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Feasibility of introducing digital music skills into South African primary school curriculum

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Background: As the global landscape of education evolves with digital advancements, the feasibility of integrating digital music skills into primary school curricula has become a subject of exploration, South Africa is no exception.

Aim: This study aims to conduct a content analysis of the existing scholarly writings to assess the feasibility of infusing digital music skills into the curriculum of South African primary schools.

Setting: The research is conducted using content analysis, the inclusion of different South African public-school contexts allows for a comprehensive examination of the feasibility of digital music skills integration across varied environments.

Methods: The study uses a rigorous qualitative content analysis methodology, drawing on historical documents, archival materials and scholarly discourse.

Results: The study reveals nuanced insights into the cultural emphasis on music, historical disparities influencing resource distribution, the role of positive social interactions, challenges in curriculum alignment and the imperative for teacher professional development in the context of digital music skills integration.

Conclusion: Findings underscore the importance of a balanced and culturally sensitive approach to curriculum development, highlighting the need for tailored strategies that address historical inequalities and promote collaborative efforts.

Contribution: This article enhances music education by integrating digital technologies, offering virtual practice spaces, collaborative platforms and interactive opportunities. The incorporation of real-time feedback, specialised courses and immersive experiences through virtual and augmented reality not only boosts skill development but also readies students for contemporary music careers.

Keywords: cultural diversity; curriculum; digital music skills; primary schools; transformation.

Introduction

It is prudent to foreground this article by stating that Music education is widely acknowledged for its role in fostering cultural awareness, enhancing cognitive function and providing a creative outlet for emotional expression (Cloete 2015; De Villiers 2017; Mugovhani 2012; Yende 2023a). This holistic approach to education recognises music as a thread that unites cognitive, cultural and emotional components, making it an integral part of the educational fabric (Cloete 2015; De Villiers 2017; Yende 2023a). As such, music education not only develops musical abilities but also contributes significantly to the development of well-rounded individuals (Yende 2023a).

In recent years, the educational landscape has been transformed by the rapid integration of digital technologies (Cloete 2015; De Villiers 2017). The use of digital tools has revolutionised traditional educational paradigms, leading to novel approaches to curriculum delivery and redefining conventional methods of instruction (Yende & Madolo 2023). This digital transformation has expanded the accessibility of educational materials and provided educators with new tools to engage and inspire learners. However, the integration of digital innovations into the curriculum of South African primary schools remains a challenge, particularly because of resource constraints and infrastructure limitations (Chomunorwa, Mashonganyika & Marevesa 2023; Yende 2023b). Despite these challenges, there is a growing recognition of the potential of digital technologies to enhance music education in South African primary schools. Digital music education, which encompasses a modernised approach to music education using electronic tools

and platforms, offers opportunities to enhance the educational experience (Gouzouasis & Bakan 2011).

It is essential to mention that the use of digital tools and technologies to improve music learning and expression is referred to as 'digital music skills' in this article. For primary school learners, these abilities can be applied to a variety of tasks and situations (Chomunorwa et al. 2023; Jansen van Rensburg 2022). Basic music theory apps, virtual instruments, digital composition tools, music listening and appreciation and digital storytelling through music are a few examples of digital music abilities suitable for this age group (Chomunorwa et al. 2023). It goes without saying that the objectives of this study are to evaluate the situation of music education in South African primary schools at the moment, investigate the possible advantages and difficulties of implementing digital music skills and provide information that can guide the development of educational policies and practices.

While global trends in digital music education have been extensively studied, there is a noticeable gap in research specific to the South African primary school context (Cloete 2015; De Villiers 2017; Mkhombo 2019; Netshivhambe 2023). Limited studies have explored the unique challenges and opportunities in South Africa, including issues of cultural relevance, infrastructure discrepancies and resource constraints (Yende 2023a). Moreover, the existing literature often focuses on the benefits of digital music education without delving into potential drawbacks or unintended consequences. Understanding both sides of the equation is crucial for making informed decisions about curriculum development and implementation.

The motivation behind this research stems from a commitment to advancing the educational landscape in South Africa. As the nation strives for inclusivity and excellence in primary education, it is imperative to explore innovative approaches that align with the needs of a digital era. By investigating the feasibility of infusing digital music skills, this research aims to contribute valuable insights that can inform policy decisions, curriculum development and teacher training programmes. The potential impact on cognitive development, cultural enrichment and the overall educational experience of primary school learners in South Africa serves as a driving force (Yende 2023b).

