistance of more knowledgeable others (Windschitl, 2002). According to Olson, a major role of schooling is to create the social contexts (zones of proximal development) for mastery and the conscious awareness of the use of cultural tools (e.g., language and technologies of representation and communication) so that individuals can acquire the capacity for higher-order intellectual activities (as cited in Windschitl, 2002).

Constructivist classroom approaches involve fundamental shifts in how teachers typically think about instruction, from focusing exclusively on dispensing content to placing students’ efforts to understand at the center of the educational enterprise (Windschitl, 2002). Windschitl (2002) suggested that the following features should characterize teacher and student activity in a constructivist classroom;
• Teachers elicit students’ ideas and experiences in relation to key topics, and then create learning situations that help students elaborate on or restructure their current knowledge.
• Students are given opportunities to engage in complex, meaningful, problem-based activities.
• Teachers provide students with a variety of information resources as well as the tools (technological and conceptual) necessary to mediate learning.
• Students work collaboratively and are given support to engage in task-oriented dialogue with one another.
• Teachers make their own thinking processes explicit to learners and encourage students to do the same through dialogue, writing, drawings, or other representations.
• Students are routinely asked to apply knowledge in diverse and authentic contexts, to explain ideas, interpret texts, predict phenomena, and construct arguments based on evidence, rather than to focus exclusively on the acquisition of predetermined “right answers.”
• Teachers encourage students’ reflective and autonomous thinking in conjunction with the conditions listed above.
• Teachers employ a variety of assessment strategies to understand how students’ ideas are evolving and to give feedback on the processes as well as the products of their thinking.

Engaging students in active learning is linked to positive learning outcomes (Arthurs & Kreager, 2017). Arthurs and Kreager (2017) added that knowing transmitted facts and other information forms the basis for further learning, but learning involves more than the ability to recall information. It includes developing higher order thinking skills, modeling what scientists do, science literacy and the ability to apply scientific knowledge to decision-making, and self-efficacy in science disciplines (Arthurs & Kreager, 2017). According to Freeman et al., active learning engages students in the process of learning through activities and/or discussion in class, as opposed to passively listening to an expert. It emphasizes higher order thinking and often involves group work (as cited in Arthurs & Kreager, 2017).

Research Questions

The study seeks to answer the following research questions:

1. What are the levels of pre-service teachers’ teaching and learning conceptions?
2. Is there any significant difference in the levels of constructivists’ conception and traditional conception?
3. Do pre-service teachers’ teaching and learning conceptions differ significantly in terms of gender?

METHOD

Design of the study

The study adopted a descriptive survey design. Descriptive designs are designs that are neither experimental, observational, nor quasi-experimental. The primary goal of studies based on descriptive designs is to give an account of the state of social reality at a specific point time or its development over time (Jann & Hinz, 2016).

Sample and Sampling

The sample of this study consisted of 176 pre-service teachers (males = 98, females = 78). The sample was conveniently selected. Convenience sampling is a type of non-probability sampling in which people are sampled simply because they are “convenient” sources of data for researchers (Battaglia, 2008).
Data Collection Tool

The Teaching and Learning Conceptions Questionnaire (TLCQ) was used to collect data for the study. TLCQ developed by Chan and Elliot (2004) was used to measure teachers’ conceptions about teaching and learning. The original TLCQ comprises 30 items that measure two different conceptions of teaching and learning. The first is traditional conception, which views teaching as a non-problematic transfer of knowledge and considers learning as the absorption of this process (Chan & Elliot, 2004). The second is constructivist conception, which stresses that teaching is not about transmitting knowledge but facilitating the learning process (Chan & Elliot, 2004). The current version of the TLCQ (Chan & Elliot, 2004) used in this study, was validated by Lee et al. (2013) in an exploratory factor analysis (EFA) using principal component method with varimax rotation to explore the factor structure of the TLCQ (Chan & Elliot, 2004) in a Chinese setting. The two original factors with eigenvalues greater than 1.0 were clearly extracted and measured by 26 items. The two factors explain 67% of the total variances (Lee et al., 2013). The constructivist conception factor was measured by 12 items, whereas the traditional conception factor was measured by 14 items. The reliabilities of the subscales were; constructivist conception [α = .96], traditional conception [α = .95] (Lee et al, 2013). Participants rated the items along a five-point scale ranging from strongly disagree to strongly agree. The reliabilities of the subscales for this current study were; α = 0.812 for constructivist subscale and α = 0.808 for traditional subscale. The overall reliability of the instrument was α = 0.836.

