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Analysing the Epistemological and Ontological Assumptions Underpinning Teachers' Instructional Practices

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Abstract

This study helped fill the gap in understanding how teachers' belief about knowledge and reality affect their teaching, especially among Bachelor of Technology and Livelihood Education teachers in provincial schools. The reseach was done at Abra State Institute of Sciences and Technology and used a descriptive-correlational approach. Ten BTLED teachers, selected on purpose, answered printed questionnaires about their beliefs and teaching styles. The results showed that teachers had moderately strong viewa about knowledge and teaching practices. There were strong significant links between beliefs about knowledge and teaching practices, beliefs about reality and teaching practices and between knowledge and reality beliesf themselves. These findinfs show that what teachers believe strongly shapes how they teach, plan lessons, and interact with students.

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INTRODUCTION

In the context of education, pedagogy is the expression of teacher's viewpoint; it is more that just subject presentation. Whether international or not, every educational decision reflects the educator's philosophical perspective, particularly their ontological and epistemic presuppositions. These basic assumptions affect how the curriculum is carried out, how students engage in class, and how student learning is treated. Despite the fact that these assumptions have a substantial behaviour and efficacy, many teacher preparation programs including those in the Philippines, typically fail to question them (Hofer and Pintrich, 1997).

Epistemology, a subfield of philosophy, investigates the nature, origins, and limits of knowledge. In education, debates arise over the absoluteness versus contextuality of knowledge, the activity of learning, and the static versus dynamic nature of knowledge. Teachers with absolute belief tend to use teacher- centered methods, while constructivist perspectives favor learner-centered approaches that promote cooperation, inquiry and the co-creation of knowledge (Schommer, 1990; Chan & Elliott, 2004).

Conversely, ontology deals with beliefs about reality and truth. Teachers who adhere to objectivist ontological perspectives may believe that all students must constantly learn to comprehend a single external world. On the other hand, proponents of relativism or contextual ontology. It acknowledges that learner's perspectives and understandings of reality differ according to their background, experiences and cultural background. These viewpoints have a big impact on how educators manage conflict in the classroom, address diversity, and design learning environments (Biesta, 2015).

The impact of different philosophical positions on instructional conduct has been demonstrated by numerous worldwide research. Chan and Elliot (2004) found that teachers who held relativist epistemic perspective were more likely to use constructivist pedagogies. Magno's (2010) found that pre-service teachers with more advanced beliefs about knowledge were more aware of their own thinking and could adapt their learning better.

In Bachelor of Technology and Livelihood Education program, teachers' philosophical belief are crucial for effective teaching, influencing both student engagement and critical thinking. Success depends not only on technical skills but also on aligning teaching practices with progressive and constructivist approaches. At Abra state Institute of Sciences and Technology, understanding instructors' ontological and epistemological belief is essential for implementing learner-centered and outcome-based education. This study aims to examine these beliefs and their impact on teaching strategies.

Objectives of the Study

This study aims to examine the philosophical foundations of teaching among BTLEd teachers at Abra State Institute of Science and Technology (ASIST) by analyzing their epistemological and ontological beliefs and how these relate to their instructional practices. Specifically, it sought to determine the following.

1. The epistemological beliefs of BTLEd teachers.
2. The ontological beliefs of BTLEd teachers.
3. The instructional practices employed by BTLEd teachers.
4. The relationship between epistemological beliefs and instructional practices.
5. The relationship between ontological beliefs and instructional practices.
6. The relationship between epistemological beliefs and ontological beliefs of BTLED teachers.

METHODOLOGY

A. Research Design

This study used a quantitative descriptive-correlational research design, which was suitable for examining the relationship between BTLED teachers' philosophical beliefs and their instructional practices. The descriptive aspect allowed the researchers to profile teacher's ontological and epistemological beliefs, while correlation aspect enabled statistical analysis of how these beliefs relate to actual teaching methods.

B. Participants

The study involved 10 BTLED teachers from Abra State Institute of Sciences and Technology, utilizing total enumeration sampling to include all qualified teachers, ensuring comprehensive representation.

C. Research Questionnaire

A systematic questionnaire was developed to gather quantitative data on instructors' philosophical and teaching beliefs, divided into three sections: Ontological Beliefs, Epistemological beliefs, and instructional practices. The first section, adapted from existing research, include 20 items measuring teachers' views on learning and knowledge. The second section, based on Schraw and Olafson's four quadrant ontological scale, contained 15 statements evaluating perceptions of reality in educational contexts. The third section assessed teaching strategies, examining the extent of learner-centered versus teacher-centered approached using 20 items. A 5-point likerts scale was utilized for responses, indicating stronger agreement with higher scores. The questionnaire underwent expert validation and pilot testing, and achieved 0.81 confirming its reliability for data collection.

