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Personal Epistemic and Learning Approaches as Predictors of Pre-service Teachers use of Strategies to Counter Cognitive Dissonance from Supervisor Feedback

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Abstract

This study investigated how epistemic and learning approaches of pre-service teachers (PRESETs) in Obafemi Awolowo University, Southwestern Nigeria, predict their use of strategies to counteract cognitive dissonance arising from incongruent feedback from supervisors. The study adopted the descriptive survey research design. The population comprised 192 PRESETs in the third and fourth year of their teacher training. Findings revealed that the PRESETs possessed sophisticated personal epistemic approaches and utilised the deep approach to learning more than the surface approach. It was also revealed that the PRESETs are likely to utilise multiple strategies to counteract cognitive dissonance that may arise from conflicting feedback from university assigned supervisors during teaching practice. Findings revealed a function with coefficients as follows: deep approach (0.78), simple knowledge (0.21), surface approach (0.22), innate ability (-0.015), quick learning (-0.09), omniscient authority (0.17) and certain knowledge (0.24). The structure was maximised for 77% of PRESETs with high use of strategies to counteract dissonance arising from incongruent supervisors' feedback; 36.7% and 67.6% of PRESETs with moderate and low dissonance reduction strategy users respectively. The conclusion reached was that teacher educators and other stakeholders should be made aware of these findings. Also, these findings should be incorporated in the implementation of course contents on sources of cognitive dissonances during teaching practice and how to counter them.

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Introduction

The importance of teaching practice exercise to the professional identity, competence, teaching beliefs and attitude of pre-service teachers (PRESETs) has been indicated in teacher education research (Hollingsworth, 1989; Adeleke, Adesina, Salami & Adebayo, 2011; Jaimes, 2013; Zhao & Zhang, 2017). Teaching practice is an integral component of initial teacher education that exposes PRESETs to the cognitive overload they would often experience as teachers. One of the goals of the teaching practice exercise is, therefore, the alignment of PRESETs' teaching and learning beliefs with best practices in pedagogy. Another goal which is accomplishable through an organised supervision process is the counteraction of misrepresentations that may occur between supervisors' feedback and PRESETs' cognition, attitude and beliefs. The organisation and implementation of the teaching practice is, however, fraught with a lot of challenges. Recent research findings conclude that the teaching practice exercise is insufficient in building the bridge between theory and practice and in meeting teacher trainees' expectations about teaching and the teaching profession (Gursoy, 2013; Akyeampong, Ampiah, Fletcher, Kutor, & Sokpe, 2000).

The challenges of the teaching practice programme are related to factors like inadequate planning and implementation time vis-à-vis considerations for the teaching schedules of cognate units and departments, inadequate funding for the payment of emoluments to university supervisors and teacher collaborators at the local schools, apathy of teacher trainees and trainers, the use of non-specialist university supervisors in the supervision of teacher trainees, and the neglect of local school teachers who collaborated to supervise the trainees (Onyebukwa-Nwanoro, 2017). Other challenges are related to teachers at the schools who assist with the supervision who are not trained to support and guide students (Sethusha, 2014; Onyebukwa-Nwanoro, 2017) or else there was ambivalence in the role expected of them, and teacher trainees often lacked real avenues to recount and reflect on their experiences for the improvement of the teaching practice programme (Gursoy, 2013). Sometimes the challenge was in the inappropriate and stale assessment formats used (Smith, 2010 in Chimhenga, 2017). All these challenges influence how

teacher trainees perceive the teaching profession and the performance of their future roles as teachers.

However, a significant number of problems in the implementation of teaching practice are attributed to supervisors (Gursoy, 2013; Sethusha, 2014; Chimhenga, 2017). University assigned supervisors are expected to provide regular on-site observations of student teachers' teaching performance and help student teachers to develop lesson plans which encourage an activity-based approach (TESSA, n.d.). They are also expected to assess the student teacher's performance based on pre-established teacher performance standards, interact with student teachers about their teaching experience and their progress, analyse the student teacher's logbook/diary, conduct seminar classes to prepare student teachers for the teaching practice exercise and evaluate the success of their teaching during the exercise. The poor performance of these roles by supervisors most especially in sub-Saharan African Countries seems to account for the growing number of literature on the need for, and how to use clinical supervision and communication approaches that are collaborative and non-directive in teaching practice in these countries (Centre for Teaching, n.d.; Strieker, Adams, Cone, Hubbard & Lim, 2016).

The primary task expected of supervisors is the generation of feedback to the teaching practice committee, other supervisors and the pre-service teachers themselves. The feedback is to be used to improve deficiencies in PRESETs learning outcomes. In other words, these stakeholders want to know the extent to which the PRESETs have been able to meet prior determined expectations. However, studies have revealed that the feedback received by PRESETs are insufficient and sometimes negate the principles and practice of effective teaching that they have learnt in teaching methodology classes. Spear, Lock and McCulloch's (1997) exploratory study established that mentors rarely reflect on the purpose of feedback and often fail to tailor the nature of the feedback to the needs of the student teachers. In the same vein, Brett, Fitzallen, Kilpatrick and Reynolds (2018) recently observed incoherence in the style of reporting the performances of PRESETS by assigned teacher educators and absence of links between feedback and learning outcomes expected of the teaching of PRESETs. They concluded that this lack of coherence in the style of reporting and learning outcomes expected of teachers are capable of undermining the gains of teaching practice. The experiences of the researchers as tutors in the field of pedagogy include PRESETs in Nigeria reporting to them the incongruence between what

they were taught in pedagogy/teaching methodology classes and the feedback given by their assigned supervisors. For instance, informal feedback from PRESETs revealed that PRESETs who have been taught to generally use reinforcements such as clapping to motivate students in methods classes will consider incongruent, feedback from a supervisor to the effect that clapping should be used sparingly in a class comprising adolescents. This incongruent feedback needs to be countered with the explanation that clapping as reinforcement does not work well with students of this group and if used frequently, may become monotonous and cease to be a motivator. Until these corrective counter narratives are provided, the incongruent feedback would continue to destabilise the knowledge the PRESETs learned in the Methods class. Also, PRESETs who have been using the verb 'familiar' in the construction of their students' entry behaviour/previous knowledge which has gone uncorrected by previous supervisors do consider incongruent feedback from a supervisor who informs them that 'familiar' is a verb that is rather ambiguous for the sake of crafting specific and measurable entry behaviour/previous knowledge (Oyetoro, 2020).

