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Teachers' Pedagogical Knowledge of Integrating Indigenous Knowledge Systems in Economics Education Curriculum

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Abstract: In South Africa, the movement towards a decolonised curriculum is gaining traction. In contrast to the Western-centric emphasis of school curricula, indigenous knowledge systems (IKS) highlight and utilise indigenous materials and knowledge processes. Several research works have emphasised the importance of IKS and the necessity of incorporating them into South African educational practices in an effective manner. This study aims to assess the pedagogical competency of instructors in integrating IKS into the teaching of economics. The pedagogical competency of economics teachers regarding the incorporation of IKS into economics education was investigated through a qualitative literature review. Sixteen studies were selected following a search conducted in electronic resources such as ResearchGate and Google Scholar. The results of the literature review synthesis were analysed using the content analysis approach in light of the framework for culturally responsive pedagogy. This review identified aspects, including IKS incorporation guidelines, policy reviews, teacher professional development on IKS, development of specific IKS study materials, and IKS knowledge strands, that influence teachers' integration of IKS in economics education. The study's recommendations, based on the findings, suggest that professional development, appropriate content selection training, instructors' competency in using IKS, and IKS integration policies all affect their pedagogical proficiency in the subject. According to the study's findings, the CAPS curriculum document ought to specifically specify which economics topics can be taught using IKS in order to prevent teachers from relying on their own judgment when deciding how to incorporate IKS into their lessons.

Keywords: Economics education, indigenous knowledge systems, pedagogical knowledge, traditional knowledge.

1. Introduction

The integration of Indigenous Knowledge Systems (IKS) in education has garnered considerable attention in recent years, acknowledging the significance of safeguarding and enhancing cultural diversity and relevance in learning (Photo & McKnight, 2024). IKS denotes the knowledge, beliefs, and practices cultivated by Indigenous populations over millennia, frequently embedded within their cultural, spiritual, and environmental frameworks (Govender & Mutendera, 2020). Incorporating IKS into education can enhance the significance and efficacy of learning, particularly for Indigenous learners, by providing a culturally sensitive and inclusive curriculum (Ngololo & Kasanda, 2024). Recognising and appreciating IKS allows economics education to transcend prevailing Western epistemologies, facilitating a more sophisticated comprehension of the universe while advancing intercultural understanding and social justice (de Beer & Kriek, 2021). As such, the incorporation of IKS in economics education can contribute to decolonising knowledge and promoting cognitive justice (Onyewuchi & Owolabi, 2022). Therefore, integrating IKS into education is a crucial step towards creating a more inclusive, relevant, and effective learning environment. For centuries, Indigenous peoples have developed unique knowledge systems that are deeply rooted in their cultural, spiritual, and environmental contexts (Ngololo & Kasanda, 2024). However, these knowledge systems have often been marginalised or excluded from mainstream education, leading to a disconnect between the curriculum and the lived experiences of Indigenous learners (Madlela,

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2024).

Unlike the school curriculum that prioritises information from a Western perspective (McCarty et al., 2017), IKS emphasises local content and the processes of knowledge (Photo & McKnight, 2024). Numerous studies have highlighted the significance of IKS and the imperative of effectively integrating educational processes with indigenous knowledge in South Africa (Madlela, 2022; Photo & McKnight, 2023). Investigations into IKS, along with its advantages and potential for the curriculum, have gained prominence both in Africa and worldwide (Tarisayi, 2024; Madlela, 2023). Researchers, including Madlela (2024), Mabasa-Manganyi, and Ntshangase (2021), have undertook numerous studies advocating for the integration of IKS into the educational curriculum in South Africa and other African nations. Indigenous knowledge denotes the distinctive, location-specific knowledge systems cultivated by indigenous African people in southern Africa over generations through their interactions with the environment (Kgope, 2023). It encompasses comprehensive worldviews, technologies, governance frameworks, and pedagogical methods rooted in connections to land and culture (Mavuso, Olawale & Mkosi, 2021). Historically, indigenous knowledge has been marginalised within colonial and apartheid educational frameworks that favoured Western epistemologies over indigenous African languages, cultures, and knowledge systems (Malapane et al., 2024). It was viewed as primitive or unsophisticated, while Western knowledge was seen as superior due to cultural bias and ethnocentrism. Furthermore, the oral transfer of indigenous knowledge made it challenging to record and authenticate using Western academic standards.