Furthermore, it is essential to notice that the researcher deliberately decided not to identify a specific grade level within primary school, rather, focus on kids in the early to middle years of education. This method is justified because, regardless of the particular grade they are in, children in these years typically have similar developmental phases and educational needs. With such a broad focus, this article hopes to cover a wide range of age groups and educational circumstances in the primary school setting, making the observations and recommendations accessible to a variety of primary school environments. This research seeks to be a catalyst for positive change in South African primary education, embracing the harmony of tradition and innovation. Therefore, to align with the purpose of this study, the four research questions were developed:

1. How does the cultural context of South African primary schools influence the incorporation of digital music skills into existing music education practices?
2. What role do historical factors play in shaping the current state of music education in South African primary schools?
3. How do social interactions among educators, learners and other stakeholders within the South African primary school system contribute to or hinder the integration of digital music skills?
4. In what ways does the existing music education curriculum align with or diverge from the principles and tools associated with digital music skills?

Theoretical framework

Cultural-historical activity theory (CHAT), developed by Lev Vygotsky and further expanded by his followers, Alexei Leont'ev and Yrjö Engeström, has its roots in socio-cultural perspectives and was founded in the early to mid-20th century (Batiibwe 2019; Jenlink & Austin 2013; Leont'ev 1978). Lev Vygotsky, a Russian psychologist, introduced the foundational concepts during the 1920s and 1930s. However, because of his untimely death in 1934, it was his colleagues and students, including Leont'ev and later Engeström, who continued to elaborate and refine the theory over subsequent decades (Yasnitsky 2018). Scholars have agreed that CHAT provides a comprehensive framework for understanding human cognition and learning within social and cultural contexts (Batiibwe 2019; Jenlink & Austin 2013; Leont'ev 1978). Vygotsky's initial work laid the groundwork by emphasising the importance of social interaction and cultural tools in shaping cognitive development (Yasnitsky 2018). Leont'ev further developed the theory, focusing on the concept of activity systems and the role of mediating artifacts in human activities. Engeström extended CHAT by introducing the idea of expansive learning and the model of the activity system, emphasising the collective and dynamic nature of human activities (Engeström 1987).

The central tenet of CHAT is the notion that human activities, including learning, cannot be understood in isolation from the cultural and social environments in which they occur. Activities are seen as complex, interconnected systems involving individuals, artifacts, rules and the broader socio-cultural context. The theory posits that meaningful learning takes place within these activity systems, where individuals engage in purposeful actions guided by cultural tools and societal norms. When applied to the study on the feasibility of infusing digital music skills into South African primary school curriculum, CHAT offers a lens to analyse the cultural and historical factors at play. The historical background and diverse cultural fabric of South Africa have a big impact on educational methods. Through the use of CHAT, researchers can investigate the ways in which cultural components of the

music education activity system influence the incorporation of digital advances. The theory offers a methodical framework for comprehending how historical influences, cultural relevance and the viability of teaching digital music abilities interact. The rationale behind utilising CHAT in this particular scenario is its capacity to provide a comprehensive comprehension of the complex interrelationships between cultural factors and educational methodologies. Through the application of the CHAT lens to the activity system, the researcher hoped to reveal societal norms, historical influences and layers of meaning that determine the viability of novel activities. Based on socio-cultural viewpoints, this theoretical framework fits in well with the intricacies of elementary school education in South Africa and the suggested incorporation of digital music skills.

Methodology: Qualitative content analysis

This research employed a qualitative research methodology within a systematic, descriptive review design to investigate the feasibility of infusing digital music skills into the South African public primary school curriculum (Forman & Damschroder 2008; Kleinheksel et al. 2020; White & Marsh 2006). The study aimed to provide a comprehensive understanding of the potential challenges, benefits and strategies associated with integrating digital music skills into primary school education.

Search strategy

A systematic search was conducted using various academic databases, including the University of Western Cape library portal, Proquest, EBSCOhost, JSTOR, Google Scholar and the Thesis Repository. The search terms 'digital music skills', 'music education', 'primary school curriculum' and 'South Africa' were utilised in various combinations to identify relevant literature. The search was restricted to articles published in English between 2000 and the current year to ensure the relevance and currency of the literature reviewed. However, the researcher chose to use two articles published in 1980s based on their merits (see Figure 1).

Inclusion and exclusion criteria

Following the initial search, articles were screened based on their titles and abstracts. Articles were included if they focused on the integration of digital music skills into the primary school curriculum in South Africa and provided valuable insights, recommendations or empirical data. A total of 100 articles that did not meet these criteria or were duplicates were excluded. In total, 70 articles were initially reviewed, with 27 meeting the inclusion criteria. Two additional articles were included in a subsequent search, bringing the total to 29 articles included in the final review.

