# Contextualization of critical thinking in sub-Saharan Africa: A systematic integrative review

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## ABSTRACT

Cultural norms affect the efficacy of critical thinking instruction. In several sub-Saharan African countries, governments have publicly declared critical thinking skills to be a major educational priority to increase global economic competitiveness. However, many schools and education systems have not taken action to translate the stated government policies into revised curricula, pedagogies and assessment frameworks. Faced with these challenges, the overall objective of the study is to analyse, by means of an integrative systematic review, how the concept, implementation and assessment of critical thinking has been contextualized in sub-Saharan Africa. Of the 51 documents that met the inclusion criteria, a total of 5 categories, 95 codes, and 1,075 quotes were analysed. The findings highlight that researchers and practitioners apply western concepts of critical thinking to the sub-Saharan context without questioning its actual transferability. Moreover, the analysis shows that there is a lack of familiarity with adaptation strategies of assessment tools and teaching methods in sub-Saharan Africa.

## 1. Introduction

In several sub-Saharan African countries, governments have pointed to critical thinking skills as a major educational priority to increase global economic competitiveness. Though not many education systems have translated government priorities into a revision of traditional curricula and pedagogies (Atkinson, 1997; Hallinger, 1998; McGuire, 2007), critical thinking has become an educational priority to promote economic, political and cultural independence from the legacy of colonialism (Grosser, 2006; Ijaiya, Alabi & Fasasi, 2010; B. J. J. Lombard & Grosser, 2004; K. Lombard & Grosser, 2008).

Given the prominence of critical thinking within the education discourse, it would be reasonable to assume a degree of conceptual uniformity in the literature, but this, however, is far from the case. Despite several extant expositions of critical thinking in the fields of psychology (Halpern, 1998; King & Kitchener, 1994, 2004; Schön, 1987), education (Bailin, Case, Coombs & Leroi, 1999; Davies & Barnett, 2015; Ennis, 2015) and philosophy (Facione, 1990; Fisher & Scriven, 1997; Scheffler, 1965; Siegel, 1989), there is still no clear agreement concerning what the terms actually mean (Arum & Roksa, 2011; Barnett, 1997; Siegel, 1989).

Since the surge in interest in the topic, beginning in the last century, several authors have attempted to synthesize the complexity of critical thinking in a definition. Dewey states that "the essence of critical thinking is suspended judgement" (1910, p. 74). Following him, several other authors in their definitions discuss the central role of judgement in critical thinking (Ennis, 2015; Pierce, Gassman & Huffman, 2013). According to Ennis (1992), critical thinking aims at reaching reasonable and reflective judgement on what to believe,

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accept, or do. Lipman (2003), Paul and Elder (2005) introduce and broadly elaborate the issue of standards and criteria, suggesting that these critical judgments should sustain a level of acceptability, both internal (the critical thinker) and external (others) (Lai, 2011). The central aspect of reflective judgement is also emphasized in relation to metacognitive reflections and epistemic assumptions, which are vital to any situation whenever critical thinking is required (King & Kitchener, 1994).

Theorists also define critical thinking as a *process* (Elder & Paul, 2001; Ennis, 1996; Halpern, 1998; Moore, 2011; Paul & Elder, 2005); an intellectually disciplined process that involves an ethical position reflecting consistency in thinking and doing (Davies & Barnett, 2015; Scriven & Paul, 1987). Though critical thinking can be described as a set of *procedures* to be followed, Bailin et al. (1999) contend that developing student competence in thinking should not be limited to teaching steps to follow. The educational challenge is that the simple though structured performance of procedures does not ensure that critical thinking is happening (Lipman, 1988).

Critical thinking is also cited as an important learning outcome in many different national contexts, and though there has been little discussion on how critical thinking is manifested in African contexts, there is wide consensus on the fact that culture is one of the fundamental mediating factors for the development of these cognitive abilities (Deregowski, 1970; Nisbett & Norenzayan, 2002; Norenzayan, Smith, Kim & Nisbett, 2002; Rogoff, 1990, 2018). Rogoff (2003) argues that cognitive development can only be understood in light of cultural practices, as cognitive functions develop in different ways depending on cultural circumstances.

In non-western cultural contexts, problems in teaching critical thinking may occur if students or a faculty perceive discordance between existing cultural norms and practices and new pedagogical or curricular models (Atkinson, 1997; Egege & Kutieleh, 2004; Grosser & Lombard, 2008; Lun, Fischer & Ward, 2010; McGuire, 2007; Simpson & Courtney, 2002; Stapleton, 2001; Zhang & Lambert, 2008).

Moreover, African cultures, including those of sub-Saharan countries, are considered "high-context" and rely on implicit communication and nonverbal cues. In such contexts, a message cannot be understood without a great deal of background information (McGuire, 2007).

## 2. Formulation of the problem and justification

In sub-Saharan countries, critical thinking has become an educational priority to help citizens become aware of their social, political, and economic environment (Grosser, 2006; Grosser & Lombard, 2008; Ijaiya et al., 2010; B. J. J. Lombard & Grosser, 2004). Nevertheless, educational practices still favour memorization and rote-learning; examination-orientated education (Allen, Elks, Outhred & Varly, 2016; Mitana, Muwagga & Ssempala, 2018) and a classroom pedagogy that emphasises factual recall over more advanced cognitive skills like synthesis and evaluation, which might influence the African students' thinking patterns (Grosser & Lombard, 2008; Ijaiya et al., 2010; Temel, 2014).

Faced with these challenges, the overall objective of the study is to analyse, by means of an integrative systematic review, the extent to which the concept, implementation and assessment of critical thinking has been contextualized in sub-Saharan Africa. The specific research questions are as follows: (1) How has the concept of critical thinking in sub-Saharan Africa been culturally contextualized within the field of education? (2) How have the assessment and teaching methods of critical thinking in sub-Saharan Africa been culturally contextualized within the field of education? The purpose of the study is therefore to synthesize the scientific evidence on the contextualization of critical thinking in sub-Saharan African countries in order to inform researchers and practitioners about the best practices in conducting research, assessing and enhancing critical thinking in those countries.

Since critical thinking has been so pervasively sited as vital to the success of students in academic, work and life settings, a systematic study of critical thinking in sub-Saharan African contexts is warranted, more specifically, for the following reasons:

- Critical thinking is perceived as a high order cognitive ability, very vital for individuals to make decisions in their career and life (Hale, 2012);
- The ability to think critically is almost always listed as one of the desirable outcomes of undergraduate education (Halpern, 1993; Moore, 2013);
- Nurturing critical thinking requires focusing on the learning process, instead of the learning outputs, from learning to thinking (Perkins & Murphy, 2006);
- The results of meta-analytical studies show that both critical thinking skills and dispositions improve substantially in the course of the post-secondary academic experiences (Abrami et al., 2008); and
- Recent systematic reviews have focused on the study of critical thinking at post-secondary school level, (Puig, Blanco-Anaya, Bargiela & Crujeiras-Pérez, 2019) including e-learning environments (Chou, Wu & Tsai, 2019) or on a specific discipline (Sapeni & Said, 2020; Weidman, 2020), but none has focused on the African context.

