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Student Teachers' Critical Thinking Beliefs and Abilities in South and East Africa: Transitioning From Quantitative Description to Qualitative Implications for Social Change⁷

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Abstract

This study examines student teachers' beliefs, self-efficacy, and abilities in teaching and learning critical thinking. Data from 3,877 participants, gathered through questionnaires and modified critical thinking and self-efficacy tests, were analysed to transition from quantitative to qualitative insights. The findings reveal that while student teachers support the value of critical thinking, many struggle to identify effective methods for its development, and most exhibit below-average or average critical thinking skills. The study suggests that teacher education programmes should intentionally teach critical thinking strategies, address gaps between beliefs and practices, and enhance self-efficacy—all within the broader context of education for social change.

Keywords: critical thinking, self-efficacy, learning, beliefs, pedagogy, student teachers

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Introduction

Social constructivist theory has led to a focus on teachers' thought processes, which create their idiosyncratic socially constructed beliefs about teaching and learning. These beliefs in turn, shape their teaching practice (Stipek et al., 2001). While there is little empirical evidence that teacher education changes teachers' beliefs, and little is understood about the processes leading to a change in teachers' beliefs (Levin, 2015; McKeown et al., 2016), there is abundant evidence that the "apprenticeship" they receive during their own schooling and through observation of the school culture they end up teaching in has a great effect on their beliefs (Lortie, 1975; Valcke et al., 2010). There is also evidence that by getting teachers to reflect on their teaching and learning beliefs, they become more aware of the meaning and impact of these beliefs on their classroom practices (Borg, 2011; Farrell & Ives, 2015).

For decades, there has been a movement towards emphasising critical thinking approaches at all levels of education curricula (Alsaleh, 2020; Ennis, 2011). Teaching critical thinking is important because it is a cognitive skill that promotes situational analysis towards developing effective solutions to complex problems where solutions are not always apparent. Critical thinking is a

mechanism for individuals to make inferences, question assumptions, make deductions, draw conclusions, challenge beliefs, and evaluate arguments objectively. In short, critical thinking is reasonable, reflective thinking that is focused on deciding what to believe or do (Ennis, 2011). These skills have become increasingly important in terms of 21st century skills and living in an age of digital communication, information, and artificial intelligence.

Although critical thinking has become an important objective of most educational approaches including recent curriculum changes in school-level curricula in East Africa (Ongesa, 2020), antithetical teaching and learning approaches to critical thinking, namely when children are made to repeat back what the teacher or textbook says, learn to follow the correct steps in the correct order to get the correct answer, do classrooms drills, and memorisation, have unfortunately been the experiences of the authors of this article and others in South and East African schools (cf. Abd-Kadir & Hardman, 2013; Namwambah, 2020). There are also many reports of similar first-hand experiences from other teacher educators when visiting African schools across national contexts, suggesting that such antithetical approaches may still be prevalent in many schools, despite revised curricula that promote critical thinking (Nsengimana et al., 2020; Ongesa, 2020).

In resource-poor schools and communities, rote teaching is particularly disadvantageous because learners must rely on teachers more than in resource-rich environments that provide textbooks and digital and other learning resources. Given the poor education outcomes in sub-Saharan Africa, Dembélé and Lefoka have identified the need for a pedagogical renewal, which they defined as the “planned qualitative change towards a desirable teaching practice” (2007, p. 534). Teacher education and professional development are regarded central in promoting pedagogical renewal, which is seen as a complex process in which many stakeholders need to be involved (Dembélé & Lefoka, 2007). The introduction of the Competence-Based Curriculum in East Africa can be regarded as such an effort towards a pedagogical renewal, focusing on learner-centred teaching strategies and skills development for the 21st century (Ennis, 2011).

For any school-based change to be implemented, the self-efficacy beliefs of the teaching staff are critical. Self-efficacy is the belief in one's capacity to execute a specific behaviour (Bandura, 1997) and is positively related to academic achievement (Zimmerman, 2000). Similarly, the ability to teach critical thinking and teacher self-efficacy are closely related. Teacher self-efficacy refers to a teacher's belief in their ability to impact student learning outcomes (in this case, critical thinking). The ability to teach critical thinking refers to the teacher's pedagogical skills in teaching

students how to think critically, which, in turn, is related to their beliefs about how something should be taught. When teachers have a strong sense of self-efficacy and positive teaching and learning beliefs, they are more likely to believe that they can effectively teach critical thinking skills to their students. This belief can lead to increased efforts to improve their teaching skills, seek out professional development opportunities, and implement evidence-based instructional strategies that foster critical thinking. Conversely, when teachers lack self-efficacy, they may doubt their ability to teach critical thinking and may avoid attempting to teach these skills altogether. This may lead to a lack of focus on developing critical thinking skills among students and missed opportunities to enhance their pupils' cognitive development.

