Teacher educators' practice and vision of good teaching in teacher education reform context in Ghana


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Teacher Educators’ Practice and Vision of Good Teaching in Teacher Education

Reform Context in Ghana

Abstract
Teacher education in sub-Saharan Africa (SSA) has been criticized for the lack of attention to learning to teach in real classrooms, which limits the opportunity for pre-service teachers to successfully introduce learner-centered pedagogy in African primary school classrooms. To address this problem, Ghana has implemented a teacher education reform since 2004 to incorporate practicum. However, the critical role of teacher educators has been overlooked by policymakers, and few studies have qualitatively investigated their practice and vision. The study draws on qualitative data from the Ghana component of the Teacher Preparation in Africa (TPA) research project to explore eight teacher educators’ practice and vision of good teaching of primary mathematics. The study found that teacher educators’ practice and vision of good teaching consist of the use of Teaching and Learning Materials (TLMs) and small group activities following specific steps, without understanding the principles of learner-centered pedagogy that could be applied in a variety of classroom contexts and mathematics topics. The study also identified the hierarchical relationship between teacher educators and school teachers as a major challenge for effective practicum, limiting the opportunity to transform teacher educators’ vision and practice of primary mathematics teaching. Recommendations for enhancing professional learning opportunities for teacher educators are offered.

Keywords: teacher educators; Ghana; practicum; mentors, learner-centered methods; learner-centered pedagogy, teacher preparation in sub-Saharan Africa
Introduction

Teacher education reforms in sub-Saharan Africa have a history of targeting the preservice curriculum to improve its influence on classroom practice (Akyeampong & Lewin 2002; Dembélé & Miaro 2003; Dembélé & Lefoka, 2007; Lewin & Stuart, 2003; Moon, 2007; Mtika & Gates, 2010; Mulkeen 2010; Pryor, Akyeampong, & Westbrook, 2013; Schwille & Dembélé 2007; Thomas, Thomas & Lefebre, 2014; Vavrus & Bartlett, 2012; Vavrus, 2009). The aim is to reform the historically common teacher-centered teacher education curriculum by introducing a model in which learner-centered pedagogy is used to improve teaching and learning in schools. Teacher education in sub-Saharan Africa (SSA) has been also criticized for not providing enough opportunities for pre-service teachers to learn teaching in the context of real classrooms, thus limiting the impact that it can have on classroom practice (Lauwevler & Akkari, 2015; Mulkeen, 2010). To address this problem, Ghana has implemented a teacher education reform since 2004 to incorporate practicum into teacher education programs.

Researchers have argued that despite the structural changes to teacher education in Ghana that brought in practicum, learner-centered pedagogy has not become embedded in pre-service teachers’ classroom practice (Adu-Yeboah, Kwaah, Abreh, & Amuah, 2014; Akyeampong & Lewin, 2002; Akyeampong, 2003). Some researchers have suggested that the problem might be related to teacher educators’ practice (Stuart, Kunje, & Lefoka, 2000). However, no prior studies have conducted an in-depth analysis of teacher educators’ practice and vision of good teaching to understand ‘why’ teacher-centered teaching approach persists even if the teacher education program structure and curriculum have been modified to incorporate practicum and learner-centered pedagogy. In this study, I draw on data from the Ghana component of the Teacher Preparation in Africa (TPA) research project to explore answers to these issues. The TPA is an international study of teacher education practices in
six African countries—Ghana, Kenya, Mali, Senegal, Tanzania and Senegal, conducted from 2009 to 2011 and funded through a research grant from the Flora and Hewlett Foundation in the United States.

Based on the analysis, I argue that in the Ghanaian context, teacher educators continue to practice teacher-centered instruction while emphasizing the use of teaching and learning materials (TLMs) and small group activities as representing innovative methods to change the traditional teaching characterized by rote-learning, chorus responses, and copying and imitation. Furthermore, teacher educators do not see the importance of understanding the classroom contexts based on the premise that teacher-centered approach can be practiced regardless of the classroom contexts. Since 2004, Ghanaian teacher education reforms have contributed to this situation by emphasizing activities that could be used in learner-centered pedagogy, but not the principle - that knowledge should be co-constructed between the teacher educator and pre-service teachers, instead of transmitted from teacher educators to pre-service teachers.

The hierarchical relationship between teacher educators and teachers in schools acting as mentors is another barrier to learning from real classroom practice. As teacher educators in the tertiary system, they are perceived to have superior knowledge about teaching. Although a model of teacher education that incorporates practicum at school has been introduced to raise the value of learning from real classrooms, the hierarchical relationship prevents teacher educators from engaging with and valuing the knowledge of experienced school teachers who are expected to support pre-service teachers in their learning in real classrooms.