The incongruent feedback received from university assigned supervisors creates dissonance in the cognitive processes of the PRESETs. How much dissonance is generated by the influx of incongruent feedback depends on the strength of the cognition held and whether the feedback is consistent with PRESETs generative cognition which is the most resistant to change (E. Harmon-Jones, C. Harmon-Jones & Levy, 2015). Clearly put, generative cognition refers to the one cognitive element against which everything is determined to be consonant or dissonant (Stone, 1998). It is the cognition a person holds that is most resistant to being changed and could be an attitude or future commitment (E. Harmon-Jones, et al., 2015). In this instance, the generative cognition is the prior lessons and instructions that PRESETs had received in teaching methodology courses. It also includes feedback from prior teaching practice exercises (for those who are in their third year of training and those who had undergone the National Certificate in Education Programme) before the commencement of their present teaching practice. It is important that the generative cognition should be appropriate cognitive inputs. The cognitive dissonance theory explains that when two or more elements of cognitions (ideas, attitudes, beliefs, opinions) that are relevant to each other but inconsistent with one another are held by an individual (Harmon-Jones, 2012), that individual would seek to counteract the dissonance through a variety of behaviours.

Unresolved cognitive dissonance has negative effects on the attitude and disposition of PRESETs towards teaching as a profession and on their development of teacher agency. However, its timely resolution could initiate meaningful learning experiences for PRESETs on their journey to becoming professional teachers (Hansen, 2001). When cognitive dissonance is triggered by the incongruent feedback from assigned supervisors, a dissonance counteracting process by PRESETs via the use of a variety of techniques should follow. One of these techniques includes the application of the principles of clinical supervision which requires that PRESETs first discuss the dissonant feedback with their assigned supervisors. Unfortunately, in Nigeria this does not usually happen due to factors like high PRESETs/supervisor ratio, assigned supervisors and supervisees' limited knowledge of the clinical supervision process, and socio-cultural inhibitions that considers PRESETS querying of supervisors' feedback to be disrespectful. Rather than consult with supervisors who are the source of this form of cognitive dissonance, PRESETS fear that supervisors' reaction might result in lowered grade outcome often made them overlook supervisor-induced dissonance. The findings of a pilot study by Oyetoro and Eyebiokin (2018) indicated that PRESETS chose alternative dissonance resolution techniques, including discussing the conflict with other PRESETs; discussing with faculty members other than the assigned supervisors; reading articles, journals and other texts on the area of dissonance, etc. It was also observed that some PRESETs rationalised the dissonant feedback and accommodated them into their cognitive schemata (Oyetoro, 2020). Yet, some PRESETs use a combination of the aforementioned techniques during the dissonance resolution process, a scenario that makes it possible for PRESETs' use of a technique to be divided into units of measure along a high-medium-low strategies use continuum (Oyetoro & Eyebiokin, 2018).

The strategies PRESETs use to counteract cognitive dissonance arising from discordant feedback from supervisors could also be influenced by factors related to beliefs about cognitive processes. Abby and Lynch's three assumptions about how people interact with religion via their belief systems as highlighted by Bae (2016) are good examples:

1. All people have some form of [religious or] existential belief system which forms a central reference point for their lives and beliefs can be universally found in all human cultures.
2. Religious belief exists as cognitive, creedal propositions, in relation to which people orient their identities and practices in a direct and generally consistent way.

3. A person's religious beliefs or spirituality, can be explicitly stated as a set of propositions and are, therefore, open to the gaze of the researcher through methods such as surveys (which measure degrees of assent to creedal propositions) and the research interview (which allows for a more open-ended explication of an individual's "beliefs").

These beliefs and how they influence decision making during the presentation of dissonant supervisor feedback to PRESETs should be identified through research. This might enable teacher educators and other stakeholders develop instructional programmes and such other interventions that are targeted towards helping PRESETs deal with dissonant feedback with the right mental disposition. Two of the factors that are presently hypothesised to influence the use of strategies to counteract dissonant feedback from supervisors by PRESETs are epistemic stance/approaches and learning approaches. This conjecture is consistent with the postulation of Chai, Khine and Teo (2006) that highlighted that one's stance to the nature and source of knowledge has been thought to influence one's cognitive and metacognitive operations in a significant way. Epistemic stance/approach as used in this study refers to what a person/individual agrees on as the meaning of knowledge, its characteristics (fluidity or rigidity, complexity, etc.) and source.

Different perspectives have been brought forward by scholars on the variants of human knowledge and knowledge structure and how they could be identified and developed in individuals. Perry (1970) hypothesised that students go through nine fixed stages of development in their intellectual positions (These stages have been summarised into four) namely: dualism, multiplism, relativism and commitment. Belenkey, Clinchy, Goodberger and Tarule (1986) espoused the dimensions of knowing (among women) : silenced knowing, received knowing, subjective knowing, procedural knowing and constructed knowing. Schommer (1990) proposed five independent beliefs based on the work of Perry (1970) viz.: the beliefs that pertain to certain knowledge (i.e., absolute knowledge exists and will eventually be known), simple knowledge (i.e., knowledge consists of discrete facts), omniscient authority (i.e., authorities have access to otherwise inaccessible knowledge), quick learning (i.e., learning occurs in a quick or not-at-all fashion), and innate ability (i.e., the ability to acquire knowledge is endowed at birth). King and Kitchener (1994) identified three dimensions of epistemological beliefs namely; pre-reflective thinking, quasi-reflective thinking and reflective thinking. While the nuances of these models are beyond the scope of this study and could be found in other works such as Hettich (1997), they

have been chronologically outlined here to provide a glance at the progression in their development through the years. Similarities could be observed in their classification albeit differences in their foci. The similarity lies in students' progression through stages where they experience more and more uncertainty, and simultaneously, their way of acquiring knowledge changes from being passive to being more active and constructive (Kalman, Sobhanzadeh, Thompson, Ibrahim & Wang, 2015). It is worthy of note that recent scholars in this field such as Schommer, Schraw and associates, etc. have adopted the word *beliefs* to mean individual's approach to knowledge and its structure. In the words of Schommer (1990), epistemic beliefs refer to individuals' subjective beliefs on what knowledge is and how knowing and learning take place. Literature places these beliefs about a specific facet of knowledge such as certainty, complexity, or the source of knowledge and knowing along a spectrum (Schraw & Olafson, 2008). Schommer's (1990) taxonomy of the nature and sources of knowledge have been adopted for use in this study as it is considered appropriate for how knowledge about teaching is perceived to be acquired within the Nigerian teacher education context.