Curriculum change is a feature of education. Competency-based curricula (CBC), grounded in Bloom's Taxonomy of learning objectives, have recently been designed and implemented in Kenya, Tanzania, and Uganda. CBC was first introduced in Tanzania in 2015 and revised in 2024, and in Kenya and Uganda starting in 2017. A partial underpinning *raison d'être* was to move school-going children from rote memorisation towards critical thinking. Even though there has been opposition to CBC in East Africa, mainly based on the fact that most schools lack resources and infrastructure, that classrooms are overcrowded, that there has been insufficient teacher training and lack of consultation with stakeholders, and that CBC ignores communal values and traditions in African societies, CBC has nevertheless been implemented. Teacher training curricula in higher education institutions have naturally followed suit.

The reason why East and South Africa are specifically mentioned above is the recent curriculum changes that have been made and the fact that this study was funded under the auspices of the DAAD-funded East and South African-German Centre for Educational Research Methodologies and Management (CERM-ESA). This multi-university partnership provided access to student teachers at universities in Kenya, Uganda, Tanzania, and South Africa.

The paragraphs above provide the rationale for this study, namely, that it was designed to investigate student teachers' pedagogical perceptions of teaching and learning practices in terms of critical thinking across five African universities in four countries. Their critical thinking abilities, as an important component of implementing critical thinking, and their perceived self-efficacy in terms of implementing critical thinking, were also investigated. The specific issues for the research project were 1) What are student teachers' critical thinking beliefs in terms of teaching and learning? 2) At what level are the student teachers operating in terms of their perceived self-

efficacy to implement critical thinking when implementing their school curricula? 3) What are these student teachers' own critical thinking abilities?

It is sine qua non that successful teachers of critical thinking can, themselves, think critically. In other words, strong teachers of critical thinking think critically and are, therefore, probably good teachers (as far as critical thinking is concerned). They think critically about their teaching goals, evaluate what they do, determine what they will need, and critically reflect on how and when they should assess their students' progress. Thus, this investigation provides a contribution to understanding student teachers' teaching and learning beliefs, their self-efficacy beliefs in terms of teaching critical thinking, and their personal critical thinking abilities, to gain a better understanding of changes needed in the teacher education programmes of the participating universities.

Design and Methodology

The initial research design was based on a quantitative approach. The findings were then interrogated to move from a quantitative description to qualitative understandings based on the literature reviewed towards framing the implications for education for social change. A questionnaire was developed comprising questions on biographical data, perceptions of critical thinking pedagogy as well as teaching and learning practices, a modified critical thinking test based on the Watson Glaser critical thinking test, and a self-efficacy test based on Enochs and Riggs STEBI-B test. In the case of the Tanzanian participants, the questionnaires were printed, and the results scanned. For the other participating universities, an email invitation to complete the questionnaires was sent to all third- and fourth-year education students at the respective universities, that is, the universities in Kenya, Uganda, and South Africa. The data from the completed questionnaire were then subjected to statistical analyses, which were then interpreted within the framework of critical thinking. An open-ended question with regard to the student teachers' experiences with teaching critical thinking in their own contexts, and particularly the challenges of doing so complemented the closed-ended questions on the questionnaire. In summary, this study was designed to investigate East and South African student teachers' perceptions of teaching and learning practices in terms of critical thinking, their self-efficacy in terms of implementing critical thinking, their own critical thinking abilities as an important component of implementing their school curricula, as well as their immediate experiences in the school contexts they had worked in.

Sample and Setting

As noted above, the student teacher samples were generated on paper and online from third- and fourth-year teacher education students who had a minimum of five weeks of classroom practice at five universities in East Africa and South Africa, namely, Moi University in Kenya, the University of Dar es Salaam in Tanzania, Makerere University and Kyambogo University in Uganda, and the Nelson Mandela University in South Africa. All these institutions have links to the DAAD-funded East and South African-German Centre of Excellence in Educational Research Methodologies and Management (CERM-ESA).

Research Instruments

The questionnaire comprised questions on biographical data, perceptions of teaching and learning pedagogies and practices, a critical thinking test, and a self-efficacy test followed by an open-ended question. The critical thinking test was modified from the free example questions from the Watson Glaser critical thinking test on inferences, recognition of assumptions, deductions, interpretations, and evaluation of arguments. The modifications made were in terms of context where Western-based contexts were converted to African contexts and conditions. Similarly, questions relating to critical thinking self-efficacy were taken from the well-validated and reliable self-efficacy test created by Enochs and Riggs' (1990), namely the Science Teacher Self-Efficacy Beliefs Inventory-B (STEBI-B). This test was also modified to meet the contextual needs of the study, namely that of critical thinking.

