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Integrating knowledge systems in South African school education as crises response: re-focusing on epistemological questions

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Abstract

Situated in ongoing scholarly reflections on how to respond to interconnected educational, epistemological and colonial crises, the article proposes that a bold giant leap scenario for transforming South Africa's school education system may be one such response. To that end, the article engages with discourses on integrating indigenous and Euro-Western knowledge systems. The article argues for a holistic rather than tokenistic integration – one that requires examining epistemological assumptions and revisiting basic questions such as *why*, *what*, and *how* to integrate indigenous knowing. It suggests (re-) installing Ubuntu as an overarching rationale for integrating knowledge systems. Drawing on this rationale and on insights from a participatory action research study, the article makes several recommendations to inform future research and policy work: recognising the global importance of local indigenous practices; position teachers as facilitators of dialogue between epistemologies; combine approaches of teaching both non-predefined and predefined indigenous knowing; develop epistemologically appropriate ways to represent indigenous knowing in curricula and textbooks.

Keywords: Education system, indigenous knowing, integrating knowledge systems, South Africa, sustainability, Ubuntu

Introduction

The present article is part of ongoing scholarly reflections on how the educational community may act and react in times of multiple and worsening crises, especially crises of environmental, educational and colonial nature, which are recognised as interconnected. Within this broad framing, the article is anchored in discourses on rethinking and decolonising South African school education through integrating knowledge systems as one possible crisis response. The article invites to un-accept present structures of education and to consider underlying epistemological assumptions when exploring the integration of knowledge systems.

Much recent research on integrating knowledge systems is very pragmatic in nature. Pragmatic in the sense that it accepts, and takes a starting point in, the given educational settings, the given curricula and the given school subjects. It explores, empirically or conceptually, how specific aspects of indigenous knowing may be included into specific subjects or curriculum themes. There is great value in this kind of research. It may inform longer-term efforts for comprehensive transformation of the education system. It may also move involved stakeholders' focus from perceived powerlessness to agency by enacting educational change in small, bottom-up ways (Seehawer, 2018a). At the same time, however, there is a risk to create unwilling complicity to the hegemony of Euro-Western knowledge. Adding indigenous perspectives onto settings that are characterised by Eurocentric curricula, compartmentalised subjects and knowledge disciplines that cater to the epistemological tenets of the so-called Euro-Western knowledge, does not challenge prevailing knowledge hierarchies (Ahenakew, 2017), but confirms indigenous knowing in the position of the other(ed) knowledge.

Having studied stakeholder views on integrating Xhosa indigenous ways of knowing in

South African science education, Paul Webb (2013) concluded more than a decade ago that

> …more critical reflection on the *why, what, whether, when, where,* and *how* of reconciling differing worldviews in science classrooms may be required. If these reflections could produce a more easily navigable framework for *charting epistemological and ontological positions, and the logical curricular positions they lead to*, a better shared understanding of the main pressures for and against inclusion, *what is included, why it is included, and how it is included*, might possibly ameliorate the sometimes adversarial positioning of protagonists and provide more broadly acceptable local regional, and national curricula which include non-mainstream, cultural ways of knowing (p. 107, emphases added).

Scholarly debate on how to structure, balance and organise indigenous knowing and Euro-Western knowledge in school education and curricula has never fallen completely silent, but it has recently been much less vocal than the abovementioned pragmatic studies. Its contributions (e.g., Msimanga & Shiza, 2014; Nhalevilo, 2013; Òtúlàjà, Cameron, & Msimanga, 2011), though mostly from the previous decade, are still relevant and inform the article's discussion sections. If anything, Webb's (2013) questions are even more pertinent today. Therefore, the article suggests reflecting on Webb's *why*, *what*, *whether*, *when*, *where*, and *how* questions by taking a starting point in the epistemological positions of indigenous knowing rather than in taken-for-granted Eurocentric structures. Not to exotify or dichotomise, but to lay a foundation for teaching and learning indigenous knowing on its own epistemological premises. To stimulate such work, the article focuses particularly on the questions "*what* is included, *why* it is included, and *how* it is included" (Webb, 2013, p. 107, emphases added). To address these, I draw on the case of the present South African science education curriculum (DoE, 2011a; DoE, 2011b; DoE, 2011c) and the experience of five teachers who sought to teach indigenous knowing in line with, and despite, this curriculum (Seehawer, 2018a; Seehawer & Breidlid, 2021). While the article's focus is on South Africa, it may have relevance for other Southern African countries facing relatable educational situations. In the following, I first account for the theoretical and normative foundations that guide the article before presenting and discussing the case.