I explore these issues by focusing on teacher educators’ practice and vision for educating pre-service teachers to teach mathematics in the early primary grades (Grades 1 to 3). The focus on early grade mathematics is informed by concerns about the poor quality of mathematics teaching and learning in the first three years of basic education in Ghana, and
other African systems (T-TEL, 2015; World Bank, 2004). According to a recent study, African primary teachers are still failing to improve students’ success in learning mathematics (Bethell, 2016).

Although the research upon which this article is based focused on the Ghanaian context, the insights generated are likely relevant to teacher education in other African contexts, both those included in the TPA project, and elsewhere where similar concerns have been raised (see Akyeampong, Lussier, Pryor, & Westbrook, 2012; Lauwevier & Akkari, 2015; Mulkeen, 2010).

Specifically, the investigation addresses the following questions:

1. What characterizes teacher educators’ approaches in teaching primary mathematics methods courses in Ghana?
2. What characterizes the vision of good teaching held by these teacher educators?
3. What explains the teacher educators’ practice and vision of good teaching?

The next section briefly describes the background and goals of teacher education reform in Ghana. This is followed by a brief discussion on key issues of learning to teach in real classrooms in Africa and its significance for teacher educators’ practices. Next, I describe details of the methods used to collect observation and interview data, before discussing the findings. The paper concludes with a discussion of the study implications for improving teacher education in Ghana, and a call for further research into teacher educators’ practice in the sub-Saharan Africa context.

**Teacher Education Reform in Ghana**

Ghana has 38 government funded teacher education colleges for educating pre-service teachers to teach in primary and junior high schools (grades 1 to 9). The training for teaching in senior high schools are offered by two public universities. Seven of the teacher education
colleges educate female teachers only, one is an all-male technical-oriented college, and the remaining 30 are co-educational. The Diploma in Basic Education (DBE) is the minimum professional qualification for teaching in the basic school system in Ghana. The DBE is offered through three routes. This article focuses on the traditional three-year residential program offered by all the colleges of education. This program is designed for pre-service teachers who have completed secondary education and have no previous teaching experience, although in this study, about 23 percent of pre-service teachers had a few months to one year of teaching experience.

Teacher education in Ghana came under the spotlight for reform in the 1990s after being criticized by policymakers and reformers that it overemphasized subject content knowledge at the expense of pedagogical content knowledge (Awuku, 2000). A National Commission on Teacher Education weighed in with its evaluation of teacher education in the 1990s by arguing that:

“[Teacher Education Colleges] are inefficient in producing effective teachers since the trainees (pre-service teachers) and the tutors (teacher educators) have so little exposure to actual schools and classrooms, and academic content is taught and tested above practical teaching methodology.” (Ministry of Education, 1993, p. 23, parentheses added by the author)

In 1995, the UK’s Department for International Development (DFID), then the ‘Overseas Development Administration’ (ODA), provided technical assistance and funding to reform the curriculum of teacher education in Ghana. The Junior Secondary School Teacher Education Project (JUSSTEP), as it was known, aimed to change what it described as the highly didactic and teacher-centered approach in teacher education colleges, to a program that embedded learner-centered approaches in teacher education pedagogy (Ghana Education Service/Teacher Education Division, 1993). Through professional development workshops,
teacher educators were introduced to learner-centered methods such as small group work, group discussions, investigations, problem-solving activities as methods through which students’ understanding of the subjects could be deepened. In mathematics, for example, the workshops introduced teacher educators to the use of mathematical investigations, problem-solving activities and TLMs, to foster small group work and discussions to enrich student learning of the subject (Ghana Education Service/Teacher Education Division, 1993). The idea seemed to be that by using TLMs and engaging in small group activities and discussions, the instructor can practice learner-centered pedagogy (Martin, 1994).

Teacher education reformers from 2004, tackled the problem from a different angle by going for a restructuring of teacher education. The time pre-service teachers spend in residential teacher education was reduced from three to two years, and the third year was devoted to practicum - learning to teach in schools. This was known as the ‘in-in-out’ model. It extended the two blocks of 4-weeks teaching practice in schools to one year of practicum, supervised by teacher educators, but with limited involvement of school teachers. The main purpose of the ‘in-in-out’ model was to “establish a judicious balance between theoretical knowledge and teaching skills; … and produce teachers who can create productive interactive discourse in the classroom” (Institute of Education, 2005, p. 2; emphasis added).

This model, for the first time introduced “on-campus teaching practice” (OCTP) for pre-service teachers to practice teaching methods before going into practicum. The introduction of OCTP was meant to create space for pre-service teachers to practice learner-centered methods through peer teaching before embarking on practicum for classroom experience (Institute of Education, 2014).