Biographical Data

The biographical data generated via the questionnaire included the respondents' country, gender, age, highest qualification, type of school, school environment (city, rural, etc.), language, teaching experience, and training on teaching critical thinking. The participants' responses received on paper and online provided the data for analysis and comparison.

Beliefs on Teaching and Learning Pedagogies and Practices

The questionnaire section on teaching and learning practices included questions on the importance of 11 selected teaching pedagogies that would facilitate or hinder teaching and learning of critical thinking. Specifically, the student teachers were asked to rate the importance of pedagogies like "to listen to your pupils' views and reasons," "to help pupils identify and correct

their mistakes,” and “to make pupils believe your own opinions” when helping them to develop critical thinking. They were then asked to choose the teaching pedagogies they thought were the most and least important to facilitate critical thinking.

In a subsequent section, the student teachers were asked to indicate how often they used nine selected teaching and learning practices presented. These included “encourage pupils to discuss and listen to each other,” “let the pupils answer my questions in chorus,” or “use conflicting information.” Again, they were asked to choose the teaching strategies they thought were the most and least important to facilitate critical thinking. The participants’ responses received on paper and online provided the data for analysis.

Modified Watson Glaser Critical Thinking Test

The Watson Glaser critical thinking test evaluates a candidate’s critical thinking ability in five separate areas, namely, 1) inferences, 2) recognition of assumptions, 3) deductions, 4) interpretations, and 5) evaluation of arguments. In this study, the first free questions in each of the five areas were modified to suit the African context (the core ideas stayed the same) and were presented to the participants.

Self-Efficacy Test

The well-validated and reliable Science Teacher Efficacy Beliefs Inventory–B of Enochs and Riggs (1990) was modified to change the context from science teaching to critical thinking. As with the Watson Glaser critical thinking test, only the context was changed while the underpinning ideas remained the same. The participants’ responses received online provided the data for analysis.

Open-Ended Question

The open-ended question, which was part of the questionnaire, asked the student teachers to share their experiences with regard to teaching critical thinking in their own contexts and what they thought was the biggest obstacle to teaching critical thinking effectively.

Data Generation⁸

After obtaining ethical clearance at each of the participating universities according to their regulations, an email invitation to complete questionnaires was sent to all third- and fourth-year

⁸ Note: The full set of quantitative data is available on request from the first author.

education students in Kenya, Uganda, Tanzania, and South Africa. Response rates were variable, with Tanzanian students at the University of Dar Es Salaam providing the most responses (n = 1,887) followed by the Ugandan students at Makerere University and Kyambogo University (n = 968), Moi University, Kenya (n = 973), and the Nelson Mandela University in South Africa (n = 49).

Data Analysis

Descriptive statistics were used to summarise and describe the demographic characteristics of the study participants, including gender, degree, age, language, teaching experience, and their perceptions of selected competencies. Inferential statistics, such as Welch's F-test was used for the one-way ANOVA analysis, with Games-Howell post hoc tests used to compare the composite mean scores of the importance of learner and teacher-focused teaching methods, facilitation of critical thinking and prevention of critical thinking, self-efficacy and outcome expectancies, and self-reported use of learner- and teacher-focused teaching methods.

Finally, critical thinking scores were calculated for each participant based on their responses to statements on a Watson-Glaser Critical Thinking Appraisal, with mean scores and standard deviations reported for each country. Additionally, a formula was developed to operationalise critical thinking, based on learner- and teacher-based perceptions of methods that promote or hinder critical thinking. The formula was used to calculate scores for each participant, who were then classified as confused thinkers, non-critical thinkers, or critical thinkers. The open-ended question was analysed using thematic analysis.

Results

Demographic Characteristics

The results of the descriptive statistics show that there are variations in the gender, degree, age, and type of students studying to work with young children, learners in secondary school, and adults across the four countries examined. In terms of gender, the percentage of female students was highest in Tanzania. Regarding degree, the vast majority of students have a bachelor's degree in all countries. In terms of age, most students in all countries fall within the 22–25 year-old-age range. Most students in all countries are studying to work with learners in secondary school, except for Tanzania, where a higher percentage of students are studying to work with young children. In terms of English language competency, the majority of students in all countries perceive themselves as very competent or competent in the language. Regarding weeks spent in

school observing and teaching, most students in all countries had spent more than five weeks in observation and/or teaching, with South Africa having the highest percentage of students with more than 12 weeks in classrooms. Finally, the vast majority of students in all countries had taught alone in a real classroom situation, with Tanzania having the highest percentage of students who had taught alone.

The student teachers were also asked, “How strongly has critical thinking been integrated in your study programme?” to reveal the perceptions of whether critical thinking is part of their curriculum and how strongly this competency has been integrated into the study programmes across the countries.