Theoretical and normative groundings

To enable what Webb (2013) calls charting epistemological and ontological positions, this section of the article starts by considering characteristics of indigenous knowing and so-called Euro-Western knowledge. Secondly, I briefly review scholarly rationales for integrating knowledge systems. The review includes references from three decades to underline that these debates have been ongoing for a long time. Thirdly, I frame the discussed rationales as the absence of Ubuntu in South African education. Acknowledging the scholarly work done on this subject, I suggest Ubuntu as a normative framework for decolonised African school education.

Epistemological issues. Knowledge versus knowing.

In contrast to the mostly noun-based European languages, many non-Western languages are verb-based (Nisbet, 2003). In English, only 30 percent of the words are verbs. In the Northern American vernacular of Potawatomi, in contrast, about 70 percent of the words are verbs, which expresses a worldview that accentuates process and relationality. Concepts are often understood as actions rather than static entities (Kimmerer, 2013; Nisbet, 2003). This is illustrated in the experience of Kimmerer (2013). Learning Potawatomi, Kimmerer pondered the fact that English nouns such as *bay* or *Saturday* are verbs in Potawatomi. She notes:

> A bay is a noun only if water is dead. When bay is a noun, it is defined by humans, trapped between its shores and contained by the world. But the verb weekwegamaa – to be a bay – releases the water from bondage and lets it live. To be a bay holds the wonder that, for this moment, the living

> water has decided to shelter itself between the shore… (p. 55).

In some South African studies, indigenous knowing is referred to as indigenous knowledge, commonly abbreviated as IK. Conceptualised as IK, indigenous knowing becomes compatible with other forms of knowledge such as Euro-Western knowledge; it becomes an operationalisable unit that may be included into school subjects, curricula and textbooks. However, considering the verbal structure of indigenous languages, the question is whether the noun indigenous *knowledge*, appropriately captures its meaning. Aikenhead and Elliot (2010) argue that

> the expression Indigenous knowledge is problematic because the word knowledge is embedded in a Eurocentric epistemology and should be replaced by other expressions that more authentically capture an Indigenous worldview, such as Indigenous *ways of knowing*, *living*, or *being*. Concomitantly, the Eurocentric meaning of to learn becomes *coming to know* in most Indigenous contexts, a meaning that signifies a *personal, participatory, holistic journey toward gaining wisdom-in-action* (p. 322, emphases added).

Following this understanding, the term indigenous knowledge could send misleading signals to curriculum makers and be a first step towards pressing indigenous knowing into epistemologically ill-fitting structures. The also often-used term *indigenous knowledge systems* (IKS) may be better suited. This article mostly uses indigenous *knowing* in contrast to Euro-Western *knowledge*, as a reminder to consider epistemological aspects when conceptualising an integration of the two systems.

The dynamic nature and place-based relevance of indigenous knowing may be understood from its processual and activity-based nature. Definitions often emphasise that indigenous knowing results from a peoples' sustained attachment to a place over generations to the extent, that the place is "known". Known in the sense of developing a "perfect understanding of the relationships of their communities to their surrounding natural and social environment" (Dei & Asgharzadeh, 2006, p. 54). Both the coming to know and the knowing of the place are thus relational and connected to lived experiences. Some Euro-Western traditions of thought such as feminism or post-human approaches also recognise relationality and the situatedness of knowledge. What Euro-Western knowledge refers to in this article, is the dominant knowledge system that "originated in 16th-century Europe and together with industrial capitalism produced a specific kind of knowledge that is embodied in modern science" (Breidlid, 2013, p. 1). The universality claim of this knowledge system enabled epistemicide and the ongoing subjugation of indigenous knowing (Breidlid, 2013). Euro-Western knowledge is not static either in the sense that new research results may refine and revise previous studies. However, the Cartesian tradition separates ratio and spirit. Change in Euro-Western knowledge springs from an atomistic understanding of knowledge, rather than from holistic processes that reflect changing conditions of life and land.

