

Responsiveness of the South African teacher education curriculum for 21st-century needs: a narrative review

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ABSTRACT

This narrative review analyzed what a responsive curriculum is and whether the South African teacher education curriculum is responsive to the demands of the 21st-century. We utilized the desktop research via a narrative review methodology to extract answers to these questions by searching Google, Scopus, ERIC, and EBSCO databases. Findings show that a responsive curriculum allow educators and students to be aware of their responsibilities within the teaching and learning environment, enable students to pursue knowledge and skills that align with their interests and backgrounds, enabling job seekers to become entrepreneurs, and adapting to the shifting demands of employers while ensuring emancipation and empowerment. A responsive curriculum aligns with students' economic, cultural, disciplinary, and learning needs. However, the South African teacher education curriculum is yet to fully respond to 21st-century skills' needs. A responsive curriculum is sensitive to current contextual realities and that the South African teacher education curriculum be designed and implemented to develop 21st-century skills among pre-service and graduate teachers. The teacher education curriculum should be dynamic by meeting up with the demands cum expectation of the Fourth Industrial Revolution era and be balanced in addition to its role of developing responsible, humane, and compassionate citizens/graduates. Especially for South African, the decolonization discussion and the inclusion of Indigenous knowledge and systems should be fully enshrined into the teacher education curriculum—the “mother” of other curricula.

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1. INTRODUCTION

South Africa has had a rueful past and is still recovering from the colonial wounds that are physical, emotional and epistemological [1], [2]. In the South African higher education sector, issues on decolonization of the curriculum remain unabated and unaddressed and need further research [3]–[5]. Teacher educators must work within unchallenged hierarchies of knowledge, western-centric epistemologies and hard boundaries between disciplines [6]. The key reason for these decolonization quests stem from the nonresponsive nature of the curriculum in satisfying essential societal needs [3]. In this Fourth Industrial Revolution era, there are serious concerns and implications stemming from the rising rates of unemployment in South Africa. Many believe that the traditional curriculum only prepares graduates for the world of work

without preparing them to become employment creators themselves [4]. This depicts the need for a curriculum that should be responsive.

Consequently, one such curriculum that should be responsive is the South African teacher education curriculum, which is the compass with which persons (teachers) are professionally trained and/or retrained to further train others for societal good, development, and transformation [7]. Researchers and scholars have advocated for further research on a responsive curriculum [8]. Providing interns and practicing teachers with applied research and scientifically substantiated results. These could guide them toward enhanced teaching and learning in schools, which is crucial for the quality of teacher education and the teaching profession [9]. Recently, there has been a heightened quest within the South African space for a realigned curriculum that meets the challenges of the 21st-century [10]–[13]. Furthermore, Matshe and Mahlangu [10] have argued that the South African curriculum statement stresses high knowledge and skills for all. This paper, therefore, interrogates the extant literature through the lens of narrative review in ascertaining what a responsive curriculum entails and whether the South African teacher education curriculum is responsive to the needs of the 21st-century skills.

Research interests in curriculum responsiveness in South African higher education within the context of decolonization are still growing. Different social contexts use curriculum to address political, cultural, and economic needs [14]. When used or implemented properly, a responsive curriculum will probably result in the development of well-educated people who have the knowledge and abilities needed to handle the various opportunities and challenges of the modern world [4], [15], [16]. According to Ameyaw *et al.* [17], curriculum responsiveness is desirable because it offers well-crafted standards to measure whether educational initiatives have the desired impact on society. The curriculum is expected to contextualize issues and prepare students for societal good while sustaining their diverse voices and talents [3]. Funmayam [4] claim that a responsive curriculum could turn job seekers into job creators, allowing students the autonomy to acquire and pursue knowledge or skills in line with their interests and backgrounds.

Despite the import of a responsive (teacher education) curriculum, higher education institutions in South Africa have gone unaddressed or not sufficiently prioritized [18]. The impact of a responsive curriculum on students' lives, learning, performance, and skills development remains an undeveloped area in research [19]. The teacher education curriculum currently used in many South African higher education institutions seems outdated and unable to provide or equip students with the necessary skills and training for future life aspirations, nor matches the current labor market demands [20]. Studies have revealed that higher education graduates (including teachers) enter the workforce without the desired 21st-century skills [21]. The SDG Target 4.7 emphasizes the essence of individuals' possession of 21st-century skills and their implication to policy planning, teacher education training and assessment, and curriculum content.

The phrase "Fourth Industrial Revolution" was coined in 2016 by the World Economic Forum to describe the current period marked by digitization, automation, robotization, and connectivity. These factors are all intended to improve manufacturing, productivity, efficiency, and competitiveness, with an increased focus on guaranteeing and realizing an inclusive and sustainable society [22]. Professional training and qualifications, such as teacher education and training programs, have not kept up with these changes in society and the labor market, despite these efforts [23]. Furthermore, reconsidering the curriculum for the future and the way we think and talk about it, particularly its responsiveness, has gained prominence in the aftermath of the #FeesMustFall movement [24].

Employers are becoming increasingly concerned about the skills gap between education and the workforce, as evidenced by the rising demand for 21st-century skills [25]–[27]. It thus becomes binding for higher education institutions offering teacher education programs to impart these skills and competencies to pre-service teachers [28]. It is also unclear what constitutes a responsive curriculum [15]. This study is based on the responsive curriculum development (RCD) and partnership for 21st-century skills (P21) frameworks. The RCD emphasizes the need for curricula to adapt to societal, technological, and professional changes. It is iterative, stakeholder-inclusive, and context-sensitive [29]. Its main elements are vision and stakeholder involvement, action-oriented pedagogy, and continuous improvement. RCD ensures that curriculum design remains dynamic and responsive to the changing demands of education and the workforce [29]. The P21 framework is widely recognized for its comprehensive approach to integrating 21st-century skills into education [30]. It categorizes essential skills into three domains: learning skills (4Cs) (critical thinking, communication, collaboration, and creativity), life skills (flexibility, adaptability, initiative, social skills, productivity, and leadership), and literacy skills (information literacy, media literacy, and technology literacy) [31].