Balogun and Kalusopa (2021) assert that the Curriculum and Assessment Policy Statement (CAPS) 2012 curriculum materials merely indicate that teachers should incorporate Indigenous Knowledge Systems (IKS) into their instruction, without specifying the IKS content to be taught. IKS is excluded from the four knowledge strands in the economics curriculum (Madlela, 2022; Toti, 2024). Mavuso et al. (2021) acknowledge that while the South African school curriculum policy advocates for flexibility in incorporating IKS into the mainstream curriculum (Mhlongo, 2021), significant concerns remain regarding the actual implementation of IKS integration in subject teaching. Onyewuchi and Owolabi (2022) assert that a systematic effort to provide an effective framework for integrating Indigenous Knowledge into the school economics curriculum, aimed at enhancing the teaching process, is lacking (Blose & Gumbo, 2024). This situation persists despite the growing recognition of the significance of using IKS for contextualising school economics instruction, as IKS constitutes an essential component of learners' prior experiences and the information they bring to the classroom (Bhuda & Gumbo, 2024). Cindi's (2021) study indicates that while the Department of Basic Education (DBE) mandates the incorporation of IKS in instructional delivery, it is ultimately the instructors who have the discretion to determine its implementation in their classrooms.

Mavuso et al. (2021) conducted a study on the integration of IKS. Educators, subject advisors, and Heads of Departments indicated that, despite their efforts to contribute substantially to the integration of IKS, they encountered several obstacles. They noted restricted capacity, insufficient or nonexistent training, excessive workloads, and a lack of clear policy regarding the integration of IKS and the roles of stakeholders in this process. Scholarly literature, including works by Madlela (2023), Onyewuchi and Owolabi (2022), indicates that incorporating IKS into the mainstream educational curriculum presents numerous challenges. Inadequate resources, poor teacher preparation, and a lack of institutional support hinder successful integration. Furthermore, indigenous viewpoints may be suppressed by epistemic violence resulting from the predominance of Western epistemology. Curriculum development is complicated by power relations and cultural sensitivities, and genuine representation is undermined by tokenism and superficial inclusion. It is essential to address these issues to guide researchers, academics, and scholars in developing models that effectively integrate IKS within the formal school curriculum, specifically within the National Curriculum. Govender and Mutendera (2020) indicate that the integration of IKS into the mainstream educational curriculum

faces specific hurdles in African nations. The issues identified include instructors' attitudes towards indigenous knowledge, attitudes towards the use of indigenous languages in educational settings, a deficiency of indigenous study materials, and the omission of IKS in teacher training curricula (Madlela, 2023; Gumbo, 2021). To successfully integrate IKS into the curriculum, current challenges must be addressed and effective integration strategies developed.

In South African society, economic education is essential because it aims to provide people with the values, knowledge, and skills they need to make wise decisions about their own finances, entrepreneurship, and civic involvement (Cindi, 2023; Gumbo, 2021). In South Africa, encouraging sustainable economic development, financial inclusion, and economic literacy are the main goals of economic education (Tarisayi, 2024). However, the cultural and historical background of South Africa's diverse people is frequently ignored by traditional economic education methodologies (Masenya, 2024). In order to close this gap, IKS must be included (Mhlongo, 2021). With roots in African beliefs and customs, IKS can offer distinctive viewpoints on economic ideas, including social entrepreneurship, cooperative economics, and environmental sustainability (Bhuda & Gumbo, 2024; Aiseng, 2023). Teachers can foster cultural relevance, increase student participation, and foster a more nuanced understanding of South Africa's economic potential and constraints by incorporating IKS into economic teaching (Mavuso et al., 2021). Despite its significance, research indicates that there is a dearth of curriculum resources, teacher preparation programmes, and evaluation frameworks for IKS in economic education (Ajani & Gamede, 2021). The study poses this research question:

- How does the teachers' pedagogical knowledge help integrate IKS into the teaching of economics education?

1.1 Culturally responsive pedagogy

Culturally Responsive Pedagogy (CRP) is an educational methodology that acknowledges and utilises students' varied cultural origins, languages, and experiences to improve learning outcomes (Gay, 2002; Ladson-Billings, 1995). CRP emphasises the importance of teaching in alignment with the strengths of ethnically diverse students, leveraging their cultural knowledge, prior experiences, frames of reference, and performance styles (Gay, 2015, 2018). This approach recognises the diverse backgrounds and experiences of students, seeking to create inclusive and engaging educational environments. CRP aims to enhance academic achievement, foster a positive self-concept, and promote critical thinking skills in pupils (Ladson-Billings, 1995).