Critical Thinking and Integration in Study Programmes

The findings reveal that the student teachers believe critical thinking has played either a very important or an important role in their study programmes. However, there are differences across countries in the extent to which these competencies have been integrated into study programmes, with Tanzania having the highest percentage of students indicating that critical thinking has played a very important role in their study programme.

Perceptions on Teaching Critical Thinking

The grouping of items related to perceptions on teaching critical thinking, which are categorised into different groups including the importance of learner-focused teaching pedagogies, importance of teacher-focused teaching pedagogies, facilitating critical thinking, and preventing critical thinking across different countries. The specific items that are included in each group are listed, ranging from considering different points of view from pupils to making sure that pupils do not stand out from the rest.

Participants were asked to select one item from the list provided that they perceive to be the most important aspect in terms of developing critical thinking, as well as one item that they believe to be the least important aspect. The most important aspects in terms of developing critical thinking in pupils was "considering pupils' level of understanding when teaching." This aspect was rated as the most important aspect of teaching across all countries.

In all East African countries, the most identified aspect of least importance when teaching critical thinking was “let pupils make mistakes.” Yet, studies have shown that it is an essential component of supporting the development of critical thinking skills to let pupils make mistakes in the process

of learning (Halpern, 2014). When learners are given the freedom to make mistakes, they are encouraged to think independently, take risks, and learn from their experiences. It also refers to a teaching and learning culture and practice that allows for trial-and-error processes, which help to cultivate the learners' critical thinking abilities, allowing them to analyse and evaluate information more effectively.

"Make the pupils believe your own opinion" was rated as least important by few of the Tanzanian respondents as something that indeed hinders critical thinking, but was hardly considered by the South African, Ugandan, and Kenyan students. South Africa identified "Use the method of teacher-centred teaching when you pass your knowledge to the pupils" as the least important factor. In all countries, "Make sure that one pupil does not stand out from other children in the class" was considered as a factor of low importance.

Subsequently, composite scores were calculated using the item groupings and one-way Welch ANOVAs were conducted to compare the importance of learner- and teacher-focused teaching methods across the four different countries. The results revealed a significant difference in learner-focused teaching pedagogies among the countries. Significant differences were found in the importance of learner- and teacher-focused teaching pedagogies between the countries, with South Africa and Kenya having higher mean scores in the importance of learner-focused teaching methods.

Self-Efficacy and Outcome Expectancies

The quantitative results indicated significant differences in self-efficacy and outcome expectancies among countries. South African student teachers had the highest mean scores in both self-efficacy and outcome expectancies, followed by Uganda, Tanzania, and then Kenya.

Self-Reported Use of Learner- and Teacher-Focused Teaching Practices

There were eight items, with two focusing on the use of teacher-focused teaching practices, and six focusing on the use of learner-focused teaching practices. Participants were asked to select one item from the list provided in terms of what they perceive to be the most important teaching practice, as well as one item that they believe to be the least important teaching practice. "Group work" was identified as the most important teaching method in Tanzania and Kenya, whereas South Africa rated "encourage pupils to discuss and listen to each other on the issues that I am teaching" as the most important. "Brainstorming topics with pupils" received the highest rating

in Uganda. Across all countries, group work, encouraging pupils to discuss and listen to each other, and brainstorming topics with pupils emerged as the top three most important teaching methods. The least important teaching method was "letting pupils answer questions in chorus." This method was rated as the least important teaching method across all countries. "Letting pupils repeat the teacher's words" and "using conflicting information" were also rated low.

While answering questions in chorus and repeating the teachers' words are indeed classified as irrelevant when teaching critical thinking, the use of conflicting information is a deliberate tool for making learners analyse arguments. Subsequently, composite scores were calculated using the item groupings, and the one-way Welch ANOVA showed a significant difference in the practices used for teaching among countries. The results of the one-way Welch ANOVAs revealed a lack of clear distinction between learner-focused and teacher-focused teaching practices in some countries (Uganda, Kenya, and Tanzania), suggesting a potential lack of understanding regarding the importance of, and use of, these different methods.

The results indicate that there is variation among countries in their use and understanding of learner-focused and teacher-focused teaching practices as well as their approaches to facilitating and inhibiting critical thinking. South Africa demonstrated the largest differences in mean scores between the importance of learner-based and teacher-focused teaching methods, suggesting a deeper understanding of the use of these different approaches. Similarly, South Africa also demonstrated the largest differences in mean scores between the importance of actions that facilitate versus prevent critical thinking in learners. With regard to self-reported use of learner-versus teacher-focused teaching methods, the largest differences were seen in Kenya.

