



Pedagogical Beliefs of Teachers in Tanzania: Experience of Pre-service and In-service Teachers of University Students

Michael Msendekwa *

Local Government Training Institute, P. O BOX 1125, Dodoma, Tanzania

Email: michael.msendekwa@lgti.ac.tz

Abstract

This study investigated the pedagogical beliefs of pre-service and in-service teachers working toward a degree in education at a university in Tanzania. A total of 702 pre-service and in-service teachers from year one and three participated in the study. The Teaching and Learning Conception Questionnaire [1;2] was used to measure student-teachers' pedagogical beliefs. Factor analysis of data from the Teaching and Learning Conception Questionnaire resulted in a two-factor solution very similar to that found by other researchers [1;3], with the factors representing a traditional conception and a constructivist conception. Student-teachers had a mean of 4.24 on the constructive conception whereas a mean of 3.20 on traditional conception, on a five-point scale where 1 = 'strongly disagree' and 5 = 'strongly agree.' MANOVA found significant main effects of year of study, $F(1, 606) = 22.11$, $p = .001$, $\eta^2 = .04$, and Teacher type, $F(1, 606) = 8.67$, $p = .001$, $\eta^2 = .01$, for the traditional conception. Third year students were closer to neutral in their beliefs about the traditional conception than first year students, and in-service teachers closer to neutral than pre-service teachers. For the constructivist conception, there was a significant interaction of teacher type and year of study for constructivist conception, $F(1, 606) = 10.68$, $p = .001$, $\eta^2 = .02$. In year one, in-service teachers held more strongly to the constructivist conception than pre-service teachers, but in year three, there was no difference between these groups.

Keywords: Pedagogical beliefs; pre-service teachers; in-service teachers.

* Corresponding author.

1. Introduction

With the rapid rise of globalization, the Tanzanian government undertook reforms in different sectors, including education. In the educational reform of 2005, Tanzania launched a paradigm shift from a focus on teaching to a focus on learning. This shift called for change, including the renovation of the Tanzanian Education Curriculum [4]. This reform reflects contemporary educational thought. It sounds beneficial, as it takes the education system from an essentialist to a progressive curriculum, from teacher-centered pedagogical instruction to learner-centered pedagogical instruction reflecting a constructivist approach. Constructivism is a view of learning and development that emphasizes the active role of the learner in building understanding and making sense of the world, in which learners use their prior understanding and experience to construct, elaborate or restructure their current knowledge [5;6]. Authors [7] stipulate the benefit of a learner-centered instructional approach as: to better meet the needs of more students - that is, to have more of them stay in school, learn, and exit school with the knowledge and skills needed to become productive and satisfied citizens and with the desire to continue learning after formal schooling has ended [7]. Generally, this reform is directed toward enabling students to be capable of constructing and discovering their own knowledge. It is the position of constructivists, like the authors [8] and [9], that knowledge discovered is more useful to learners than knowledge merely received [8]; [9]. The implementation of the Tanzanian 2005 Primary (Elementary) and Secondary School Curriculum, which calls for a learner-centered curriculum and instructional approach, is still problematic for many teachers in Tanzania [10;11;12;13]. Among the critical issues are that teachers do not get enough pre-service or in-service teacher training focused on how a learner-centered instructional approach works; nor is adequate training provided to address teachers' and students' perceptions of the learner-centered approach which the Ministry of Education and Vocational Training (MoEVT) has insisted teachers adopt. These perceptions include the teachers' opinion that the learner-centered instructional approach is time-consuming, it does not allow students to properly understand the content, it makes teachers to be seen as not knowledgeable, it does not go with the pace of examination pressures, it creates difficulty in covering the syllabus, and it is unworkable in big classes [10;11;12;13].