## 3. Method

As stated by Whittemore & Knafl "an integrative systematic review is a specific review that summarises past empirical or theoretical literature to provide a more comprehensive understanding of a particular topic" (2005, p. 546). In accordance with the objectives of this study, a heterogeneous design for the resulting set of studies was used as opposed to the homogeneous one that often characterises statistical meta-analysis (Thomas & Harden, 2008). Therefore, we included theoretical and empirical studies, and qualitative and quantitative approaches for all types of designs, to understand the use and contextualization process of critical thinking in the education field in sub-Saharan Africa.

This study follows the stages of the process of an integrative review as highlighted by Cooper (1998) and Russell (2005): (1) formulation of the problem and review questions; (2) literature review; (3) quantitative and qualitative evaluation of information; (4) quantitative and qualitative tools and techniques; (5) quantitative and qualitative analysis of data; and (6) interpretation and discussion of results.

### 3.1. Research questions that guide the systematic review

The following research questions provide a guide to our systematic review of the literature. (1) How many scientific documents studied critical thinking both theoretically and empirically in educational settings in sub-Saharan Africa?; (2) What are the theoretical approaches and the methodological characteristics of the primary documents that met the inclusion criteria?; and (3) What is the contextualization process in the selected studies?

### 3.2. Review of the literature: data base, descriptors, and inclusion criteria

The literature review comprised a search of bibliographical databases, such as Education Resources Information Centre (ERIC), Scopus, Web of Science (WOS), PubMed, PSYCINFO and African Journals Online (AJOL). We searched for the terms "Critical Thinking" and "Africa'' or all the sub-Saharan countries in the title, in any language, in any year. The African data base AJOL, has been considered in spite of the fact that it includes articles not indexed in Scopus, WOS or ERIC, to avoid biases and errors in the literature search (Whittemore & Knafl, 2005) and to have a more complete consideration of primary sources in Africa.

The inclusion criteria consisted of scientific primary studies with the following characteristics: (1) empirical (qualitative or quantitative) or theoretical; (2) no time-related criteria; (3) comprising the full text; (4) placed in sub-Saharan Africa; (5) placed in the education field regardless of level; (6) unpublished manuscripts were excluded (Russell, 2005).
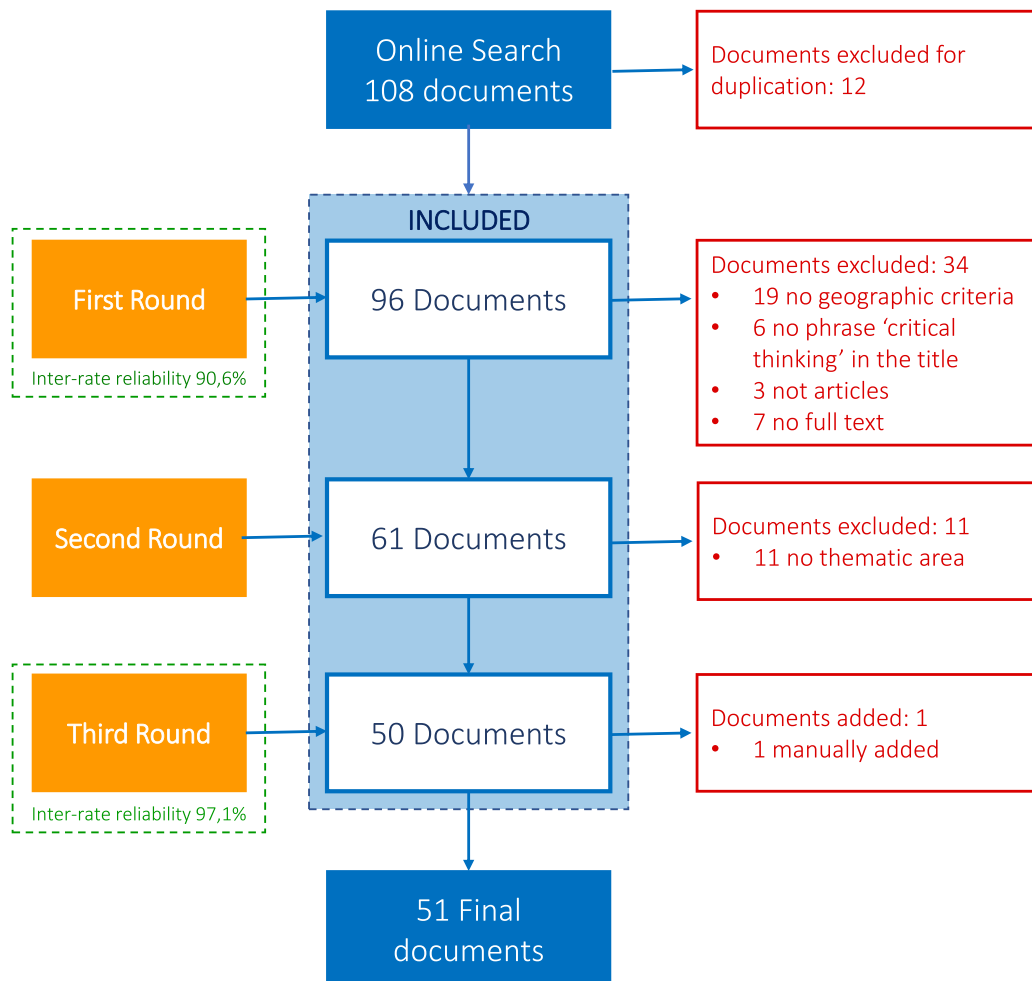


**Fig. 3.1.** Flow diagram of the searching process.

### 3.3. Review process: stages and flow diagram

In the *first round* of the review process, 108 documents were screened (*ERIC*, 23; *SCOPUS*, 19; *WoS*, 18; *AJOL*, 29; *CINHAL*, 11; *PubMed*, 2; and *PsychInfo*, 6) and 12 were eliminated due to repetition. At this stage, inter-rater reliability was 90.6%, and any discrepancies were resolved by the three researchers.