Effective culturally responsive pedagogy requires the deliberate incorporation of students' cultural identities and perspectives within the educational framework. Educators must acquire knowledge and skills to meet the specific needs of culturally diverse students. CRP comprises five essential qualities, including the acknowledgement of varied cultural histories, the integration of home and school experiences, and the advancement of cultural awareness (Gay, 2018). This methodology enhances students' intellectual, social, emotional, and political capacities through the application of cultural references. CRP utilises students' cultural and linguistic resources to improve learning and promote understanding (Gay, 2002). In doing so, CRP creates classrooms that empower students and enhance academic performance.

For the successful implementation of CRP, educators must critically reflect on their own cultural biases and assumptions. Teacher preparation programmes must address the challenges of whiteness and cultural diversity, equipping educators with vital competencies to operate effectively in culturally varied educational settings. Ongoing teacher reflection and self-awareness are essential for effective culturally responsive pedagogy (Gay, 2018). CRP necessitates the acquisition of knowledge and skills to effectively meet the needs of culturally diverse students (Ladson-Billings, 1995). Utilising CRP enables educators to foster a sense of belonging and respect among all pupils. This approach surpasses traditional notions of "effective teaching" and emphasises the imperative for

educators to incorporate students' cultural backgrounds and experiences into the learning process (Gay, 2002). CRP acknowledges the importance of affirming diversity in educational institutions. Educators must recognise and integrate cultural diversity into curricula and teaching strategies to promote inclusive educational environments (Gay, 2015). Effective culturally relevant pedagogy fosters academic success, enhances self-identity, and cultivates critical thinking skills.

2. Methodology

The article critically reviewed the literature to analyse teachers' pedagogical knowledge of integrating IKS) into the economics education curriculum. Although content analysis has primarily served as a complement to other research methods, it has also been employed as a stand-alone method, and some specialised forms of qualitative research rely solely on content analysis. The qualitative content analysis method is defined as the systematic reduction of content, analysed with special attention to the context in which it was created, to identify themes and extract meaningful interpretations of the data. Content analysis is suitable for analysing various qualitative and unstructured data, such as those collected during unstructured or semi-structured interviews or web-based documentary research. Like other analytical techniques in qualitative research, content analysis necessitates the examination and interpretation of data to extract meaning, gain comprehension, and provide empirical knowledge. Developing a conceptual definition of a construct based on shared meaning to explain the linkages between ideas, characterise the theory's application, and determine how the concepts have been assessed in empirical inquiry is facilitated by a synthesis of the literature review. The study also explored some IKS frameworks. In this study, triangulation was achieved through the use of ResearchGate and Google Scholar as data collection tools.

Thus, finding, selecting, evaluating, and synthesising facts contained in documents are all part of the analytical process. In accordance with the recommendations put forward by Kitchenham (2004), content analysis was introduced and used for this study's literature assessment of journal articles reporting on earlier research regarding teachers' integration of IKS into their pedagogical knowledge. The review protocol comprised several components, including Inclusion and Exclusion Criteria. The goal of the inclusion criteria was to find studies that directly address the study topic. Consequently, the researcher identified and selected publications based on their value and applicability to initiate the review process. To address the research objectives of the study, the literature and empirical studies reporting on prior research in the decolonisation of IKS, international initiatives in promoting and protecting indigenous knowledge, knowledge-sharing strategies, obstacles to effective knowledge sharing, and the impact of policies and protocols—whether positive or negative—on protecting indigenous systems were reviewed. A comprehensive evaluation of existing literature on knowledge management and the digital preservation of indigenous knowledge was carried out using prominent databases like Google Scholar to ensure that all pertinent studies were included in the literature review or content analysis. However, since editorials and book reviews do not contain original research, they were not included in this study's literature evaluation; only journal articles were. Peer-reviewed journal articles are used as an analytical unit, as they represent a primary means of communication for researchers.