It is thought that epistemic beliefs are related to a variety of factors in the teaching and learning process. Hence, many studies have been conducted to determine the nature of this relationship. Lee, Roh and Lee (2010) reported that gender and academic domains are significant factors in the determination of epistemological beliefs. The study also reported that age, grade level, prior teaching experiences in schools, completion of school practicum, intention to pursue a teaching career were not statistically significant in the determination of epistemological beliefs. On the other hand, Abedalaziz, Leng, Dameaty and Orleans (2017) in their study indicated that there are no gender-related differences in certain knowledge, quick learning, structure of knowledge and innate ability of their subject of study, whereas gender-related differences exist in the belief about the source of knowledge. They also showed that epistemic beliefs are directly proportional to academic level; epistemological beliefs are related to socio-economic status; and significant relationship exists between epistemological beliefs and cumulative grade point average (CGPA) with certain knowledge and innate ability as significant predictors of CGPA. Leng, Abedalaziz, Orleans, Naimie and Islam (2018) investigated how the beliefs of science teachers in Malaysia about intelligence and their beliefs about knowing and knowledge acquisition influence their teaching practices. They reported that the teachers hold more eclectic beliefs in which they

view teaching as a combination of student-directed and some teacher-centred learning. Findings of the study also revealed that the teachers hold sophisticated epistemological beliefs and are incremental theorists who believe that ability can be developed and improved upon and are thereby more likely to adopt student-centred practices; and teachers' teaching practices are antecedents of epistemic beliefs and implicit intelligence beliefs variables. Within the ambit of their study, each dimension of epistemological beliefs could either be naïve or sophisticated depending on the responses of the respondents. For instance, believing that knowledge is simple is considered naïve while believing that knowledge is complex is considered sophisticated. Also, implicit intelligence refers to an individual's beliefs about their own intelligence. Leng, *et* al adopted Dweck's (2006) classification that students who hold an implicit belief that ability is a fixed state are entity theorists and those who implicitly believed that ability is malleable are incremental theorists. The studies on the influence of epistemological beliefs on cognitive processes even as demonstrated in the brief review have depicted that results obtained are diverse, unpredictable and thus should be construed within context. The adoption of strategies to counteract cognitive dissonance that could arise as a result of differing feedback from supervisors is a cognitive operation. In the absence of known studies in the Nigerian context that explore how PRESETs respond to dissonance arising from incongruent supervisor feedback and how this response could be affected by the epistemic beliefs of these PRESETs, this research seeks to bridge this knowledge gap.

The role of learning or study approaches, viz. deep approach and surface approach in PRESETs use of strategies to counter dissonance due to incongruent supervisor feedback are also considered in this study. Studies by Poh (1999); Fox, McManus & Winder (2001); Smith (2005); Phan & Deo (2007); Mogre & Amalba (2014); and Martinelli & Raykov (2017) affirmed the presence of the deep and surface approaches for diverse population, including pre-service teachers. Deep approach entails learner's concentration on the meaning of what is learnt while surface learning approaches are characterised by learners' attempts to capture material in total rather than understand it (Jackson, 2012). A deep learner may concentrate on testing the material against general knowledge, everyday experience and knowledge from other fields or courses with the aim of obtaining principles to be used to organize information while a surface learner emphasises sign rather than significance- a focus on copying down diagram without listening to

the explanation of it (Jackson, 2012). Deep approach learner therefore carries out learning activities that are characterised by higher order verbs such as construct, analyse, create, etc. Surface approach learners on the other hand are content with carrying out learning activities defined by lower order verbs such as list, enumerate, state, etc. Biggs et al (2002) highlighted that teachers' use of surface approach to teaching is often as a result of the non-alignment of teaching and assessment methods to the overall aims of teaching the subject. Learners who use the achieving approach tend to focus on obtaining grades in their study. Also, the prevalent approach is indicative of the quality of the learning environment. Cetin and Onsekiz(2016) and Herrmann, McCune, and Bager-Elsborg, (2017) reported a positive significant relationship between academic performance and the deep approach and a negative relationship between academic performance and surface approach.

This study hypothesised that PRESETs use of strategies to counter dissonance arising from incongruent supervisor feedback could be linked to their use of deep approach rather than surface approach to learning. Recent studies have also shown that there exists a relationship between epistemic beliefs and learning approaches of students and, ultimately, their educational achievement (Tanriverdi, 2012). Sheppard and Gilbert (1991) asserted that the development of students' epistemology is influenced by teachers' theories of teaching and learners' perceptions of the learning approaches. Chan and Elliot (2004) also reported that there is influence of epistemological beliefs dimensions on the conceptions about learning. Tanriverdi (2012), in a study that explored the beliefs pre-service teachers hold about knowledge and learning and the ways they approach their learning, reported that students who believe that learning depends on innate ability were likely to be surface-motivated and utilise a surface strategy in their studying. Meanwhile, those who believe in learning being effort-dependent were deep-motivated and adopt a deep study strategy. Establishing how these learning approaches combine to predict PRESETs use of dissonance counteracting strategies is one of the goals of this study. The studies reviewed showed that individual epistemology dimensions behave differently in relation with other cognitive variables. How learning approaches of PRESETs predict their use of strategies to counter dissonance in supervisor feedback is yet an unexplored area that this study seeks to explore.