It is expected that since teaching and learning is a dynamic process, the curriculum must follow suit. Higher education institutions in South Africa are to ensure that their curriculum is responsive to its context, vision, and mandates and to help students benefit optimally from their learning while meeting their needs [32]–[34]. The necessity for a more responsive curriculum in higher education is attested to by the

recent waves of protest in South Africa that have demanded the decolonization and transformation of the country's higher education system [3], [16]. It is impossible to overstate the need for a more responsive teacher education curriculum given Education 5.0 and the disruptive technologies it has brought about that are changing students' way of life [35].

Many South African higher education institutions seem to be using antiquated teacher education curricula that neither adequately prepare students for the demands of the labor market today nor give them the skills and training they will need for their future aspirations [20]. Research appears sparse on what constitutes a responsive teacher education curriculum vis-à-vis the extent of responsiveness of the South African teacher education curriculum [7], [13]. Essentially, while curriculum responsiveness has been explored in general higher education, few studies have specifically examined South African teacher education curricula against 21st-century skills frameworks. This necessitates this current study.

The findings of this study will provide the department of higher education (DHET) and decision-makers at the district, provincial, and national levels with useful information on how responsive the teacher education curriculum is in its present form. It will help educators, school administrators, legislators, and education faculty and staff (especially in South Africa) navigate the difficulties of implementing student skill development and responsive teacher education curricula. This study will provide empirical evidence for further inquiry into teacher education curriculum responsiveness and the development of 21st-century skills. Indeed, curriculum reform in higher education institutions should be informed and aligned with our society's current trends and needs. Accordingly, a responsive South African curriculum is crucial for addressing the dynamic and multifaceted demands of the 21st-century. This is true if the curriculum in teacher training programs seeks to develop prospective and in-service teachers about modern pedagogical techniques, digital literacy, and critical thinking skills.

There is a dearth of literature on the responsiveness of the African curriculum especially in aligning with the demands of the new era (era noted for 21st-century driven skills, artificial intelligence, machine learning and the likes, Fourth Industrial Revolution, and Education 5.0). More so, little attention has been given to a responsive South African curriculum, particularly in Higher education space, and this translates into the development of students' 21st-century skills. These are the hallmark of this current study and the value it adds to the curriculum design, policy and implementation literature. It is arising from these that this current study interrogates the extant literature through narrative reviews in providing answers to the under-listed research questions:

- What is a responsive curriculum?
- Is the South African teacher education curriculum responsive to the demands of the 21st-century?

2. LITERATURE REVIEW

2.1. Responsive curriculum design

Halliburton [36] and Vreuls *et al.* [29] explained the obsolescence of curricula, citing the ever-changing nature of education and its need to adjust to broad historical and social demands, new developments in professional education, or paradigmatic changes and adjustments to widely held disciplinary presumptions. Curriculum planning is divided into three categories by the author: i) mechanism or statics, which describes curriculum maintenance or tweaking rather than a complete overhaul; ii) dualism, which represents curriculum changes that alternate between popular trends of emphasis; and iii) knowledgeism, which emphasizes changes in disciplinary content.

As it happens, these processes are usually laborious and time-consuming [8]. But when it comes to dealing with the rapid changes and demands that are currently taking place in professional practice and society, including the teaching profession, time is of the essence [8]. As such, creating a responsive curriculum is a cycle that calls for a manner of thinking and doing that offers sufficient assurances of quality and gradually necessitates recalibrating the processes that have been started [8]. This research aims to clarify the definition of a responsive curriculum and the extent to which the South African teacher education curriculum is adapted to meet the needs of the 21st-century.

A responsive curriculum, according to Funmayam [4], needs to be flexible, diverse, integrated, and relevant. The goal of curriculum responsiveness has been to create academic programs and degrees with names that imply relevance to the workplace. However, it is unclear how much of this has happened in South African classrooms [7]. Curriculum responsiveness, according to Moll [37] is the ability of a curriculum to consider the needs of both students and society at large. According to the author, by emphasizing not just what happens in the classroom but also what students do with what they learn, the curriculum addresses issues of employability (economic responsiveness), diversity in the student body (cultural responsiveness), the nature of underlying knowledge within the discipline (disciplinary responsiveness), and pedagogical/learning responsiveness.

The ability of a curriculum to train skilled professionals in various economic sectors is referred to as economic responsiveness [7]. People exposed to an economically responsive curriculum are expected to understand the nuances of the labor market, be resilient to current economic challenges, be creative and innovative with their use of resources, and be able to withstand and overcome setbacks [7]. Conversely, cultural responsiveness refers to the curriculum's capacity to identify and address cultural dissonance in the classroom [7]. The ethnicity, race, gender, cultural and social backgrounds of teachers and students may cause this dissonance.

Cultural and social changes worldwide make it increasingly important to adequately prepare prospective teachers for teaching students from diverse backgrounds and coping with constant changes in learning [38]. Gamble [39] contends that a curriculum that not only addresses cultural challenges but also acknowledges diversity in the classroom is necessary in a country like South Africa, which has a history of corrosive discrimination. According to Gay [40], a culturally responsive curriculum should be able to cater to social and cultural diversity among students while fostering teaching and learning endeavors.