Despite the changes, there was still some dissatisfaction with the model because reformers felt that to maximise their professional learning, pre-service teachers needed experience of teaching in real classrooms with school teachers as their mentors (Institute of
Education, 2014). Thus, from 2007 to 2014, the ‘in-in-out’ model was modified, bringing in school teachers as mentors alongside teacher educators. The mentors were expected to mould the classroom practices of pre-service teachers and work with them in areas where they experienced challenges (Adu-Yeboah et al., 2014). However, the OCTP was expanded at this time to balance the level of supervision by teacher educators and practicum was reduced to one semester in the last year.

Overall, these changes seem to fulfill what the 1990 reformers had asked for - to make learning to teach in real classrooms an integral part of teacher education with the hope that what is learned in colleges is not distant from the realities of the Ghanaian classrooms. It also offered the opportunity for both teacher educators and school teachers to work together and support pre-service teachers to maximize the benefits of learning to teach in real classrooms and enhance the effectiveness of teacher education. These changes have shaped teacher education in Ghana into its current form.

The latest teacher education reform which started in 2015 is the Transforming Teacher Education and Learning (T-TEL) reform. Funded by the UK’s Department for International Development (DFID), T-TEL places emphasis on improving college classroom practice of teacher educators through activity-based learning, TLMs, and group work. Underpinning the T-TEL reform is the view that participatory and active learning using TLMs as tools to foster learner-centered pedagogy can impact the quality of practicum (T-TEL, 2016).

Teacher Educators’ Practices and Learning to Teach in Real Classrooms in Africa
In the late 1990s, the UK’s Department for International Development (DFID) funded the Multi-Site Teacher Education Research (MUSTER) project – a five-country study of teacher education in Ghana, Malawi, Lesotho, South Africa and Trinidad and Tobago, which
explored the content and process of learning to teach in teacher education institutions. It revealed that, the teacher education reforms had not produced commitments in pre-service teachers to adopt learner-centered methods in real classrooms (Akyeampong, 2003; Akyeampong & Lewin, 2002; Lewin & Stuart, 2002). Lewin and Stuart (2002) argued that the problem was with teacher educators not modelling learner-centered teaching in the context of real classrooms. Instead, their “trainees were told about how to handle primary classes, and occasionally shown, through a demonstration lesson, … but were seldom given first-hand experience to use the [learner-centered] methods in real classroom teaching” (Lewin & Stuart, 2002, p. 76, emphasis added by the author). They argued that this was “an example of an ‘applied theorist’ approach, in that students were presented with the concepts as though this model of [learner-centred] teaching could be used regardless of context, rather than being presented as a set of guiding principles … developed and modified in classrooms” (Lewin & Stuart, 2002, p. 128).

Mulkeen’s (2010) analysis of teacher education in Anglophone Africa from case studies in Eritrea, Gambia, Liberia, Lesotho, Malawi, Uganda, Zambia and Zanzibar, cites evidence to make a similar argument. Synthesising evidence from these case studies, he argues that, “teaching methods and assessments used in teacher education colleges do little to provide models of good pedagogical practice developed in the context of real classrooms” (p. Mulkeen, 2010, p. 89). More recent analyses of teacher education in Ghana, Mali, Kenya, Senegal, Tanzania and Uganda also reached a similar conclusion (see Pryor at al., 2013).

After the teacher education reform in Ghana that integrated practicum since 2004, but before the new T-TEL reform in 2015, the T-TEL study quantitatively measured 276 teacher educators’ usage of student-centered teaching strategies by observing their lessons. The results showed that only 43 tutors (16 percent) demonstrated the use of interactive learner-centered methods, such as students engaged in whole group discussions and group and pair
work to co-construct knowledge and skills for teaching. However, no explanations were offered as to why so many teacher educators were not using these methods as the study did not interview teacher educators to examine their perceptions and understanding of learner-centered methods.

In summary, while the importance of closely examining teacher educators’ practice and vision of effective teaching has been pointed out (Stuart, Kunje, & Lefoka, 2000; O’Sullivan, 2010) and general quantitative assessments of their teaching approaches have been conducted, no previous studies have qualitatively explored the nature of teacher educators’ practice and vision of good teaching of primary mathematics. Policymakers have also mainly focused on the structural changes in teacher education through curriculum reforms, overlooking the critical role of teacher educators in improving pre-service teachers’ learning opportunities to adapt learner-centered pedagogy in their future classrooms until recently. This study fills the knowledge gap by not only examining the nature of teacher educators’ practice and vision of good teaching of primary mathematics, but also by discussing why their practice and vision persist despite the structural changes in teacher education programs in Ghana.