Table 1: *Inclusion and exclusion criteria*

Dimension	Inclusion criteria	Exclusion criteria
Studies	Empirical studies	Non-empirical (conceptual, review, discussion paper, and opinion piece)
Publications	Peer-reviewed full journal articles	Conference papers, dissertations, books/book chapters
Context	Economics education/related studies	Studies not on teacher education
Focus	Studies focus on teachers embedding indigenous knowledge	Studies focus on teaching Indigenous learners and their learning

	and perspectives.	
Timeframe	Published between 2020 to 2024	Not published between 2020 to 2024
Language	English	Other languages

Search strategy: To locate published works reporting on teachers' pedagogical expertise in integrating Indigenous Knowledge Systems (IKS) in the teaching of economics, the search phrases "IKS" and "economics education" were utilised. Data from similar studies were gathered using these search phrases in the databases ResearchGate and Google Scholar, which provide access to papers across a range of topics. The use of sophisticated search strings and filters in databases like Google Scholar facilitates the application of intricate selection criteria, making them a favourable option for literature review synthesis (Wang & Noe, 2010). Since it was considered a crucial component of IKS knowledge integration, the study also conducted a more targeted search on teachers' pedagogical expertise regarding indigenous knowledge. The articles used were published in accredited journals.

Study selection: After reviewing the titles and abstracts of the publications, the researcher eliminated any duplicates, significantly reducing the sample size. The study had to meet certain selection criteria, such as being empirical, focusing on teachers' pedagogical understanding of IKS integration, and being published in a peer-reviewed journal. Although a large number of papers were produced related to the study, following a careful review of each article, some were eliminated, primarily due to poor quality or lack of relevance to the study's objectives and topic of interest.

Data analysis and synthesis: The qualitative data, or text taken from earlier studies on the decolonisation of IKS and the influence of policy and protocols in decolonising these systems, were systematically analysed using the thematic analysis technique developed by Braun and Clarke (2006). Below is a summary of the thematic analysis procedure:

- Gaining familiarity with the data: This was accomplished by employing the "repeated reading" strategy to read the selected papers and look for patterns and meanings. The extracted data were linked to the original publication to eliminate any uncertainty and provide context that was useful for interpreting the data.
- Developing initial codes and themes: The coding process was driven by the research objectives; that is, codes were developed by documenting aspects of IKS, involving diverse cultural groups, reviewing IKS policy, developing IKS knowledge strands, creating specific IKS study materials, and developing textbooks with IKS content, activities, and examples being investigated. This process facilitated the assignment of relevant codes. Following the coding procedure, all codes were examined and compiled to produce prospective themes pertinent to the study's goals.
- Reviewing the themes: In accordance with the study's objectives, each theme was identified, and its common traits were delineated. This process resulted in the emergence of higher-level themes made up of several sub-themes. The decolonisation of indigenous knowledge, for instance, served as a unifying theme that connected various themes and prompted the development of major themes, such as the involvement of diverse cultural groups, the review of IKS policy, the development of IKS study materials, the creation of IKS knowledge strands, and textbooks with IKS content, activities, and examples.
- Writing the analysis: The analysis method identified prospective research gaps requiring further study, as well as the integration of teachers' pedagogical knowledge of IKS in economics education, which has been examined in earlier studies.

3. Findings and Discussion

In the search of the Google Scholar database, 2,040 publications were retrieved. This original sample underwent a refinement process that included inclusion criteria for works that were completely accessible and published in peer-reviewed journals. Theses, dissertations, books, reviews, and proceedings from scientific meetings were removed, yielding 113 articles. Consequently, studies that

were duplicates (49), papers unrelated to indigenous themes (217), or the context of indigenous knowledge in developing and/or emerging nations (38), literature reviews, systematic reviews, and/or studies that did not encompass economics education (16), or did not employ participatory or ethnographic methods (7) were also excluded. As a result, a total of fifteen investigations were acquired. These elements were evaluated in this literature review synthesis. The extraction of information from the documents was structured according to the following elements: authors, location of the study, year of publication, participating ethnic group, educational context, employed methodology, primary aims, and outcomes achieved. The sixteen publications meeting the inclusion criteria reported research undertaken in four countries: one from Malaysia, Nigeria, Namibia, and Botswana, and eleven from South Africa. In terms of methodological context, nine publications reported ethnographic investigations, six were conducted using participatory approaches, and two were developed from case studies. The chosen case studies are analyses that employ ethnographic methods for data collection, including participant observation and interviews (see Table 2). The papers were published between 2020 and 2024, with 2022 and 2024 being the most significant years, featuring four and seven articles, respectively. In the other years, 2023 had two articles published, 2021 had two articles published, and only one article was published in 2020.