Operationalising Critical Thinking in the Context of Teaching and Learning

In order to address the conflicting findings regarding the importance of different teaching pedagogies and factors that either facilitate or impede critical thinking in learners, as well as considering self-reported teaching approaches, the present study aimed to operationalise a comprehensive understanding of critical thinking within the context of teaching and learning. The operationalisation is based on comparing learner-focused perceptions of pedagogies that promote critical thinking, and their corresponding perceptions of pedagogies that hinder it, against teacher-based perceptions of pedagogies that hinder critical thinking and actions that prevent critical thinking.

The word statement would be taking the average score from the items “importance of learner-focused teaching pedagogies and facilitating critical thinking” minus average score of the items “importance of teacher-focused teaching pedagogies and hindering of critical thinking.” A positive score indicates that the individual has effectively understood how to foster critical thinking in learners by establishing a clear delineation between teaching pedagogies that promote critical thinking and those that hinder it, and is defined in this study as a “critical thinker” in terms of teaching and learning. On the other hand, a zero score ($\pm 25\%$) indicates an unclear delineation between teaching pedagogies that promote versus hinder critical thinking, and are considered to be “confused thinkers” in terms of teaching and learning of this topic. A negative score implies that the individual favours teaching pedagogies and thoughts and actions that are teacher-based and hinder critical thinking, and are “non-critical thinkers” in terms of teaching and learning.

In Tanzania, some of participants were classified as “critical thinkers with a teacher-focused approach” (i.e. confused thinkers), while in Kenya and South Africa, no participants fell into this category. More than half of the participants in Tanzania and Uganda were classified as non-critical thinkers. For the Kenyan case, half the participants were classified as “critical thinkers with a learner-focused approach,” while many South African participants were classified as critical thinkers with a learner-focused approach.

The results of the classification of participants into critical thinkers, confused thinkers, and non-critical thinkers mostly align with the outcomes of the Watson Glaser critical thinking test. The Watson Glaser test aimed to assess critical thinking abilities in the areas of inferences, recognition of assumptions, deductions, interpretations, and evaluation of arguments. The results of the Watson-Glaser test showed that the participants from Tanzania, Uganda, Kenya, and South Africa scored just lower than the international average.

Challenges and Obstacles to Teaching Critical Thinking in East and South African School Contexts

The quantitative findings presented earlier provide insights into student teachers' critical thinking and self-efficacy beliefs, highlighting some uncertainties regarding which teaching methods and pedagogies support or hinder the development of critical thinking in learners. This section, however, focuses on the teacher education students' experiences and perspectives, offering a foundational understanding for future qualitative research on teaching and learning critical thinking within East and South African schools. The written responses from participants revealed

recurring themes concerning the challenges and obstacles to effectively teaching critical thinking. These challenges primarily centre on the following five aspects.

Learners' Backgrounds

Many learners come from underprivileged families, which limits their exposure to experiences that foster critical thinking. Related obstacles include language barriers, poor concentration, low levels of comprehension, a lack of interest and motivation, and generally weak academic performance. Additionally, the diversity of learners' socio-cultural backgrounds and religious beliefs was sometimes identified as a barrier to developing critical thinking in the classroom.

Teacher-Related Challenges

Participants noted that teachers themselves often struggle with motivation and interest, influenced in part by low salaries and limited societal recognition of the teaching profession. Further, teachers were perceived as lacking competence due to insufficient training and education, poor content knowledge, ineffective teaching methods, and low self-efficacy—all of which are exacerbated by challenging socio-economic conditions.

Inadequate Resources and Infrastructure

Many public schools are severely under-resourced, with a shortage of teachers relative to the number of students, and a lack of essential teaching and learning materials. This lack of resources creates significant barriers to effectively teaching critical thinking.

Structural Factors

School curricula and policies often do not reflect the realities of the school environment. Diffuse requirements create tensions between content knowledge and skills development. In some cases, participants questioned the relevance of the curricula, doubting whether what schools teach is truly beneficial to the learners. Additionally, inclusive education policies, particularly in under-resourced school settings, add to the challenges teachers face in fostering critical thinking.

Classroom and School Environments

Closely related to the issues of resources and structural factors is the overall school environment, which many participants described as problematic for teaching and learning in general, and for the development of critical thinking skills in particular. The difficult conditions under which schools operate are evident in the following responses:

Poor government support and lack of teaching materials like books and other facilities. I can't explain because you see and you know the reality of our country especially in rural areas. (208)

The lack of community support, which are mostly dominated by tradition, beliefs and lack of motivation. (430)

These responses underscore the complex array of challenges faced by teachers in East and South African schools when attempting to cultivate critical thinking in their learners. Future research should explore these themes in greater depth to identify potential strategies for overcoming these barriers and improving critical thinking instruction in these regions.

