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Strategies to Incorporate and Support Indigenous Knowledge (IK) in Teacher Training Education: Lessons and Insights for Higher Education Institutions in Namibia.

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ABTRACT

Purpose: The Agenda for Sustainable Development (2030) makes references to indigenous peoples and the significant role indigenous knowledge play in the achievement of Sustainable Development Goals. However, despite significant literature on the benefits of indigenous knowledge, indigenous knowledge is often overlooked in education most especially in the training of teachers. Teachers are expected to have the greatest appreciation for cultural diversity and to create multicultural teaching materials that take into account their students' cultural backgrounds and work to give marginalized groups a sense of acceptance and belonging and subsequently enable communities to live harmoniously in multicultural society. However, they are not adequately prepared for this during their own training. Therefore, the study aims to explore on how indigenous knowledge can be incorporated effectively in the training of teachers in Namibia.

Methodology: Qualitative study approach purposively selected 30 peer reviewed articles to draw strategies that could be implemented to acknowledge the indigenous knowledge in teacher education in higher education.

Findings: The study found six areas that higher education institutions can integrate indigenous knowledge into, such as teaching and learning, curriculum, assessment and evaluation, research, and human resources, in order to adequately include and promote it. However, for this to be sustained, there is a need for committed collaborative approach between academics, curriculum developers, communities and administrative staff.

The originality and value of this study: The study underscores the significant role of indigenous knowledge and how it can be integrated into the teacher training programs in various ways.

Keywords: Indigenous knowledge, Teacher training education, Higher Education, Namibian higher education institutions.

1. Background and Introduction of the study

The 2030 Agenda for Sustainable Development explicitly mentions indigenous peoples and emphasizes the significant role that indigenous knowledge can play in driving the achievement of Sustainable Development Goals (Sultana et al., 2021). However, it is noteworthy that existing literature highlights the

frequent neglect of indigenous knowledge in the field of education, often contrasting it with scientific knowledge as a traditional versus modern dichotomy.

This oversight extends to the training of teachers. The challenge lies in the Namibian educational system, which expects teachers to incorporate local or indigenous knowledge (IK) into their teaching without providing them the necessary training on how to effectively integrate such lessons. Additionally, Namibian educators are tasked with fostering cultural appreciation and developing multicultural teaching materials that cater to the diverse cultural backgrounds of their students. These materials should aim to create a sense of acceptance and belonging, especially for marginalized groups.

Namibia's demographic makeup, as reported by the United Nations Development Programme (UNDP, 2000), comprises nine major indigenous ethnic groups, with Aawambo representing 50.0% of the population, followed by Kavango (9.0%), Ovaherero (7.0%), Damara (7.0%), Nama (5.0%), and smaller percentages distributed among Lozi, San, Baster, and Tswana populations. These culturally rich and diverse regions hold a wealth of indigenous knowledge.

Both national and international literature reveal a lack of consensus among researchers regarding the limited integration of indigenous knowledge at various levels of the education system. For instance, Seehawer (2018) discovered that while curricula for Grades 4–9 in Namibia expect teachers to incorporate indigenous knowledge, only a few indigenous knowledge elements are mentioned, and they are not included in examinations. The study further concludes that teachers in Africa lack the necessary tools to translate theories and policies into practice. Consequently, there is a need for empirical evidence on how the integration of knowledge can operate within today's African educational systems, complementing theoretical debates and paving the way for long-term educational transformation.

Similarly, the National Policy Options for Educationally Marginalized Children (MBESC 2000) and the Sector Policy on Inclusive Education (MoE, 2013) require teachers to successfully implement these policies to ensure that no child is left behind. Nevertheless, many authors recognize the challenges associated with these expectations. Thaman (2013) observes that teachers are inadequately prepared during their training. According to Funk & Woodroffe (2023), educators who lack knowledge about Indigenous peoples and their knowledge find it challenging to work effectively with indigenous students who must navigate the expectations of their home cultures and those of their schools.