2. Theoretical Underpinnings and Review of Related Literature

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 [14]. Constructivism is a view of learning and development that emphasizes the active role of the learner in building understanding and making sense of the world in which learners use prior understanding in concert with current experiences to construct, elaborate or restructure their knowledge [5;6]. Several prominent educational scholars and psychologists, John Dewey, Jean Piaget and Lev Vygotsky, are associated with constructivism and have demonstrated its relevance to pedagogy. Each of them made distinct contributions to the development of constructivist theory and focused on its various influences. However, they all see knowledge as emerging in specific situations and contexts. Also, they consider knowledge as relevant for teachers and students when it is 'in use' rather than when it is 'delivered' in a way that dissociates it from previous experience and from the opportunity for engagement with it [14]. So, this suggests that teachers should create

conditions for learners to discover and actively construct knowledge - to learn to learn - and to develop higher order thinking skills of analysis and synthesis through inquiry-oriented lessons in the classroom. So, this means that lessons should encourage learners to draw upon, connect and analyze their prior knowledge and experiences through self-discovery and interaction with other learners and with teachers [15].

In order to implement any education reform, there is a need to involve teachers as they play a dominant role in implementing the curriculum. Teachers are critical components of processes of change because they can decide whether to implement the reform or not [16]. In order for teachers to change their curricular orientation, there must be change in their beliefs [17;18]. This aligns with a study done by [19] that focused on how teachers' instructional practices are closely influenced by pedagogical beliefs. Moreover, Reference [20] found that teachers with traditional essentialist beliefs tend to use a teacher-centered instructional approach while teachers with constructivist beliefs tend to use a learner-centered instructional approach. Furthermore, teachers' pedagogical beliefs have been found to be influenced by their epistemological beliefs; that is, the way they think about what the source of knowledge is, and how people learn that knowledge [21;1;22]. So, knowing teachers' pedagogical beliefs would help policy makers, as well as curriculum reformers determine the kind of pedagogy the teachers are likely to employ in classrooms. Hence, they could explore ways to change teachers' beliefs towards the proposed curriculum reform.

The purpose of this study were to: 1) examine if there were differences between pedagogical beliefs of student-teachers in first year and third year of study at St John's University of Tanzania 2) examine if there were differences in pedagogical beliefs between pre-service and in-service teachers at St John's University of Tanzania. The researcher had predicted that in-service teachers and year three student-teachers will have a more constructivist approach than pre-service teachers and year one student-teachers.

3. Methodology

3.1 Research Design

This present study used a comparative design. A comparative design was used to compare beliefs of pre-service with those of in-service teachers, and beliefs of student- teachers in their first year of study with those of student-teachers in their third year of study.

3.1.1 Participants and Sampling Process

The participants in this study consisted of 702 pre-service and in-service teachers from years one and three at St. John's University of Tanzania. The participants were from the Bachelor of Science with Education (BSc Ed), Bachelor of Arts with Education (BA Ed), and Bachelor of Commerce with Education (BCom Ed) programs. This is a convenience sample; however, the researcher selected these participants for the following reasons: (1) they are prepared to be teachers with bachelor degrees in Tanzanian schools, and (2) year one are in the beginning of the teacher education program while year three exit the teacher education program. Among this sample, there are teachers who hold certificates and diplomas in teaching who have been teaching in different primary (elementary) and secondary schools in Tanzania, who in this study are identified as in-service teachers

while those who come directly from advanced level secondary schools are labeled as pre-service teachers. Year one students are those who are in the first year of their education program while year three are those who are in the third, or final year of the education program. Students joining St. John's University of Tanzania come from different regions of Tanzania. So, the sample represents teachers in the context of Tanzania.

3.1.2 Instrumentation

The study used the Teaching and Learning Conceptions Questionnaire (TLCQ) developed and validated by Chan and Elliott, and also validated by Lee, Zhang, Song, and Huang. The survey instrument was organized in two parts as follows: Part A consisted of demographics which included gender, year of study, name of the program, teaching subjects, age, teaching experience, religion, and parents' education. Part B consisted of the Teaching and Learning Conceptions Questionnaire (TLCQ). The Teaching and Learning Conceptions Questionnaire (TLCQ) had 30 items, representing two dimensions: Constructivist Conceptions (12 items), and Traditional Conceptions (18 items), with Cronbach alpha value of .84 each factor. The entire questionnaire used a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Each demographic item was scored as a discrete variable. For instance, teacher type was coded as pre-service = 1, in-service = 2; year of study was coded as year one = 1, year three = 3. For each scale, scoring was divided into subscales known as factors/ dimensions in this study. To get a score for each factor, all items in a particular factor were added up and the total was divided by the number of items in a particular factor. For instance, factor one in TLCQ had 12 items. These 12 items were added up and the sum was divided by 12 to get the score for factor one. This procedure was done to the second factor of TLCQ.