Purpose of the Study

The purpose of the study is to determine how epistemological beliefs and learning approaches predict the use of strategies to counteract dissonance induced by incongruent supervisors' feedback among 192 pre-service teachers (PRESETs). Understanding how these variables could be used to classify PRESETs' response behaviour to dissonance triggered by supervisors' feedback could help teacher educators and other stakeholders in teacher education such as policy makers, cooperating teachers and school management take definitive actions on how to intervene in order to counteract these dissonances. The PRESETs themselves could obtain valuable information on which psychological traits or epistemological stance and learning approaches could impact their dissonance resolution behaviours. The specific objectives of the study were, therefore, to:

(i) determine pre-service teachers' epistemic approaches, learning approaches and level of use of strategies to counteract dissonance induced by incongruent supervisors' feedback; and

(ii) assess how epistemic approaches and learning approaches predict the use of strategies to counteract dissonance induced by incongruent supervisors' feedback among the pre-service teachers.

Research Questions

Two research questions were asked from the objectives raised for the study. They are:

1. What are pre-service teachers' epistemic approaches, learning approaches and level of use of strategies to counteract dissonance induced by incongruent supervisors' feedback?
2. How do the predictor variables of epistemic approaches and learning approaches predict pre-service teachers' use of strategies to counteract dissonance induced by incongruent supervisors' feedback?

Methods

The study utilised the descriptive research design.

Population, Sample and Sampling Technique

The population comprised 902 pre-service teacher candidates who registered and sat for examinations in an intermediate teaching methodology course (ASE 202 - Curriculum and Instruction) during the 2014/2015 and 2015/2016 sessions at the Faculty of Education, Obafemi Awolowo University, Nigeria and participated in the 2016/2017 teaching practice exercise. The sample for the study comprised 200 pre-service teachers in the penultimate and final years of their teacher education programmes and were selected using the simple random sampling technique. The sample profile is: 85 males, 107 females. Ninety-nine (99) were in a penultimate class (3rd year) while 93 were in final class (4th year). One hundred and forty-three (143) were from the Department of Arts and Social Science, 33 from the Department of Science and Technology and 16 from the Department of Kinesiology, Health Education & Recreation. The average age of the respondents is 22.73± 3.32.

Instrumentation

Three instruments were used for the collection of data used for the study. These instruments are: *Epistemic Beliefs Inventory (EBI), the Revised Two-Factor Study Process Questionnaire (R-SPQ-2F)* and *Strategies Used for Reducing Supervisor-Induced Dissonance Questionnaire (SRSDQ).*

Epistemic Beliefs Inventory (EBI)

The Epistemic Beliefs Inventory developed by Schraw, Bendixen and Dunkle (2002) was used for the study. The EBI is a 28-item 5-point Likert scale questionnaire that uses the five factors proposed by Schommer (1990). These factors are Simple Knowledge (7 items), Certain Knowledge (5 items), Omniscient Authority (5 items), Innate Ability (6 items), and Quick Learning (5 items). Pre-service teachers responded to the items with 1 corresponding to "Strongly disagree" and 5 corresponding to "Strongly Agree". The responses for Items 2, 6, 19, 24 and 28 were reversed for the purpose of data analysis as they are negatively worded. The items of this inventory have been reported to yield Cronbach Alpha values that ranged from 0.58 to 0.68. Schraw *et al.* (2002) correlated the overall epistemological belief score with a reading comprehension test to evaluate the EBI's predictive validity. So, Lee, Roh and Lee (2010) reported reliability indices of -0.15 for simple knowledge, 0.47 for certain knowledge, 0.53 for quick learning, 0.72 for innate ability and 0.24 for omniscient authority. An overall Cronbach Alpha value of 0.83 was obtained for the present study.

Strategies Used for Reducing Supervisor-Induced Dissonance Questionnaire (SRSDQ)

SRSDQ was developed by the researchers. It comprised 14 items on the alternative course of actions pre-service teachers may take when they are given feedback that are incongruent with what they have learnt in teaching methodology classes. The items were pooled from the researchers' interactions with pre-service teachers, from a pilot study on the strategies used to resolve cognitive dissonances caused by discordant supervisor feedback, and from personal reflections of the researchers on their teaching practices as trainee teachers and from literature on cognitive dissonance. The pre-service teachers responded to the items on a continuum that ranged from 0 (Not likely) to 5 (Most likely). Sample items from the questionnaire include: "*try to see how different facts and ideas fit together*" and "*discuss the area of conflict with an expert in the field of teacher education.*" A Cronbach alpha value of 0.85 was obtained for the present study. This was considered appropriate for the present study.

The Revised Two-Factor Study Process Questionnaire (R-SPQ-2F)

The R-SPQ-2F was developed by Biggs, Kember and Leung (2001) to enable teachers evaluate their own teaching and the learning approaches of their students. The instrument assesses deep and surface approaches to learning only. It included the deep and surface motive and strategy scales each with 5 items, 10 items per approach scale. The unidimensionality of the items for each of the four subscales was established through Confirmatory Fit Index (CFI) and Standardised Root Mean Squared Residual (SRMR). Cronbach Alpha values of 0.73 and 0.64 were obtained for the deep and surface approaches respectively in a sample of 495 undergraduate students from a variety of departments in a university in Hong Kong. Cronbach Alpha values of 0.86 and 0.76 for deep and surface approaches respectively were established for this study.

Procedure for Data Collection

Data were collected from the pre-service teachers during the 2016/2017 six-week teaching practice period, via the three quantitative instruments described in the preceding section. The pre-service teachers were approached during school hours. The purpose of the study was explained to them and the instruments were administered to those who volunteered to take part in the study. The participants were encouraged to ask questions where there were grey areas about the

instructions for filling the questionnaire. They were assured of the confidentiality of their responses.

Results

Research Questions

*Research Question One***:** What are pre-service teachers' epistemic approaches, learning approaches and level of use of strategies to counteract dissonance induced by incongruent supervisors' feedback?

In order to answer this question, the mean and standard deviation of the variables of interest were obtained. The results obtained are presented in Table 1.