Discussion

The data from this study suggest that across all participating countries, student teachers believe that critical thinking is an important aspect of teaching and learning. However, there is confusion among many as to the teaching and learning aspects that promote the process and those that inhibit the development of their pupils' critical thinking.

This first claim, namely, that student teachers in this study believe that critical thinking is an important aspect of teaching and learning, may be attributed to the fact that they are exposed to the importance of critical thinking as part of their teacher education programmes. The data in this study attest to this attribution because the majority of participants recognise that critical thinking forms part of their university curriculum. Hopefully, some student teachers may also recognise the intrinsic value of critical thinking beyond just fulfilling their curriculum requirements, and believe that teaching critical thinking is important by recognising its value in various contexts. Indications that this hope may be forlorn are the data that show that so many of them cannot differentiate between teaching and learning methods that promote and deter critical thinking in their pupils.

This brings us to the fact that there is strong evidence that even the student teachers who espouse belief in promoting critical thinking may not enact their beliefs in the classroom (Calderhead, 1996; Pajares, 1992). The question then is “How do we change teachers' espoused beliefs (what they say they believe) to enacted beliefs (what they actually do in the classroom)?” According to many scholars, this is a complex and challenging process (Darling-Hammond et al., 2017; Harris & Sass, 2011; Hattie & Timperley, 2007; Schön, 1983). However, they do offer strategies that may help, which include feedback and coaching, modelling, collaboration, peer support, holding student teachers accountable for implementing effective teaching practices, and encouraging student teachers to reflect on their own teaching practices and how their beliefs and values might influence their behaviour in the classroom (Hattie & Timperley, 2007; Johnson & Stevens, 2018; Leithwood & Louis, 2011). It is important to note that translating espoused beliefs into enacted beliefs is not a one-time event but rather, a continual process that requires ongoing support, encouragement, feedback, resources, support, and guidance to help translate espoused beliefs into enacted beliefs—ultimately leading to improved teaching and learning outcomes (Darling-Hammond et al., 2017).

The second claim emanating from the data is that there are significant differences in self-efficacy and outcome expectancies among countries. South African student teachers had the highest mean scores in both self-efficacy and outcome expectancies, followed by those in Uganda, Tanzania, and then Kenya. These differences were statistically significant. The question that then arises is, “Can one teach self-efficacy?”

Answers from the literature generally promote the idea that a person's belief in their ability to achieve specific goals and tasks can be modified by providing individuals with opportunities to experience success, positive feedback, and encouragement. Such techniques include mastery experience, in other words, by providing opportunities for individuals to experience success in achieving specific tasks or goals, which can help build their confidence and belief in their abilities. Vicarious experience is also suggested as a means to promoting self-efficacy, that is, by allowing student teachers to observe others who are successful in promoting critical thinking. The reason given is that seeing someone else achieve success can help develop a belief that they too, can be successful. Researchers also believe that providing positive feedback and encouragement from others can help to increase self-efficacy. Hearing others express confidence in their abilities can

help one to build their belief in their ability (Bandura, 1997; Pajares, 2002; Schunk & Pajares, 2005; Stajkovic & Luthans, 1998).

Despite curricula seldom giving specific examples on how to teach and learn, it is generally recognised that teacher education programmes can play a crucial role in developing teachers' ability to promote critical thinking in their classrooms (Paul & Elder, 2006). Effective teacher education programmes usually provide student teachers with opportunities to develop their own critical thinking skills, as well as strategies for teaching critical thinking to their future students (Perkins, 1992). Student teachers are given opportunities for hands-on experience with teaching critical thinking, such as through observation and practice teaching in classrooms that prioritise critical thinking, and being allowed to reflect on their own teaching practices and strategies for promoting critical thinking in order to continually improve their skills (Lipman, 2003; Norris, 1992; Paul & Nosich, 1993). However, teaching critical thinking can be challenging because it requires students to question their assumptions and beliefs, it requires time and effort, and it involves complex cognitive processes (Halpern, 2014). Consequently, it requires a deliberate and intentional approach from teacher educators, for example, teaching the role of argument in constructing and evaluating knowledge claims (Norris, 1992).

Although there are limitations to this study, namely, that the data were generated mostly in 2020 and in breaks between COVID lockdowns, and that there are disparities of group sizes of participants, we believe that there has probably been no significant change in the general education situation since the data were generated, and the large sample in East Africa allows us to make the following claims. Namely, in essence, this study has revealed that while the student teachers who participated in this study ($n = 3,877$) espouse beliefs that are coherent with what is expected of successful teaching and learning of critical thinking, the majority are incoherent in terms of the teaching and learning methods that facilitate or inhibit their pupils' critical thinking skills. Furthermore, it is evident that most of the student teachers only have below average/average critical thinking skills and need deliberate intentional approaches and strategies from teacher educators for their students to master this skill before they are entrusted to teaching critical thinking in their classrooms.