Data analysis

The included articles were subjected to qualitative content analysis, which involved identifying key themes, patterns and relationships related to the feasibility of integrating digital music skills into the South African primary school curriculum.

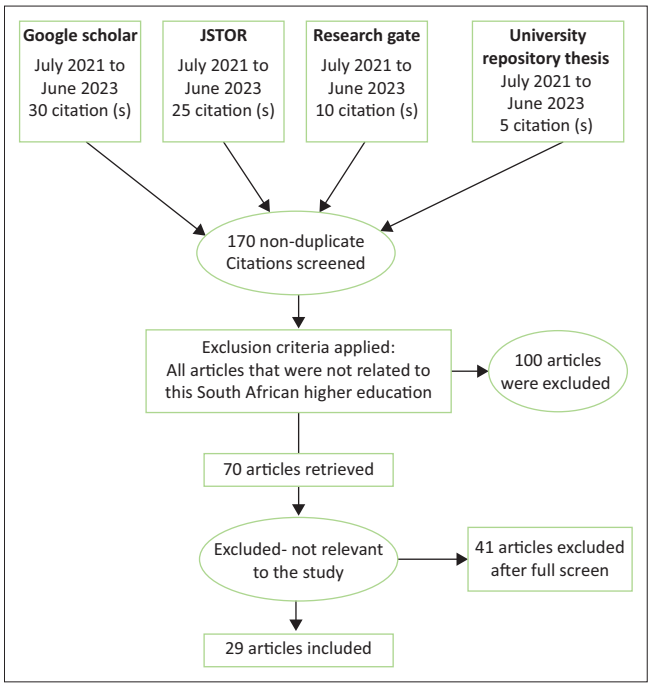

FIGURE 1: Represents the literature collection process.

Triangulation approach

The research utilised a triangulation approach, drawing upon several data sources to bolster the validity and dependability of the conclusions. Apart from academic journals, books and university archives, websites and digital repositories were also consulted. In order to support specific claims and offer a more thorough grasp of the research issue, this method entailed cross-referencing data from these different sources. To increase the validity of the research findings, the study triangulated data from several sources and viewpoints.

Contextualising the findings of this study

This article examines how digital technology is incorporated into music teaching in South African public schools. Discoveries highlight the need for strategic solutions by highlighting issues such as resistance to change and the digital divide. Improvements in learning resources and online practice are among the opportunities that show how digital tools can be revolutionary while removing obstacles to ensure their equitable and efficient use. The study's conclusions emphasise how critical it is for educational innovation to comprehend the sociocultural context. Making sure that the introduction of digital music skills is in line with the particular requirements and complexity of South African primary education, the findings not only highlight the challenges and opportunities but also provide insightful guidance for curriculum developers, educators and policymakers in navigating the harmonious integration of tradition and innovation. The study's findings reveal

common themes that emerged from the four research questions developed earlier, and these themes are: (1) Opportunities for digital technologies in music schools, (2) hurdles on digital technologies in music schools, (3) cultural influence on digital music skills integration, (4) historical factors shaping music education, (5) social interactions and integration challenges and (6) curriculum alignment and divergence. All themes were answered using scholarly literary writings.

Opportunities for digital technologies in music schools

Digital technology has brought about a multitude of opportunities inside music schools, so fundamentally changing the field of music education (Author(s) in press 2023; De Villiers 2017). Students have access to extensive and individualised learning resources through interactive software, instructional apps and online platforms (Cloete 2015). Virtual practice and performance spaces are created using virtual instruments and music production software, facilitating collaborative experiences and skill development (Mugovhani 2012). Digital technologies provide distance learning programmes that improve accessibility, especially for students who live in rural places (Yende & Madolo 2023). Diverse learning styles are accommodated via gamification-infused interactive learning platforms. Composition is made easier, and creativity is fostered by digital sheet music and notation software (De Villiers 2017). Mechanisms for real-time feedback hasten the development of skills (Cloete 2015). Specialised music technology courses prepare students for contemporary music careers, and virtual reality (VR) and augmented reality (AR) provide immersive experiences (Mugovhani 2012; Yende & Madolo 2023). Embracing these digital opportunities empowers music schools to offer inclusive, engaging and forward-thinking education for aspiring musicians.