A community of scholars that generates new knowledge by the discipline's rules is closely linked to a higher education curriculum [3]. The capacity of a curriculum to support new findings within the discipline and stay current with field research is known as disciplinary responsiveness [41]. However, most academic disciplines and curricula are frequently extremely systematized forms of inquiry that avoid the daily activities that education is meant to inform, challenge, and prepare people for [37]. To be deemed disciplinarily responsive, the higher education curriculum in South Africa must be in line with current research in the field and applicable in addressing real-world problems. In addition to encouraging students to think globally and act locally to advance the discipline, disciplinary responsiveness will guarantee that what is happening locally and internationally as it relates to the discipline is covered [29], [42], [43]. Through these frameworks, we analyzed the sampled literature how the teacher education curriculum aligns or advances the transmission of 21st-century on students. Further summary of the comparison between the RCD and P21 framework is shown in Table 1.

Table 1. Comparison between the RCD and P21 frameworks

S/no	Dimensions of RCD framework	Dimensions of P21 framework
1	Societal responsiveness: aligning curriculum with societal changes and preparing learners for societal contribution	21st-century student outcomes (the rigor, relevance, and relationships (3Rs) and 4Cs): core academics plus 4Cs, tech, and life skills
2	Contextual responsiveness (variety of schools/settings): adapting curriculum to different school types and environments	Support systems: standards, assessments, curriculum, teaching professional development, and learning environments
3	Student diversity responsiveness: supporting diverse learners with inclusive and equitable practices	21st-century learning environments: real-world relevance, collaboration, equity in access to resources, professional learning communities

2.2. South African education system and the 21st-century skills

Conceptualizing "21st-century skills" is controversial [44]. Soft skills, life skills, teamwork skills, communication skills, critical skills, transversal skills, ICT skills, and digital skills are all subsumed in 21st-century skills [13]. It comprises a variety of abilities, skills, and knowledge required for individuals to function in a drastically altered work environment to contribute to both present and future society [45]. It also refers to particular technology-driven skills needed in a knowledge-based economy that is globally diverse, highly resourced, and highly connected [44]. Kim *et al.* [46] state that various competencies, such as critical thinking, problem-solving, creativity, metacognition, communication, digital and technological literacy, civic responsibility, and global awareness, are generally considered part of the 21st-century skills set. According to Tushar and Sooraksa [47], developing 21st-century skills in graduates would guarantee their employability and suitability for the workforce. They also raise concerns about how little emphasis higher education (HE) institutions currently place on developing these skills.

People must acquire 21st-century skills, particularly in Sub-Saharan Africa, as this is the only way to escape the region's low-skilled labor force [46]. It becomes essential to coordinate the training, assessment, and curriculum for teacher education with the acquisition of these skills [46]. Care *et al.* [48] reaffirm that many African nations have not yet fully integrated the development of 21st-century skills into their curricula, and Akongo *et al.* [49] stress the importance of doing so. According to Liao and Chen [50], the curriculum is a sophisticated social practice that encapsulates educational values, including what is intended and what is done and experienced, as well as the kinds of future opportunities that are created and made possible. Rather than being an aim, the curriculum is a tool to support a more comprehensive and meaningful educational experience [51].

In essence, for educational curricula to be successful, they must be sensitive to both the needs of the students and the society in which they are situated [3], [29]. Funmayam [4] contend that a responsive curriculum for higher education would guarantee that South African universities generate graduates capable of contributing to the global community and South African society in the 21st-century. The Curriculum Assessment Policy Statement (CAPS) curriculum, a single, comprehensive policy document that offers guidance for learning and teaching in South African schools, is one way that the South African education system has addressed 21st-century skills [52].

In South Africa, the CAPS curriculum explicitly addresses the teaching and learning of these skills: life skills and life orientation are two distinct subject areas that have allotted time and recommended pedagogical approaches within the senior secondary curriculum. Learners are exposed to a broad range of knowledge, skills, and values such as communication, creativity, social and interpersonal skills, moral responsibility, self-confidence, self-discipline, and cultural values through the four study areas under life skills: beginning knowledge, personal and social well-being, creative arts, and physical education. Life orientation targets four learning outcomes: personal well-being, citizenship education, recreation and physical well-being, and career choices [44]. Its goal is to prepare students for “meaningful and successful living in a rapidly changing and transforming society” [53].

2.3. Teacher education/curriculum and the 21st-century skills demand

The global shift to a 21st-century curriculum has resulted in modifications to the role of the teacher, as they must adapt to the needs of modern learners [54]. Scholars from local and international institutions have noted that teacher educators appear stuck in bygone eras when new technologies were unproblematic. Nevertheless, they realize that their student teachers will end up in classrooms full of students with a clear idea of what a 21st-century education should offer [55]. UNESCO [56] lists the following as goals of teacher education: the development of pre-service teachers’ “general education and personal culture; their ability to educate others; an awareness of the principles which underlie good human relations, within and across national boundaries; and a sense of responsibility to contribute, both by teaching and by example, to social, cultural, and economic progress”.

Moll [37] reiterates that fresh university students face various disadvantages, particularly when adjusting to a foreign institutional and epistemic context. The curriculum’s capacity to adapt to students’ learning needs is known as pedagogical or learning responsiveness. No meaningful learning can occur if the curriculum does not adapt to these unique students’ needs. “Approaches to the design of curricula, instructional strategies, methods of assessment, and approaches to student support that take the characteristics and context of target student groups seriously” are necessary to respond to students’ needs through the curriculum [57].

Educators who will be teaching in the classroom in the 21st-century must stay up to date on the changes in the socio-political, economic, and technological landscape of the day, as well as the demands made on teacher preparation programs that are responsive to these changes [58]. Education is the albatross for desired societal development and change [59]. The quality of the teaching profession, and consequently the caliber of the curriculum and teacher training programs, determines the success or failure of any educational system [59]. The teacher education curriculum is the professional education and training intended for pre- and in-service teachers to help them acquire the attitudes, abilities, and knowledge necessary to improve teaching and learning effectiveness and meet societal needs. It is crucial to assist pre-service teachers in developing into resilient, aware, and global citizens even after they enter the teaching field.