The Study – Sample and Methods
The TPA project in Ghana gathered quantitative survey and a range of qualitative data from four teacher education colleges between 2010 and 2011 (see Adu-Yeboah [2012], for a full account). The team of researchers were drawn from the Faculty of Education at the University of Cape Coast in Ghana and researchers from the University of Sussex in the UK. The four case study colleges – two in the Ashanti Region and the other two in the Central Region of Ghana – follow the same national curriculum and assessment procedures for certifying all primary and junior high school teachers. Eight mathematics teacher educators
(one female and seven male) with college teaching experiences ranging from 8 to 20 years participated in the study. The gender composition and the college teaching experiences in this sample represent the typical teacher educators across the country. Four TPA researchers working in pairs observed each teacher educator teach two mathematics methods or demonstration classes. A semi-structured observation guide was used to describe the structure and content of each lesson, noting the specific characteristics of the lessons, how pre-service teachers were introduced to group work and other activities to teach mathematics concepts. After each observation, researchers compared and discussed the data before reaching consensus on the key features of each lesson including critical incidences supported with concrete examples.

This was followed with interviews with teacher educators to explore their perceptions of good primary mathematics teaching and how their methods classes tried to emulate their vision of effective teaching and learning of primary mathematics. The interviews also explored their preparation for the job – where they had acquired their knowledge and experience of teaching pre-service teachers how to teach primary mathematics. Each interview lasted about 45 minutes. Focus group interviews were also conducted with 34 pre-service teachers who had completed their practicum and taught by the eight teacher educators from the four colleges. The main purpose of these focus group interviews was to explore pre-service teachers perspectives on teacher educators’ college lessons and reflections on some of their practicum experiences.

Data collection was conducted over 5 months in 2010 with qualitative data from interviews and focus groups transcribed and imported into the Nvivo qualitative data analysis software along with summaries of observations. The data were coded using a system of hierarchical categories that enabled patterns to be identified and further queries to be run. For this article, I focused on the part of the data dealing with teacher educators’ instructional
practices and their understanding of good primary mathematics teaching. I also included the focus group interview data to explore pre-service teachers’ views on practicum experiences especially in relation to their practice of the methods of teaching acquired from the college methods courses in primary mathematics. The data were used to draw attention to possible conflicts that might arise between college based teacher education and learning to teach in real classrooms.

It soon became clear from the data that teacher educators’ approaches in mathematics method courses for lower primary grades were very similar across the four colleges, so a cross-case analysis identified examples that were typical across the four college sites. A possible reason for this level of consistency with teacher educators’ practice across the four colleges may be from the similarities in their professional backgrounds – they had all earned their teaching qualification from two public universities in Ghana which are the only programs in the country that train teachers to teach in senior high schools. One teacher educator had only a Bachelor of Education Degree in Mathematics Education, six had both a Bachelor of Education Degree and a Master of Education Degree in Mathematics Education, and one had a Bachelor of Education Degree in Mathematics Education and a Master of Science Degree in Mathematics.

Their degrees qualified them to teach pre-service teachers, but none of them had been specifically trained as teacher educators. School teaching experience is not a pre-requisite for becoming a teacher educator in Ghana, although most teacher educators in Ghana would have taught at the junior high school level prior to their university education (Akyeampong, 2003). Out of the eight teacher educators, three of them were initially trained to become a primary or junior high school teacher, but had about 5 years teaching experience at junior high school and none at primary school level prior to their university education. Thus, the teacher educators in this study would have had to rely mostly on the national curriculum on teacher
education and their learning experience from their mathematics education methods courses on secondary level mathematics to teach pre-service teachers. The national curriculum on teacher education prescribes what should be taught in teacher education colleges and how to prepare pre-service teachers for primary and junior high school (Institute of Education, 2005). Learner-centered pedagogy is not specifically taught as a topic in the national teacher education curriculum. The expectation is that teacher educators would embed learner-centered approaches in teacher education pedagogy (Akyeampong, 2003, Institute of Education, 2014).

The mathematics methods courses they had taken at the universities would include topics such as, methods of teaching and learning mathematics (emphasizing problem-solving activities, TLMs), assessment methods, curriculum studies in mathematics, and some university-level mathematics courses from either the Departments of Mathematics and/or Mathematic Education. All the programs focus much more on the study of advance mathematics topics. For example, the 4-year B.Ed. program offers courses in the study of advanced topics in mathematics which takes up approximately 64% of program time and only about 36% of instructional time reserved for Education courses, including methods of teaching mathematics in secondary schools. The program offers an average of eight weeks of practicum in secondary schools (Akyeampong, 2005). These methods courses do not separately address the principles of learner-centered pedagogy as a topic or thematic issue (Akyeampong, 2005).