Saurombe (2018) points out that the difficulty with indigenous knowledge arises from the varying conceptualizations of the phrase itself, with no single widely accepted definition due to its contextual dependence. Eurocentric scholars tend to view it as an unfamiliar cognitive system, while in the African context, it takes on a different meaning. Traditional knowledge (TK), also referred to as indigenous knowledge (IK), encompasses a body of knowledge passed down through generations with minimal alteration over time, which contrasts with the African perspective on the concept.

According to Moyo and Kizito (2014), the indigenous knowledge system (IKS) represents a complex amalgamation of skills, knowledge, and technologies that have evolved in response to the distinct characteristics of local populations and communities. Consequently, it encompasses the collective wisdom accumulated by specific communities over time, continually evolving. It's evident that these two definitions stand in contrast to each other. The Eurocentric perspective primarily centers on the

knowledge, customs, and practices of indigenous peoples, documenting their local terminology and compiling information about them.

As a consequence of this cognitive process, instruction on indigenous knowledge tends to be biased. African research is now delving deeper into investigations that support this bias. Moreover, many academics today are actively working to ensure that the African perspective is duly acknowledged. Recognizing that African issues must be approached with African solutions, the teaching profession emerges as a pivotal agent of this transformation.

Numerous studies provide compelling justifications for the importance of incorporating indigenous perspectives. For instance, by introducing indigenous viewpoints into teaching, student teachers develop increased respect and understanding for other cultures, enabling them to think more broadly when addressing social and environmental issues. Additionally, viewing these perspectives through a sociological lens fosters an awareness of the intricate relationship between people and their environment. It also enhances understanding of a country's indigenous history. On a global scale, the United Nations has acknowledged that traditional knowledge could hold the answers to pressing global issues such as discrimination, exploitation, dispossession, and colonization (The United Nations Inter-Agency Support Group (IASG), 2014).

Despite a wealth of literature supporting the need and significance of indigenous knowledge, there is limited research exploring how it can be effectively integrated into teacher training. Studies, such as Siseho (2018, p. ii), have recommended that higher education institutions should provide training to teachers on incorporating indigenous knowledge into the curriculum. When teachers are not adequately prepared, indigenous learners may feel disconnected from their environment. The literature highlights the dangers of this disconnect, as indigenous individuals often grapple with the challenge of straddling two worlds—indigenous and non-indigenous (Handayani, Wilujeng, and Zuhdan Prasety (2018).

Hence, the primary objective of this study is to investigate effective methods for incorporating indigenous knowledge into teacher training. This paper asserts that all student teachers should not only be professionally qualified but also culturally competent, as emphasized by Thaman (2013). To enhance teachers' ability to impart knowledge effectively, Suarta et al. (2022) recommend that academic institutions and school administrative organizations provide appropriate teacher training and development opportunities related to indigenous knowledge. Thus, the pressing need for research on indigenous knowledge to enhance teacher training and education.

2. Methodology

An initial investigation was undertaken to assess the teacher training practices within Namibian higher education institutions. The objective was to gauge the extent to which teacher education programs embraced and integrated aspects of distinct cultures, along with their corresponding knowledge and value systems. Subsequently, a comprehensive study was initiated to explore effective methods of integrating intricate indigenous knowledge into teacher training. To critically assess both teacher education practices and training strategies, a qualitative research approach involving the examination of 30 peer-reviewed studies was employed. The term "Indigenous knowledge" was utilized as a search criterion in the Ebscohost Discovery database to compile the 30 peer-reviewed articles from various regions around the world.

3. Data Presentation and Discussions

Ebscohost search yielded outcomes encompassing articles, journals, reports, and a global body of work concerning the effective integration of indigenous knowledge into the teacher training process.

The following table presents the themes and categories that surfaced during the review of these articles.