According to Chigona [60], pre-service teachers’ education affects the caliber of education students receive in the classrooms these new teachers oversee when they begin their careers. Teachers with the necessary 21st-century knowledge, skills, and experiences must instruct the 21st-century students who are now considered digital natives. In developing countries, concerns have been expressed about the curriculum for teacher education and its alleged inability to provide teachers with the skills needed to help their students participate fairly in this day and age [60].

Pre-service teachers’ efficacy in the classroom is determined by the caliber of instruction they receive from their teacher educators. Still, how can pre-service teachers obtain the high-quality teacher preparation required for classrooms in the 21st-century? Researchers such as Strydom [61] argue that to meet the demands of the global knowledge economy, which is the workforce of the 21st-century, government-assisted teacher education should focus its resources on preparing pre-service teachers who can teach digital natives. Teacher education programs must take on the challenge of reinventing themselves to produce students who will be able to apply the knowledge and skills that will be required for the global economy and who will be ready to use the resources and technologies of the 21st-century [62]. It is argued that most programs for preparing teachers for teaching do not adequately prepare them for teaching in the 21st-century [60].

Fomunyam and Teferra [3] conducted a qualitative study to enhance the responsiveness of the South African curriculum. Human-Hendricks and Meier [15] reviewed the literature to critically analyze the body of research on the nature and function of responsive curricula in maximizing learning in higher education. The findings demonstrated that learning optimization and a responsive curriculum have a complicated and dynamic relationship. Despite prioritizing it in their policies, most higher education institutions, according to the literature, are still unclear about what a responsive curriculum is and how to put it into practice.

Chigona [60] qualitative study aimed to determine how well new teachers are being prepared for the profession through their various training programs and curricula. Results indicate that graduate teachers are not getting the kind of teacher education needed to meet 21st-century demands because they are not receiving adequate training on integrating digital technologies into the delivery of curricula effectively. Other studies reveal that most teachers are not equipped with the humanistic and pedagogical skills needed for culturally responsive education and that many institutions are not equipped to deal with the ever-increasing number of multicultural classrooms [38]. The contributions of Morrison *et al.* [63] have pointed out the need to empower teachers to understand cultural responsiveness in education to promote cultural diversity in schools, knowledge creation, and sustainable development. The authors also affirm the non-responsiveness of the teacher education curriculum in aligning with the multifaceted current changes and societal developments.

Pre-service teachers' (PTs') perceptions of the teacher education curriculum's (TEC) responsiveness to their economic, cultural, disciplinary, and learning needs, as well as the barriers to this responsiveness and the tactics they believed to enhance it, were evaluated by Osiesi and Blignaut [7] using a quantitative case study design. The results illustrate the elements influencing the implementation of a responsive TEC and ideas for development, demonstrating that PTs believe the TEC is responsive to their economic, cultural, disciplinary, and learning requirements.

The views of pre-service teachers (PTs) at Nelson Mandela University in South Africa regarding the contribution of the Teacher Education Curriculum (TEC) to the development of 21st-century skills among PTs were investigated by Fraillon and Duckworth [13]. The study used the descriptive survey research type of the non-experimental design, which was supported by the theories of planned behavior, technological pedagogical content knowledge, and self-regulated learning. According to the findings, the South African TEC heavily instills 21st-century skills in PTs. The most common 21st-century skills among PTs are collaboration, communication, critical thinking, and creativity skills (in that order). The main obstacles impeding PTs' development of 21st-century skills are their excessive academic workloads, lack of digital literacy and competencies, and insufficient evaluation of ICT-related skills. Human-Hendricks and Meier [16] examined the three factors that drive a responsive curriculum in South African higher education, the need for decolonization, the ability to accommodate disruptive technologies, and 21st-century graduate characteristics, using a critical interpretative literature analysis.

2.4. Strengths and weaknesses of the curriculum

Although the curriculum for higher education in South Africa shows promise in expanding access and making an effort to match students' needs and 21st-century skills, it suffers from structural rigidities, transitional gaps that lead to high dropout rates, and the ineffectiveness of extended curriculum support [64], [65]. Concisely, the strengths of the South African Higher Education curriculum have been highlighted to include helping students transit from secondary to higher education with ease using strategies such as the Liao and Chen (SLA); the availability of foundation programs, or extended curriculum programs, which give underprepared but capable students, especially those from underprivileged backgrounds, access and support to education; giving students practical skills and technology capabilities that meet the demands of the workforce in the 21st-century, as well as critical thinking and autonomous problem-solving abilities [7], [13], [66], and government and educational organizations' strategic plans and dedication toward enhancing student wellness, quality, access, and language policy support, curriculum relevance and student success. However, there are few criticisms with same curriculum among which are the CAPS "one-size-fits-all" approach and lack of vertical curriculum articulation, rigidity of the curriculum, inefficiencies of the curriculum and the need for systemic change, as well as inadequate curriculum evaluation attempts [66].

Curriculum responsiveness in South African higher education is centered on decolonization, accommodating disruptive technologies, and equipping graduates with 21st-century skills [16], [67]. Addressing colonial legacies, incorporating technology-enhanced learning, matching curricula to the demands of the labor market, and encouraging creativity, innovation, and problem-solving abilities are all prioritized. In Nigeria, curricular responsiveness frequently focusses on integrating technology, solving socioeconomic issues, and matching the demands of the job market with the outputs of higher education [68].