The articles were downloaded and added to EndNote. The researcher charted each article by entering its details into a table (see Table 2). These details included: (1) author/s, (2) year of publication, (3) title, and (4) findings. An overview of the studies included in this scoping review is presented in the next section.

Table 2: *Articles included in the review (in alphabetical order)*

S/N	Authors & Years	Titles	Findings
1	Adam, A.A., Othman, N. & Halim, A.A. (2022)	Indigenous Knowledge Documentation: Perspectives of Dusun and Bajau Communities in Kota Belud, Sabah, Malaysia	The findings in this study revealed that the informants acknowledged that indigenous knowledge gradually vanished. Following that, they expressed a positive attitude towards the documentation of indigenous knowledge. At the same time, informants conveyed some of the possible constraints in documenting indigenous knowledge, such as biopiracy, lack of support from authorities, and lack of initiatives among indigenous peoples. Finally, this study concludes by presenting some recommendations to address the issues of indigenous knowledge documentation.
2	Aiseng, K. (2023)	Challenges and Opportunities of Preserving African Indigenous Knowledge Using Digital Technologies: The Case of Bogwera	Most IKS, practices, and values disappear due to the influence of technology, human migrations, climate change, globalisation, death, memory loss, and civilisation. Therefore, IKS will disappear if they are no longer used. This is because many

			traditional practices and activities within IKS that have been used are essential coping and living strategies and are now in danger of disappearing.
3	Balogun, T. & Kalusopa, T. (2021)	A Framework for Digital Preservation of Indigenous Knowledge System (IKS) in Repositories in South Africa	The findings reveal that there are no digital preservation policies in place in the institutions, especially long-term digital preservation for IKS. However, some of the institutions are formulating policies that will include the management of IKS collected in the institutions. This study also reveals that digital curation, policy formulation, and disaster preparedness plans, to some extent, are measures said to be in place for the digital preservation of IKS.
4	Blose, P., & Gumbo, M. T. (2024)	Developing a Framework for Integrating IKS in Technology Education with Sustainable Development Principles	However, teachers do not take full advantage of the opportunities to integrate indigenous technology into the subject, especially through collaboration and teamwork methods. This then acts as a barrier to the successful teaching of sustainability in technology. They confessed that westernisation shapes their understanding of technology and that the approaches they use are attributed to this situation.
5	Buthelezi, S.C., Ocholla, D. & Dlamini, P. (2024)	Strategies for documenting and disseminating indigenous knowledge at a South African university	The study revealed that many departments and faculties across the University of Zululand were involved in the creation of IK-related content, led by the Department of African Languages. The multidisciplinarity of IK at the university was confirmed for further exploitation. The dominant challenges relate to IK sharing, limited facilities, a lack of policy, and inadequate partnership among the stakeholders. The creation and documentation of IK by different departments was another challenge.

6	de Beer, J.J., Kriek, J. (2021)	Insights provided into the decolonization of the science curriculum, and teaching and learning of indigenous knowledge, using Cultural-Historical Activity Theory	The findings reveal tensions between the intended and realised curriculum, indicating that teacher professional development does not necessarily lead to the transfer of knowledge and skills in the classroom. Using indigenous knowledge as a vehicle to decolonise the curriculum holds potential for the rediscovery and appreciation of people's own history, culture, language, and identity.
7	Govender, N., & Mutendera, G. (2020)	Teachers' and custodians' views and dilemmas arising thereof regarding the integration of indigenous knowledge in the primary school	The custodians were of the view that they possess a storehouse of cultural knowledge and skills that should be shared with teachers and learners before these are annihilated and so were willing to support the curriculum integration process in schools. Through indigenous education, they wanted their youth to reaffirm their African identity and culture and to challenge the status quo of only western knowledge being taught in schools through a decolonizing curriculum. Most teachers welcomed and would like to learn from the valuable local experiences and skills of custodians.
8	Kom, Z., Nicolau, M.D. & Nenwiini, S.C. (2024)	The Use of IKS Practices to Enhance Food Security in Vhembe District, South Africa	The findings revealed that local farmers depend on the use of indigenous knowledge practices to improve household food security. The majority of farmers apply manure on their farms using livestock dung. It also shows that 87.8% of households used sun-drying processes for food preservation and used local mortars to pound and grind foodstuffs such as peanuts and maize. Practices such as crop rotation, mixed cropping, and intercropping were employed to improve soil fertility and combat climate change, as well as to reduce insect pest outbursts on crops,