Table 1: Strategies to integrate indigenous knowledge in the teacher education program

Key arears	Strategies
Curriculum	Adapt the curriculum to align with the culture, knowledge, and languages of the citizens' context.
	Designing of inclusive curricula using pedagogies that reflect the changing needs of African society
	Development of Curriculum local materials to support learning
	Application of a bottom-up approach in special cases when Indigenous Knowledge (IK) is formally not acknowledged
Teaching and learning	Providing Conducive learning environment
	Embracing of Indigenous research in native languages
	Implementing Collaborative Peer-Assisted Learning, with teachers facilitating and creating opportunities for students to assist and translate for one another.
	Contextualizing learning
	Use of teacher support materials Eg:Development of worksheets, lesson planning and the use of technology.
Assessment and evaluation	Design reflective assessments Design collaborative evaluation techniques
Research	Encouraging ethnographic research and; collaborative research
Human resources	Recruitment of aboriginal staff
	Inviting guest speakers/ visiting parents

3.1 Curriculum

Indigenizing the curriculum involves the incorporation of indigenous knowledge into the educational framework, as noted by Moyo and Kizito (2014), and the inclusion of often unheard indigenous perspectives, as discussed by Acton, Salter, Lenoy, and Stevenson (2017). This process aims to adapt curricula to be inclusive, contextually relevant, and practical, aligning with the evolving needs of African society. Higgs (2016, p. 7) emphasizes the pivotal questions of "what should be learned?" and "how should knowledge be organized for teaching?" in the realm of education. In this context, scholars like Apple (2017) contend that the decision to privilege certain groups' knowledge as official, while marginalizing others, reveals a society's power dynamics.

A contextually relevant curriculum should take into consideration the knowledge, languages, and teaching and learning practices of its citizens. Hunter (2015, p. 79) underscores that a pertinent pedagogy requires educators to adapt their curricula to better serve their students. Therefore, incorporating cultural elements into teacher education programs is essential for creating a successful, culturally relevant teacher education initiative. This approach can have a significant and engaging impact on all students' learning, prompting teacher educators to employ diverse resources and redesign approaches to meet curriculum objectives.

Higher education institutions should actively encourage teachers to develop worksheets, design lessons, and leverage technology while considering indigenous knowledge. Even though current lesson plans may include provisions for English reading, writing, and HIV/AIDS integration, there is room to introduce elements of indigenous knowledge.

Despite the explicit encouragement of knowledge integration in the South African science curriculum, it largely lacks representation of indigenous knowledge, and accessible teaching materials are scarce, as reported by Seehawer (2018). This dearth of relevant resources, both human and material, hinders those seeking to contextualize their work, whether in teaching, curriculum planning, or policy development. As Higgs (2016) notes, a curriculum grounded in indigenous African epistemologies aims to instill pride in teachers and students regarding their unique perspectives on the world and to nurture their self-confidence in their skills.

Consequently, Morrison et al. (2008) argue that diverse student learning can be enhanced by employing culturally relevant resources and instruction aligned with students' cultures. The integration of culture into the curriculum, through effective instructional strategies, has also been found to improve learners' academic performance (Morrison et al., 2008). For instance, in science classes, Thaman (2013) contends that incorporating indigenous knowledge can help learners connect what they learn in school with their daily experiences in their communities. In culturally diverse communities like Namibia, teachers may encounter conflicts between the expectations of different indigenous cultures and Western practices adopted in schools. Therefore, it is imperative to train student teachers to mediate between these distinct cultural systems, which persist in educational settings.

Higher education institutions should provide teacher training that equips educators to develop curriculum materials instructing them to use the local environment and cultural resources as the foundation for all learning. This approach promotes experiential, inquiry-based pedagogy, as advocated by Barnhardt (2014).