3.2.3 Procedures

The Faculty Dean of Humanities and Education at St. John's University of Tanzania administered the questionnaires to first and third year college-students in regular classes. Participation in this study was voluntary and participants were told that their ratings on the questionnaire would be kept confidential and had no impact on their coursework and grades. The Dean gave the informed consent letter to the participants before they filled out the questionnaires. The participants read and signed the informed consent letter and then completed the questionnaires which took 20 to 30 minutes. This procedure of administering the questionnaires was followed for both year one and three participants. The participants were asked to rate their beliefs about teaching and learning using a five-point Likert scale ranging from 1 to 5 -'Strongly Disagree to Strongly Agree.'

4. Findings and Discussion

Descriptive statistics was computed to determine normality of variables and to identify possible outliers. A principal axis factoring (PFA) with oblimin rotation was conducted on TLCQ to determine the validity of the instruments. In order to check for reliability of individual factors and to find out whether the pedagogical dimensions found in earlier research apply to this population, Cronbach's alpha was calculated for each factor on TLCQ instrument. Then MANOVA was computed. The MANOVA was for type of teacher (pre-service and in-service) and years of study (year one and year three) as independent variables and scores from the two

dimensions of pedagogical beliefs (constructivist conceptions and traditional conceptions) as dependent variables. To assess the validity and reliability of TLCQ, exploratory factor analysis (EFA) was conducted on the 30 items with oblimin rotation. The Kaiser-Meyer-Olkin (KMO) measure verified the sampling adequacy for the analysis, $KMO = .80$ which is well above the acceptable limit of .5 [24]. Bartlett's test of sphericity $\chi^2 (435) = 2793.42$, $p = .001$, indicated that correlations between items were sufficiently large for EFA. An initial analysis was run to obtain eigenvalues for each factor in the data. Eight factors had eigenvalues over Kaiser's criterion of 1 and in combination explained 48.50% of the variance in post rotation. Inspection of scree plot showed inflexions that would justify retaining two factors. Therefore, two factors were retained and accounted for 23.69% of variance in post rotation. The items that cluster on the same factors suggest that factor 1 represents traditional conception, and factor 2 represents constructivist conception. The assignments of items to factors were almost identical to that found in earlier studies. Cronbach alphas were calculated from these two factors and produced the following values: Factor 1: Traditional conception, $\alpha = .75$, factor 2: Constructivist conception, $\alpha = .75$. Field suggested a Cronbach of .7 to .8 was adequate for such type of a test [23]. Table 1 shows the Cronbach's alpha, means, and standard deviations for TLCQ of St. John's University of Tanzania student-teachers. The mean score of the student-teachers in this sample on constructivist conception subscale ($M = 4.23$) is well above the midpoint of 3, indicating that these student-teachers are in favor of constructivist conception beliefs. However, the mean score of these student-teachers on traditional conception ($M = 3.21$) which is only slightly above the midpoint of 3 indicating that the majority of the student teachers are neutral; that is, they do not seem either to favor or reject the traditional conception beliefs.