Hurdles on digital technologies in music public schools

It is essential to mention that there are several obstacles in the way of the successful integration of digital technology in music education in public schools, which call for thoughtful planning and calculated responses. One major challenge is the digital gap, which causes socioeconomic background-based discrepancies in pupils' access (Yende 2023b). The significant obstacle of educator and stakeholder opposition to change, which arises from worries about technical proficiency and the influence on conventional teaching techniques, necessitates focused approaches. It is difficult to acquire and maintain the hardware and infrastructure required for digital tools in public schools because of funding and resource limitations (Cloete 2015; De Villiers 2017; Jansen van Rensburg 2022; Nompula 2011). The need for thorough and continuous professional development is emphasised by the findings of Yende (2023a), which highlight the importance of inadequate teacher training and low levels of digital literacy among educators. Privacy and security concerns associated with the use of digital technologies raise important considerations that warrant the establishment of robust policies (Cloete 2015; De Villiers 2017; Yende 2023a). Aligning digital technologies with the existing music education curricula proves challenging because of the rapid evolution of these tools, necessitating careful planning and curriculum revisions (Cloete 2015; De Villiers 2017; Yende 2023a).

Maintaining a balance between conventional and digital aspects in music education is crucial, as evidenced by the potential dangers of placing too much emphasis on technology at the expense of core music concepts (Cloete 2015; De Villiers 2017). It may be difficult for public schools to provide sufficient technical assistance and upkeep for digital instruments, highlighting the necessity of frequent upgrades and appropriate handling (Yende 2023a). In order to overcome these obstacles and realise the full potential of digital tools, educators, administrators, legislators and the community must work together to create a supportive environment for the successful integration of digital technologies in public school music education (Cloete 2015; De Villiers 2017; Yende & Madolo 2023). Important strategies for overcoming these obstacles include strategic planning, ongoing professional development and targeted investments.

Cultural influence on digital music skills integration

This article's emerging themes demonstrated how the cultural environment has a significant impact on how digital music abilities are integrated in South African elementary schools. The focus on cultural preservation is a recurring theme, highlighting the strong desire to preserve and honour traditional music components within the educational system (Mkhombo 2019; Mugovhani 2012; Netshivhambe 2023). This emphasis on culture is consistent with the understanding that music serves as a means of heritage preservation and identity instillation in students (Mkhombo 2019).

Yende and Madolo (2023) underscore a notable conflict between preserving cultural heritage and integrating digital innovations. This tension signifies a challenging balance that must be delicately struck – maintaining cultural heritage while incorporating digital advancements within the realm of music education. The desire to infuse digital music skills introduces a dynamic where traditional practices encounter modern tools, posing a challenge that requires careful navigation (Mkhombo 2019). This tension suggests that the integration process is not merely about introducing technological advancements but necessitates a nuanced approach that respects and integrates cultural values. According to Yende and Madolo (2023), successful integration of digital innovations into music education respecting cultural values involves collaborative planning with educators and communities, ensuring technology aligns with cultural contexts. Implementing inclusive policies, offering targeted training and engaging stakeholders in decision-making foster a balanced approach that harmonises technological advancements with cultural preservation.

This result emphasises the significance of matching technological interventions with cultural context and sensitivity, which is in line with the larger conversation on technology in education (Mkhombo 2019). South Africa is not the only place where tradition and innovation clash; other educational contexts throughout the world face comparable difficulties when incorporating digital aspects into long-standing practices (Mkhombo 2019; Yende 2023a). The call for a balanced integration aligns with the principles of CHAT, which asserts that any innovation should be understood within its cultural and historical context (Engeström 1987). The cultural influence on the integration of digital music skills in South African primary schools reveals a nuanced landscape where cultural preservation is cherished, thus a delicate balance is essential for successful implementation (Mkhombo 2019; Yende 2023a). Acknowledging and navigating this tension is crucial for crafting an educational environment that embraces both the rich cultural heritage and the potential benefits of digital music skills in fostering well rounded and culturally relevant learning experiences. This can be achieved by actively involving educators, communities and cultural experts in the decision-making process. Tailoring digital music programmes to align with specific cultural values and traditions ensures that technology complements, rather than overshadows, cultural heritage (Yende 2023a). Therefore, providing comprehensive training for educators in integrating digital tools sensitively within cultural contexts is essential. In addition, incorporating culturally relevant content and materials in digital resources fosters an inclusive educational environment. Regular assessments and feedback mechanisms help fine-tune the balance, ensuring that the benefits of digital music skills enhance, rather than compromise, the rich cultural tapestry of South African primary school education (Yende 2023a).