Table 1: Descriptive Statistics of Epistemic Approaches, Learning Approaches and Use of Strategies to Counteract Dissonance Induced by Incongruent Supervisors' Feedback

Variables	Sub-scales	N	Mean	Adjusted Mean*	S.D.	Skewness	Minimum score obtained	Maximum Score obtained	Maximum Score Obtainable
Epistemic Approaches	Quick Learning	192	20.17	80.68	4.58	0.34	9	35	35
	Certain Knowledge	192	14.61	81.82	2.57	-0.03	7	22	25
	Omniscient Authority	192	16.25	91.00	2.91	-0.32	6	24	25
	Innate Ability	192	18.78	87.64	3.42	-0.43	5	28	30
	Simple Knowledge	192	16.66	93.30	3.71	-0.45	2	25	25
Learning Approaches	Deep Approach	192	32.38	32.38	8.13	0.12	12	50	50
	Surface Approach	192	29.10	29.10	7.32	0.27	13	50	50
Use of strategies to counteract dissonance induced by Supervisors' Feedback	High	35	59.94	59.94	3.55	0.52	55	68	70
	Moderate	123	42.98	42.98	6.52	0.10	32	54	70
	Low	36	25.44	25.44	4.48	-1.31	11	31	70
	Total	192	42.83	42.83	12.00	-0.075	11	68	70

***** Adjusted Mean was calculated for the epistemic approaches subscales as the items are not evenly distributed. The calculation was done as follows: Initial mean of the sub-scale/Maximum score obtainable on the sub-scale * Maximum score obtainable from the whole scale

Table 1 shows that the mean values of pre-service teachers' epistemic approaches are above average for all the categories of epistemic approaches. The adjusted mean values, however, reveal that, in decreasing order of magnitude, pre-service teachers' epistemic approaches: simple knowledge (93.30), omniscient authority (91.00), innate ability (87.64), certain knowledge (81.82) and quick learning (80.64). The table shows that the mean score of the PRESETs on the deep approach is 32.38 while that for the surface approach is 29.10. This depicts that the PRESETs use deep approach more than the surface approach. The mean difference of the two approaches is 3.28. Further analysis using paired sample t-test statistics reveal that the mean difference is significant at 0.05 significance level (t=5.82, p=0.000, df =191). Lastly, the table indicates that using the mean ± one standard deviation criterion, that 35 PRESETs with 59.94 mean score on use of dissonance reduction strategies, 123 with 42.98 mean and 36 with 25.44 mean were classified as high, moderate and low users of dissonance reduction strategies respectively.

*Research Question Two***:** How do the predictor variables of epistemic approaches and learning approaches beliefs predict pre-service teachers' use of strategies to counteract dissonance induced by incongruent supervisors' feedback?

Table 2: Eigen Value of Discriminant Function

Eigen Values				
Function	**Eigen Value**	**% of Variance**	**Cumulative %**	**Canonical Correlation**
1	.324[a]	90.0	90.0	.495
2	.036[a]	10.0	100.0	.186

First 1 canonical discriminant functions were used in the analysis

Table 2 above depicts two functions; the first yielding an Eigen value of 0.324indicates a moderate proportion of variance. The canonical correlation coefficient of 0.495 depicts a positive and moderate relationship among the variables in the function. The combination of the factors presented by the first discriminant function equation is 0.25 (about 25%) (obtained by calculating

the square of 0.495). The second function shows an Eigen value of 0.036, indicating a small variance and therefore a weak one. Though the canonical correlation coefficient of the second function is positive, it is weak. The combination of the factors presented by this second discriminant function accounts for about 3.5% (obtained by calculating the square of 0.186) proportion of variance in the dependent variable. The first function, therefore, appears to maximise pre-service teachers' use of strategies to counter cognitive dissonance arising from incongruent supervisors' feedback.

Table 3: Wilks' Lambda Coefficient of the Discriminant Functions

Wilks' Lambda				
Test of Function(s)	**Wilks' Lambda**	**chi-square**	**df**	**sig.**
1 through 2	.729	58.792	14	.000
2	.965	6.567	6	.363

Wilks' Lambda value for function 1 is 0.729 and for function 2 is 0.965. These values are the proportion of the total variance in the discriminant scores not explained by differences among groups. The value is significant for function 1 ($p<0.05$) and not for function 2 ($p>0.05$). Function 1, therefore, maximises the predictor variables of epistemic approaches and learning approaches for the use of strategies to counter dissonance arising from incongruent supervisors' feedback among the PRESETs.

Table 4: Standardised Discriminant Function Coefficients and Structure Coefficients

Standardised Discriminant	**Canonical Function Coefficients**	
	Function	**Function**
	1	2
Deep approach	.776	-.610
Surface approach	.217	-.295
Quick learning	-.090	.407
Certain knowledge	.241	.333
Omniscient authority	.172	.438
Innate ability	-.015	.641
Simple knowledge	.210	-.045
Structure Matrix		
	Function	**Function**
	1	2
Deep approach	.926*	-.205
Simple knowledge	.564*	.350
Surface approach	.536*	-.142
Innate ability	.516*	.507
Quick learning	.467*	.446
Omniscient Authority	.475	.574*
Certain Knowledge	.060	.272*

* Largest absolute correlation between each variable and any discriminant function

From Table 4, the standardised discriminant coefficients of the predictor variables for function 1 reveal the values of 0.776 for deep learning, 0.217 for surface learning, -0.090 for quick learning, 0.241for certain knowledge, 0.172 for omniscient authority, -0.015 for innate ability and 0.210 for simple knowledge. The standardised discriminant coefficients of the predictor variables for function 2 depict the values of -0.610 for deep learning, -0.295 for surface learning, 0.407 for quick learning, 0.333 for certain knowledge, 0.438 for omniscient authority, 0.641 for innate ability and -0.045 for simple knowledge. The functions that can be derived from Table 4 and which can be used to calculate a score for each subject for the discriminant function are:

DDA+ Score from function 1= *0.776 Deep approach + 0.210 Simple knowledge + 0.217 Surface approach -0.015 Innate ability -0.090 Quick learning + 0.172 Omniscient Authority + 0.241 Certain Knowledge*

DDA+ Score from function 2= *0.438 Omniscient Authority + 0.641Innate ability + 0.407 Quick learning -0.045 Simple knowledge + 0.333 Certain Knowledge -0.295 Surface approach -0.610 Deep approach*

+ Descriptive Discriminant Score

Function 1 shows that for every 1 standard deviation increase in deep approach scores, pre-service teachers' DDA score is predicted to increase by 0.776 if all other variables are held constant. The function also reveals that for every 1 standard deviation decrease in innate ability, pre-service teachers' DDA score is predicted to also decrease by 0.015 if all other variables are held constant. This explanation is applicable to the other coefficients in the function. Function 2 reveals that for every 1 standard deviation increase in each of the variables of omniscient authority, innate ability, quick learning and certain knowledge, the pre-service teachers' DDA scores for the use of strategies to counteract dissonance induced by incongruent supervisors' feedback increase by 0.438, 0.641, 0.407 and 0.333 respectively. However, for every 1 standard deviation decrease in simple knowledge, surface approach and deep approach, the pre-service teachers' DDA scores for the use of strategies to counteract dissonance induced by incongruent supervisors' feedback decreases by 0.045, 0.295 and 0.610 respectively.