D. Data Collection Procedure

To adhere to ethical norms, the researcher obtained clearance from ASIST Research Ethics Committee before data collection. Eligible participants were identified through coordination with BTLED program chair. An orientation session informed participants about the goal of the study, its importances and their rights including voluntary participation and confidentiality, followed by completing and informed consent form. Printed questionnaires were personally delivered and retrieved, giving participants one to two weeks to complete them. The researcher ensured data accuracy and completeness, while keeping printed questionnaires secure and encrypting collected data in a password-protected file to maintain confidentiality. Ethical guidelines were meticulously followed throughout the process.

E. Statistical Treatment

The data were analysed using descriptive and inferential statistical methods. Descriptive statistics summarized participants' responses while Cronbach's alpha assessed the instrument's reliability. Pearson's correlation determined the relationship between epistemological and ontological beliefs and instructional practices.

RESULTS & DISCUSSION

Table 1. Level of Epistemological Beliefs of the Bachelor of Technology and Livelihood Education Teachers

Epistemological Beliefs	Mean	Descriptive Rating (DR)
1. Knowledge is certain and unchanging.	3.90	Agree
2. Learning happens quickly or not at all.	4.40	Strongly Agree
3. Knowledge consists of isolated facts.	4.20	Strongly Agree
4. Some people are born with a fixed ability to learn.	4.60	Strongly Agree
5. Learning is best achieved through memorization.	4.00	Agree
6. The ability to learn cannot be changed much over time.	4.10	Agree
7. Authority figures (teachers, experts) are the best source of knowledge.	3.90	Agree
8. Most things worth knowing are simple and straightforward.	4.00	Agree
9. Learning requires effort and active construction by the learner.	4.50	Strongly Agree
10. Knowledge is dynamic and evolves over time.	4.00	Agree
Composite Mean	**4.16**	**Agree**

Table 1 reveals that BTLED teachers generally hold moderately developed epistemological beliefs, with a composite mean of 4.16 describes as Agree. Strong agreement with statements such as learning ability being fixed (4.60), learning happening quickly (4.40), and knowledge consisting of isolated facts (4.20) shows that many teachers stull adopt traditional and fixed-ability views, consistent with Schommer (1990) and Perry (1970). Teachers also agreed with beliefs favoring memorization, stable learning ability, and authority as the teacher- centered orientations identified by Chan and Elliot (2004).

However, the teachers also strongly endorsed constructivist beliefs particularly that learning requires active effort (4.50) and that knowledge evolves over time (4.00). These reflect more sophisticated dynamic views of learning aligned with Hofer and Pintrich (1997). Overall, the findings show a blend of traditional and progressive beliefs, suggesting the

need for continued professional development to strengthen teacher's constructivist and growth-oriented perspectives, as emphasized by Hofer (2001).

Table 2. Level of Ontological Beliefs of Bachelor of Technology and Livelihood Education Teachers

Epistemological Beliefs	Mean	Descriptive Rating (DR)
1. Reality is fixed and independent of human interpretation.	4.60	Strongly Agree
2. Students construct their own understanding of what is real.	4.00	Agree
3. There is only one objective reality that applies to everyone.	4.10	Agree
4. What is considered "real" depends on context and perspective.	3.90	Agree
5. Effective teaching must reflect a universal truth about the world.	4.20	Strongly Agree
6. Learners experience different realities based on their backgrounds.	4.50	Strongly Agree
7. Reality can be known fully through facts and logic alone.	3.90	Agree
8. Truth is subjective and may differ across individuals.	4.40	Strongly Agree
9. Knowledge of reality is influenced by social interactions and lived experiences.	4.10	Agree
10. No single perspective can fully explain what is real in the teaching-learning process.	3.80	Agree
Composite Mean	**4.15**	**Agree**

Table 2 shows that BTLED teachers hold moderately advanced ontological beliefs with a composite mean of 4.15 which describe as Agree. This reflects an appreciation for both objective and subjective aspects of reality in the teaching-learning process. The teachers acknowledge realist perspectives, recognizing that certain elements of reality are fixed and independent (Schraw & Olafson, 2008), while also valuing constructivist viewpoints, understanding that learners/ experiences and backgrounds shape how they perceive reality (Lincoln & Guba, 1985). This blend suggest that teachers respect fundamental truths but remain open to contextual and interpretive perspectives (Guba & Lincoln, 1994). In practice, it means they balance factual, organized instruction with teaching strategies that consider students' experiences, creating a hybrid of structured and experiential learning, these findings highlight the importance of reflective practice and philosophical awareness in helping teachers develop more nuanced and adaptable instructional approaches

Table 3. Level of Instructional Practices Employed by Bachelor of Technology and Livelihood Education Teachers