To address the high rate of graduate unemployment, the nation has recently implemented reforms that prioritize ICT literacy, entrepreneurship, and skill development [69], [70]. Though infrastructure and consistent policy execution continue to be issues, Nigerian curriculum is being transformed to include global

competency frameworks [71], [72]. Similarly, decentralizing education to accommodate various regional demands and emphasizing competency-based learning are two aspects of Kenya's curriculum responsiveness [72], [73]. The proposed curriculum changes place a higher priority on digital literacy, critical thinking, and congruence with the economic growth objectives of Vision 2030 [73], [74].

Frameworks like the European Qualifications Framework (EQF), which place a strong emphasis on sustainability, digital skills, and lifelong learning, frame the responsiveness of the European curriculum. The curricula incorporate creativity, intercultural competency, and flexibility in response to swift technological advancements [75]. Diversity and decentralization characterize curriculum responsiveness in the United States of America, as educational institutions rapidly adjust to employment demands, technological advancements, and social justice objectives.

3. METHOD

The study utilized the desktop research methodology of the narrative literature review type [76]. A narrative review aims to understand current knowledge and emphasize the significance of new research by summarizing or synthesizing existing literature on a given topic. It does not, however, seek to generalize or accumulate knowledge from the reviewed material [77]. During the literature search, the processes we adopted while searching these databases were: clearly outlining the research topic and question to determine relevant keywords and concepts; use of Boolean operators (and, or and not) to refine or broaden search results; use of synonyms, related terms, and truncation (e.g., curri* for curriculum, educate* for education, and response* for responsiveness) to maximize search coverage; and for the Google database, we utilized quotation marks for exact phrases and advanced search operators like the site to limit results to specific domains.

For the Scopus database, we used field-specific searches like TITLE-ABS to target titles and abstracts, carefully structured parentheses in search strings to avoid errors, and combined search sets using their identifiers. For ERIC and EBSCO Platform, we limited results to peer-reviewed journals using the "Peer Reviewed" filter, used proximity operators like W1 or N3 to find words close to each other in a specific order or any order, respectively, searched specific fields like abstracts or titles, and combined multiple database searches on the EBSCO platform using "choose databases".

We reviewed relevant literature sources that aligned with the article's concerns and significance, including secondary research materials and academic research reports. The literature search criteria centered on teacher education curriculum, curriculum responsiveness, 21st-century skills, and South Africa. The authors continually improved the draft to align the content with the paper's primary goals. Applying a descriptive interpretative approach [76], we critically examined our assumptions and beliefs about what constitutes a responsive curriculum and how responsive the teacher education curriculum is to meeting the demands of the 21st-century to address the study's objectives [77].

Data gathered from our literature review began by clearly identifying the research question or objective that guided our literature review. Results of our searches of relevant literature that met the inclusion criteria were filtered, and the key information (findings) of these studies were recorded in a data coding sheet. We analyzed the collected data by identifying recurring themes, debates, patterns, and gaps in the literature, with studies with similar findings or methodologies grouped to synthesize insights effectively [78]. Finally, we employed both content and thematic analysis to interpret the data from the coding sheet. Data in this narrative review was gathered primarily through a broad, flexible, and iterative search of existing literature relevant to the research topic and question topic [79].

The process typically involved using the topic and research questions to guide the scope of the review, searching multiple databases and sources using the search terms aligned with the topic and research questions, screening and selecting relevant studies or articles based on inclusion and exclusion criteria, extracting key information from selected sources, often organizing the data by themes, concepts, or trends related to the research question, critically analyzing and synthesizing the qualitative content, comparing findings, identifying patterns, gaps, and relationships rather than statistically aggregating data.

We justified our choices of included literature and reflect on how their perspectives shape the interpretation of the data thereof. Data extractions were documented using summaries to capture study characteristics and findings systematically [80], [81]. Of the thirty-one articles initially downloaded, 16 of them were germane to this current study's concern. See Figure 1 for further illustration an Appendix.

4. RESULTS

Our literature review results indicate that a responsive curriculum should raise teachers' and students' awareness of teaching and learning, be fully implemented, and produce highly employable graduates ready for the workforce and empowered to support societal advancements. It also emphasized that

the South African teacher education curriculum is not fully responsive to the needs of the 21st-century. These findings will be presented in line with the research objectives and questions as outlined:

4.1. What a responsive curriculum is

A responsive curriculum, according to Funmayam [4], makes instructors and students aware of their responsibilities within the teaching and learning environment. The authors also suggested that a responsive curriculum might enable students to pursue knowledge and skills that align with their interests and backgrounds, enabling job seekers to become entrepreneurs. The authors contend that a fully implemented curriculum is responsive to guarantee its application. The curriculum is deemed responsive when teaching and learning at a higher education institution (HEI) adjust to the evolving needs of faculty, staff, and students, producing more employable graduates [15]. Curriculum responsiveness refers to the capacity of education to adapt to the shifting demands of employers, thereby supplying them with a workforce capable of boosting their businesses cum economic competitiveness [82]. By providing opportunities for critical reflection and active participation in worthwhile learning experiences, a responsive curriculum should aim to emancipate and empower students [65], [83], [84].

4.2. Responsiveness of the South African teacher education curriculum to the demands of the 21st-century

According to Iloanya [85], even in the South African education system, there is a need for a new, contextualized conceptual architecture of education and a responsive curriculum that meets local educational needs while empowering students to operate in and contribute to a globalized world. The majority of South African teacher education programs and curricula do not adequately prepare teachers for the 21st-century, according to a study by Chigona [60]. This indicates that the curriculum is not tailored to the demands of the 21st-century. Research by Human-Hendricks, and Meier [15] and Fomunyam and Teferra [3] confirms that most of the nation's higher education institutions are still unclear about a responsive curriculum and how to use it.