Table 1: Cronbach's Alpha, Mean, and Standard Deviation for TLCQ

Dimension/ Factor	Cronbach's alpha	Mean	Standard Deviation
Traditional conception	.75	3.21	.52
Constructivist conception	.70	4.23	.43

4.1 Traditional Conceptions Pedagogical Beliefs

Looking on the traditional conceptions, it was found that year one students had a mean belief of 3.34 while year three had a mean belief of 3.13. On the other side, pre-service teachers had a mean of 3.23 and in-service teachers had a mean of 3.13. The results suggest that there was a difference in beliefs on traditional conceptions between year one and three. That is year one believed more on traditional conceptions than year three. This might be because of the fact that year three have been in college for three years and have been exposed to the constructivist way of teaching. Also from the teacher type perspective, pre-service teachers had a traditional belief of 3.23 while in-service teachers had a belief of 3.13. This might be due to the fact that in-service teachers had already been exposed to constructivist approach in their lower level in teachers' colleges.

4.2 Constructivist Conceptions Pedagogical Beliefs

Referring more to the descriptive statistics, results indicated that there were no differences between first year and third year student-teachers on the constructivist conception of teaching. First year pre- and in-service teachers had a mean (M) of 4.24 while third year student-teachers had a mean (M) of 4.24 on the constructivist conception of teaching. Year one and year three student-teachers seemed to be in favor of the constructivist conception as the means were between agree and strongly agree. However, year three in-service teachers seemed to move away from extremist constructivist (see Appendix 1). Concerning the traditional conception, the mean of year one was $M = 3.33$ while year three had a mean of $M = 3.13$. Student-teachers seemed to be neutral with the traditional conception of teaching and learning as the mean is almost at the midpoint of 3. However, year three seemed to move very close to neutral as they had a mean of 3.13 compared to year one with a mean of 3.33.

4.3 More Discussion

Concerning objective number two which looks at differences in teacher type, descriptive statistics showed a very tiny difference between pre-service and in-service teachers. Descriptive statistics indicated the mean scores of pre-service and in-service student-teachers on constructivist conception, $M = 4.23$ and $M = 4.27$ respectively, while on traditional conception, pre-service and in-service teachers had a mean score of $M = 3.23$ and 3.13 respectively.

4.3.1 Inferential statistics

MANOVA indicated that year of study was statistically significant for tradition conception, $F(1, 606) = 22.11$, $p = .001$, $\eta^2 = .04$. Though there is statistical significance, its effect in terms of eta squared of .04 is small (common interpretation of eta squared .01 = small, .06 = medium, and .14 = large). MANOVA indicated a statistically significant difference in traditional conception between teacher type, $F(1, 606) = 8.67$, $p = .003$, $\eta^2 = .01$. Eta squared of .01 is a small effect size, so the difference is not big. The pairwise comparison indicated a mean difference of .14 between pre-service and in-service teachers which was significant. This difference might suggest that pre-service are a bit more traditional ($M = 3.23$) than in-service ($M = 3.13$). However, when we consider the mean of 3 as a midpoint, still the pre-service and in-service student-teachers neither agree nor reject the traditional approach strategy. The less constructivist beliefs of pre-service teachers might be due to the fact that they have not been exposed to the modern (i.e., constructivist) ways of teaching, and still remember how they were traditionally taught. Also the interaction of teacher type and year of study indicated that the Year One in-service student-teachers began with an extremist constructivist approach, with a mean of 4.36 and tended to move slightly towards a mean of 4.20 in year three where it might be perceived as moving to a normal constructivist. That is, the scores on the constructivist conception decreased as the year of study increased. However, it was opposite to Year One pre-service student-teachers who began as lower constructivist and moved to higher constructivist. In other words, scores on constructivist conception of pre-service student-teachers increased as years of study increased. Regarding the interaction of tradition conception by year of study and teacher type, year one in-service student-teachers tended to move from high tradition conception approach ($M = 3.25$) to low tradition conception approach ($M = 3.03$). In other words, scores on traditional conception of year one in-service student-teachers' decrease as year of study increases. This is the same for year one pre-