During the *second round*, which comprised a much more detailed analysis of the 96 documents remaining, 19 did not meet the geographic criteria for inclusion, 6 did not have the phrase 'critical thinking' in the title, 3 were not articles (2 theses and 1 conference proceeding) and 7 did not have the full text available. In the *third round*, the remaining 61 documents were once again reviewed by the three researchers. This time, the researchers introduced an additional criterion linked to the thematic area of the studies; the studies needed to be linked to education or human formation. The new inter-rater reliability was 97.1%. Discrepancies were discussed, and 11 documents were excluded for not meeting the additional criteria. At this stage, one article was manually added after interaction with the author as recommended by Conn, Minor, Burks, Rantz and Pomeroy (2003). This article fulfilled all the criteria, but since it was being inserted as a chapter in a book, the research databases had not tracked it. Hence, a list of 51 documents comprised the final sample of the literature that met the inclusion criteria.

Fig. 3.1 represents the review process and its constituent stages, thereby meeting the PRISMA (Preferred Reporting Items for Systematic review and Meta-Analyses) criteria (Hutton, Catala-Lopez & Moher, 2016; Moher, Liberati, Tetzlaff, Altman & Group, 2009).

Finally, a data collection tool was developed to organise the relevant characteristics of the studies with respect to the contextual and methodological variables.

### 3.4. Coding system and type of analysis

A coding system was established to analyse the 51 selected papers based on *contextual (descriptive) variables*, including (1) publishing year; (2) keywords; (3) country; (4) education level; (5) publishers. In *quantitative* terms, the contextual variables were analysed descriptively (frequency and percentage) using EXCEL.

The coding system also considered *content and methodological variables* related to (6) concept theories of critical thinking; (7) assessing approaches and tools; (8) adaptation/validation process of the tools; (9) teaching methods approaches; and (10) contextualization. In *qualitative* terms as recommended by Gibbs (2018) and using the Atlas.ti program (version 8.4.4.), we performed an analysis of the theoretical approaches to the concept of critical thinking as presented in the articles, the methods for teaching critical thinking skills and its assessment with specific attention to elements of contextualization.

These predetermined categories and others emerged to identify the main topics of critical thinking addressed in this review. The process of analysis involved the identification of patterns of similar ideas, concepts and topics to establish the connection and
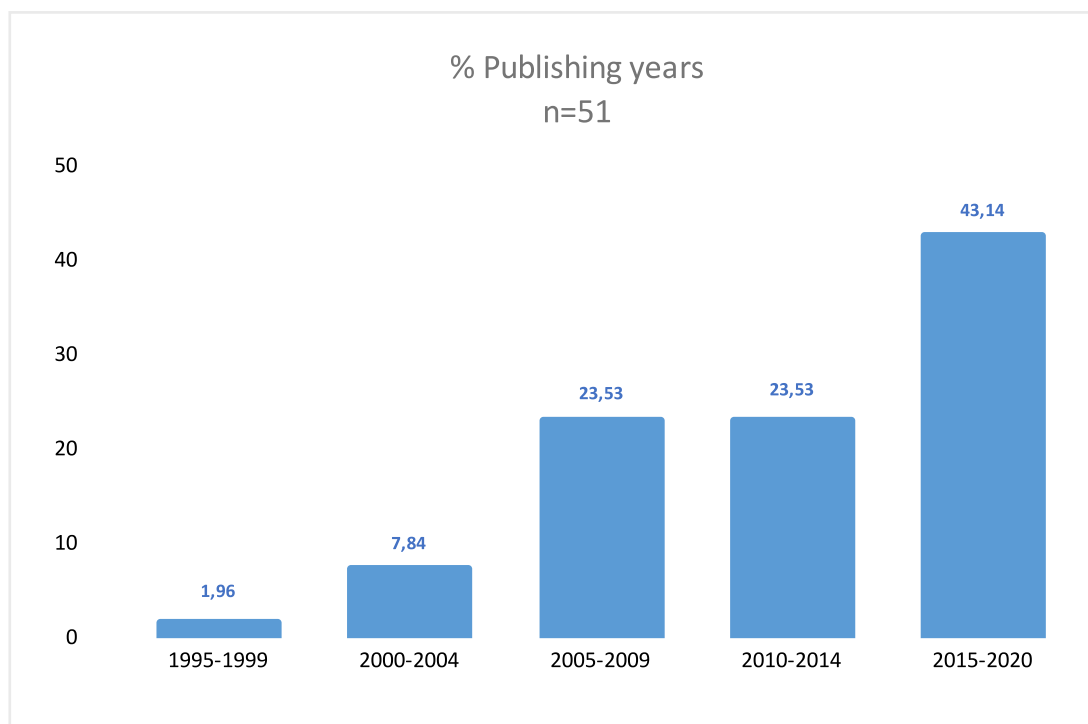


**Fig. 4.1.** Publishing years of selected articles.

integration of information with the theoretical foundation (Miles & Huberman, 1994) and to track any evidence of contextualization or recommendation for contextualization. Furthermore, codes were created in accordance with established criteria for qualitative evaluation: dependency, transferability, credibility and verifiability (Duffy, 1987).

Additionally, a *synthetic analysis* followed the three stages pointed out by Thomas and Harden (2008): free line-by-line coding of the primary studies; organization of these "free codes" into related areas to construct "descriptive" themes; and the development of "analytical" themes (p. 4), where the analytical themes go beyond the findings of the primary studies and generate additional concepts, understanding or hypotheses. The analytical themes are then related to the recommendations for intervention and policy makers in order to contextualize critical thinking in the sub-Saharan African context.

Moreover, a *Triangulation* technique (Flick, 1992, 1994) was carried out amongst the researchers in order to search, identify, select, evaluate and summarize data from scientific articles by pre-defined criteria and emergent categories.

Lastly, *Data reduction* was applied: (1) the initial subgroup classification of the studies is based on the type of evidence: theoretical and empirical (qualitative, quantitative or mixed); and (2) data reduction involves techniques of extracting and coding data.

## 4. Findings

### 4.1. General characteristics of the studies

The 51 documents that met the inclusion criteria were published between 1995 and 2020, though almost half of them (43.14%) between 2015 and 2020. This disproportionate quantity in later years is evidence of the growing interest in the study of critical thinking (Fig. 4.1), where the university is the preferred level of education to develop this skill (88.24%), followed, though not closely, by secondary education (7.84%), and only 1.96% of the studies have been conducted with primary education students.

Most of the sources of investigation were published in Africa (77.78%). Only 11.11% were published in Asia, Europe and America being the continents accounting for the smallest number of publications (5.56%). More than half of the analysed studies were published in South Africa (45.45%) and Nigeria (10.91%) (Fig. 4.2) and only two of these articles were the results of a multi-country study. Some examples of these joint works are Rosen and Tager (2014), research between South Africa, Singapore, United Kingdom and the United States, and Sharif and Siddiek (2017), between Sudan and Jordan.