Because of this, it is possible that the teacher education program used in South Africa's higher education system is not sufficiently responsive or in line with the frameworks for 21st-century skills. Most teachers lack the humanistic, pedagogical, and multicultural classroom skills required for culturally responsive education in today's schools, according to a study by Iwuanyamwu [38]. Studies by Herlinawati *et al.* [20], Rios [21], and Morrison *et al.* [63] have reaffirmed that the teacher education curriculum is not responsive to the 21st-century needs and that graduates of higher education (including teachers) enter the workforce without the desired 21st-century skills.

Findings from the studies of Osiesi and Blignaut [7] reiterate that a responsive curriculum aligns with students' economic, cultural, disciplinary, and learning needs; and Fraillon and Duckworth [13] that affirmed the potency of the South African curriculum in developing 21st-century skills among students (pre-service teachers). The findings of these studies also affirm that the South African teacher education curriculum heavily instills 21st-century skills in teachers, including collaboration, communication, critical thinking, and creativity skills. Thus, amidst the demands of this era of technology and the associated Fourth Industrial Revolutions and Education 5.0 dictates, it seems that South African curriculum experts are re-evaluating the curriculum for alignment and necessary improvements in lieu of these dictates [64].

5. DISCUSSION

This paper examined what a responsive curriculum is and whether the South African teacher education curriculum responds to the 21st-century skills needs. Accruing from the review of the literature, findings indicate that a responsive curriculum should arouse teachers' and students' consciousness regarding teaching and learning, be fully implemented, and whose graduates are adequately prepared for the world of work, adequately empowered to boost societal developments and growth, and have high employability prospects [4], [15], [16], [65].

We think that a responsive curriculum should consider students' changing needs as well as the changes happening in society. So, a responsive curriculum is sensitive to changing times and contexts or contextual realities. For the present, a responsive curriculum should cater to today's trending issues, discussions, and challenges, such as the Fourth Industrial Revolution, artificial intelligence, robotics, and machine learning. These issues could be the same or different for countries. So, a crucial question to be asked is "What" is the curriculum responsive to? It is this "what" that the curriculum needs to respond to.

In other words, agenda setting or listing the problems the curriculum needs to respond to is paramount in ascertaining if such a curriculum is responsive. Setting an agenda for curricular responsiveness in South Africa may entail matching instructional strategies and curriculum to the nation's social, cultural,

historical, and economic circumstances [15]. This approach highlights the pressing need to adapt and make curricula more relevant to meet the demands of varied learners and the country's developmental objectives. Agenda items include social context awareness, decolonization and diversity in epistemology, transformative pedagogies, institutional transparency and critical thinking, and striking a balance between various responsiveness characteristics.

Teachers and educational authorities are finding it more challenging to address various aspects of multicultural education, such as race, ethnicity, gender, and class diversity, as today's classrooms in both developed and developing countries are rapidly evolving into culturally diverse classrooms [38]. Because of this, the goal of a 21st-century teacher education program should be to assist educators in acquiring the knowledge and abilities necessary for modern teaching [13]. Findings have also revealed that the South African teacher education curriculum is not fully responsive to the needs of the 21st-century.

We contend that given the years of pre-service teachers' exposure to the curriculum, their knowledge or skills concerning the teaching profession (in terms of cultural, economic, political, disciplinary, and pedagogical diversities), seem insufficient [3], [20], [21], [38], [60], [63]. More so, can these pre-service teachers, after graduation, self-employ? What if a teacher decides to change careers? A responsive curriculum should be able to prepare its graduates for future eventualities, having reinforced the vital 21st-century entrepreneurial skills and knowledge for productivity and sustenance in society [72]. This knowledge and these skills presently lacking in teacher education programs must be incorporated into the curriculum.

We live in a fast-moving world where scientific knowledge is doubled every six or 10 years [79]. Developing competent educators to instruct and prepare the next generation of citizens—a generation that is largely “digitalized” and “artificially intelligent”, is a significant challenge facing teacher education in the 21st-century [9]. We support Paré and Kitsiou [76] proposal for a flexible curriculum with two main components: a responsive component that emphasizes important aspects of being human in a social, economic, and healthy environment and a core component that focuses on the various literacies that one needs as core learning (financial, environmental, digital, and numerical literacies).

The findings of this study thus agree with the dictates of the RCD and P21 frameworks, as it reaffirms the literature that supports the need for a responsive teacher education curriculum and that such a curriculum should develop 21st-century skills among students. In support of studies by Osiesi and Blijnaut [7] and Fraillon and Duckworth [13], the South African Higher education curriculum (in this case the teacher education curriculum), corroborates with the RCD and P21 frameworks for a curriculum that is responsive and 21st-century skills driven and oriented.

5.1. Study's implications

The implications of this study's findings for teachers, education policy, curriculum design, and practice are significant, particularly within the South African context. Teachers must acquire a wider range of abilities beyond topic knowledge to implement a responsive curriculum. They must be skilled in meeting the needs of a wide range of learners, including those from various cultural and cognitive backgrounds. Flexible, student-centered pedagogies that encourage critical thinking, problem-solving, and adaptation are expected of teachers. To be prepared to deal with disruptive technology and integrate new societal and economic demands into their teaching practices, educators must engage in ongoing professional development.

Teachers who are responsive also give insightful criticism and help students develop into independent, introspective thinkers. Regarding education policy, policies should encourage and facilitate curricular flexibility and alignment with economic and societal objectives, such as preparing students for the challenges of the 21st-century and the information economy. This entails acknowledging and incorporating technology developments, decolonization, and gradueness traits (widely applicable abilities). Institutions should be able to prioritize curriculum change, resource capacity building, and the development of accountability systems that gauge responsiveness in both content and results thanks to policy frameworks.