While many research participants echoed this need by identifying teachers' lack of competence, self-efficacy, and motivation as major obstacles to effectively teaching critical thinking, they also pointed to several other significant barriers. These included learners' challenging socio-economic

and cultural backgrounds, inadequate resources and infrastructure, the diversity of learners in inclusive and culturally diverse classrooms, and the overall lack of support in poorly equipped schools—support that is often absent from both the government and the community. These insights into the educational environments of East and South African student teachers highlight that while improved teacher education programmes that deliberately develop critical thinking skills and pedagogies are essential, other important factors on structural and political levels need to be addressed for a broader effort to empower teachers and to drive meaningful change.

Overview of Findings

The study investigated student teachers' beliefs about critical thinking as well as their abilities and perceptions of self-efficacy across five universities in East and South Africa. A notable finding is that even though student teachers widely acknowledge the importance of critical thinking in teaching and learning, many exhibit confusion regarding the pedagogical approaches that facilitate or hinder its development.

Implications for Teacher Education

Belief vs. Practice

The discrepancy between espoused beliefs in critical thinking and actual pedagogical practices raises questions about the effectiveness of teacher education programmes. Although student teachers recognise critical thinking's value, there appears to be a gap in their ability to apply this understanding in practical teaching scenarios. This suggests that teacher education programmes need to focus not only on imparting knowledge about critical thinking but also on translating this knowledge into classroom practice. Critical reflection, ongoing feedback, and a culture of inquiry within teacher education could bridge this gap.

Cultural Context

The findings indicate significant differences in teaching practices across countries, emphasising the influence of socio-cultural and educational contexts on pedagogical approaches. Variations in the perceived importance of learner-focused versus teacher-focused methods highlight how different educational environments and experiences shape beliefs about teaching. Teacher education should be responsive to these contextual factors and embrace culturally relevant pedagogies that connect theory with the lived experiences of student teachers.

Self-Efficacy

The significant variation in self-efficacy among student teachers from different countries indicates that some educational settings better foster the belief that one can effectively teach critical thinking. This points to the need for teacher education programmes to include components that enhance self-efficacy through mentorship, collaborative learning, and practical experiences that cultivate confidence in teaching critical thinking.

Pedagogical Strategies

The study reveals that student teachers struggle to distinguish between teaching methods that promote and those that inhibit critical thinking—a confusion particularly pronounced among those from East African contexts. Teacher education institutions must therefore focus on explicitly teaching the differentiation between various pedagogical methods and their impacts on the development of critical thinking skills.

Operationalising Critical Thinking

The operationalisation of critical thinking through a specific formula underscores the complexity of measuring pedagogical effectiveness in fostering critical thinking. The study advocates for a nuanced understanding of critical thinking that encompasses both learner-centric and teacher-centric approaches. Educational programmes should provide student teachers with explicit guidance on assessing their own practices and understanding how different teaching strategies affect student learning outcomes.

Long-Term Development

The emphasis on continuing professional development is crucial. The journey of transitioning from espoused beliefs to enacted beliefs cannot be achieved in isolation. Providing ongoing support, resources, and practical opportunities for student teachers to practise reflective teaching should be an integral part of teacher training programmes.

Implications for This Study in Terms of Education for Social Change

The implications and findings of the study can be framed within the context of education for social change by emphasising the transformative role that critical thinking plays in fostering active, reflective, and socially conscious citizens. The gap between beliefs and practices, cultural

contexts, and self-efficacy points to deeper systemic issues in teacher education that, if addressed, could lead to meaningful change in how education empowers students to critically engage with their environments and communities.

Critical Thinking as a Tool for Social Change

Critical thinking is essential for students to navigate and challenge social, political, and economic inequalities. The study's findings suggest that even though student teachers understand the value of critical thinking, there is a need to translate this understanding into action. Teacher education programmes must focus on helping future educators develop critical thinking skills that enable learners to question and critically engage with social norms and structures. This aligns with the broader goal of education for social change, which seeks to empower learners to become agents of change in their societies.

Addressing the Belief–Practice Gap

The discrepancy between student teachers' beliefs about critical thinking and their classroom practices is significant. To drive social change through education, teacher preparation must not only impart theoretical knowledge but also emphasise the application of critical thinking in real-world teaching. This can be achieved by integrating reflective practices, continual feedback, and an inquiry-based learning model in teacher education. Such practices would equip teachers to foster critical dialogue in classrooms, encouraging students to reflect on their roles in society and consider alternative perspectives.