In simple terms, Euro-Western knowledge can be placed in a Cartesian paradigm building on rationality, while indigenous knowing can be situated in relational paradigms such as Ubuntu. Such generalisations are dangerous in that they oversee variation. They create impressions of incommensurability, where there may be both contrast and common ground. Nevertheless, recognising and – as Dei and Asgharzadeh (2006) suggest – normalising differences between epistemological positions is a prerequisite for the integration of knowledge systems in education. An interesting question in that regard is the role of spirituality within indigenous knowing. In her classic text, Brant-Castellano (2000) suggests three types of indigenous knowing: traditional (imparted orally between generations), revealed through dreams or visions and empirical observation. It seems that some South African research contexts emphasise the latter aspect. Òtúlàjà et al. (2011) note "that not all IK components are rooted in spirituality," but that "perhaps the largest part has to do with the science of day-to-day experience, interaction and engaging symbiotically with nature" (p. 698). Others (Msimanga & Shiza, 2014) emphasise the central

role of spirituality in indigenous knowing. They explain African spirituality as meaning that "there is a spirit in everything created and found on Mother Earth" (p. 139). These positions are not necessarily in opposition, but rather point to the need for more exploration what this means within the realm of education. The below suggested paradigm of Ubuntu may provide a good framework for this work.

Decolonisation and integration of knowledge systems in times of educational, epistemological and environmental crises

For a long time, scholars have advocated for reviving indigenous knowing and integrating knowledge systems in South African school education. Thereby, one rationale is the decolonisation of, or addressing persisting coloniality in, education systems. Many education systems are still modelled after the former colonial powers' educational structures, content and pedagogies. Decolonising education refers to the epistemological dimensions of colonisation. It includes overcoming internalised notions of *education* equalling *European* education. For many scholars, this would not mean eliminating all things Western but adopting dialogical approaches in which indigenous knowing and Euro-Western knowledge are integrated without valuing one over the other (Odora Hoppers, 2002; Mawere, 2015; Muchenje, 2017; Seehawer & Breidlid, 2021). One argument is that the ability to draw on several knowledge archives that enrich and challenge one another, may provide learners with a larger repository to address contemporary challenges (Seehawer & Breidlid, 2021). This ability has been coined as Two-Eyed Seeing by elders of the North American Mi'kmaw Nation (Hatcher, Bartler, Marshall, & Marshall, 2009). A second rationale for the integration of knowledge systems is aligning education with learners' lived realities and culturally responsive teaching, rather than classrooms being sites of alienation. The central argument is that South Africa's Euro-Western education systems fail epistemologically in that learners' local or indigenous knowing is neither acknowledged, appreciated nor taught in school (Ajayi, 2025; Breidlid, 2013). A third rationale concerns sustainability – or rather the survival and thriving of the species inhabiting planet earth. Indigenous worldviews such as Ubuntu understand humans as a part of, rather than situated above, nature (Goduka, 2000). Accordingly, scholars posit that indigenous knowing is decisive for planetary wellbeing (Breidlid, 2013; Brondízio et al., 2021; Kimmerer, 2012). Here too, some suggest dialogical or third space approaches for indigenous knowing and Euro-Western science to collaborate towards planetary wellbeing (Aikenhead & Elliott, 2010; Glasson, Mhango, Phiri, & Lanier, 2010; Odora Hoppers, 2002).

In their comprehensive analysis of planet earth's condition, scientists recently diagnosed humanity to linger in a scenario termed doing *too little too late* (Dixon-Declève et al., 2022). This scenario persists despite five decades of scientific knowledge about planetary boundaries (see, Meadows et al., 1972). *Too little too late* is contrasted with a *giant leap* scenario in which bold concerted action could create turnarounds for multiple environmental crises (Dixon-Declève et al., 2022). However, due to new and persisting wars and increasing political instabilities as well as persisting conditions of coloniality, a *giant leap* towards planetary survival appears to become more unlikely as we speak.

While originally not applied to the field of education, the *too little too late* scenario may easily resonate with the (frustration of) advocates for integrating knowledge systems in education. Especially with those, who recognise environmental and epistemological crises as two sides of the same problem. In the words of Cathrine Odora Hoppers (2002), "a major threat to the sustainability of natural resources is *the erosion of [indigenous] people's knowledge, and the basic reason for this erosion is the low value attached to it*" (p. 7, emphasis in original). More recently, a coalition of 30 environmental scientists (Fernández-Llamazares et al., 2021) published a forthright *Warning to Humanity on Threats to Indigenous and Local Knowledge Systems.* Cameroonian thinker Achille Mbembe (2021) understands decolonisation as "an active *will to community* … [which] is another name for what could be called the *will to life*" (p.2-3, emphases in original). In this understanding, decolonisation will ultimately mean *will to community* between formerly colonised and former colonisers and their

respective knowledge systems. For Mbembe, survival of planetary ecological crises requires alternatives ways of living together as humans as well as humans and all other species – in an awareness of "human limits and the limits of nature itself" (p.21).