Most of the analysed articles were published in scientific publications outside Africa (76.47%). The African publications (23.53%) were found in the Africa Journal of Nursing and Midwifery, Curationis, Global Journal of Educational Research, South African Journal of Education, South African Journal of Higher Education, South African Journal of Psychology and Zimbabwe Journal of Educational Research.

Finally, 63.10% of the key words in these articles refer to critical thinking and terms related to cognition and reasoning, problem solving, learning, assessment and formative evaluation, constructivism and teaching methods. Only 31.37% refer to context (e.g.,
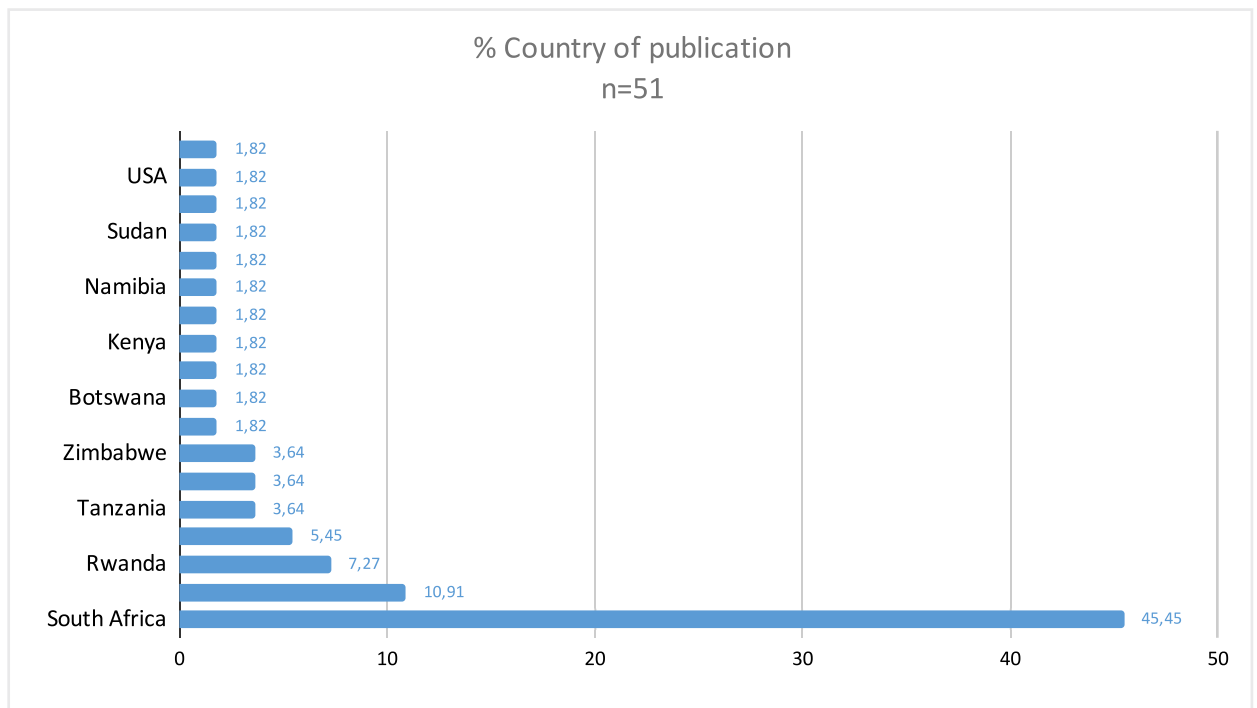


**Fig. 4.2.** Country of publication of selected articles.

discipline, educational level, geographic location…) and 5.54% mention the research method used. None of these words is associated with terms like contextualization, adaptation, or validation and the word "culture" only appears twice.

### 4.2. Qualitative analysis: central themes in critical thinking

Table 4.1 shows that a total of 95 codes emerged in the analysis of the five major categories of the study: theory (20.47%), importance (23.63%), method (data collection and analysis) (25.86%), context (9.49%) and non-context (20.56%) with 1075 quotes associated. The category named *method* was used to classify the various approaches of the documents (qualitative, quantitative and mixed) and the process the authors followed in the development and adaptation of the tools used to assess critical thinking in the local contexts. The detailed coding system/process can be seen in the appendix.

The category named *Method* was used to classify the various approaches of the documents (qualitative, quantitative and mixed) and the process the authors followed in the development and adaptation of the tools used to assess critical thinking in the local contexts. The detailed coding system/process can be seen in the appendix. The code named *Theory* in the categories *Context* and *Non-context* refers to cultural aspects underpinning the theories included in the selected documents.

The selected documents (51 in total) were qualitatively analysed and have been identified with a number.

### 4.3. Concept theories of critical thinking

This section of the review addresses the first research question and it examines how the concept of critical thinking has been culturally contextualized in the field of education in sub-Saharan Africa.

In an attempt to detect any possible effort to contextualize the concept of critical thinking, the review investigates the 'operational definitions' of the theoretical frameworks presented by the authors. These definitions are usually not directly referenced or attributed to renown theorists, though they are built on the foundations of these critical thinking theorists (Ennis, 1964; Facione, 1990; McPeck, 1981; Paul, 1992). A total of 20 articles present a somewhat structured operational definition of critical thinking. For instance, Madondo (2018) refers to critical thinking as "the ability to think outside the box." It is not so clear if, in this case, we are referring to an *innovative mind* or an *independent mind*. Both cases find support in other authors' definitions. Adeyemi (1) and van Dyk (49) describe critical thinking as engaging in a process of deep analysis to generate viable solutions and sieve out what really matters the most. Ijaiya et al. (2010, p. 381) maintain that the goal of critical thinking is "always to reach sound conclusions based on credible premises."

On the other hand, other authors focus more on the process of nurturing a critical thinking mind. Bankole-Minaflinou (2) underscores the importance of helping students evaluating their own ideas, "i) actively seeking all sides of an argument; (ii) testing the soundness of the claim made; (iii) testing the soundness of the evidence used to support the claim" (2, p. 3). Similarly, Grosser & Lombard, 2008 state that prospective South African teachers should be able to assess the validity of arguments and build their own arguments. This perspective accords with the interpretation of Madondo (2018) and Pieterse, Lawrence and Friedrich-Nel (41) who define critical thinkers as "being competent in producing an independent evaluation". Similarly, multiple articles linked critical thinking to independent thinking. According to Belluigi and Cundill (4) for such thinking to be truly emancipatory, it should be reflective. An important disposition that is necessary to make independent decisions by analysing arguments in a comprehensive and reasonable way (46) is open-mindedness (31). To be critical thinkers, according to Chabeli, requires becoming "meta-learners with the aim of being self-directed lifelong learners" (7, p. 72). Grosser & Lombard, 2008 also focus their attention on the cognitive aspects of the process and highlight the importance of the effort one should put into directing and guiding self-thinking and habits of the mind in the pursuit of reaching justifiable inferences.