Cultural Context and Culturally Relevant Pedagogies

The study highlights how socio-cultural contexts shape teaching practices and beliefs about critical thinking. In education for social change, acknowledging and embracing these cultural differences is crucial. Teacher education should promote culturally relevant pedagogies that align critical thinking with the lived experiences of students. By connecting learning to students' social realities, educators can encourage critical reflection on societal structures, thereby fostering social consciousness and activism. This approach helps develop students' capacity to challenge systemic injustices in their communities.

Building Self-Efficacy to Foster Empowerment

Self-efficacy, or the belief in one's ability to teach effectively, is critical for student teachers to confidently promote critical thinking in classrooms. The variation in self-efficacy across different regions suggests that some educational settings do not sufficiently empower student teachers. Enhancing self-efficacy through mentorship, collaborative learning, and practical experiences is crucial in building teachers' confidence. A teacher who believes in their ability to nurture critical thinking will be more likely to create a classroom environment where students are encouraged to question and analyse societal issues.

Clarifying Pedagogical Strategies for Critical Thinking

The confusion student teachers experience in distinguishing between pedagogies that promote or hinder critical thinking has significant implications. To prepare future teachers for social change, teacher education programmes must explicitly teach the link between pedagogical strategies and critical thinking development. Providing clear guidance on how different teaching methods either support or obstruct critical thinking will enable teachers to craft lesson plans and activities that promote independent thought, creativity, and problem-solving—all of which are necessary for fostering a critically aware citizenry.

Operationalising Critical Thinking for Social Justice

The study's emphasis on operationalising critical thinking as measurable outcome points to the need for teacher education to define and assess critical thinking in terms of its impact on social awareness and justice. Rather than focusing solely on technical definitions, education for social change should frame critical thinking as a tool for social justice, equipping students to critically engage with the world around them. This would involve a holistic understanding of critical thinking that goes beyond cognitive skills to include social and emotional dimensions such as empathy, social responsibility, and the ability to challenge inequities.

Long-Term Development and Continuing Professional Growth

The need for ongoing professional development underscores the importance of viewing education for social change as a continual journey. Transitioning from beliefs to practices takes time, and teacher education must provide long-term support for teachers to refine their approaches to critical thinking. Programmes should include opportunities for reflective practice,

peer collaboration, and continual learning, ensuring that educators remain equipped to address evolving societal challenges.

Developing critical thinking requires not only intellectual challenges but also attention to students' self-efficacy beliefs and the implementation of learner-centred approaches that engage them as active participants. Teachers can cultivate self-efficacy by promoting a growth mindset, which Dweck (2006) argued encourages students to see intelligence as malleable, and effort as the path to mastery. By praising effort and the process of learning rather than innate intelligence, teachers help students believe that critical thinking skills can be developed over time.

Incorporating learner-centred approaches is also essential for promoting critical thinking. When students explore open-ended questions and problems, they can engage in active problem-solving and reflection. Instead of providing direct answers, teachers should use Socratic questioning to prompt students to think more deeply because this encourages them to evaluate evidence and consider different perspectives. When learners are given autonomy in selecting topics or methods of learning, they become more invested in the process, leading to a more profound engagement with critical thinking (Perkins & Salomon, 1989).

A safe learning environment, where students feel comfortable expressing their ideas without fear of judgment, is crucial for fostering intellectual risk-taking. Exposure to diverse resources also promotes critical thinking by encouraging students to evaluate multiple viewpoints. However, obstacles such as a fixed mindset, which leads students to avoid challenges due to fear of failure, can hinder critical thinking. To ameliorate fear of failure, teachers must actively foster a growth mindset and emphasise the process of reasoning over finding the "right" answer (Dweck, 2006). Finally, developing critical thinking requires a comprehensive approach that includes building learners' self-efficacy, using learner-centred strategies, and overcoming barriers to intellectual growth.

Conclusion

In summary, the study reveals a complex interplay between beliefs, self-efficacy, and actual teaching practices regarding critical thinking among student teachers. To effectively promote critical thinking in classrooms, teacher education must align beliefs with practices, address self-efficacy and contextual challenges, incorporate culturally relevant pedagogies, and emphasise

ongoing development and support for future educators. The success of implementing critical thinking in education relies not only on curriculum reforms but also on the preparation and support of teachers who can enact these reforms in their teaching environments.

Framing these findings within the context of education for social change emphasises the critical role that teacher education plays in shaping future educators who can nurture critical thinking in their students. By addressing the gaps between belief and practice, fostering culturally relevant pedagogy, enhancing self-efficacy, and focusing on long-term development, teacher education programmes can better prepare teachers to lead classrooms that inspire critical reflection and action for social change. In this way, education becomes not only a means of knowledge transmission but also a transformative force for societal progress.

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