Mainstream international policy communities have largely ignored indigenous knowing, whereby the UN's 2015 *Sustainable Development Goals* are one central example (Breidlid, 2020). Maybe, it is not coincidental that this picture began to change under COVID 19, when the UNDP's (2020) Human Development Report recognised the pandemic as "reflection of the pressures people put on planet Earth" (p. iii). In appreciating indigenous peoples' ways of treating biosphere, the report calls for "new collaborative ways of mobilizing knowledge and learning across diverse [knowledge] systems [that] can contribute to innovations and new solutions to sustainable human development" (p. 34). In their 2022 report, the Intergovernmental Panel on Climate Change names historical and ongoing patterns of colonialism as one driver of ecosystems' and peoples' vulnerability to climate change (p.1). For Friederike Otto (2024), a leading climate scientist, climate change is a clear symptom of persisting inequalities such as patriarchal and colonial structures. For indigenous peoples, acute threats to futures and livelihoods are not new. To indigenous peoples, the concept of Anthropocene does not present "a hitherto unanticipated vision of human intervention, which involves mass extinctions and the disappearance of certain ecosystems" (Whyte, 2017, p. 159). The colonial period had "rendered comparable outcomes that cost Indigenous peoples their reciprocal relationships with thousands of plants, animals, and ecosystems—most of which are not coming back" (p. 159). Any *Giant leap* scenario towards planetary survival is impossible without recognising and thoroughly addressing conditions of coloniality.

Will mainstream acknowledgement of indigenous knowledge systems lead to anything more than tokenistic, *too little too late* changes? – Possibly not. Notwithstanding, the article suggests that one crisis response of the educational community should be (re-)considering questions concerning how education, pedagogies and integration of knowledges may be organised in ways that do justice to the knowledge systems involved. Without a tangible *giant leap* scenario in place that could boldly transform South African school education systems, the answer is: certainly not.

Ubuntu as a normative framework for a transformative giant leap scenario in education systems

Taken together, the above rationales for the integration of knowledge systems speak of the absence of Ubuntu in the South African school education system. Ubuntu is here understood as a worldview derived from the Bantu people's way of life that recognizes the interconnectedness of all creation. Due to the verbal structure of Bantu languages, Ubuntu is difficult to translate into English. However, it is commonly captured in the phrase *I am because we are* (Mbiti, 1990) and in the term *humanness* (Ramose, 2009). As Ramose (2009) and Dladla (2017) explain, Ubuntu is not a verb, but an abstract verbal noun. This implies that *being human* is never a completed project. Rather, it is a state of *being-becoming* – a state that involves constant enacting of humanness through relating constructively to fellow humans including the ancestral world and to all other creation, because, as mentioned above, all creation is spirited. In Murove's (2009) terminology: Ubuntu includes *ecological togetherness*. While sometimes washed-out and corrupted, people held on to Ubuntu even through times of suppression (Abdi, 2018). Ubuntu is here understood not as an as-is state, but as an ideal to strive for – in and though education and otherwise.

The current Southern African school education system has been criticised of focusing on the "I" rather than the "we"; of being exclusive as expressed through current testing regimes rather than inclusive through participation in the community (Hapanyengwi-Chemhuru & Makuvaza, 2017). The postulated processes of decolonising education and de-alienating learners could therefore be framed as an explicit exercise to (re-)establish Ubuntu as both foundation and aim of South African education. This exercise would inherently include a strengthened focus on

ecological togetherness. Several scholars (e.g., Ajayi, 2025; Abdi, 2022; Hapanyengwi-Chemhuru & Makuvaza, 2017; Le Grange, 2012; Machakanja & Manuel, 2020; Takyi-Amoako & Assié-Lumumba, 2018) have engaged in such a project. A possible weakness of Ubuntu as an educational paradigm is that Ubuntu as an academic concept has been drawn in many directions. It allows for differing interpretations of what Ubuntu is and ought to be. At the same time, scholarly disagreement may be constructive for refining concepts and ideas. A strength is that Ubuntu would facilitate the holistic integration of knowledge systems which Khupe (2014) calls for instead of the inclusion of single indigenous aspects. Ubuntu as an overarching rationale for the project of rethinking South African school education can offer ethical, methodological and thematic guidance. It offers a normative direction, not just *away from* coloniality, but *towards* humanness and ecological togetherness.