Nine articles explicitly mention the aim of assessing the perception of critical thinking in their objectives or research questions, both in the context or sample selection. Boso and Gross (6) investigate the perceptions of nurse educators starting from the assumption that their erroneous perception of critical thinking may hinder the transfer of these skills to the students in Ghana. The authors asked the nurse educators to define critical thinking but used a self-administered questionnaire composed of five Likert-type scales with items based on a western definition of critical thinking (by Scheffer and Rubenfeld) and evaluate the local understanding of critical thinking

**Table 4.1**
Quotes and codes by categories.

| Categories (quotes) | | n | % | Codes by categories | |
|---|---|---|---|---|---|
| | | | | n | % |
| Importance | | 254 | 23.63 | 8 | 8.42 |
| Theory | | 220 | 20.47 | 4 | 4.21 |
| Method | | 278 | 25.86 | 4 | 4.21 |
| Context | Assessment (14; 13.73%) | 102 | 9.49 | 25 | 26.32 |
| | Teaching method (28; 37.25%) | | | | |
| | Theory (50; 49.02%) | | | | |
| Non-context | Assessment (10; 4.52%) | 221 | 20.56 | 54 | 58.54 |
| | Teaching method (131; 59.28%) | | | | |
| | Theory (72; 32.58%) | | | | |
| | Role of educators (8; 3.62%) | | | | |
| Total | | 1075 | 100 | 95 | 100 |

in respect to how much they differ from the chosen definition in the literature. The main finding of these authors is that locals see this skill as having mostly a cognitive component and neglecting the affective domain of critical thinking. From the respondents' statements, *problem solving* is seen as one of the most important attributes of critical thinking such that this made the authors conclude that respondents possessed a limited understanding of the concept. The findings, according to the authors, show a poor understanding of the concept and the conclusions underscore that nursing programs in Ghana "are not adequately preparing nurses with the necessary CT [critical thinking] skills required for a dynamic health care environment" (6, p. 560).

Kassaman and Corlett (20) published a similar study showing the results of a qualitative research on the concept of critical thinking as highlighted by seven Kenyan nursing graduates. The authors report that participants could not provide a clear definition of critical thinking, most of them could only verbalize a few elements. Mostly they were referring to critical thinking "as deep thinking, an act of enquiry, reflection and analysis" (20, p. 10). Nevertheless, the findings generally concluded that the concept of critical thinking needs to be clarified in the nursing education context, but the study does not refer to the need for a locally contextualized definition of the concept.

Similarly, Onen (39) addresses the challenge that faculty members face in nurturing critical thinking skills amongst Ugandan university students. In his research, the author examines the perceptions of critical thinking held by faculty members. In the presentation of the findings, critical thinking was conceptualized as linked to creative thinking, rational judgement, and the ability to refute dogmatic statements without personal criticism (39). He concludes that "the differences in faculty members' perceptions of critical thinking were responsible for its inadequate cultivation amongst students" (39, p. 209).

Even in Botswana, college-interviewed students (33) presented a vague understanding of the concept though they mentioned several of the relevant sub-skills presented by the dominant literature on the topic. The author presents some findings as being different from what the western definition commonly entails for critical thinking. One example of this, that could also be interpreted as a local characteristic of critical thinking, is the aspect of problem solving being related with critical thinking (33).

Lastly, a few articles address quite thoroughly the problem of applying a western concept to the sub-Saharan context (14, 15, 43, 44, 45). The theoretical frameworks of these studies investigate the relationship between critical thinking and culture, posing the problem of contextualisation. These authors investigate how cognition is linked to culture and, especially, how language influences cognition and, consequently, critical thinking. They also underscore the role of social experiences in the development of cognition and how sub-Saharan culture promotes a concept of "self" as intertwined with the community one belongs to. Nevertheless, even in these cases, the authors limit their investigation to issues related to the choice of assessment tools that can be adapted or adopted for the measurement of critical thinking abilities in college students but they do not investigate the definition of critical thinking in relation to the local culture.

### 4.4. Assessment and teaching methods of critical thinking

This section aims to respond to the second research question on how the assessment and teaching methods of critical thinking have been contextualized in sub-Saharan Africa.

#### 4.4.1. Assessment methods and tools

In regard to theoretical aspects of the assessment, out of 51 documents, only two (43 and 45) addressed the need to conduct a contextualized process for developing localized tools. The rest of the attempts in assessing critical thinking skills relied on assessments developed for the United States or European markets. In these cases, both the methods and the tools were imported from other cultural contexts. Considering the instruments, only one document includes a valid contextualized strategy (45) considering an accurate language translation of the tool, a perspective that was also recommended in other documents (e.g., 23).

The articles that assessed critical thinking skills can be clustered into two main categories: assessment studies, which aim to explore and measure the level of critical thinking in a particular sample (21, 22, 24, 41, 44) and articles evaluating the effect that different methods such as ICT (37) or teaching strategies (e.g., 11, 40, 49) have on critical thinking. Only one article is focused explicitly on adapting and validating an assessment tool for a particular context (45), in this case a performance-based task of critical thinking used in Rwanda.

All the articles chose to use a qualitative or quantitative tool for assessing critical thinking in teachers or students. For both types of instruments – qualitative and quantitative – the quality and validation processes were studied.

Despite the fact that contextualization is easier to ensure using qualitative tools than adapting a quantitative instrument appropriate for the context, qualitative assessment (5, 19, 20, 26, 27, 28, 29, 30, 31, 33, 34, 39, 40, 42, 43, 43, 45, 51) of critical thinking skills is less common than the quantitative approach using questionnaires/survey/scale (2, 3, 4, 6, 9, 10, 11, 12, 13, 14, 15, 21, 22, 23, 24, 26, 36, 37, 42, 44, 48, 49). Most of the quantitative instruments used in the studies are imported; the studies do not conduct an adaptation process; and/or do not achieve quality standards. Out of 39 empirical articles, only a few use both qualitative and quantitative tools (2, 3, 4, 21, 29, 36, 42, 43, 44).