Historical factors shaping music education

Historical influences have a significant impact on how music education is currently delivered in South African primary schools, with significant ramifications for resource distribution and accessibility. Persistent disparities characterise the long-lasting effects of apartheid-era practices on South Africa's music education. As a result of apartheid, there are still significant resource gaps in schools, which primarily affect historically marginalised schools (Cloete 2015; De Villiers 2017). Racial disparities in access to high-quality education continue to exist, which restricts the chances for a thorough education in music, particularly in underserved areas. Biases in curriculum are another one of the lingering legacies that prevent varied cultural narratives from being represented in music education (Cloete 2015; De Villiers 2017). Addressing these challenges demands a commitment to equitable resource distribution, curriculum reform and fostering inclusivity, ensuring a more just and accessible music education system in South Africa. The apartheid era, characterised by systemic racial segregation and discrimination, significantly influenced the distribution of educational resources. Music education, like other aspects of the curriculum, was not immune to the disparities that characterised this period (Cloete 2015; De Villiers 2017). Access to quality music education was disproportionately distributed along racial lines, with well-documented inequities in funding, infrastructure and educational opportunities (Cloete 2015; De Villiers 2017; Nompula 2011).

Efforts have been undertaken to address the historical inequities in music education resulting from apartheid-era disparities. Post-apartheid, South Africa initiated educational reforms to promote inclusivity and equal opportunities. Policies were implemented to address funding disparities and enhance infrastructure in historically disadvantaged schools (Department of Basic Education 2011). Furthermore, curriculum revisions aimed to reflect diverse cultural narratives, ensuring that music education is inclusive and representative of South Africa's rich heritage (Cloete 2015). Initiatives advocating for the recruitment and support of educators from diverse backgrounds contribute to dismantling historical barriers, thus fostering a more equitable and culturally responsive music education landscape (De Villiers 2017).

A recurrent and poignant theme that surfaces in the study is the urgent need for a transformative shift from historical inequalities. The echoes of the apartheid era persist in the present-day educational system, impacting the availability of resources and limiting access to comprehensive music education (Yende & Madolo 2023). The call for transformation is grounded in the recognition that historical disparities continue to hinder the development of a holistic and inclusive music education environment in South African primary schools. The urgency of addressing historical disparities aligns with broader efforts in South Africa to redress the legacies of apartheid in various sectors, including education (Nompula 2011; Yende & Madolo 2023). The recognition of historical factors as a barrier to inclusive music education mirrors the broader acknowledgment of the need for social justice and equity in the country's education system.

Efforts to address historical disparities in music education are integral to the broader movement towards a more inclusive and equitable educational landscape. Initiatives that aim to equalise resource distribution provide targeted support to historically disadvantaged schools and prioritise access for all learners are crucial components of this transformative shift (Brown 2016; De Villiers 2017). The integration of digital music skills in South African education goes beyond technological enhancement; it serves as a transformative means to bridge historical gaps and provide opportunities for historically marginalised learners. Initiatives such as 'MusicWorks' have emerged, aiming to empower students in underprivileged communities by offering access to digital music education (De Villiers 2017). These programmes often provide resources such as digital platforms, software and virtual instruments, democratising access to music education. Furthermore, collaborative efforts between governmental bodies, non-profit organisations and private enterprises have been instrumental in establishing digital music labs in underserved schools, fostering a more

inclusive and equitable learning environment (Cloete 2015; (De Villiers 2017). These initiatives exemplify how the integration of digital music skills acts as a catalyst for addressing historical disparities and providing opportunities for learners who have traditionally faced educational marginalisation.

Evidently, the historical factors shaping music education in South African primary schools reveal a complex legacy that continues to influence the present. The enduring impact of apartheid-era policies on resource distribution and access underscores the need for a transformative shift to address historical disparities (Nompula 2011; Yende & Madolo 2023). Efforts to redress these historical imbalances are not only essential for creating a more inclusive music education environment but also align with broader national goals of social justice and equity in education. The study's findings emphasise the imperative of acknowledging and actively working to overcome historical barriers to ensure that all South African primary school learners have equal access to a comprehensive and culturally relevant music education.