FINDINGS

Characteristics of Respondents

The study participants consisted of 176 pre-service teachers of which 98 are males (55.7%) and 78 are females (44.3%). Majority of the student-teachers (101) age between 21-24 years (57.4%). Also, 56 of them age between 25-30 years (31.8%). Few of the participants (18) aged between 18-20 years and very few (1) ages between 31-35 years (0.6%). The program offered by participants are early grade (26) representing 14.8%, upper grade (67) representing 38.1% and junior high school program (83) representing 47.2%. Table 1 shows the sex age and program of participants.

<table>
<thead>
<tr>
<th>Table 1. Gender, Age and Program of Participants</th>
<th>n</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>98</td>
<td>55.7</td>
</tr>
<tr>
<td>Female</td>
<td>78</td>
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<tr>
<td><strong>Total</strong></td>
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<td>100</td>
</tr>
<tr>
<td>Age</td>
<td></td>
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<tr>
<td>18-20</td>
<td>18</td>
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<tr>
<td>21-24</td>
<td>101</td>
<td>57.4</td>
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<td>25-30</td>
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<td>31.8</td>
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<tr>
<td>31-35</td>
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<td>0.6</td>
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<tr>
<td><strong>Total</strong></td>
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<td>100</td>
</tr>
<tr>
<td>Program</td>
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<tr>
<td>Early grade</td>
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<tr>
<td>Upper grade</td>
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<tr>
<td>Junior High</td>
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<tr>
<td><strong>Total</strong></td>
<td>176</td>
<td>100</td>
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</table>

Research Question 1

What are the levels of pre-service teachers’ teaching and learning conceptions?
Table 2 shows the means and standard deviations of constructivist and traditional conceptions of teaching and learning. The mean score of constructivist conception was higher (M = 4.45, SD = 0.5) than the traditional conception (M = 3.57, SD = 0.65). This suggests that, pre-service teachers’ conceptions of teaching and learning are more of the constructivist conception than the traditional conception.

Table 2. Means and Standard Deviations of Teaching and Learning Conceptions

<table>
<thead>
<tr>
<th>Teaching-Learning Conception</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constructivist conception</td>
<td>176</td>
<td>4.45</td>
<td>0.50</td>
</tr>
<tr>
<td>Traditional conception</td>
<td>176</td>
<td>3.57</td>
<td>0.65</td>
</tr>
</tbody>
</table>

Research Question 2

Is there any significant difference in the levels of constructivists’ conception and traditional conception?

Paired samples t-test was performed to see if there is any significant difference in the levels of constructivist conception and traditional conception of teaching and learning. The paired samples t-test shows that there was a significant difference between the levels of constructivist conception (M = 4.45, SD = 0.50) and traditional conception of teaching and learning (M = 3.58, SD = 0.66), t (175) = 16.7, p < 0.05. The results of the paired samples t-test is shown in table 3. The results of the paired samples t-test is shown in table 3.

Table 3. Paired Samples t-test between Constructivist and Traditional Conceptions of Teaching

<table>
<thead>
<tr>
<th>Teaching-Learning Conception</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>df</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constructivist conception</td>
<td>176</td>
<td>4.45</td>
<td>0.50</td>
<td>175</td>
<td>16.7</td>
<td>.000</td>
</tr>
<tr>
<td>Traditional conception</td>
<td>176</td>
<td>3.58</td>
<td>0.66</td>
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</tbody>
</table>

Research Question 3

Do pre-service teachers’ teaching and learning conceptions differ significantly in terms of gender?

Independent samples t-test was performed to see if there is any significant difference in teaching and learning conceptions between males and females for constructivist and traditional conceptions of teaching and learning. The results showed that, for constructivist conception, there was no significant difference between males (M = 4.48, SD = 0.50) and females (M = 4.41, SD = 0.50), t (174) = .935, p = .351. Also, for the traditional conception, there was no significant difference between males (M = 3.53, SD = 0.68) and females (M = 3.63, SD = 0.61), t (174) = -0.954, p = .341. The results of the independent samples t-test are presented in table 4.

Table 4. Independent Samples t-test by Gender for Constructivist and Traditional Conceptions of Teaching

<table>
<thead>
<tr>
<th>Teaching-Learning Conception</th>
<th>Gender</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>df</th>
<th>t</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>Constructivist conception</td>
<td>Male</td>
<td>98</td>
<td>4.48</td>
<td>0.50</td>
<td>174</td>
<td>0.935</td>
<td>0.351</td>
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<tr>
<td></td>
<td>Female</td>
<td>78</td>
<td>4.41</td>
<td>0.50</td>
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<td></td>
</tr>
<tr>
<td>Traditional conception</td>
<td>Male</td>
<td>98</td>
<td>3.53</td>
<td>0.68</td>
<td>174</td>
<td>-0.954</td>
<td>0.341</td>
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<tr>
<td></td>
<td>Female</td>
<td>78</td>
<td>3.63</td>
<td>0.61</td>
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</table>
DISCUSSION