Regarding the qualitative studies, or those using qualitative instruments in a mixed method design, include the following tools: narratives (4, 43); observation (4, 5, 26, 31, 40); exam papers (2, 3, 30, 37); vignettes (41); FGD (83, 29, 33, 34, 36, 40, 43, 45, 51); field notes (5, 34, 27 and 29); various types of interviews (in-depth: 4, 26, 33; semi-structured: 2, 20, 40; and no specific: 19, 21, 27, 28, 36, 42, 43, 45, 51); semi-open questionnaires analysed through thematic process (19); and task performance (45, 42). Articles that examine official documents as the local curriculum or educational policies have been considered (4, 43) under qualitative analysis.

The quantitative studies used the questionnaire (self-made or "imported") as the main tool. Nine articles developed a questionnaire, survey, test or scale for the study purposes to assess critical thinking skills, abilities or dispositions, (2, 6, 10, 11, 21, 36, 37, 48, 49) or

open-ended surveys (3, 4). In regards to the "imported" instruments, one article (26) used and adapted a tool from the United Kingdom, and three well-known questionnaires were also used in eight documents: Watson Glaser Critical Thinking Appraisal (9, 14, 15, 22) or Cornell Critical Thinking Test (13, 23, 24), and the Flande Scale (12).

Regarding the contextualization process, both for qualitative and quantitative tools, the information about the adaptation, validation and psychometric characteristics of the instruments implemented in the field was generally scanty or hidden in the articles. Ten articles do not provide information about the development, adaptation or validation processes (3, 4, 10, 11, 15, 19, 26, 30, 36, 37); two simply mention the process without any information on it (2, 33 – structure interview and FGD). Several documents include only expert consultation for construct validity or use literature reviews for content validity - even when the literature reviewed in the articles comes from foreign countries (2, 6, 12, 13, 21, 23, 41, 48, 49). Two articles use an adapted version of instruments developed in other countries by including only the language translation process (22, 23). Six documents include at least a pilot study (6, 9, 13, 14, 42 - computer-based assessment, 49) while field testing to pilot the instruments has been conducted in some qualitative studies (5, 20, 33). In one case (15), a pilot conducted in a previous study by the same authors in the same country is considered enough to conclude the validity of the test. amongst studies that used an instrument developed in other countries, especially in the United States or Europe, those that include information on the contextualization (adaptation and/or validity), simply refer to the test reliability of the original developers (e.g., 9, 13), contextualise some items from the literature (26, 29), conduct a pilot as the only attempt at contextualizing the process (6, 9, 13, 14, 42) or just accept a pilot conducted in previous research (e.g., 15) without a normative group or considering an American norm group (14, 15, 22, 23, 24). What is surprising is the fact that the authors include this information under a section titled *Contextualization of the Study*:

> Whereas the instrument focuses on general topics and is designed to determine critical thinking abilities by using 'general scenarios', it is not subject-related. From this point of view, it was argued that the instrument's degree of foreignness to the South African circumstances could be regarded as minimal (Referring the Cornell Critical Thinking Test-Level Z). (22, p.37)

Therefore, the content and construct validity are based on the quality of the test itself, simply as developed by Ennis, Millman and Tomko (1985) with an American sample. In addition to these articles, other documents give the same justification of the construct or content validity based on the instrument itself or the existing literature (13, 26, 29 and 49). This common justification is based on using developed tools validated in different counties to ensure the quality of the test, as clearly stated by Lombard and Grosser:

> (…) despite the recommendation that "…contextualised and standardised research instruments appropriate to South African circumstances be developed to establish the critical thinking abilities of the South African society …"(Lombard & Grosser, 2004:215), no such instruments tailor-made for the South African population are as yet available. It was therefore decided to administer the WGCTA for the purposes of this research. Researchers in the field of critical thinking, who are familiar with the WGCTA, give the instrument a high rating (24, p. 566).

An example of contextualization of the assessment process can be recognised in Schendel (44, 45) through the In-depth Culture Adaptation Method. In these articles, the authors conduct a thorough process of contextualization through the careful selection of the instrument, an adaptation of the original performance-based-task, its translation to a different language, applying a conceptual equivalence of the two different forms (original and adapted) and following a contextualized validation process including a pilot (44). In another study (45), the same author refers to the three steps stated by Ennis (2009) in selecting an appropriate format when evaluating validity, and there is a section dedicated to the adaptation process, including the translation and adaptation of the task as well as the scoring adaptation and the field testing and piloting for the necessary adaptation to the context. In addition, the author explicitly named and followed the available international guidelines, where best practices in developing tests for use in diverse cultural contexts is defined (Schmeiser & Welch, 2006). In this study, the validity of the tool is not only based on the original findings or the literature reviewed but on the characteristics of the cultural context. Likewise, the comparability of the forms is studied by analysing the qualitative responses in the piloting.

Despite the few attempts at contextualization, a clear need for locally validated instruments is stated either in the limitations or in the recommendations of several documents.

The limitations of a non-contextualized assessment are presented in four documents, highlighting language issues (15, 45), absence of a local norm group (14, 22) or deductive logic of the instruments, not compatible with local understanding (15). These manifested limitations contrast and find support in the requirement for a contextualized process both in the conceptual frameworks or recommendations included at the end of some documents (e.g., 9, 42) as stated in these quotations:

> Johnson, Thompson, Wallace, Hughes, and Manswell Butty (1998) affirmed that authentic assessments are viewed as superior to traditional assessments in the promotion of critical thinking, since they require students to use their acquired knowledge to solve problems and not merely memorize information that was acquired out of context. (9, p.483).

As a matter of fact, the studies with the largest concern for contextualization highlight: how limited exposure to learner-centred pedagogy affects the assessment results (43); the numerous references of cultural variance in assessment literature (45); and the impact of the cultural background on test performance due to both implicit and explicit nuances with test questions (45).

In line with this, recommendations of several documents (13, 23, 24, 34) include the need to guarantee a validation and reliability process, for instance by triangulation (15). Some of the cultural issues in using a foreign instrument are also presented (36, 45).

After the analysis conducted of the documents comparing the contextualized process with the limitations and recommendations, we can conclude that inaccurate translation processes, mere expert validations of the tool, or the direct implementation of an imported instrument highly affect the assessment findings. Therefore, the findings are not informing adequately and influencing the teaching methods and strategies.