A case

To focus the article's project of charting epistemological positions and discuss the questions of *what, how, why*, I draw on the experience of a participatory action research (PAR) study with science teachers in the city of Makhanda, Eastern Cape Province, South Africa. All public and faith-based schools in Makhanda were invited to participate in the study. The five teachers who followed the invitation, taught science in four public and one Christian township schools. The grades they taught ranged from five to ten. Over a period of four months, we met for weekly research sessions. Thereby, we followed a typical action research cycle, progressing from *reflecting* (on the current educational situation and the role of indigenous knowing in education) to *planning* (lessons in which the teachers would integrate indigenous knowing into their regular teaching), *action* (teaching the lessons) and collaboratively *evaluating* (the taught lessons) (see, Seehawer, 2018b for a detailed discussion of the study's methodological and ethical processes). The study qualifies as one of the pragmatic studies mentioned in the introduction. While enjoyable for learners and empowering for the involved teachers, it did not challenge the status quo as such. It accepted the given educational situation and explored the integration of knowledge systems the way it is suggested in the current South African curriculum. In this article, the focus is on the question of what can be learnt from this exercise of pragmatic knowledge integration that could inform efforts towards a *giant leap* scenario of educational transformation.

From the first post-apartheid curriculum and onwards, indigenous knowing has been recognised in South African curriculum documents. In the case of science education, it was the second post-apartheid curriculum, the 2002 Revised National Curriculum Statement (RNC) (DBE, 2002), that was greeted with optimism by academic proponents of indigenous knowing (e.g., Ogunniyi, 2007). The natural sciences RNC acknowledged South African science learners' diverse worldviews and presented itself as "an enabling document" that invited research and curriculum development "which takes account of world-views and indigenous knowledge systems" (DBE, 2002, p. 12). A decade later, the RNC was replaced by the National Curriculum Statements (CAPS), which are effective to date. While upholding the curriculum principle of *valuing indigenous knowledges systems* and a generally inclusive rhetoric (Taylor & Cameron, 2016), the science CAPS marks a shift in how indigenous knowing is conceptualised. Instead of a resource that is valuable in present day South Africa, indigenous knowing rather seems to be regarded as a thing of the past. For instance, the grade seven to nine science curriculum states that '[o]ur *forebears … had* theories about cause and effect too, and *understood* many of the relationships in the environment where they *lived'* (DoE, 2011b, p. 8; emphases added). Marking a shift from outcome-based to a content-based curriculum, CAPS spells out in detail what learners should be taught in each grade in each week of the entire school year. Apart from altogether nine examples for all school years, no indigenous content is included into the curriculum (Taylor & Cameron, 2016). Rather, in the grade four to nine science curricula, indigenous knowing has literally been moved to a footnote. This footnote firstly makes a general statement that teachers "have the freedom to expand concepts and to design and organise learning experiences according to their own local circumstances" (DoE, 2011b, p. 16; DoE, 2011c,

p. 14). Secondly, directed specifically at indigenous knowing, the footnote states that "[e]xamples of indigenous knowledge that teachers select for study should, as far as possible, reflect different South African cultural groupings. They should also link directly to specific content in the Natural Sciences curriculum" (DoE, 2011b, p. 16; DoE, 2011c, p. 14).

One of the nine cases in which indigenous knowing appears in the curriculum, is a grade seven curriculum unit called *Historical development of astronomy*. This two-week curriculum unit covers both "early indigenous knowledges" and "modern developments" (DoE, 2011c, p. 34). Concerning early indigenous knowledges, it should be covered that "people observed … patterns [of the movements of moon, sun and stars] and used them to measure time and develop different calendars" as well as to "denote a time for planting, finding direction and special holy days"; moreover that "people passed this knowledge on using stories" (DoE, 2011c, p. 34). In terms of activities, the curriculum suggests "*writing* about traditional cultural interpretations and stories about the Sun, Moon and patterns in the sky" (DoE, 2011c p.34, emphasis in original). This curriculum unit was scheduled for the time of the year in which the PAR study was conducted. Therefore, one of the participating teachers chose this unit for her practical exploration of teaching indigenous knowing (Seehawer, 2016). The teacher prepared her lessons based on the widely used *Oxford Successful* textbook series and gave her learners the following assignment from the grade seven textbook:

> [S]elect a story of how time … was determined or calculated by any previous civilisation or culture of your choice. …Do research and write an essay about your findings. Your teacher will collect the stories in your class to compile a file for your classroom or library (Baxter, Collet, & Snyman, 2013, p.178).