Epistemological Beliefs	Mean	Descriptive Rating (DR)
1. I often use group work and collaborative activities in class.	4.50	Strongly Agree
2. I prefer to deliver lectures rather than facilitate discussions.	4.30	Strongly Agree
3. My students are encouraged to question what they are taught.	4.20	Strongly Agree
4. I strictly follow a structured lesson plan with little variation.	4.60	Strongly Agree
5. I incorporate students' ideas and experiences into my lessons.	4.00	Agree
6. I focus more on covering the content than on how students understand it.	4.10	Agree
7. I design assessments that require critical thinking, not just memorization.	3.90	Agree
8. I encourage multiple ways of solving a problem.	3.90	Agree
9. I use examples from real-life situations to make content relatable.	4.40	Strongly Agree
10. I expect my students to reach the same understanding at the end of a lesson.	4.00	Agree
Composite Mean	**4.19**	**Agree**

The BTLED teachers displayed excellent instructional techniques, as evidence by a composite mean of 4.19 (Agree), indicating a balanced use of traditional and student-centered methods. Structured lesson planning had the highest rating of 4.60, indicating a significant emphasis on lesson organization and sequencing, which Marzano (2007) identified as a fundamental component of effective instruction. High grades for collaborative learning (4.40) and real-life examples (4.40) demonstrate their use of constructivist methodologies. Meanwhile, the lowest rated activity was creating tests to encourage critical thinking (3.90). although still good, this highlights the need to strengthen higher order assessment

tasks in accordance with Biggs' (1999) constructive alignment. Teachers excel at planning but might improve their students' analytical skills.

Table 4. Correlation Coefficient Showing the Relationship between the Epistemological Beliefs and Instructional Practices of the BTLED Teachers.

Variables	r-computed Value	p - Value	Decision
Epistemological Beliefs and Instructional Practices	0.830	0.003($p<0.01$)	Highly Significant

The result shows a string and highly significant positive correlation between the epistemological beliefs and instructional practices of BTLED teachers. This implies that teachers' perspective on knowledge have a significant impact on how they organize and carry out their lessons. Learner-centered strategies like inquiry-based learning, contextualized instruction and teamwork are frequently employed by those who view knowledge as dynamic and ever changing. On the other hand, traditional approaches are more likely to be used by educators who believe that knowledge is fixed. This result confirms previous research (Hofer & Pintrich, 1997; Schraw & Olafson, 2008; Chan & Elliot, 2004) demonstrating that teacher's pedagogical decisions are influenced by their belief system. The strong correlation highlights the need for professional development that also addresses teacher's underlying beliefs noy just their instructional techniques to ensure alignment with modern teaching frameworks.

Table 5. Correlation Coefficient Showing the Relationship between the Ontological Beliefs and Instructional Practices of the BTLED Teachers.

Variables	r-computed Value	r-Critical Value	Decision
Ontological Beliefs and Instructional Practices	-0.874	0.001($p<0.01$)	Highly Significant

The ontological beliefs and instructional practices of BTLED teachers have a strong, significant negative correlation as table 5 demonstrates. Teachers with objectivist beliefs, who view reality as fixed tend to rely on structured, teacher-centered methods such as lectures. Conversely, those who see reality as socially constructed are more likely use collaborative ad inquiry-based, students-centered approaches (Guba & Lincoln, 1994); Phillips, 1995; Pajares, 1992). This supports constructivist theory, which holds that knowledge and reality emerge from experience and social interaction (Vygotsky, 1978). The results underscore the importance of professional development that promotes reflection, critical dialogue, and the adoption of constructivist practices to improve teaching effectiveness (Brownlee et al., 2011; Eren, 2009).

Table 6. Correlation Coefficient Showing the Relationship between the Epistemological Beliefs and Ontological Beliefs of the BTLED Teachers.

Variables	r-computed Value	r-Critical Value	Decision
Epistemological Beliefs and Ontological Beliefs	0.739	0.015($p<0.05$)	Significant

Table 6 indicates a moderate to strong positive correlation between the epistemological and ontological beliefs of BTLED teachers. As teachers adopt more constructivist views of knowledge, their understanding of reality also shifts toward a more contextual and flexible perspective. This philosophical alignment and reality tent to reinforce each other. In classroom practice, teachers with constructivist and relativist beliefs are more likely to use learner-centred and inquiry-based approaches, while those with more objectivist views favour traditional, teacher-directed methods. These findings emphasise the value of reflective teacher education to better align beliefs with effective instructional practices.

CONCLUSION

The findings highlight a philosophical dualism among BTLED teachers at ASIST; they balance objectivist and constructivist tendencies in both relief and practice. Significant correlations suggest that teachers' philosophical foundations directly shape classroom strategies.

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