Findings

Teacher Educators’ Pedagogical Practices

Teacher educators’ instructional practices were meant to demonstrate to pre-service teachers what good teaching of basic mathematics in primary grades should look like to
produce meaningful learning of the subject. Table 1 shows typical examples of the way the teacher educators in the study structured and organised the primary mathematics methods courses.

The two main characteristics of the teacher educators lessons are: (1) instructor’s use of teaching and learning materials (TLMs) to demonstrate the specific steps of teaching a math concept, and (2) small group activities to practice the steps, not to explore different approaches or discuss students’ possible responses and misconceptions.

[Insert Table 1 here]

The examples from College C and D illustrate the typical way in which the instructor uses the TLMs, often starting with a demonstration to illustrate the concept. In the example in College C, the instructor used a fraction board, Cuisenaire rods and folding strips of paper to explain the concept of fractions. This is followed with an example of addition of simple fractions with one of the TLMs, after which pre-service teachers work in small groups to practice. A similar approach is adopted in the teaching of ‘subtraction with regrouping’ in the College D lesson where the instructor used Dienes base ten blocks, bundles of sticks and single sticks and the abacus. In both examples, the instructor summarises the steps to reinforce the procedural knowledge using TLMs.

A consistent practice is the use of small-group activities to give pre-service teachers an opportunity to practice using the TLMs and the steps. In teaching measurement of length in the College B lesson, for example, they work in small groups to repeat the steps to their peers. The instructor checks to see if the steps are being followed in the same way as the demonstration. In the College A lesson, pre-service teachers were asked to describe the four steps of teaching the properties of solid shapes, taught by the instructor. The time spent on small group discussions varied from 7 minutes in College A to 27 minutes in College B. , but
all of lessons involved small-group activities for the purpose of practicing the steps of instruction or the use of TLMs.

Small-group activities were not used to explore different approaches or discuss students’ possible responses and misconceptions in large classes with limited resources in real classroom contexts. None of the methods lessons as shown in Table 1, involved a discussion or critique of different methods for enhancing students’ understanding of the mathematics concept. The instructors also did not draw attention to how these same activities are to be handled where TLMs are either in short supply or unavailable, both of which are a common occurrence in Ghanaian classrooms.

The approach used by the teacher educators essentially isolates core teaching activities with an emphasis on routinized behaviours and not reflective practice (Akyeampong et al., 2012; Mulkeen, 2010; Stuart & Lewin, 2002). Kennedy (2016), points out that the ‘core teaching activities’ approach, which partitions teaching into steps of activities including planning, setting objectives, demonstrating, assigning work, is an old model of learning to teach developed as far back as the late 1920s, and was based on the idea that teaching practices should be partitioned based on what ‘good teachers’ do. To produce ‘good teachers’, teacher education had “to find a way to identify common teaching activities independent of students, settings, and subjects … nothing is said about why teachers did any of these activities, how it contributed to a larger goal or the overall process called ‘teaching’” (Kennedy, 2016 p. 7; emphasis added). It reflects what could also be described as a ‘technicist’ approach “in which teaching (is) seen as implementation of set routines and formulas for behaviour, unresponsive to the distinctive attributes of either clients or curriculum goals” (Darling-Hammond, 2016, p. 86).

In reality, the principles of learner-centered pedagogy are not modeled in these methods courses as the instructors rarely give pre-service teachers the opportunity to explore
students’ possible responses and understanding or to question, critique or develop alternative methods in the light of what realistic classroom contexts might present.

Teacher Educators’ Vision of Good Teaching

Interviews with teacher educators after the lessons revealed that they believed that their approaches demonstrated innovative practice because of the inclusion of TLMs and small group activities. They perceived that what these methods were meant to do was to discourage traditional teaching such as rote-learning, chorus responses, and copying and imitation, but not necessarily to replace or diminish teacher-centered instructional practice. The following interview shows the teacher educator’s belief in teacher-centered instruction to promote what he called a “discovery method”:

*Interviewer:* Which methods do you think are appropriate for teaching mathematics at the lower primary?

*Teacher Educator:* It needs to be the discovery method … but also involve teacher-centered activity. For example, I did the demonstration by showing them one example, then they follow it with two or more examples to come out with their finding having gone through the activity where everything is child-centred.