The findings of this study indicated that pre-service teachers preferred constructivist conception in teaching and learning to the traditional conception as indicated by the mean scores. The mean score of constructivist conception was higher (M = 4.45, SD = 0.5) than the traditional conception (M = 3.57, SD = 0.65). The findings agree with other studies. For example, Lee et al. (2013) found that constructivist conception dominated teachers’ conceptions of teaching and learning (M = 4.29; SD = 0.58) than the traditional conception (M = 2.54; SD = 0.83). Aypay (2010) also reported the mean scores for constructivist conception to be (M = 4.1, S.D = .60) and that of traditional conception was (M= 2.7, S.D = .58). Baş and Şentürk (2019), found that teachers had a low level of traditional teaching-learning conception (M = 2.65, SD = 0.618), and a high level of constructivist teaching-learning conception (M = 4.27, SD = 0.869).

Bilgin (2016) in a study of pre-service teachers’ teaching-learning conceptions and their attitudes towards teaching profession found that the scores of pre-service teachers’ constructivist teaching and learning conception were higher than their scores for traditional conception. Canan and Fatma (2016) in their study of prospective teachers’ conceptions of teaching and learning and their attitudes towards multicultural education, found that prospective teachers’ adopt a constructivist teaching-learning conception. The constructivist teaching-learning conception mean score was (M = 4.17, SD = 0.61), while the traditional teaching-learning conception mean score was (M = 2.69, SD = 0.64). Dejene, Bishaw and Dagnew (2018) also reported that most student-teachers were found to possess traditional beliefs of teaching and learning as evidenced by the mean score in the traditional conception (M= 3.47, SD= .29) which was higher than the mean score of the constructivist conception (M=2.08 and SD=.22). Mahasneh (2018) also found that the constructive conception dimensions had the highest mean value (M=3.43, SD= 0.99) than the traditional conception (M= 3.04, SD=0.67). Mardiha and Alibakhshi (2020) in a study of teachers’ personal epistemological beliefs and their conceptions of teaching and learning found that the mean scores on the traditional and constructivist conceptions dimensions were above the midpoint score. However, the results of this study did not agree with other studies. Şentürk and Zeybek (2019) found that teachers had a low-level constructivist teaching-learning conception (M = 2.52, SD = 0.656) and a high-level traditional teaching-learning conception (M = 4.33, SD = 0.471).

This study also found that teaching and learning conceptions did not differ based on gender. This is inconsistent with other studies. For example, Aypay (2010) in a study of teacher education student’s epistemological beliefs and their conceptions about teaching and learning found that the mean scores of female student teachers on the constructivist conception was significantly higher than that of males, while the scores of male student teachers’ on the traditional conception was significantly higher than that of females. Baş and Şentürk (2019) also reported a statistically significant difference in the traditional teaching-learning conception in favor of males, and in the constructivist teaching learning in favor of females. Mahasneh (2018) found statistically significant differences by gender in teaching and learning conceptions. However, the results of the study agree with other studies. For example, Bilgin (2016) also found a similar result and reported no significant difference in terms of gender for pre-service teachers’ constructivist teaching and learning conceptions and for traditional conceptions. Şentürk and Zeybek (2019) also found no statistically significant difference among teachers by gender variable in terms of traditional teaching-learning conception, however, a statistically significant difference was found in terms of constructivist teaching-learning conception.

CONCLUSION

The study found that pre-service teachers’ conception of teaching and learning is more of constructivist conception than the traditional conception. There was a significant difference between the levels of constructivist conception and traditional conception of teaching and learning. It was also found that, for constructivist conception, there was no significant difference between males and
females. Also, for the traditional conception, there was no significant difference between males and females. Although pre-service teachers’ conception of teaching and learning was more of the constructivist conception than the traditional conception, the mean score of the traditional conception was above the midpoint. This suggests that the traditional conception of teaching and learning is noticeable. There is the need for pre-service teachers to be taught using constructivists pedagogy. Researchers suggest that most of the problems associated with implementing a constructivist approach to teaching could be overcome if teachers were willing to rethink what it means to know subject matter and what it takes to foster constructivist teaching in students (Prawat, 1992).

Richardson (2003) described five elements that characterized constructivist pedagogy and constructivist teacher education:

• attention to the individual and respect for students’ background and developing understandings of and beliefs about elements of the subject matter
• facilitation of group dialogue that explores an element of the subject matter with the purpose of leading to the creation and shared understanding of a topic;
• Planned and unplanned introduction of formal subject matter knowledge into the conversation through direct instruction, reference to text, exploration of a Web site, or some other means.
• provision of opportunities for students to determine, challenge, change or add to existing beliefs and understandings through engagement in tasks that are structured for this purpose; and
• Developing students’ meta-awareness of their own understandings and learning processes.

REFERENCES