### 4.4.2. Teaching methods and strategies

Related to the second research question on nurturing critical thinking in sub-Saharan Africa, a few articles included in the review highlight two major challenges in enhancing critical thinking that are strictly intertwined; culture and language (14, 43, 44). These authors identify the emphasis placed on the universality of the critical thinking process as one of the main reasons for which many educators tend to neglect the cultural context in developing student cognitive abilities (14, 43, 45). On the other hand, Grosser & Lombard, 2008 in South Africa and Madondo (2018) in Zimbabwe identify the peculiarities of the *Ubantu* culture as an important factor that should be considered in the implementation of pedagogical strategies that foster critical thinking in the African context. According to Madondo, *Ubuntu* cultural attributes "like being fair-minded, open-minded… not being sloppy, tolerant of ambiguity or uncertainty and engaging in self-reflection" (26, p. 6), should be considered as enablers of critical thinking. At the same time, the communitarian and altruistic vision of life is cited as a possible hindrance to fostering such skills (26) – since they are deemed in opposition to the individualistic western vision. In line with this, even the obsessive focus on controlling and predicting future outcomes, which is quite peculiar of western cultures, is quite far from the *Ubuntu* predisposition for acceptance of one's destiny (14). Moreover, the way people in the western countries deal with conflicts and the rhetorical way of participating in discussions are quite the opposite to an educational approach that promotes avoidance of conflicts and discourages argumentation (14). African cultures express the value that the good of the individual is always in relationship to the good of the society in which one lives. The African culture builds on relationships and relies on an approach to building knowledge, which is experience-based rather than being based on abstract logic and intellectual inferencing (14).

The second aspect that is considered to be quite pivotal in the transferability process is language (2, 15, 24, 31, 46). The relationship between critical thinking and language has been proven significant (46). To implement critical thinking activities, proficient language abilities are considered crucial since language, thinking and learning are intimately related (26). The problem is amplified in the case of critical thinking acquired in a second language, which is the case for the majority of the students in sub-Saharan contexts. Critical thinking entails interaction for stimulating argumentation and positive confrontation. The lack of language proficiency may actually lead to passivity and rote learning (15, 26).

Eleven articles present experiences of strategies for nurturing prospective nurses' critical thinking skills (5, 7, 8, 20, 21, 27, 29, 34, 48, 49, 50) but they did not report any adaptation to the local context in order to address the challenges linked to language or cultural dispositions. Debate (5), Socratic enquiry (27), Problem Based Learning (34), Problem Based Learning in distance education (50) and clinical accompaniment (48, 49), were some of the chosen strategies. The findings suggest that the teaching and learning strategies have a direct impact on the environment and the transfer of critical thinking skills amongst prospective nurses (5, 20, 27). The studies highlight several inhibiting factors that can hinder students' engagement and participation (5). Educators play a pivotal role in this. Their attitude, openness and efforts to generate a learning environment that is psychologically safe and that ensures mutual respect is a recurrent finding (5, 27, 29, 48, 49, 50). When implementing dialogical or Socratic methodologies, the behaviour of educators, their ability to manage the class, engage with the audience and openness to students become essential elements of the nurturing process (5, 27, 49). In the African context, the different cultural backgrounds can enrich the lesson and the learners, though the opposite is also very possible and frequent. Supporting integration, acceptance, non-judgmental attitude and mutual understanding should become a deliberate effort of every educator (27, 29).

Six articles were related to the formation of prospective teachers (10, 13, 14, 33, 40, 51). In African countries, there is still very limited evidence of the fact that pre-service teacher-students can actually improve their thinking skills while navigating through their educational path (14, 40). Lessons are mostly dominated by teacher-centred approaches with little possibility for teacher-student interaction and creative or critical thinking; innovative approaches face resistance and thinking competence in learners is reduced to mere reproduction of facts (12, 14, 33, 40). As for the nursing profession, even in the pre-service teacher education, the learning environment has proven to be pivotal in the growth of critical thinking abilities, where educators need to model efforts to direct and develop the cognitive growth of the students (14). It requires a concerted effort and a system of reforms that also impacts on the curricula. The studies suggest that teacher education curricula/designs are overloaded with content and this does not allow educators and students to concentrate on the application of content (33). A number of articles address the effectiveness of various pedagogical approaches or curricula (2, 3, 4, 9, 30, 36, 37, 43, 44) at university level. Some of these studies aim at understanding the factors of the university environment that influence the growth of critical thinking in students (2, 44), while others aim at exploring the effectiveness of techniques like integrated assessment (9), making extensive use of dialogue (3, 30), encouraging discussions that involve the whole class and critical thinking modelling helps students internalize habits of the mind that promote citizenship and personal accountability (22). Enquiry based learning (2), according to the authors, helps students delve deeper into the learning materials and textbooks, while promoting questioning and discussion amongst them. Argument analysis techniques (30) and visualization techniques (28) applied in the reviewed studies show some evidence of students who were able to transfer the critical thinking competency to other subjects. Integrated assessment methods or real-life situation assessment tests could support the shift in pedagogical approaches (2, 9). A few studies (36, 37) examine with promising results, the use of online resources and Information and Communication Technology (ICT) to enlarge the possibilities for students and lecturers to access resources that stimulate research and boost the argumentation or student thinking abilities by widening their perspective and knowledge of content.

Onen (39), in Uganda, asked the participant lecturers in his study how they were cultivating critical thinking in their lessons. The answers varied from sharing a number of resources with the students on a specific topic to promote their criticality and provoking their personal reflection, to involving the students in classroom discussions and implementing participatory pedagogical approaches. Group discussions, group works, asking open-ended questions, problem solving, and case studies were also mentioned as useful strategies to encourage personal involvement of students in the lesson.

Notwithstanding these encouraging results, the integration of effective techniques in class pedagogy is still a challenge, especially

given the fact that in many countries English, while being the sole language of instruction at university level, is still problematic for many students (2). The learning environment remains a major hindrance; teacher-centred pedagogies (3, 9, 43, 44), overcrowded classrooms, limited or outdated learning materials, and inconsistent assessment methods (2, 9, 43) are very common. Moreover, many of the strategies adopted in sub-Saharan universities are not bringing the expected results. Group work is often small in scope and ineffective (43). Class discussions are described as venues for asking lecturers clarifying questions and not opportunities for exploring new ideas and confronting new perspectives (43). Active teaching methods and laboratory experiences are rare and hampered in their effectiveness by lack of resources. Research is limited and usually students are not helped in questioning their findings or even simply assessing the soundness of their research methods. Instructor motivation is also low and usually faculty members lament the lack of support by the administration (43). Considering these challenges, Schendel (43, 44) maintains that increasing the exposure to a specific pedagogical method is not going to lead to significant progress in student critical thinking. She insists on the importance of accompanying lecturers in the shift of mentality that must occur primarily in them. "Sustained and substantial faculty development programming, therefore, appears to be a crucial component of any attempt at pedagogical reform" (43, p. 566).