Social interactions and integration challenges

Social interactions play a crucial role in improving the current state of music education by fostering collaboration, communication and a supportive learning environment. Encouraging collaborative learning through group projects and activities enables students to exchange ideas, learn from one another and collectively create music (Cloete 2015; De Villiers 2017; Yende 2023a). Positive peer-to-peer interactions contribute to a dynamic and engaging atmosphere, where students can share knowledge and provide feedback (Yende 2023a). In addition, involving stakeholders, such as parents and policymakers, in music education initiatives strengthens overall support, leading to increased resources and advocacy for music programmes. Collaborative efforts among music educators, community engagement and addressing resistance through open communication further contribute to creating a positive and enriching music education experience (Cloete 2015; De Villiers 2017; Yende & Madolo 2023). By emphasising social interactions, institutions can cultivate a vibrant learning environment that nurtures musical skills and fosters a lifelong appreciation for music. Teachers who engage in open communication and collaborative planning with their peers demonstrate a higher readiness to adopt and incorporate digital music skills into their teaching practices (Bonneville-Roussy & Eerola 2018; Dammers 2019; Lee 2020). Furthermore, positive interactions among learners themselves, in the form of group activities or peer-to-peer learning, contribute to a more supportive and conducive environment for the adoption of digital music skills. Stakeholder involvement, including parents, policymakers and community members, also emerges as a critical aspect of successful integration. Positive social interactions with stakeholders contribute to a shared understanding of the benefits of digital music education, fostering a supportive environment for implementation (Cloete 2015; De Villiers 2017; Nompula 2011). Implementing stakeholder engagement involves transparent communication, collaborative decision-making and addressing concerns to enhance the integration of digital tools in music education (Cloete 2015; De Villiers 2017). Open forums, workshops and regular updates can facilitate dialogue, ensuring that stakeholders feel heard and are actively involved in shaping the direction of music education initiatives, fostering a more inclusive and receptive environment.

Conversely, the study identifies resistance as a significant challenge in the integration of digital music skills. Educators and other stakeholders may exhibit resistance because of concerns about technological competence, fear of change or uncertainty about the impact on traditional teaching methods (Bonneville-Roussy & Eerola 2018; Dammers 2019; Lee 2020). This resistance can impede the smooth adoption of digital tools in music education and highlights the need for strategies that address apprehensions and promote a positive outlook towards innovation (Cloete 2015; De Villiers 2017). Addressing concerns through open communication and collaborative decision-making is crucial for overcoming resistance in the context of digital music education (Cloete 2015; De Villiers 2017). In a community, this can be achieved by organising forums, workshops and sessions that provide opportunities for educators, parents and community members to voice concerns and actively engage in decision-making processes (Cloete 2015). Transparent communication channels, such as regular updates and feedback mechanisms, are essential for maintaining ongoing dialogue, fostering understanding and gaining support for the integration of digital tools in music education initiatives (De Villiers 2017).

Providing educators with opportunities for professional development, training and support can enhance their confidence and competence in integrating digital music skills (Cloete 2015; De Villiers 2017). In addition, involving educators in the decision-making process and seeking their input can foster a sense of ownership and reduce apprehensions about the perceived challenges associated with the integration.

The study's exploration of social interactions in the context of integrating digital music skills into South African primary schools reveals a nuanced landscape. Positive collaborations among educators, learners and stakeholders are associated with successful implementation, while resistance poses a significant challenge (Cloete 2015; De Villiers 2017). The findings underscore the importance of addressing concerns through open communication, collaborative decision-making and targeted support for educators. Fostering positive social interactions for the integration of digital music skills in South African primary schools can be achieved through several strategies. Organising collaborative music projects and group activities encourages teamwork and enhances the learning experience (Dammers 2019). Furthermore, creating peer-to-peer learning opportunities, such as group discussions and collaborative music creation, contributes to a supportive environment (Lee 2020). Stakeholders' involvement, including parents and policymakers, can be facilitated through community events and workshops (Cloete 2015).

Addressing resistance through open communication and teacher collaboration is crucial (Bonneville-Roussy & Eerola 2018). These strategies collectively contribute to a conducive environment for the successful integration of digital music skills (Cloete 2015; Dammers 2019).

Curriculum alignment and divergence

The integration of digital music skills into the existing music education curriculum in South African primary schools presents a nuanced landscape marked by a complex interplay of both alignment and notable divergences. While certain elements of the traditional curriculum align well with the principles and tools associated with digital music skills, there are significant divergences stemming from the rapid evolution of digital technologies (Chomunorwa et al. 2023; Gorgoretti 2019; Yende & Madolo 2023). This intricate balance underscores the necessity for strategic curriculum revisions and targeted teacher professional development to ensure a seamless and effective integration of digital music skills within the established educational framework.

However, the study also brings to light significant divergences between the traditional curriculum and the requirements of digital music skills. These divergences may stem from the rapid evolution of digital technologies and the challenges of adapting established curricular structures to accommodate innovative elements (Chomunorwa et al. 2023; Gorgoretti 2019; Yende 2023a). To address these divergences, the findings emphasise the imperative of revising the Creative Arts curriculum to strategically incorporate digital music skills. This strategic revision is crucial to ensure a more seamless integration of digital music skills within the existing educational framework (Chomunorwa et al. 2023; Gorgoretti 2019; Yende 2023a). Therefore, it is evident that by aligning the curriculum with the evolving landscape of digital technologies, South African primary schools can better equip students with the skills needed for the contemporary and technologically driven music landscape. This approach underscores the importance of adapting educational structures to meet the demands of the digital age.