To complete the assignment, learners were required to write three to four pages "of relevant and correct content", provide a cover and a contents page, a list of "at least three references/sources" and "clear labelled diagrams and pictures with captions to explain the story" (Baxter et al., 2013, p. 178). While not central for the below discussion of epistemological positions, it is for the sake of completeness mentioned here that the learners complained about, and did not do, the assignment (Seehawer, 2016). The teachers involved in the study agreed that the assignment was too difficult for a grade seven.

The other four teachers in the study taught science in grade five, six, nine and ten. No indigenous content was scheduled for any of these grades during the period of our study. There was no teaching material available, and not all four teachers were custodians of indigenous knowing. Thus, in the absence of any guidance beyond a footnote in the curriculum, the teachers had to find their own answers to the questions of *what, how* and *why*. Answers to *why* to teach indigenous knowing was therefore based on personal interests. All four emphasised the local relevance, mostly in connection with environment friendly practices and the wish to broaden learners' perspectives by giving more options of knowing, being, and doing things in the world. Another motivation was to (re-)connect learners with their cultural roots and bring back community into education (Seehawer, 2018a). Answers to the question *what* – and to some extend to the question *how* – were determined both by the footnote stating that indigenous content should directly relate to curriculum content, the unavailability of educational material and the fact that the teachers were not necessarily well-versed in indigenous knowing. As a solution, rather than specifying specific knowledge content as done in the curriculum, the teachers identified curriculum *themes* which they deemed suitable (Seehawer, 2018a). For instance, the grade five teacher chose a unit on soil (DoE, 2011b), the grade ten teacher one on water purification (DoE, 2011a). The teachers then asked their learners to inquire with their families and communities about different practices of soil use and water purification respectively. The outcomes of these inquiries were presented and discussed in class (see Seehawer & Breidlid, 2021 for a detailed discussion of one such lesson). Concerning the *how*-question, the teachers considered a collection of pedagogical suggestions (Shava, O'Donoghue & Ngcoza, 2015) that was under development by the time the study was

conducted. Considering the epistemological tenets of indigenous knowing, this collection suggests practice-oriented activities such as observation, learning by doing, investigation and classroom deliberation.

Discussion

Is there anything that can be learnt from the above case that may inform answers to Webb's basic questions? In this section, I discuss the questions *what*, *why* and *how* knowledges and ways of knowing could be integrated in school education by paying specific attention to epistemological issues. The aim is not to provide exhaustive answers, but to spark further scholarly work on these questions which could lead up to *giant leap* policy suggestions.