			hence improving crop production.
9	Kom, Z., Nethengwe, N. S., Mpandeli, S., & Chikoore, H. (2022)	Indigenous knowledge indicators employed by farmers for adaptation to climate change in rural South Africa	Indigenous knowledge of rainfall prediction is helpful in preparation for the planting season. The farmers employed wind movement, the presence of black ants, flowering and fruit production of local trees, and the appearance of red ants to predict weather conditions. The study further identified Indigenous people's perceptions of climate change within their specific local area as including signs such as increases in temperature, heatwaves, prolonged drought spells, and reductions in rainfall..
10	Madlela, B. (2024).	Techniques and a Model for the Incorporation of IKS Into the Natural Science Curriculum in Schools	Findings revealed that although the NS Curriculum and Policy Statements (CAPS) 2012 curriculum documents instruct teachers to use IKS in class, these documents do not state which IKS content should be taught. Discretion is left to individual teachers. This poses challenges to teachers as IKS differ across various cultures in the country, and schools do not have IKS study material for teachers and learners.
11	Madlela, B. (2023)	Prospect and challenges of integrating IKS into the natural science curriculum in schools	Findings revealed that IKS has benefits in the NS curriculum, such as contextualising education and acting as learners' prior knowledge, promoting diversity in class and making it possible for teachers to use field trips and traditional visual materials when delivering instruction in NS classes. Findings also revealed that integrating IKS into the NS curriculum faced challenges, such as a lack of government commitment to review education policies, a lack of IKS study material in schools, and the extinction of IKS.
12	Madlela, B. (2022)	The needed categories of IKS in Natural	Findings revealed that participants advocated for the incorporation of

		Science Curriculum in South Africa: Narratives from Pongola schools	the following six IKS categories into the NS curriculum, traditional veterinary medicines, traditional diets and food processing, traditional medicines, weather forecast, environmental and disaster management, traditional values, uBuntu lenhlonipho (humility and respect).
13	Malapane, O.L., Chanza, N. & Musakwa, W. (2024)	Transmission of IKS under changing landscapes within the vhavenda community, South Africa	The research indicates that IKS is fundamentally important to indigenous identity, culture, languages, heritage, and livelihoods. The transfer of IKS from one generation to the next must be preserved and promoted, as these interactions represent the knowledge of the local ecologies. Through the results, it can be concluded that IKS constitutes a fundamental component of the cultural and traditional identity within the Vhavenda community. The erosion of these systems presents significant threats to the socio-cultural dynamics and the preservation of identity in the region. The urgency of safeguarding and facilitating the intergenerational transmission of this knowledge has highlighted the necessity for policy interventions to bolster such systems' resilience.
14	Ngololo, E. N., & Kasanda, C. D. (2024).	Inculcating IKS cultural practices into the pre-service science and mathematics teacher education curriculum at an Institution of Higher Education in Namibia.	Teacher preparation programmes should not only emphasise Western knowledge and pay lip service to IK; concrete steps regarding the promotion of teaching strategies and attitudes and values towards the integration of IK must be put in place to acknowledge its importance. Teacher training programmes should present opportunities to contribute to the development of Africa's unique science, theory, and indigenous innovations, and in turn, the development of new instructional practices, standards,

			curriculum materials, professional and community development, and dialogue among nations.
15	Onyewuchi, F.A., & Owolabi, T. (2022)	Effect of IKS strategy on secondary school students' performance in physics in Lagos State, Nigeria	Findings showed that students from the locality possess rich indigenous knowledge backgrounds and systems that can be deployed to teach physics. Results also revealed that students taught by harnessing their indigenous knowledge system performed better than those taught using the conventional method [$F(1, 318) = 68.27$; $p < 0.05$]. Moreover, there is no statistically significant difference in performance between male and female students taught using the indigenous knowledge system strategy [$F(1, 130) = 0.002$; $p > 0.05$].
16	Photo, P., & McKnight, M. (2024).	Investigating indigenous knowledge awareness among South African science teachers for developing a guideline	The findings reveal varied levels of familiarity among teachers, differing perceptions of IKS relevance, and few proposed strategies for IKS integration. Additionally, preliminary guidelines were developed to bridge the gap between cultural knowledge and scientific understanding. These guidelines aim to empower teachers to transition from the familiar (IKS) to the unfamiliar (Western science), fostering a more culturally responsive science education environment. The study acknowledges the limitations of a small sample size, emphasising the depth of qualitative awareness over generalisability. The proposed guidelines offer a foundation for further research and practical implementation, contributing to the advancement of inclusive and culturally relevant science education.