In this particular case, the “discovery method” was perceived as being promoted through a teacher-centered approach to allow pre-service teachers follow the method using different examples to discover that they all reach the same conclusion (finding) as the instructor’s demonstration. This perception reveals what could be described as “a sense of knowledge as predetermined to be discovered, with the teacher’s role being to facilitate the discovery of a body of authoritative knowledge” (Vavrus & Bartlett, 2012, p. 647).
Teacher educators believed that giving pre-service teachers opportunity to experiment or work in groups using TLMs to reach the correct answer represented a major departure from the traditional teaching. The teacher educator in College C explained:

*Teacher Educator:* Children learn mathematics better when they work in groups … [through] group play. You see them putting things together and you see them sharing things. As I was doing in my teaching, when you have explained the concept, you should give them chance to show that they understand by using concrete objects, [referring to the use of Cuisenaire rods to demonstrate addition of fractions – example in College C, (Table 1)]

This, and other similar statements, indicated teacher educators’ desire to show pre-service teachers how to use TLMs and small group activities to promote students’ understanding of basic mathematics concepts. However, they did not see the importance of giving pre-service teachers an opportunity to reflect, analyse, critique teaching in order to fully understand how a specific method would work for teaching their future students in real classroom contexts.

Teacher educators’ vision of good primary school teaching was also linked to ‘mistake-free’ lesson plans - which meant following a prescriptive lesson delivery structure that had no room for reflection and change as this teacher educator in College A explained:

“We train them on how to prepare lesson plans, stressing that every plan *should* go with materials because we know that at the end of their training they will be going to teach in schools, so teaching and learning materials *should* correspond to each mathematics topic, if they are to teach well. We give them assignments, to prepare lesson plans for us to mark, … to see whether they are doing the *right thing* before they start the on-campus teaching practice.” (emphasis added)
Two of the teacher educators recognized that pre-service teachers do not necessarily follow this advice in real classrooms – a recognition which appears to be a puzzle to them:

“… when we look at their lesson plans [in schools during practicum], you find that what they learn in college is really not what they do there. It is only when you are going to supervise and you care to go through the lesson plan that you see that some things are not like what you taught them. So, it means they copy [teachers in the class]. The problem is that even after they’ve gone through the training itself, they put these things aside and then make use of what the teachers on the field are using. So, this has been a problem.”

This view shows that teacher educators believe that they taught innovative practice using TLMs and small group activities that changes the traditional method of copying, but pre-service teachers failed to follow them in classroom settings for some reasons they are not aware. Perceiving what school teachers do in the classroom as ‘the problem’ did not seem to invite a critique and reflection on the college method of planning lessons, and why it had been rejected and instead school teachers approach copied.

**Explaining Teacher Educators’ Practice and Vision**

To better understand the teacher educators’ practice and vision, the researchers asked them how they learned and developed their practice of educating pre-service teachers to teach. The teacher educators explained that they had developed their practice from a range of sources, college textbooks, more experienced colleagues, professional development workshops, but mainly from the national curriculum and math education methods courses they have taken at universities. They recognised that their university methods courses were sometimes inadequate for teaching pre-service teachers in the colleges, as these two teacher educators explained:
“Actually the training I received from my university courses did not help me very much to teach the methods ... \textit{it only gave you strategies but circumstances change,} so you have to find more when you get here [college] ...” (Teacher Educator, College A. Emphasis added)

“At times the topics [curriculum content] you’ll go through at that level [University] will be different from what you encounter when you come to teach in the college. The best you get are some \textit{general strategies} as to how to go about it” (Teacher Educator, College B. Emphasis added)

According to the teacher educators, university mathematics methods courses focused on teaching problem-solving skills in mathematics, using concrete materials and hands-on activities to teach concepts. This is likened to learner-centered pedagogy because of the element of practical activities. They had come away from these methods courses with the idea that, ‘active construction of meaning’ (Hopkins, 2002), occurred when TLMs and activities are used to reconstruct pre-determined steps and procedures for learning mathematics concepts. The teacher educators appear to apply the same mindset when they teach methods courses and supervise OCTP and practicum, presenting themselves as authority. It is consistent with the way their university mathematics methods courses had generally introduced them to ‘effective’ teaching of the subject, as this teacher educator explained:

“... the course [university methods courses] teaches the importance of activities, investigations, and how you the teacher has to use activities to teach them [students] the concepts ... going step by step” (Teacher Educator in College A)

This focus on using activities, small group discussions, and TLMs has also been promoted by Ghanaian teacher education reforms - from the JUSSTEP reforms in the 1990s and more recently, the 2015 T-TEL reforms described earlier. What is lacking in the teacher
education reform and university methods courses is the development of learner-centered pedagogy shaped by insights from real classroom contexts. This gap means that, the opportunity to raise critical questions about methods and to understand how classroom diversity makes the case for responsive and flexible methods rather than authoritative prescriptive methods without questioning, is missed by teacher educators.