A recurring and crucial theme revolves around the necessity for teachers' professional development to bridge the gap between traditional pedagogies and innovative digital approaches. Educators play a central role in the successful implementation of any curriculum, and the study underscores the importance of equipping them with the skills and knowledge required for effective integration (Bonneville-Roussy & Eerola 2018; Gorgoretti 2019; Yende & Madolo 2023). Professional development initiatives tailored to the specific needs of music educators can enhance their digital literacy, pedagogical skills and confidence in navigating the nuances of incorporating digital tools.

The study's findings align with broader educational research emphasising the pivotal role of teacher professional development in technology integration (Bonneville-Roussy & Eerola 2018). Addressing the gap between the existing curriculum and the demands of digital music skills requires a proactive approach to empower educators with the necessary competencies. In exploring the integration of digital music skills in South African primary schools, the study unveils a complex interplay between established curricular structures and emerging technological innovations. Although some alignment between traditional curricula and digital music skills is noticed, significant divergences pose challenges (Chomunorwa et al. 2023; Gorgoretti 2019; Yende & Madolo 2023). These divergences stem from the rapid evolution of digital technologies, creating a need for targeted curriculum revisions. Notably, elements of the traditional curriculum may support the integration, but strategic revisions are imperative to bridge the gaps and ensure a harmonious incorporation of digital music skills within the existing educational framework. The overarching theme emphasises the critical role of teachers' professional development as a key strategy for bridging the gap, ensuring that educators are well prepared to navigate the evolving landscape of music education in the digital age.

Discussions

In the context of CHAT, the study's findings on the integration of digital music skills in South African primary schools offer a nuanced understanding of how cultural, historical and social factors shape the feasibility of this innovation. The CHAT posits that cultural tools and artifacts play a crucial role in shaping human activity. The study's identification of the desire to preserve traditional music elements within South African primary schools aligns with CHAT's emphasis on the cultural context. The tension observed between cultural preservation and digital innovations underscores the need for a balanced approach, acknowledging the cultural tools that learners bring into the educational context (Engeström 1987).

This article emphasises on digital innovation creates new opportunities for improving student engagement and learning outcomes. The study illustrates how technology may democratise access to music education and enable students to explore and produce music in new ways by highlighting the possibilities of digital tools such as virtual instruments, digital composition tools and applications for music theory. Furthermore, it highlights on inclusivity, and cultural relevance are also very important. The report encourages a more comprehensive and inclusive approach to music education by emphasising the value of including traditional music in the curriculum and making sure that digital tools are in line with South Africa's rich cultural diversity.

In line with the CHAT, the findings of this study highlight the influence of historical factors on current activities. The study's revelation of the enduring impact of apartheid-era policies on resource distribution and access in music education aligns with CHAT's focus on the historical

development of activity systems. The call for a transformative shift to address historical disparities reflects the recognition that historical inequalities continue to shape the current landscape of music education (Batiibwe 2019; Jenlink & Austin 2013; Leont'ev 1978). The CHAT underscores the importance of social interactions in mediating activities. The study's emphasis on positive collaborations among educators, learners and stakeholders resonates with CHAT's view that social interactions are integral to the development and transformation of activities. The identification of resistance as a barrier emphasises the social nature of educational practices and the need for collaborative efforts to address challenges (Engeström 1987).

The CHAT emphasises the development and transformation of tools within activity systems. The study's exploration of curriculum alignment and divergence aligns with CHAT's focus on the role of cultural tools, such as the curriculum, in mediating activities. The call for curriculum revisions to accommodate digital music skills reflects the dynamic interplay between established tools and emerging technological innovations within the educational context (Leont'ev 1978). Cultural-historical activity theory places significance on individual agency and development within activity systems. The study's recurring theme of the necessity for teacher professional development aligns with CHAT's emphasis on the role of individuals in mediating and transforming activities. It highlights the importance of empowering educators with the skills and competencies required for successful integration, emphasising the agency of teachers in shaping the activity system (Yasnitsky 2018).

The discussions within the framework of CHAT provide a comprehensive understanding of the integration of digital music skills in South African primary schools. The theory's emphasis on the interplay of cultural, historical and social factors enriches the interpretation of the study's findings, offering insights into the complexities of educational innovation within a specific cultural-historical context. The CHAT proves to be a valuable lens for examining the intricate dynamics that influence the feasibility of infusing digital music skills into the educational landscape of South Africa.