The results of the systematic review addressing the research topic, "What Influences Teachers' Pedagogical Knowledge in IKS Integration," are presented below and addressed thematically.

3.1 IKS incorporation guideline

The findings indicate that the curriculum framework of the South African education system hinders the integration of IKS due to insufficient guidance on incorporating IKS within the economics curriculum. The latest South African curriculum identifies the appreciation of IKS as one of the seven foundational principles of the education system (Adam et al., 2022). While the curriculum accommodates several epistemologies, it lacks clarity on their integration. The subjects taught by educators are predominantly Western scientific, and curriculum designers are similarly Western-oriented; consequently, IKS is often overlooked (Photo & McKnight, 2024). This aligns with the findings of Madlela (2023), which demonstrate that the CAPS curriculum document lacks clarity as a policy directive on the integration of IKS in teaching practices. The economics curriculum policy statement at Western specifically delineates the topics to be taught, but does not specify the content related to IKS (Govender & Mutendera, 2020). Discretion appears to be assigned to individual educators without any policy directives. Research by Ngololo and Kasanda (2024) indicates the absence of a definitive policy to guide the integration of IKS and the roles of stakeholders in this process. This necessitates an immediate evaluation of the education policy to facilitate the full and systematic integration of IKS into the National School curriculum under the policy's direction.

3.2 Review of IKS policy

The findings revealed that during the colonial period, colonial powers implemented strategies and mechanisms to rule and enslave African communities. These strategies involved the persistent oppression and denigration of indigenous cultures, aiming to eradicate existing knowledge systems and replace them with Western knowledge systems and ideologies. Madlela (2024) asserts that intentional policies successfully resulted in the total domination of cultures and fostered stigma against IKS. Following independence, the integration of IKS into the curriculum has faced resistance, mostly due to persistent colonial mindsets regarding IKS (Photo & McKnight, 2024). According to Madlela (2022), this policy serves as a legal mechanism that recognises and protects IKS nationwide (IKS Policy, 2006). The IKS 2006 policy imposed by the Department of Basic Education (DBE) requires educators to integrate IKS into their economics teaching, as specified in the Curriculum and Assessment Policy Statement (Department of Education, 2012). Although the IKS policy in South Africa was instituted in 2006, Madlela (2023) criticises it for insufficiently incorporating IKS into the regular school curriculum. This indicates that, in terms of policy, South Africa has made considerable progress in integrating IKS into the educational curriculum (Ngololo & Kasanda, 2024). It is essential to thoroughly integrate IKS into the policies of the Ministry of Basic Education and Training. Blose and Gumbo (2024) contend that the United Nations' Sustainable Development Goal 4 for 2030 emphasises the importance of preserving culture and indigenous knowledge in education, thereby enhancing the relevance and quality of learning through the incorporation of students' cultural backgrounds into the curriculum.

3.3 Teacher professional development on IKS

The study indicated that the majority of teachers raised in urban environments lacked exposure to IKS throughout their formative years. It found that the integration of IKS in schools faced challenges, including limited capacity and insufficient or non-existent training. Research conducted by Photo and McKnight (2024) indicated that educators who participated in IKS workshops exhibited greater confidence in the classroom and showed reduced reliance on students for IKS examples compared to their counterparts who did not attend the workshops. Buthelezi et al. (2024) express concerns regarding teachers' insufficient understanding of indigenous science, as well as the inadequacy of study aids in providing sufficient information and clarification. This has led to teachers

misinterpreting IKS content. These findings align with those of Madlela (2023), which indicate that for indigenous knowledge to be effectively integrated into the economics curriculum, educators must receive training in IKS scientific principles to facilitate the decolonisation of their perspectives. Training aimed at decolonising teachers' perspectives would help them acknowledge IKS as a valid epistemological framework (Ngololo & Kasanda, 2024) that should coexist with Western economics within the formal school curriculum. This integration would enable the world to derive benefits and progress from these two principal modes of knowledge (Mabasa-Manganyi & Ntshangase, 2021). Dube and Hlalele's (2021) study indicated that instructors opposed the integration of IKS into the secondary school economics curriculum due to their lack of professional development, resulting in diminished familiarity and receptiveness to IKS.