Creating a responsive curriculum entail eschewing strict, content-heavy frameworks in favor of adaptable, outcomes-based strategies that strike a balance between the development of general abilities and disciplinary rigor. Curriculum designers must match learning objectives with real-world issues, such as the objectives of social and economic growth. For the curriculum to be effective, it must be globally relevant while also reflecting local context and histories. Additionally, it must support diversity and consider the varied origins of its students. Coherence between teaching strategies, learning objectives, and assessment is crucial for constructive alignment.

Several requirements have been adduced for developing and putting into practice an effective or responsive curriculum. These requirements include figuring out what the needs of workplaces and other stakeholders in society are, defining the goals of graduate education and assessing whether those goals are in line with industry and societal needs, and outlining what must be taught to students from the time of registration until graduation; putting in place instruments for ongoing evaluation to see if students are

regularly meeting the necessary learning objectives; creating a warm and inviting atmosphere by providing students with the best possible learning opportunities; continually monitoring the state of the sector and other relevant parties, and conducting recurring evaluations of the curriculum for “updatedness”.

A balanced curriculum should, in addition to its role of developing responsible, humane, and compassionate citizens/graduates, also respond to the current needed innovative skills which are now the demands of the labor market. In the case of South Africa, the decolonization discussion and the inclusion of indigenous knowledge and knowledge systems have not had enough emphasis in the curriculum yet. Developing genuine relationships with indigenous leaders, elders, and knowledge holders to co-develop course content; updating curricula to include Indigenous perspectives across subjects; teaching about the historical and ongoing effects of colonization to contextualize indigenous knowledge and realities; and providing educators with the pedagogical competence to integrate Indigenous knowledge respectfully and effectively are some examples of practical steps that could be taken to incorporate Indigenous knowledge into the curriculum.

Others might include: establishing safe spaces for the validation of Indigenous knowledge; bridging Indigenous and scientific knowledge systems through culturally sensitive pedagogy and constructivist approaches that foster critical thinking and cultural appreciation; advocating for educational policies that formally integrate Indigenous knowledge as a core curriculum strand; arranging immersive experiences such as visits to Indigenous sites, participation in cultural events, and reciprocal research projects that benefit both students and Indigenous communities; and using local indigenous elders and custodians as resource persons in classroom and community settings to validate knowledge and aid in learning.

Putting a responsive curriculum into practice entails changing teaching and evaluation strategies to be more transformative and learner-centered rather than concentrating only on rote learning and content delivery. Teaching required knowledge while encouraging creativity, independence, and critical thinking must be balanced. Institutions must create settings where students can study on their own with the support of feedback. Furthermore, there is a conflict that needs to be carefully balanced in practice between addressing the demands of the market right now and educating students for adaptation throughout their lives.

6. CONCLUSION

To critically examine the literature on what constitutes a responsive curriculum and the degree of responsiveness of the South African teacher education curriculum, the researchers in this study used a narrative literature review. A responsive curriculum ought to address the topics, debates, and difficulties of the modern world. Making higher education South African graduates relevant to the rapidly evolving local and global society can be achieved by developing and adopting a responsive curriculum which gives graduates of the program opportunities and knowledge that aligns with 21st-century skills.

Every stakeholder must find the curriculum unsettling and thought-provoking for it to systematically respond to contextual societal needs and the shifting demands of globalization and internationalization. Curriculum evaluation models of yesteryear, based on traditional curriculum theory that argue that curricula should be evaluated in cycles of five to seven years, are dated and might have been appropriate/relevant in more stable times. While we agree that the curriculum is not to control but should enhance and emphasize freedom, inclusivity, humanity, and expose injustices; it should also be dynamic by meeting up with the demands cum expectation of the Fourth Industrial Revolution era.

This is an important matter that students have firmly placed on the curriculum agenda since the #FeesMustFall Movement of 2015. If these issues are not adequately addressed, in addition to the argument we have made in this paper, there will be no meaningful transformation of the curriculum nor the education system for that matter. Despite these findings, we contend that higher education institutions run the risk of becoming obsolete if their curricula are not flexible and adaptable enough for the modern world. We also strongly recommend that co-teaching with community elders to integrate Indigenous knowledge and embedding compulsory digital literacy modules in all teacher education programs within the context of South Africa be implemented and prioritized.

For this study, few data bases were explored for data curling and collation. This may have limited the findings thereof and its generalizability. Future research could consider exploring other databases beyond those considered in this current study for more robust findings. Being a narrative review, authors’ biases and relational subjectivity may have impacted the findings and its interpretations. We also acknowledge that narrative reviews risk selection bias, unlike systematic reviews. Thus, we suggest follow-up empirical studies (qualitative/mixed methods) to validate the review findings accruing from this narrative review. Future research could adopt the systematic review approach for more generalizable findings. For replicability, future research should adopt other research methodologies (qualitative, quantitative and mixed research approaches) in ascertaining the responsiveness of the South (African) curriculum amidst the study’s foci.

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C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

DATA AVAILABILITY

Data availability is not applicable to this paper as no new data were created or analyzed in this study.