Conversely, it's crucial to recognize that certain governments have yet to acknowledge or incorporate Indigenous Knowledge (IK) into their curricula. For instance, Chepchirchir (2017, p. 36) highlights that the Government of Kenya is currently in the process of advocating for a redesign of its official curricula. This redesign aims to seamlessly integrate diverse Indigenous ways of knowing into the established educational system, fostering students' self-worth rooted in their authentic cultural knowledge systems. While the transformation of the educational system from the top-down may be challenging for academics, parents, students, elders, and traditional healers, they can initiate the process of decolonization from the grassroots level. This approach includes the training of student teachers to incorporate IK into their lessons and inspire student engagement.

According to Seehawer (2019), there is room for creative strategies that enable the integration of Indigenous knowledge without deviating from the curriculum, without compromising teaching time, or without explicitly mentioning IK in the curriculum. Indigenous knowledge can become the focus of

student teachers' theses, academic research projects on integration, and teacher educators' inclusion of IK in teacher preparation. Ngcoza (2018) illustrates that, in South Africa, a bottom-up approach has been applied in science-related curricula. Xhosa elders collaborated with science majors at Rhodes University to explore the production of the local brew, umqombothi. Although this endeavor may not seem explicitly tied to the curriculum, it serves as an example of Indigenous knowledge integration through project-based learning. There is significant potential for higher education institutions to harness the benefits of this bottom-up approach, enriching traditional educational discourses with Indigenous knowledge perspectives.

3.2 Teaching and learning

The study uncovers disparities in knowledge and practice, as well as differences between dominant Western pedagogies and indigenous approaches. Murphy (2009, p. 35) defines "pedagogy" as the interactions and relationships among teachers, students, the learning environment, and learning activities. It encompasses the strategies and techniques teachers employ to facilitate student learning. In contrast, Alexander (2008) distinguishes teaching as an action while pedagogy encompasses both action and discourse. The seemingly independent act of teaching is intertwined with culture, structure, and social control mechanisms through pedagogy (p. 6). Pedagogy, apart from defining teaching practices, also reflects social and cultural values within the context of the learning relationship and institutional settings where education occurs (Willis, 2012).

Indigenous pedagogies, also referred to as Native pedagogical approaches, are equally vital for effective teaching and learning, much like Western pedagogies. They require an environment that is "culturally safe, respectful, and conducive to shared learning," influenced by both formal and informal cultural learning, for educators and student teachers (Biermann & Townsend-Cross, 2008, p. 150). Furthermore, (Hunter, 2015) contends that educators must establish an environment where all students feel valued, comfortable, and at home to foster a culturally inclusive classroom.
Leroy-Dyer (2020) elucidates that Aboriginal pedagogy places value on localized and traditional knowledge, emphasizing storytelling and respectful listening in a safe space, enabling a unique form of learning. Instead of traditional lectures and lessons, educators conduct interactive workshops involving "yarning" and "yarning circles" to help students connect their learning to their communities (Leroy-Dyer, 2020). Educators assist learners, and students are encouraged to help or translate for one another.

Handayani et al. (2018) acknowledge the challenge educators and researchers face in aligning curricula and courses with contemporary needs without sacrificing cultural values. Given that indigenous knowledge and conventional classroom scientific knowledge can complement each other, it's crucial for student teachers to be aware of this synergy, particularly in the sciences (Regmi & Fleming, 2012).

Academics should enhance student teachers' contextualization skills, enabling them to align their teaching with local contexts and serve as effective role models. Since knowledge is highly context-dependent and closely tied to the lives of indigenous communities, Thaman's (2013) research reveals that most higher education institution personnel often fail to consider the cultural backgrounds of their students when designing course content, teaching methods, and assessment approaches.

3.3 Assessment and evaluation

The curriculum needs to be updated to align with current standards, culturally appropriate, and supported by effective pedagogical and evaluation methods, as emphasized in the study by Preston and Claypool (2021). Despite a significant body of literature on indigenous knowledge, there remains a research gap concerning the most suitable assessment methods and approaches that contribute to the academic success of Indigenous students. According to Person and Hayward (2020, p. 167), student assessment is an ongoing process of collecting evidence to determine students' knowledge, understanding, and abilities.