Table 5: Functions at Group Centroids

Functions at Group Centroids		
Classification of Strategies Use	**Function** 1	**Function** 2
High	1.025	205
Moderate	-.050	.145
Low	-.808	-.275

Unstandardised canonical discriminant functions evaluated at group means

The average discriminant score for subjects in the three groups are presented in Table 5. It shows that when the variable means are entered into the discriminant function 1, the discriminant score will be 1.025 for those who are classified as high users of dissonance reduction strategies, -0.050 for those who are classified as moderate users of dissonance reduction strategies and -0.808 for those with low users of dissonance reduction strategies. For discriminant function 2, the discriminant scores will be -0.205, 0.145 and -0.275 respectively for pre-service teachers with high, moderate and low use of strategies to counteract dissonance induced by incongruent supervisors' feedback.

Table 6: Prediction of Group Membership Based on the Use of Dissonance Reduction Strategies Using Descriptive Discriminant Function 1

Classification Results

	Classification of Strategies Use	**Predicted Group Membership** ***High***	***Moderate***	***Low***	**Total**
Count	***High***	27	6	2	35
	Moderate	33	44	43	120
	Low	3	9	25	37
Percentage	***High***	77.1	17.1	5.7	100.0
	Moderate	27.5	36.7	35.8	100.0
	Low	8.1	24.3	67.6	100.0

a. 50.0% of original grouped cases correctly classified.

Table 6 shows that 27 PRESETs (77.1%) with high use of strategies to counteract dissonance induced by incongruent supervisors' feedback are correctly classified by the function. Also, 44 PRESETs (36.7%) with moderate use of strategies are correctly classified while 25 PRESETs (67.6%) with low use of strategies are correctly classified.

Discussion of Findings

The findings of this study revealed that the epistemological beliefs of the PRESETs are eclectic as combinations of the beliefs are used and they are sophisticated because their use of each of the beliefs is high. The present findings corroborate previous findings of Leng, Abedalaziz, Orleans, Naimie, & Islam (2018) which established that teachers hold eclectic and sophisticated beliefs about intelligence. The findings indicate that the PRESETs might have been aware of the need for the combination of these beliefs for success in their studies as teachers. Findings of this present study also revealed that the PRESETs use both the deep and surface approaches; with more of the deep than the surface approach. The present finding reveals the versatility of the PRESETs in adopting the approach that is suitable for the objectives, contents, assessment format, interaction patterns and the overall environment of particular courses as was been corroborated by Biggs et al. (2001).

The classification of the PRESETs into high, moderate and low users of strategies to counteract dissonance in supervisors' feedback reveals a normal distribution curve with most PRESETs classified as moderate users of dissonance reduction strategies. The present findings may be related to the overall negative attitude of PRESETs to teaching practice exercises and to the teaching profession, a situation which has been confirmed by Adeleke, Adesina, Salami and Adebayo (2011). Hence, the moderate use of strategies to counter dissonance from incongruent supervisor feedback could mean that the PRESETs utilize minimal efforts that could make them acquire good grades in the teaching practice exercise and not efforts that could make them internalise the lessons from the exercise. The moderate use of strategies could also be hinged on the relative non-utilization of clinically-oriented supervision by the supervisors and collaborative teachers during the teaching practice which would provide PRESETs with result-oriented guidance. The findings of the present study revealed that each of the learning approaches—the deep and surface approaches—contributed to the prediction of PRESETs use of strategies to

counter incongruent feedback from supervisors. The deep approach, however, contributed more to the prediction than the surface approach. The present findings support the literature indicating the alternate use of both approaches depending on circumstances (Biggs, et al, 2001). Our finding that surface learning also contributes to the prediction of the use of strategies to counter dissonance from supervisor feedback points to the need not to jettison surface learning altogether in PRESETs learning outcomes. Surface learning approach might provide PRESETs the needed cognitive buffer to deal with emanating dissonance from incongruent feedback pending the availability of time to engage in deep learning. The study findings also revealed that only three out of the five epistemic approaches contributed positively to the prediction of the use of cognitive dissonance reduction strategies among the PRESETs. These three epistemic approaches to knowledge are simple knowledge, omniscient authority, and certain knowledge. Innate ability and quick learning did not contribute to the prediction. The present finding is not surprising as DeBacker, Crowson, Beesley, Thoma and Hestevold (2008) had reported higher correlations among these three beliefs about knowledge (that is, knowledge is simple, knowledge is certain and knowledge is gained from omniscient authorities). A similar study confirmed three epistemological beliefs of certain knowledge, quick learning and innate ability with Korean PRESETs (So, Lee, Roh & Lee, 2010). Out of these three beliefs identified by So et. al., only certain knowledge has a positive coefficient yet non-significant value in this present study.

The dynamics of disparities in how these knowledge beliefs influence cognitive processes and decision-making lies in the contextualization of the findings with respect to the dependent variables and the population involved. This finding in our study of the lack of impact of innate ability on the use of strategies to counteract cognitive dissonance arising from incongruent supervisor feedback speaks to the question of the relative importance of training and education of teachers versus their innate abilities. The education and training of teachers should be carried on with adequate cognisance of the pertinent knowledge areas and skills. This pertinent knowledge area includes sources of dissonances, effects of dissonances and how to counter them. This education and training should also be for a relatively long period of time since, in this case, quick learning seem to not contribute to the use of cognitive dissonance reduction strategies. The present finding is not considered consistent with the prevalent beliefs about the nature of knowledge and knowing and practices in initial teacher education in Nigeria where many yet

believe that formal training is least needed in order to become a teacher in as much as one is trained and competent in the teaching subject discipline. Hence, PRESETs' use of strategies targeted at counteracting cognitive dissonance arising from inconsistencies in the feedback given by university assigned supervisors is dependent on their development of sophisticated beliefs about personal epistemology.