3.4 Developing specific IKS study material

The research indicated that the Curriculum and Policy Statement (CAPS) 2012 for economics mandated educators to use IKS in their instructional practices (Department of Education, 2012). However, this curriculum document does not specify the categories or content of IKS that economics educators should integrate into their instruction. Buthelezi et al. (2024) assert that for the standard and national integration of IKS into the official economics curriculum, the Department of Basic Education (DBE) must clearly delineate the categories of IKS that Natural Science teachers should incorporate during instruction. Neglecting to address this issue presents a significant risk that economics educators may resort to personal discretion or disregard IKS altogether (Blose & Gumbo, 2024). The literature indicates a lack of IKS material in economics textbooks, highlighting the necessity for its development for both educators and students (Adam et al., 2022). This aligns with the findings of Madlela (2023), which demonstrated that incorporating IKS as a comprehensive knowledge strand in the economics curriculum and textbooks would elevate its standing to that of Western knowledge strands. These strands will mutually enhance one another in overlapping sections of the curriculum while preserving their distinctiveness (Adam et al., 2022). Photo and McKnight (2024) assert that the absence of documentation for indigenous knowledge leads to its eventual obsolescence. Balogun and Kalusopa (2021) express concern that IKS may vanish when their custodians migrate or pass away before the transfer or proper documentation of their IKS can occur. Ngololo and Kasanda (2024) assert that the scarcity of indigenous teaching and learning materials for educators poses a significant challenge, particularly regarding textbooks and handouts intended for use by students and educators.

3.5 IKS knowledge strands

The findings indicated that although the DBE (2012) delineates IKS and asserts its incorporation within the economics curriculum, the IKS knowledge strand and materials are absent from the CAPS 2012 economics curriculum paper. Blose and Gumbo (2024) argue that the curriculum must incorporate indigenous perspectives to support indigenous learners and reflect the cultural realities of the community. Photo and McKnight (2024) emphasise the necessity of integrating local IKS into the mainstream curriculum as an alternative solution to societal challenges. This aligns with the research undertaken by Madlela (2023), who expresses concern over the omission of IKS from the school curriculum. He articulates his significant worries by posing the rhetorical question, "Whose knowledge do schools impart?". Adam et al. (2022) advocate for the transformation and enhancement of the curriculum to accurately represent African IKS. Modifications to the curriculum will inherently alter the knowledge discourse and provide a platform for the historically overlooked IKS. If the curriculum fails to delineate the specific areas of IKS to be addressed, educators are likely to encounter significant difficulties in its implementation. Onyewuchi and Owolabi (2022)indicate in their study that a majority of teachers reported uncertainty regarding the IKS content they were expected to teach due to the absence of such details in the curriculum. Ngololo and Kasanda (2024) assert that the curriculum must encompass sufficient content for learners to acquire through IKS,

along with appropriate instructional methods. The inclusion of such content in the curriculum provides guidance to educators in the preparation of their schemes of work and lesson plans.

4. Conclusions and Recommendations

This study advocates for a departure from dominant Western educational paradigms and promotes the release and manifestation of IKS through curriculum decolonisation. Nonetheless, the implementation of such methodologies within a consistently affected curriculum appears daunting. Furthermore, there is a scarcity of research regarding the integration of IKS in economics education. The content analysis method was employed to analyse the findings from the literature review synthesis in light of a culturally responsive pedagogy framework. This review identified factors that influence teachers' pedagogical knowledge in integrating IKS into economics education, including IKS incorporation guidelines, a review of IKS policy, professional development for teachers on IKS, the development of specific IKS study materials, and IKS knowledge strands.

Based on the findings, the study recommends that teachers' pedagogical proficiency in IKS is influenced by their competence in IKS utilisation, adequate training on content selection, IKS integration policy, and professional development. The study concludes that the CAPS curriculum document should specify which economics content may be taught through IKS to avoid leaving it to teachers' discretion to determine the integration of IKS into their teaching.

5. Declarations

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Data Availability: This review is based entirely on publicly available data and information sourced from peer-reviewed articles, reports, and other academic publications cited in the manuscript. No new primary data were generated or analysed during this study. Readers may refer to the cited sources for detailed information.

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