Why

The footnote in the grade four to nine science curricula states that teachers may adjust teaching according to local circumstances. This statement is not explicitly linked to indigenous knowing, but the fact that indigenous knowing is mentioned in the subsequent sentence suggests that there is an assumption that local circumstances somehow include indigenous knowing. Such an assumption points to the rationale of aligning education with learners' lived realities, which is part of what scholars have argued for. The question is, however, if the statement insinuates that indigenous knowing is not relevant beyond local circumstances. In its general introduction, CAPS (DoE, 2011a; DoE, 2011b; DoE, 2011c) states that children should learn "in ways that are meaningful to their own lives" and that the curriculum therefore "promotes knowledge in local contexts, while being sensitive to global imperatives" (p. 4). It is unclear what the latter refers to, but the general marginalisation of indigenous content in the curriculum suggest that indigenous knowing is not considered a part of global imperatives. The second sentence in the footnote states that included indigenous examples should reflect different South African groupings. While the two sentences do not stand in direct contrast to each other, this confuses the rationale for the integration of knowledge systems, because representing different South African groupings may include examples that are not connected to local contexts. The footnote's formulation that teachers have the *freedom* to expand concepts and adjust learning, reflects the curriculum's inclusive rhetoric. However, when this is paired with the requirement that chosen indigenous content must relate to curriculum content – which is almost exclusively Euro-Western – the inclusion of indigenous examples becomes instrumental. It is turned into a tool for operational use, when implementing the curriculum. A tool that refers to the above statement that learners should learn in ways that are meaningful to their own lives, while the actual content is Euro-Western knowledge. In their analysis of South African post-apartheid science curricula, Taylor and Cameron (2016) come to a related conclusion: the actual rationale for including indigenous knowing in the present curriculum is to (enable the teaching of) what they call Western mainstream science. In applying Nhalevilo's (2013) model of post-colonial curriculum development, Taylor and Cameron (2016) suggest that South Africa's first post-apartheid science curriculum was colonial, because indigenous knowing was not valued. The second science curriculum was decolonised, because indigenous knowing was invited and valued as elaborated above. The current curriculum, in turn, is neo-colonial in that indigenous knowing serves as a tool to facilitate learning Euro-Western knowledge (Taylor & Cameron, 2016). If the known statement "curriculum defines what counts as valid knowledge" in a country (Bernstein, 1972, p.47) holds true, there is little doubt that valid knowledge in South Africa is Euro-Western. That this truth is covered behind inclusive rhetoric and the inviting characteristic of the previous curriculum which many still remember well, utterly marginalises indigenous knowing.

In sum, the present South African science curriculum presents blurry rationales for the integration of knowledge systems, which can be explained by the fact that there is little, or no relevance attached to indigenous beyond appreciation of cultural roots. Indigenous knowing may serve as a tool to implement the curriculum locally, but is not part of global imperatives. Such a stance towards indigenous knowing stands in direct contrast to the abovementioned

acknowledgements of indigenous knowing as central for the survival of planet earth.

Nhalevilo's (2013) final stages of post-colonial curriculum development are theorising and re-birth. In "the re-birth stage, researchers question the ways IK is included in the curriculum but lack theoretical frameworks for doing so, and so these are grades developed in the theorising stage" (Taylor & Cameron, 2016, p. 39). In applying this terminology, it is such theorising that the present article wishes to enliven. As a contribution, I suggest that in an Ubuntu framework for education, there is no dichotomy between local relevance and global imperatives. Rather, to borrow the title of Brondizio et al.'s (2021) review, indigenous knowing is *Locally-Based, Regionally-Manifested, and Globally-Relevant*. Global citizens may be those who practice Two-Eyed Seeing.

What

One central learning from the study was that the answer to the question *what* indigenous knowing to teach depends on *why* it should be taught. The four teachers chose to focus on their learners' and learners' communities' indigenous knowing. Partly, because there were no textbooks suggesting indigenous content, but mostly because of their personal rationales as described above. A strength of this approach is that it directly addresses the issue of epistemological alienation and meaningfulness for local livelihoods. It is flexible and responsive to epistemological diversity in the classroom. It is inclusive in the sense that indigenous knowing of all present groups is acknowledged and taught. A weakness is that it will include indigenous knowing somewhat haphazardly and only to the extent in which it is present in learners' communities. Most teachers in the study were impressed by the quantity and diversity of examples that learners presented in class, but in classrooms with many learners growing up without indigenous knowing, the picture may be different. Within an Ubuntu educational framework that promotes dialogical approaches and Two-Eyed Seeing, also learners who do not grow up with indigenous knowing in their homes would benefit from encountering those forms of knowing at school. To address this weakness, the study's approach can be complemented. Nuntsu (2020) invited custodians of local indigenous knowing to teach in his classroom. Other studies foreground collaboration of teachers and traditional healers or community elders (Glasson et al, 2010; Hewson, Javu, & Holtman, 2009).

Even such collaboration would not suffice to systematically counteract the rapid disappearance of much indigenous knowing, however. Therefore, Òtúlàjà et al. (2011) stress the urgency of "documenting and vetting" (p. 699) indigenous knowing to develop a canon and teaching material that is made equally available as materials for "mainstream science" (p. 699). To enable the development of such materials, Msimanga and Shiza (2014) propose a "high quality Africa-wide research agenda that relates directly to the diversity of African teaching and learning contexts" (p. 143). Such an agenda could be envisioned in an Ubuntu paradigm in which researchers collaborate with stakeholders on shared agendas aiming at holistic integration of knowledge systems as exemplified in the studies of Khupe (2014) or Keane (2006).