Recommendations

Based on the findings of the study and within the framework of CHAT, three key recommendations are proposed to facilitate the successful integration of digital music skills into South African primary schools. Firstly, there is a pressing need for targeted curriculum revisions that harmonise traditional music education practices with innovative digital approaches. This involves adapting existing curricular structures to accommodate digital tools and methodologies, ensuring a cohesive and relevant educational experience for learners. Secondly, a robust and ongoing teacher professional development programme is essential. Educators play a central role in mediating the integration process, and empowering them with the necessary skills, digital literacy and pedagogical knowledge is crucial for the effective implementation of digital music skills. This can involve tailored training sessions, workshops and collaborative learning opportunities that address the specific needs and concerns of teachers. Lastly, fostering collaborative efforts and open communication among educators, learners and stakeholders is imperative. Overcoming resistance and addressing challenges associated with the integration of digital music skills requires a collective approach. Establishing platforms for dialogue, collaboration and knowledge-sharing is essential for creating a supportive environment that facilitates the successful adoption of digital innovations in South African primary schools. This can be achieved through collaborative initiatives involving educators, policymakers, parents and community members. Workshops, conferences and community forums provide spaces for dialogue and collaborative planning (Cloete 2015; De Villiers 2017). Online platforms, such as dedicated forums or educational networks, offer opportunities for broader knowledge sharing (Bonneville-Roussy & Eerola 2018). By embracing CHAT principles, these platforms foster inclusivity and collaboration, aligning with the diverse needs and perspectives within the South African educational context.

Limitations of the study

Despite the valuable insights gained from this study on the feasibility of infusing digital music skills into South African primary schools, it is crucial to acknowledge certain limitations that may impact the generalisability and scope of the findings. Firstly, the study's focus on a specific cultural and educational context may limit the generalisability of the findings to other regions or countries with different cultural backgrounds, educational systems and infrastructural contexts. South Africa's unique history and challenges may not fully reflect the complexities of other educational environments. Secondly, the research design, which primarily employs qualitative methods such as content analysis, which may have limitations in capturing quantitative data or broader statistical trends. This qualitative focus allows for in-depth exploration but may not provide a comprehensive quantitative overview of the entire primary school system. Lastly, the study's scope primarily focuses on the primary school level, leaving out potential variations or nuances that may exist in secondary or tertiary education. Exploring the continuum of education could provide a more holistic understanding of the challenges and opportunities related to digital music skills integration. Therefore, recognising these limitations is essential for interpreting the study's findings and guiding future research. Addressing these constraints can contribute to the development of more comprehensive and contextually informed strategies for the successful integration of digital music skills in South African primary schools and beyond.

Conclusion

In conclusion, the study on the viability of integrating digital music education into South African elementary schools, analysed via the CHAT framework, sheds light on the complex interplay of social, historical and cultural elements. The results show a complex picture that is

influenced by several factors, including the need for teacher professional development, the importance of pleasant social contacts, the lingering effects of apartheid-era laws, the need to maintain cultural heritage and the difficulties associated with curriculum conformity. The CHAT provides a thorough framework that takes into account the interaction of parts within the activity system, which is helpful in grasping such complexity. The conflict between technological advancements and cultural preservation highlights the fine balance needed in innovative teaching. The historical disparities underscore the urgency for transformative shifts to address persistent inequalities. Positive social interactions emerge as facilitators, while resistance highlights the need for collaborative efforts and open communication.

Curriculum alignment and divergence showcase the dynamic interplay between established tools and emerging technologies, necessitating curriculum revisions for seamless integration. The recurring theme of teacher professional development underscores the pivotal role of individual agency in mediating and transforming educational activities. As South Africa seeks to harmonise tradition and innovation in primary education, the insights gleaned from this research offer valuable guidance. Recommendations include targeted curriculum revisions, robust teacher professional development programmes and collaborative efforts involving educators, learners and stakeholders. Embracing a culturally sensitive and historically informed approach will be essential for successful integration.

This study contributes not only to the understanding of digital music skills integration but also to the broader discourse on educational innovation within diverse cultural and historical contexts. It is hoped that these insights will inform policy decisions, curriculum development and teacher training programmes, fostering a harmonious blend of tradition and innovation in South African primary education. As the nation advances towards inclusivity and excellence, the integration of digital music skills stands as a promising avenue to empower learners, bridge educational gaps and cultivate a love for learning that resonates beyond the classroom.

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Author's contributions

S.J.Y. is the sole author of this research article.

Ethical considerations

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Data availability

The data that support the findings of this study are available from the corresponding author, S.J.Y., upon reasonable request.

Disclaimer

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