Nelson-Barber and Trumbull (2007) and Fleet and Kitson (2009) argue that many assessment methods employed, such as written quizzes, tests, and exams, are predominantly rooted in Western traditions. These methods primarily promote academic development through logical, sequential, and measurable activities. However, such assessments often overlook the physical, emotional, and spiritual needs of students, neglecting to address their broader instructional objectives.

Fair assessment practices involve providing students with equitable opportunities to demonstrate their learning, representing a holistic learning experience encompassing content, process, and purpose. Biermann and Townsend-Cross (2008, p. 150) stress that assessments should encourage reflection and move away from individual merit, aligning with the essence of indigenous education, which emphasizes the collective over the individual.

Trumbull and Nelson-Barber (2019) explain that many common assessment practices are ineffective and sometimes even detrimental for both Indigenous and non-Indigenous students, as highlighted in the study by Preston and Claypool (2021). Indigenous knowledge studies have underscored the challenges of assessing life experiences through traditional examinations and tests. Assessment methods should consider the values of students' home cultures, which are often overlooked, de-emphasized, or discouraged due to their conflicts with the values promoted by the educational system. For example, indigenous education systems prioritize specific contexts and interpersonal relationships, while mainstream schooling relies on universalism and impersonality. Student teachers need to be trained to assess both indigenous and non-indigenous learners, as many assessments are rooted in a Western perspective focused on individualism and competition. This includes linguistic assessment procedures that can disadvantage indigenous students, and standardized exams based on a specific language or culture that may exhibit bias.

Therefore, Riley and Johansen (2019) argue that higher education institutions should advocate for more collaborative evaluation methods, such as group work and real-life simulations. Such assessments may take the form of comprehensive or project-based assignments, similar to those offered at cultural or outdoor education camps (Preston, 2017). These initiatives redefine assessment as a practical and relevant tool, possibly involving oral exchanges between student teachers and academics.

3.4 Research

Research plays a crucial role in the incorporation of Indigenous knowledge, encompassing both the need for educators to engage in Indigenous research to become reflective practitioners and the academic research projects undertaken by students.

Thaman (2013) challenges the prevailing unilateral assumption of a universal research model dictating how knowledge should be generated. Thaman points out that despite the adoption of Western or global

knowledge as a standard, many researchers have discovered that the European-derived research systems and frameworks lack the concepts necessary to authentically express, define, depict, and understand their experiences and realities. In cases where indigenous knowledge is included in certain fields, such as education, it often occupies a subordinate position compared to Western knowledge.

Research plays a pivotal role in the process of decolonizing education and granting agency to marginalized groups to construct their own models and frameworks, especially in the realms of teaching and learning. This shift reduces reliance on the ideas and expertise of individuals who frequently lack an understanding of the cultural contexts within the communities they serve.

3.5 Human and supporting Resources

Chinsembu and Amunyela (2015) have identified several key barriers to the effective integration of indigenous knowledge, including a lack of skilled personnel, insufficient documentation, and cultural differences among lecturers and students. According to Jackson et al.'s study (2016, p. 510), teachers who lack knowledge of indigenous knowledge, thus possessing underdeveloped pedagogical content knowledge (PCK), become demotivated when attempting to incorporate indigenous knowledge into their teaching. Therefore, the recruitment of indigenous educators is crucial for the successful integration of indigenous knowledge in higher education institutions. In the absence of suitable candidates, inviting or hosting parents as guest speakers can serve as an alternative approach. Thaman (2013) underscores the importance of indigenous people in preserving and sustaining natural processes, which are reflected in their rituals and beliefs. Education, in this context, extends beyond formal classroom settings to encompass the entirety of nature and its phenomena. To achieve educational goals, particularly those aligned with Education For All principles, the curriculum must embrace cultural inclusivity in both content and instruction.