Conclusion

The findings of this study indicated that the sampled PRESETs utilised sophisticated approaches to personal epistemology and utilise the deep learning approach more than the surface learning approach. The findings also indicated that PRESETS are likely to utilise diverse strategies to counteract cognitive dissonance that may arise from conflicting feedback from university assigned supervisors during teaching practice exercise. These complex characteristics demonstrated by the PRESETs are the much-needed bases for the induction of course contents into teacher education curriculum on the nature of cognitive dissonances that may arise from incongruent feedback given by assigned supervisors of PRESETS. The understanding of these complex characteristics are also needed in order to inform how to teach the nature of the cognitive dissonances and epistemic factors that influence them to PRESETs by educators and specialists of pedagogy.

The present study, however, does not provide evidence of the interaction of the learning approaches and epistemic approaches on the propensity of the PRESETs to utilise the strategies. Given the limitation of this study to how two cognitive-related variables could predict the use of strategies to counteract cognitive dissonance arising from incongruent feedback among PRESETs, other studies could consider the potency of affective variables or traits.

References

Abedalaziz, N., Leng, C. H., Dameaty, F. & Orleans, A. V. (2017). Epistemological beliefs in Jordanian context. *Advanced Science Letters.* Retrieved on 20th September, 2018 from https://www.researchgate.net.

Adeleke, M. A., Adesina, B. A., Salami, M. O. & Adebayo, J. A. (2011). Influence of teaching practice exercise on accidental teacher education candidates at the Obafemi Awolowo University. *Review of Higher Education in Africa 3* (1), 3-16.

Akyeampong, K., Ampiah, J., Fletcher, J., Kutor, N., Sokpe, B. (2000). *Learning to teach in Ghana: An evaluation of curriculum delivery.* Sussex, United Kingdom: Centre for International Education, University of Sussex Institute of Education.

Bae, B. B. (2016). Believing selves and cognitive dissonance: Connecting individual and society via "Belief". Religions 7 (86). Retrieved on April 28, 2019 from www.mdpi.com/journal/religions. DOI: 10.3390/rel7070086

Belenkey, M., Clinchy, B., Goodberger, N., & Tarule, J. (1986). *Women's ways of knowing: The development of self, mind, and voice.* New York: Basic Books.

Biggs, J. B. (1987). *Student approaches to learning and studying.* Camberwell, Vic.: Australian Council for Educational Research.

Biggs, J., Kember, D., & Leung, D. Y. P. (2001). The revised two factor study process questionnaire: R-SPQ-2F. *British Journal of Educational Psychology,71*, 133-149.

Brett, P. D., Fitzallen, N., Kilpatrick, S., & Reynolds, B. (2018). Learning the words: Supervising teachers and the language of impact in an initial teacher education programme. *Australian Journal of Teacher Education, 43* (8), 105-122.

Center for Teaching (n.d.). *Supervisors of Teaching Assistants.* Retrieved on May 2, 2020 from *https://cft.vanderbilt.edu/guides-sub-pages/ta-supervisors/*

Cetin, B. & Onsekiz, C. (2016). Approaches to learning and age in college students' academic achievement. *Journal of College Teaching and Learning, 13* (1), 21-27.

Chai, C. S., Khine, M. S., & Teo, T. (2006). Epistemological beliefs on teaching and learning: A survey among pre-service teachers in Singapore. *Educational Media International 43* (4), 285-298.

Chan, K. W., & Elliot, R. G. (2004). Relational analysis of personal epistemology and conceptions about teaching and learning. *Teaching and Teacher Education, 20* (8), 817-831.

Chimhenga, S. (2017). The student teachers' perceptions on teaching practice supervision in Zimbabwe: Is it a process of grading or improvement of teaching skills? *International Journal of Scientific and Technology Research 6* (7), 1-5.

DeBacker, T. K., Crowson, H. M., Beesley, A. D., Thoma, S. J., & Hestevold, N. L. (2008). The challenge of measuring epistemic beliefs: An analysis of three self-report instruments. *Journal of Experimental Education,* 76 (3), 281-312.

Fox, R. A., McManus, I. C., & Winder, B. C. (2001). The shortened Study Process Questionnaire: An investigation of its structure and longitudinal stability using confirmatory factor analysis. *British Journal of Educational Psychology 71,* 511-530.

Freiberg, H. J., Waxman, H. C., & Houston, W. R. (1987). Enriching feedback to student-teachers through small group discussion. *Teacher Education Quarterly 14* (3), 71-82. Retrieved on April 30, 2020 from www.jstor.org/stable/23474769

Gursoy, E. (2013). Improving practicum for a better teacher training. *Procedia-Social and Behavioural Sciences 93,* 420-425. DOI: 10.1061/j.sbspro.2013.09.214

Hansen, E. J. (2001). From Cognitive dissonance to self-motivation learning. *Essays on Teaching Excellence 13* (1), 1-6.

Harmon-Jones, E. (2012). Cognitive dissonance theory. In V. S. Ramachandran (ed.), *The Encyclopedia of Human Behaviour*, vol. 1, pp. 543-549. Academic Press.

Harmon-Jones, E., Harmon-Jones, C. & Levy, N. (2015). An action-based model of cognitive dissonance processes. *Current Directions in Psychological Science 24* (3), 184-189.

Herrmann, K. J., McCune, V. & Bager-Elsborg, A. (2017). Approaches to learning as predictors of academic achievement: Results from a large scale, multi-level analysis. *Högre utbildning, 7* (1), 29-42.