In the Ghanaian context, however, the hierarchical relationship between teacher educators and mentors might limit such learning and consequently leave teacher educators’ practice and vision unquestioned. This hierarchical relationship enforces the teacher educators’ practice and vision as it does not give space to question their practice and vision based on what works in real classrooms. The hierarchical relationship between teachers and students was also pointed out by Vavrus and Bartlett (2012) as a challenge for practicing learner-centered pedagogy in Tanzania. The data presented here extend this finding to show that this hierarchical relationship also exists between teacher educators and school teachers, teacher educators and higher authorities (i.e. the national curriculum, university methods courses).

Such hierarchical relationship was evident in the structure of practicum. In theory, teacher educators and school mentors are expected to work collaboratively, sharing their expertise and knowledge to supervise and support pre-service teachers. In practice, however, there is a division of labor. Mentors guide the pre-service teachers in their lesson preparation and teaching while teacher educators’ attention is mostly focused on summative assessment of the pre-service teachers’ teaching (Adu-Yeboah et al., 2014).

Before the onset of practicum for all teacher education colleges, including the four colleges in the study, mentors are given training in mentoring in the colleges to ensure consistency in the delivery of the service. However, this training often amounts to an orientation on the procedures and processes of mentoring using benchmarks of ‘good
practice’ set by the teacher education colleges (Adu-Yeboah et al., 2014, p. 45). It is likely that teacher educators would use such occasion to not only teach the teacher education colleges’ benchmarks of good practice, but also their vision of good teaching, which they perceive that school teachers need to learn. Teacher educators in Ghana hold a higher professional status than school teachers because of their higher qualifications and positions in tertiary institutions, which lead them to emphasize their distinction from the school teachers (mentors) they are expected to collaborate with, and in effect, reinforce the hierarchical relationship between them.

This hierarchical relationship was also evident when pre-service teachers spoke about differences in the expectations between teacher educators and their mentors on good teaching. Third-year pre-service teachers in focus group discussions, often described situations where mentors would defer to teacher educators when it comes to judging the appropriateness of a teaching method or strategy. This would suggest to them that the views and experiences of mentors did not count as much in evaluating good teaching, as these views from focus group interviews suggest:

“All our mentors show us how to improve … sometimes telling us to use simple words, … get the pupils who are weak to work with the ones who are strong to learn from them, …[but] our tutors when they come to supervise us want to see whether you are putting into practice what they taught us, whether the lesson is following the sequence, whether you have used TLMs …”

“We have to listen to them [teacher educators] because they award the marks for our teaching practice. At the end of the day, it is what they say which is important”

From the account of the pre-service teachers, the teacher educators’ focus during the practicum was on checking whether they were implementing the methods they had learned. This division of labour in the supervision of pre-service teachers coupled with the
hierarchical relationship between teacher educators and school teachers leaves teacher educators’ practice and vision of good teaching unquestioned. This situation likely undermine the contribution of mentors and who may also undervalue their own wisdom of practice, especially if they weigh this against the vision of good teaching espoused by teacher educators. Some pre-service teachers spoke openly to researchers about pedagogical conflicts and challenges in real classrooms suggesting they were beginning to develop a sense of the limitations of the methods taught in college. However, even if some pre-service teachers chose to do what mentors do, this does not resolve the conflict unless teacher educators are willing to engage and not dismiss mentors’ wisdom of practice.

In summary, the hierarchical relationship deeply rooted in teacher education programs and schools among teacher educators, pre-service teachers, and school teachers seems to reinforce the teacher educators’ practice and vision of good primary mathematics teaching using TLMs and small group activities. The result is that teacher educators themselves do not question what they learned from the national curriculu, university methods courses, college textbooks, and senior colleagues. They are also less likely to take a cue from pre-service teachers’ inability to apply what they taught them in classrooms during practicum to reflect and revise their practice and vision.

**Conclusion and Implications**

Policy makers and researchers often make the assumption that the teacher education reform of incorporating practicum would provide better learning opportunities for pre-service teachers to learn how to practice learner-centered pedagogy in real classroom contexts. This study has revealed that teacher educators’ practice and vision of good teaching continue to influence pre-service teachers’ practice despite the incorporation of practicum. This points to the importance of understanding teacher educators’ role in improving pre-service teachers’
instruction. As this study shows, teacher educators’ approaches to teaching primary mathematics retain its didactic nature even when the aim is to teach learner-centered methods. Their vision of good teaching is not based on deep knowledge of what it is like to teach in primary schools because it excludes knowledge derived from critical and reflective dialogue with pre-service teachers and mentors. Instead, it is drawn mainly from their university methods course, college textbooks and the experience of senior colleagues. This usurps the intention of practicum which instead comes to stand for an opportunity to determine whether pre-service teachers have implemented the ‘innovative teaching methods’ as they were taught.