Higher education institutions should prioritize not only the development of pedagogical content knowledge (PCK) but also cultural competence as essential attributes for graduate teachers. Educators must be aware of the differences and similarities among various cultural perspectives. Student teachers must understand their roles, continually self-reflect, and theorize their own education to devise strategies for integrating the diverse cultural influences that have shaped their growth. Teachers play a pivotal role in revitalizing learning across all schools, and teacher training institutions must recognize the profound implications of this. According to Hunter (2015), the foundation of indigenous knowledge lies in teachers who respect cultural identity, create conducive learning environments, and select appropriate pedagogical approaches for the classroom. Therefore, teachers should receive training that imparts a relevant conceptual understanding of indigenous knowledge in their specific educational context (Chepchirchir, 2017).

Thaman (2013) discovered that the force of globalization deterred Pacific teachers and students from recognizing, valuing, and studying their own indigenous knowledge systems, out of fear of being labeled as outdated, romantic, or even racist. Several researchers have explored the factors influencing successful curriculum integration. Jackson et al. (2016) noted that some teachers do not place value on transmitting indigenous knowledge systems due to their intrinsic value systems, particularly in the affective domain. Additionally, some teachers perceive indigenous knowledge as pseudoscience, as highlighted in Mothwa's study (2011). Jackson et al. (2016) conclude that teachers may lack cultural sensitivity beyond their ingrained mental models.

To ensure cultural sustainability and a positive correlation between classroom learning and students' lives outside the classroom, student teachers should undergo training and development that includes a change in attitudes, knowledge, and skills. Jackson et al. (2016, p. 510) report a general shift towards a more nuanced understanding of indigenous knowledge among teachers following indigenous knowledge professional teacher intervention training. Many teachers progressed from being uninformed about indigenous knowledge to partially informed and then to fully informed views. Attitudes and perceptions can be reshaped through training and workshops provided by higher education institutions to help student teachers gain a comprehensive understanding of indigenous knowledge.

Moreover, a thorough review of the literature demonstrates that students benefit from teachers who invest time in building relationships based on their social, cultural, historical backgrounds, and cultural identities. Additionally, high-quality instruction rooted in cultural competencies enhances the learning experience for students.

4 Conclusion

The paper emphasizes the importance of including indigenous knowledge as an essential component of teacher training to cultivate awareness and the ability to connect with the environment. Successful integration of indigenous knowledge relies on various elements such as curriculum design, teaching methodologies, assessment procedures, available resources, and the presence of supportive structures. The integration of indigenous knowledge is crucial to bridging gaps and establishing meaningful connections in students' understanding.

Indigenous science, for instance, encourages students to perceive themselves as stewards and protectors of both culture and nature, acting as safeguards against exploitation. The research findings underscore the need for a collaborative approach with indigenous communities to decolonize indigenous knowledge systems, as these communities hold the knowledge. Additionally, allocating resources and funding for indigenous research and resource development is essential to achieve the objectives outlined in the Sector Policy on Inclusive Education (MoE 2013) and the National Policy Options for Educationally Marginalized Children (MBESC 2000).

5. Implications

Firstly, the study serves as a call to action for higher education institutions to incorporate Indigenous Knowledge (IK) either as a pedagogical approach or as a distinct area of study. This recognition is based on the significant role that teachers are expected to play in their profession.

Secondly, it acts as a catalyst for advancing the goals outlined in the Sector Policy on Inclusive Education (MoE, 2013) and the National Policy Options for Educationally Marginalized Children (MBESC 2000). It does so by proposing a collaborative approach to decolonizing indigenous knowledge, which involves, among other aspects, partnerships with indigenous communities as the rightful custodians of their own knowledge. Additionally, the study emphasizes the importance of allocating budgetary resources for indigenous research, which is a preliminary and essential step in realizing the objectives of these policies.

6. Limitations

Given that this study is a systematic review focused on indigenous knowledge, it may not be possible to thoroughly examine all potential strategies or assess their effectiveness. This limitation arises from the likelihood that valuable data might be available in indigenous languages with which the researcher is unfamiliar.

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