Hettich, P. (1997). Epistemological perspectives on cognitive development in college students. *Being a paper presented at the annual meeting of the American Psychological Association between August 15-19 at Chicago, Illinois.*

Hollingsworth, S. (1989). Prior beliefs and cognitive change in learning to teach. *American Educational Research Journal.* DOI: doi.org/10.3102/00028312026002160

Jackson, M. (2012). Deep approaches to learning in higher education. In N. M, Seel (eds) *Encyclopaedia of the sciences of learning*. Boston, MA: Springer. https://doi.org/10.1007/978-1-4419-1428-6_1843

Jaimes, J. C. (2013). The role of English pre-service teachers' beliefs about teaching in teacher education programs. *Profile 15* (1), 195-206. Retrieved on August, 22nd, 2018 from http://www.scielo.org.co/pdf/prf/v15n1/v15n1a12.pdf

Kalman, C. S., Sobhanzadeh, M., Thompson, R., Ibrahim, A., & Wang, X. (2015). Combination of interventions can change students' epistemological beliefs. *Physics Educatio n Research 11,* 1-17. DOI: 10.1103/PhysRevSTPER.11.020136

King, P. M., & Kitchener, K. S. (Eds.). (1994). *Developing reflective judgment: Understanding and promoting intellectual growth and critical thinking in adolescents and adults*. San Francisco: Jossey-Bass.

Leng, C. H., Abedalaziz, N., Orleans, V., Naimie, Z., & Islam, A. (2018). Teaching practices of Malaysian science teachers: Role of epistemic beliefs and implicit intelligence. *Malaysian Online Journal of Educational Sciences 6* (2), 48-59.

Martinelli, V. & Raykov, M. (2017). Evaluation of the Revised Two-Factor Process Questionnaire (R-SPQ-2F) for student teacher approaches to learning. *Journal of Educational and Social Research, 7* (2), 1-6.

Marton, F. & Säljö, R. (1976). On qualitative differences in learning: I-Outcome and process. *British Journal of Educational Psychology*, *46*, 4-11.

Mogre, V. & Amalba, A. (2014). Assessing the reliability and validity of the Revised Two Factor Study Process Questionnaire (R-SPQ2F). *Journal of Educational Evaluation for Health Professions 11*, 19. Doi:10.3352/jeehp.2014.11.19.

Onyebukwa-Nwanoro, C. J. (2017). Challenges of student-teachers during teaching practice in Nigeria. *Journal of Educational Policy and Entrepreneurial Research 4* (5), 30-36.

Oyetoro, O. S. & Eyebiokin, T. S. (2018). Strategies for resolving cognitive dissonance arising from incongruent supervisor feedback during teaching practice. *Unpublished raw data. Obafemi Awolowo University, Ile-Ife, Nigeria.*

Oyetoro, O. S. (2020). Responses to discordant feedback from supervisors during teaching practice. *Unpublished qualitative data, Obafemi Awolowo Univeristy, Ile-Ife, Nigeria.*

Perry, W. G. Jr (1970). *Forms of intellectual and ethical development in college years: A scheme.* New York: Holt, Rinehart & Winston.

Phan, H. P. & Deo, B. (2007). The revised learning process questionnaire: A validation of a western model of students' study approaches to the South Pacific context using confirmatory factor analysis. *British Journal of Educational Psychology, 77* (3), 719-739. DOI: 10.1348/000709906X158339

Poh, S. H. (1999). Investigating the approaches to learning and studying of tertiary students in Singapore: A longitudinal study. *NIECER Research Bulletin, 4* (1), 7-8.

Schommer, M. (1990). The effects of beliefs about the nature of knowledge on comprehension. *Journal of Educational Psychology, 82,* 498-504.

Schraw, G. J., Bendixen, L. D., & Dunkle, M. E. (2002). *Development and validation of the epistemic belief inventory.* In B. Hofer and P. Pintrich (Eds.), Personal epistemology: The psychology of beliefs about knowledge and knowing (pp. 261-275). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Schraw, G. J. & Olafson, L. J. (2008). Assessing teachers' epistemological and ontological worldviews. In M. S. Khine (ed.), *Knowing, knowledge and beliefs: Epistemological studies across diverse cultures.* New York: Springer.

Sethusha, M. S. (2014). Challenges experienced by teaching practice supervisors in an open and distance learning environment. *Mediterranean Journal of Social Sciences 5* (15), 409- DOI: 10.5901/mjss.2014.v5n15p409.

Sheppard, C. & Gilbert, J. (1991). Course design, teaching method and student epistemology. *Higher Education 22* (3), 229-249. DOI:10.1007/BF00132289.

Smith, L. (2005). An investigation into student approaches to learning at a multicultural university using the Revised Study Process Questionnaire. In A. Brew & C. Asmar (Eds.), *Higher Education in a changing world: Higher Education research and development* (pp. 533-541). Sydney: HERDSA.

So, H., Lee, J., Roh, S. & Lee, S. (2010). Examining epistemological beliefs of pre-service teachers in Korea. *The Asia-Pacific Education, 19* (1), 79-97.

Spear, M., Lock, N. D., & McCulloch, M. (1997). The written feedback mentors give to student teachers. Teacher Development 1 (2), 269-280. DOI: 10.1080/13664539700200019.

Spector, J. M. & Bhagar, K .K. (2018). Promoting and assessing deep learning using technology. In R. Z. Zheng (Ed.). *Strategies for deep learning with digital technology: Theories and practices in education.* USA: Nova Science Publishers, Inc.

Stone, J. (1998). Review of "A Radical Dissonance Theory by Jean-Leon Beauvois and Robert-Vincent Joule. *The American Journal of Psychology, 111* (2), 319-326.

Strieker, T., Adams, M., Cone, N., Hubbard, D., Lim, W. (2016). Supervision matters: Collegial, developmental and reflective approaches to supervision of teacher candidates. *Cogent Education (3),*1251075. DOI:10.1080/2331186X.2016.1251075

Tanriverdi, B. (2012). Pre-service teachers' epistemological beliefs and approaches to learning. *Procedia-Social and Behavioural Sciences 46,* 2635-2642. DOI: 10.1016/j.sbspro.2012.05.538

Tasdemir, M., Caliskan, N. & Kula, S. (2014). Learning approaches of prospective teachers. *International Journal of Social Science, 28,* 39-53.

Teacher Education in Sub Saharan Africa (n.d.). The teaching practice supervisor retrieved on April 27, 2020 from www.tessafrica.net/

Zhao, H. & Zhang, X. (2017). The influence of field teaching practice on pre-service teachers' professional identity: A mixed methods study. *Frontiers in Psychology* doi: 10.3389/fpsyg.2017.01264