service student-teachers who start with Traditional beliefs of $M = 3.39$ and move down to $M = 3.17$. These results are similar to the study of [21] that was conducted in Hong Kong, as fourth year pre-service teachers had a mean of 4.22 in the constructivist conception. The results are also aligned with the study of the adoption of the teaching-learning conception in Turkey done by [24], where pre-service student-teachers preferred the constructivist approach, $M = 4.1$ over the traditional approach, $M = 2.7$. Another study done by authors [3] in Turkey, indicated that pre-service teachers were in favor of the constructivist approach, $M = 4.25$, and sometimes with the traditional approach, $M = 2.78$. The authors [25] in their study of the relationship between student-teachers' epistemological beliefs and conceptions of teaching, found a significant difference between first-year pre-service teachers ($M = 3.75$) and senior students ($M = 3.88$) in the constructivist conception. Although, with a significant difference, still the means show that first-year and senior students prefer the constructivist conception. The results of this study align also with a study by the authors in [21] who traced teachers' change on epistemological, and teaching and learning conception beliefs of postgraduate pre-service teachers in Singapore. The Singaporean teachers had a mean of $M = 4.25$ in a pre-test on the constructivist approach and a post-test mean of $M = 4.18$ after nine months; while the mean of the traditional approach in their pre-test was $M = 2.15$ and $M = 2.28$ during the posttest. The similarity of the results are in the sense that as teachers are in the final year of their program, they may tend to move away from an extreme constructivist position, whereas during the first year of their program, they may tend to move slightly towards the neutral point in the traditional conception. However, the results of this study stand in contrast to [26] findings that third-year pre-service teachers tended to favor the constructivist approach when compared to first- and second-year pre-service student-teachers. This is because third years had stayed in the teacher education program for three years hence, been exposed to constructivist approach.

5. Conclusion and Implications for Practice

The TLCQ is based on the constructivist and traditional approach of teaching. This implies that the higher the means student-teachers score on the constructivist conception subscale, the more student-teachers believe in the constructivist approach. This is the same in application of the traditional conception subscale in the sense that the higher the means score, the more student-teachers believe in the traditional approach. These results are different from the predictions made that the third year pre- and in-service teachers would have more positive beliefs about the constructivist conception. Predictions based on the fact that third-year student-teachers are in their final year of the teacher education program, were made because Tanzania had instituted a pedagogical reform in 2005, so universities and teacher education colleges would have been expected to reform their curricula to meet the nation's expectations; that is, the constructivist pedagogical approach should have been emphasized in preparing teachers. The prediction that in-service teachers would have been more constructivists was also based on the notion that these teachers have had experience with teaching and have attended teachers' colleges, studying for a level of certification and/or diplomas in teaching. Therefore, they should have been exposed to a constructivist pedagogical approach, particularly those with less than nine years of experience. The findings that there is no statistical significance (and wherever there is, the effect size is too small) in pedagogical beliefs or conception along dimensions of years of study (year one and three) and in teacher type (pre-service and in-service) where both favor the constructivist approach, and at the same time neither reject nor agree with the traditional pedagogical belief or conception may bring a different thought. First, it may be that these student-

teachers have been exposed to the constructivist approach differently; that is, third-year in-service and pre-service student-teachers may have been exposed to it in their teacher education program, while Year One pre-service student-teachers may have been exposed to the constructivist approach in secondary or high schools by observing their teachers teach. Second, neither rejecting nor agreeing with the traditional belief or conception may imply that these teachers do not ignore the traditional conception. It might imply that they prefer the balance of the two pedagogical beliefs or conceptions. This aligns with author [27]'s argument that teachers might simultaneously hold both traditional and constructivist conceptions of teaching. This might be true in classroom practice as it is very rare for teachers to be pure constructivist or traditional in their pedagogical beliefs [28]. For instance, constructivists have the notion that every student is unique and learns differently [3]. This might imply that a particular student might learn well by either traditional or constructivist approaches. Third, although [31] found that student-teachers with stronger constructivist beliefs made use of constructivist pedagogical strategy or approach in classroom practice [39] found that teachers' classroom practices differed with their pedagogical beliefs. The present results might be evidence that there is a similar disconnects between teachers' beliefs and their classroom practices in Tanzanian schools.

6. Limitation of the Study

The study used quantitative approach only. This approach may have limited to get some more information and clarification from subjects (participants).

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