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APPENDIX

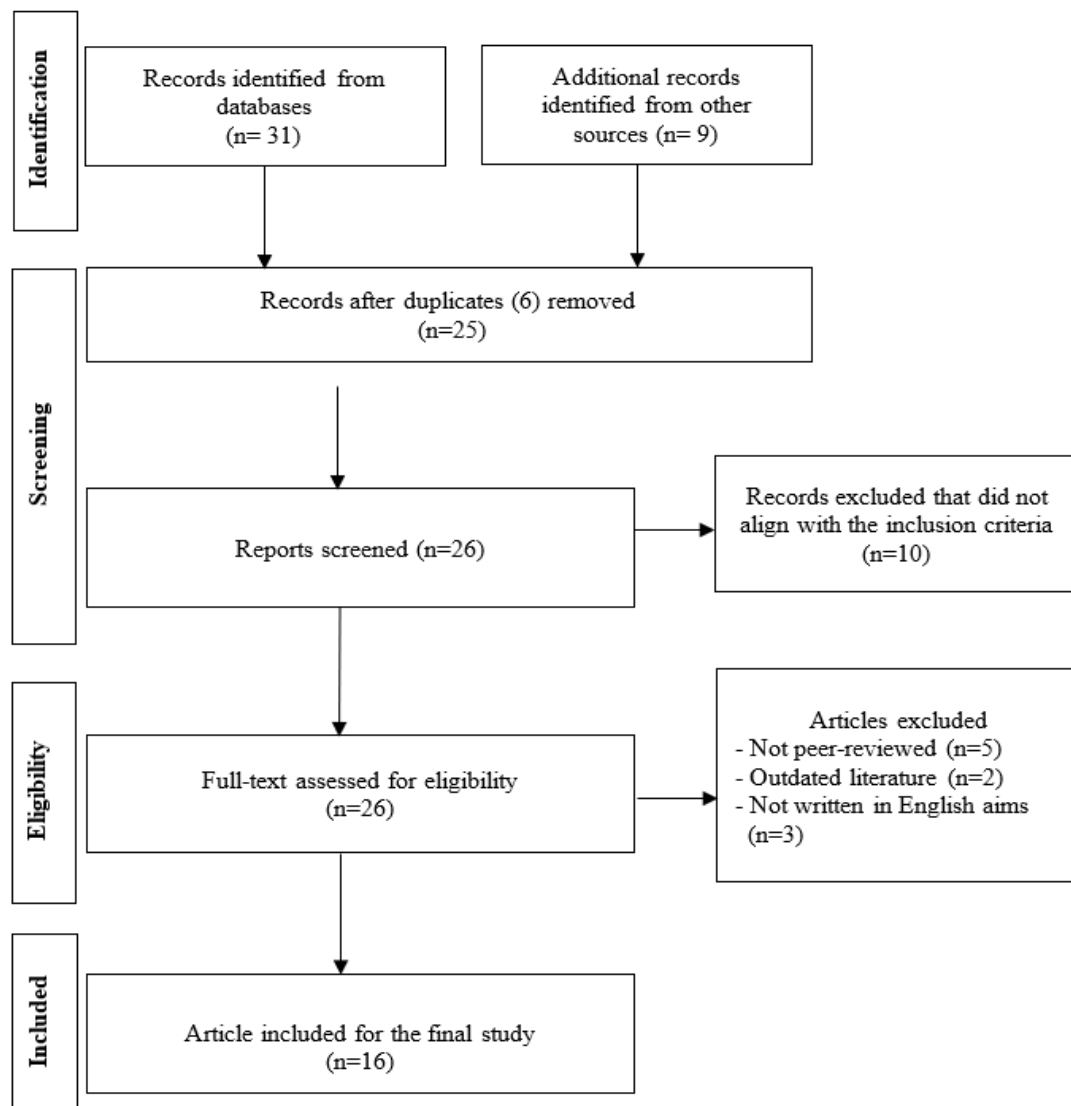


Figure 1. PRISMA diagram showing the articles selected for review

BIOGRAPHIES OF AUTHORS



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Cina Patricia Mosito    is an associate professor of inclusive education at Nelson Mandela University. Her research, teaching, postgraduate supervision, and community engagement concern: i) understanding and supporting child development and learning in diverse circumstances and ii) mainstreaming inclusive education in initial teacher education and continuing professional development of teachers. She has provided academic leadership in the roll-out of a British Council supported project, Teaching for All, in the Western Cape, Eastern Cape and the Northern Cape provinces of South Africa. Teaching for All is a curriculum and materials development project that aims to equip teachers with the skills, attitude, and knowledge to teach inclusively in diverse South African classrooms. Currently, she is a principal investigator in Understanding Teacher Pedagogy in South Africa, a longitudinal study that is being conducted by a consortium of 13 universities, in partnership with the National Education Collaboration Trust (NECT). Her publications are predominantly on Inclusive Education and the latest is an edited book titled “Inclusive education in South African further and higher education: reflections on equity, access, and inclusion”. She can be contacted at email: cina.mosito@mandela.ac.za.



Sunday Ade Adeniran    is an associate professor of science education in the Department of Science Education, Faculty of Education, Federal University Oye-Ekiti (FUOYE), Ekiti State, Nigeria. He is currently the dean of the faculty. He holds a Ph.D. in Science Education from the University of Ilorin (2011) and began his academic journey at the Federal University of Agriculture, Makurdi, where he served from 2012 to 2020 before joining the Federal University Oye-Ekiti in July 2020. His research interests include creative thinking in science education, gender inclusivity, inquiry-based learning, and the development of effective STEM pedagogies in Nigeria. He has authored numerous peer-reviewed journal articles and book chapters on curriculum development and innovative science teaching strategies. He is a seasoned educator and mentor and has successfully supervised numerous undergraduate and postgraduate research projects, nurturing future scholars with patience and scholarly rigour. He currently serves as the managing editor of the FUOYE International Journal of Education (FIJED). He actively participates in peer-review activities for academic journals and contributes to academic development through mentorship and collaboration. He actively participates in policy dialogues and advocacy initiatives focused on strengthening STEM education in Nigeria. In his ongoing pursuit of innovation, he is currently developing a custom educational chatbot named Scientade, designed to support science education through interactive digital means. He can be contacted at email: sunday.adeniran@fuoye.edu.ng.