The teacher educators in our study generally perceived that they are introducing innovative teaching methods that incorporate TLMs and small group discussions to change the traditional teaching methods such as rote-learning, chorus responses, and copying and imitation. However, their belief that innovative teaching should be teacher-centered in which the instructor demonstrates before students practice with TLMs through small group activities to discover that they all reach the same conclusion, means they do not realize the importance of understanding real classroom contexts. For them, teacher-centered innovative methods can be taught to any classroom regardless of the contexts. This is because their vision of good primary mathematics has not been subjected to critical inquiry in a way which can transform it.

The good news is that teacher education in Ghana is moving in a direction similar to many countries in the world to bring college-based training closer to school-based training (e.g. in the United States, Zeichner 2013). However, from the evidence presented in this study, the ‘in-in-out’ teacher education model incorporating practicum needs to be accompanied with a paradigm shift in teacher educators’ practices of teaching methods courses and their visions of good teaching. Kennedy (2016) argues that, “reasoning about
practice, rather than … prescribing a set of practices for (pre-service teachers) to adopt”, (Kennedy, 2016, p. 15), should be the guiding principle in teacher education. A teacher education approach based on reasoning about practice fits well with the principles underpinning learner-centered pedagogy. It creates the conditions for co-construction of pedagogical knowledge and skills where teacher educators, school mentors, and pre-service teachers subject their teaching methods to critique and analysis to promote reflective practice. Such an approach allows the classroom context to play an important part in pedagogical choices, and allows pre-service teachers to give more thoughts and attention to the development of appropriate teaching approaches (Zeichner & Tabachnick, 1999).

In the context of the ‘in-in-out’ teacher education program incorporating practicum in Ghana, however, the impact of the hierarchical relationship poses a significant challenge. To reduce the effect of this relationship, the first step would be to identify experienced and effective school teachers and raise their professional profile so that teacher educators feel it is worth engaging them to co-construct effective teaching based on principles of learner-centered pedagogy. Every year, through a rigorous selection process, many Ghanaian teachers are selected as ‘best teacher award’ winners across all districts and regions, and their innovative practices are often documented by the Ministry of Education (e.g., Ministry of Education, Youth and Sports, 2003). Through professional development, teacher educators could study these practices to sensitise them to their perspectives. Evidence from research on experienced school teachers’ practices in Ghana suggests some have the capacity and experience to articulate constructivist approaches to teaching and learning, under real classroom conditions where they have to balance many pressures, including teaching large classes with limited resources (Akyeampong, Pryor, & Ampiah, 2006).

Changing teacher educators’ practice and vision of good teaching considering the existing hierarchical relationship will have to start with bringing their own professional
development much closer to the real classroom context. The goal would be to focus their professional learning on the practice of experienced and effective school teachers through a collaborative and inquiry-based approach. The National Teaching Council (NTC) established in 2014 is legally mandated to accredit teacher education programs in Ghana (Ghana Education Service, 2015). Given this role, the NTC will be the right institution to make this an important requirement for accrediting teacher education programs.

Through analyzing learner-centered methods in the environment of real classrooms incorporated into professional development activities, teacher educators in collaboration with experienced and effective teachers may be able to subject their teaching methods to critical reflection and change. The value of this approach is the space it can create for the knowledge and experience of school mentors to be valued as a resource for learning to develop context-sensitive learner-centered pedagogy.

This study is based on a small number of teacher educators from four colleges and therefore the findings are not applicable to all teacher educators in Ghana. However, it is clear that teacher educators’ practice and vision of good teaching play a critical role in shaping learning opportunities of pre-service teachers, and teacher education reform will not succeed without reforming the way teacher educators learn to teach pre-service teachers.

More research is needed to understand the practice and preparation of teacher educators in the African context in order to improve the quality of teaching and students’ learning opportunities in classrooms. This study also calls for teacher education reformers in Africa to give more attention to the preparation and practice of teacher educators. The studies on the preparation and practice of teacher educators is still limited in the teacher education literature around the globe (Knight et al., 2014). This study provided some preliminary findings in the context of Ghana that could serve as the basis for further research and policy attention in African countries and elsewhere.
Notes

1 The other two routes are the four-year distance learning program and the two-year sandwich program. The four-year distance learning program is for middle and secondary school leavers employed in schools as untrained teachers and who lack the necessary entry qualifications for the three-year program. The third type of program is the two-year sandwich program which started in August 2007 for practicing teachers with the outdated post-secondary teachers’ certificate and who are required to upgrade their qualification to a diploma status. These teachers attend two intensive summer residential courses over the two-year program (Adu-Yeboah et al., 2014).
References


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