Lastly, only a few studies describe critical thinking pedagogical strategies implemented at secondary school level (28, 31), but their scope (both in sampled population and application) is quite limited. One study (12) described how teachers influenced pupils in a Nigerian primary school science class in the acquisition of critical thinking skills. It reports using qualitative evidence that classroom instruction reflects a dominative pattern, where the teacher does most of the talking, explaining and directing with little or no involvement of learners (12). This last finding raises questions on the appropriateness of current continuous professional development for teachers, lecturers and educators. Apparently, this remains one of the main challenges (23, 24, 43). New reforms that envision curricula upgrading without proper accompaniment of teachers and support to the whole system are likely to have little impact on the classroom environment and on students (43).

## 5. Discussions and conclusions

This study presents the results of a qualitative analysis through an inferential process. This thematic analysis goes beyond the coding of descriptive characteristics of the selected articles to enhance the understanding of the contextualization characteristics of the critical thinking process in sub-Saharan Africa. To achieve this result, abstract codes were generated, increasing the complexity of the process and introducing the risk of possible limitations. Below, the studies that met the inclusion criteria are discussed and compared with the literature.

To respond to the first research question regarding the local conceptualization of critical thinking, some studies (Grosser & Lombard, 2008; Madondo, 2018; Schendel, 2016) deepened the debate on the connection between culture, language, and critical thinking. These authors highlighted the importance of starting from the local understanding of critical thinking for developing and measuring through relevant and context sensitive strategies. Only a few studies investigated the local understanding of critical thinking skills, even though they did not deepen the influence of cultural differences. These researchers asked the participants in the study to elaborate on what they thought the meaning of critical thinking was, but in all these cases, the authors were trying to document the alignment of the participants' definitions to the general definition of critical thinking as found in western literature. These authors were not aiming at explaining how the cultural aspects could influence the understanding of these skills.

The problem of not contextualizing the definition of critical thinking has an impact on the way assessment and enhancement are approached. The lack of attention to the local interpretation of what critical thinking is, and how it relates to culture and language, results in the acquisition of assessment tools and pedagogical strategies that do not take the cultural nuances into account. Actually, the present review raises questions of cultural relevance of the methods used for assessing and teaching critical thinking and highlights the need for localization and adaptation processes that could inform the education system, both in secondary and higher education, on the contextually appropriate ways of assessing and enhancing critical thinking in sub-Saharan Africa. Assessment is particularly relevant in the context of formal education for the strong connection with the process of enhancing critical thinking. On this, it is important to consider the washback or backwash effect, also known as measurement-driven instruction, which refers to the influence of testing on teaching and learning and it is a prevailing phenomenon in education (Alderson & Wall, 1993; Biggs, 1995, 1996; Cheng, Watanabe & Curtis, 2004). This concept is rooted in the notion that tests and overall assessment processes should and could drive teaching and learning. On the other hand, every assessment process, including the instruments used, is underpinned by a particular concept of critical thinking.

In regard to the second research question, and after analysing the findings produced by this review, it is clear that there is lack of awareness of the need to conduct contextualised processes. In addition, the lack of familiarity with adaptation methods is notorious, probably because "there is fear that this process will affect the psychometric properties of the instruments or will add excessively to a study timeline" (Schendel & Tolmie, 2017, p. 674).

Most of the attempts of empirical studies to assess critical thinking in low-income contexts relied solely on assessment instruments imported from other cultural contexts (Schendel & Tolmie, 2017), generating problems of comparability, absence of normative groups and lack of familiarity in adaptation and validation processes. The general process to ensure the contextualization of an instrument (Ennis, 2009) is thoroughly followed only by one author. Overall, there is neither reflection on the selection of an appropriate instrument nor adaptation of the content, in case the tool is "imported", field testing, piloting and validation analysis of the final version.

We can conclude that the reason for selecting and using imported instruments relates to the quality of the instrument itself, but it does not adequately consider the context and the particular cultural components, as instead shown by Schendel (2015, 2016). This author follows the *In-depth Culture Adaptation Method* in adapting a performance-based task tool. In addition, she refers to the three steps stated by Ennis (2009) and the available international guidelines, where best practices in developing tests for use in diverse

cultural contexts is defined (Schmeiser & Welch, 2006). This adaptation process agrees with the numerous examples available in the literature on how children performed poorly in assessments due to language aspects (Prado, Ullman, Muadz, Alcock & Shankar, 2012), and being unfamiliar with materials (Serpell, 1979).

In reference to the methods used in nurturing critical thinking, the studies by Grosser and Lombard (2008) and Madondo (2018) highlight how the peculiarities of the traditional African cultures should be considered while designing for fostering critical thinking in the classroom. The findings describe how the western individualistic vision of life differs from the African communitarian and altruistic life style. This leads to an approach to problems that avoids a rhetorical and confrontational way of discussing or arguing with people; thus, the limited importance placed on argumentation that is instead considered to be key in the critical thinking process as highlighted in the western literature (Grosser & Lombard, 2008). Approaches to enhancing critical thinking in the school environment should consider the communitarian approach to life that encourages collective interdependence and collaborative approaches to problem solving (Grosser & Lombard, 2008). Experiential learning methodologies and collaborative problem-based learning might be more-widely preferred in culturally adapted approaches to critical thinking than dialogical or Socratic approaches that require high levels of language proficiency and abstract thinking. Collaborative learning is a strategy that could also be helpful in fostering critical thinking in sub-Saharan contexts. In these countries centralized academic policies underscore the relevance of pedagogical practices that foster critical thinking (e.g., group-work and class discussions), but apparently these policies have so far not resulted in a real change in practice; teachers or lecturers tend to adapt these strategies to pre-existing teaching habits without introducing any change in the teaching-learning experience (Schendel, 2016). Moreover, though collaborative learning strategies and active teaching methods are respectful of the local culture, the lack of pedagogical training for teachers or lecturers is likely to limit the ability of teachers and lecturers to successfully implement the pedagogical innovations that should foster critical thinking in learners.

This study can serve as a methodological guide for professionals and academics who wish to investigate critical thinking in the African context. The few papers that underscore the cultural dimensions that influence critical thinking are a relevant starting point for developing a localized strategy for assessing and enhancing critical thinking. For instance, the analysis of Grosser and Lombard (2008) is very important for understanding and framing the problem. The process of adaptation followed by Schendel (2015, 2016) in developing contextualized assessment tools is also quite exemplary. Moreover, this integrative review identifies conceptual and methodological limitations and strengths and presents contextualized designs to understand, enhance and assess critical thinking.

Based on the presentation and discussion of the findings, the main recommendation is to address the gap related to local understanding of critical thinking using ethnographic or grounded theory studies with the aim of constructing a contextualized definition of critical thinking, unearthing its local peculiarities and the connections of the concept with the traditional cultures. Moreover, these studies should appraise the definition of a localized critical thinking skill-structure, which is key to strategies for the enhancement of critical thinking in academic settings and for the validation of assessment frameworks.

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