Capturing indigenous knowing may be central for its survival. There is a concern, however, that canonising indigenous knowing may involve its decontextualizing and stiffening. This could compromise its fluid nature, its local relevance and the connection between the knowing and the knower. – Are there ways to capture indigenous knowing in textbooks and curricula that do not compromise its epistemological tenets? One possible way forward could be combining the strengths of the approach taken in the study with the strength of a well-researched canon. If textbooks and curriculum defined fields and areas of practice/knowing rather than specific content knowledge, this would leave space for contextual variation and local content. These fields could be identified through the proclaimed Africa wide research agenda, which is guided by the rationale of re-installing Ubuntu as the foundation of education. In educational contexts with less indigenous knowing present in learners' communities, well-researched examples that capture the breadth of African indigenous knowing could serve as supplements. While this approach

may not entirely solve the problem of decontextualization, it may be a back-up solution that still serves the aim of Two-Eyed Seeing. Recent efforts to digitise indigenous knowing may be more responsive to the oral nature of much indigenous knowing and should be pursued further. Currently, digital exclusion is still a challenge however, and especially so for indigenous people (Ngulube, 2023).

How

The grade seven curriculum unit on early indigenous knowledges states that knowledge was acquired through observation and passed on orally through stories (DoE, 2011b). The connected textbook assignment mirrors to some extent the passing on of stories as the teacher should collect learners' assignments for the classroom or the library (Baxter et al., 2013). Apart from that, the textbook assignment is framed as "research" (p. 178) that includes central aspects of Euro-Western knowledge production. Learners are asked to collect information from written sources such as suggested books and website; they should structure, explain and label this information into "correct content" (p. 178), using diagrams to display the content. In other words, indigenous knowing is studied though methods that are tailored to produce compartmentalised atomist Euro-Western knowledge. This is possible, but raises – again – questions about the underlying rationale for including indigenous knowing. It was the study of indigenous peoples and their ways of knowing through Euro-Western lenses that led to epistemological colonisation in the first place. Small as this individual case may be, it demonstrates one of the subtle ways in which indigenous knowing can be channelled into structures that confirms Euro-Western knowledge as the norm and re-affirms the need to consider epistemological positions when planning the integration of knowledge systems.

As elaborated, many indigenous languages are verb-based and emphasise knowing as an active process rather than knowledge as an accumulable product. Correspondingly, the above-mentioned pedagogical suggestions for teaching indigenous knowing (Shava et al., 2015) focused on practice-oriented activities. Scholars who situate education in an Ubuntu paradigm describe learning as relational activity that includes listening, mutual respect, and appreciating difference (Hapanyengwi-Chemhuru & Makuvaza, 2017; Waghid, 2018). Relatedly, Age (2025) understands assessment practices to reflect local cultural values and practices as well as collective responsibility and mutual support. Exams may include oral presentations, practical or collaborative work (Age, 2025, referring to Tariq et al., 2023). Teaching indigenous knowing might best take place in verb-based languages. While South Africa's policies recognise the importance of indigenous languages, it remains challenging to implementing them, however. One challenge is the linguistic diversity in South African classrooms (Diko & Celliers, 2024). Moreover, if an Ubuntu paradigm includes Two-Eyed seeing, also noun-based Euro-Western knowledge has its place in the classroom. A way forward here may be the practice of translanguaging as suggested by Brock-Utne (2016). Some (Hapanyengwi-Chemhuru & Makuvaza, 2017; Obanya, 2017) suggest learning from pre-colonial educational structures. There, education was a "whole society undertaking" (Obanya, 2018, p. 94), that comprised of both informal situated learning and formal elements such as initiation ceremonies and rites.

Understanding education as whole society undertaking, connects the question *how* to teach with the question *who* should do the teaching. It invites to rethink the role of the schoolteacher. Traditionally, parents, elders, other community members, ancestors as well as the land served as teachers. By formalising the teaching of indigenous knowing as part of regular school education, the school may take over some of these practices (Obanya, 2017). At the same time, Ubuntu's understanding of being-becoming human through relationality also invites community into formal teaching settings (Khupe, 2014; Mawere, 2015; Msimanga & Shiza, 2014). As mentioned above, studies have foregrounded such stakeholder collaboration within formal educational settings. Due to the Euro-Western content of both teacher education and curriculum, schoolteachers currently necessarily act as representatives of Euro-Western knowledge. Reconceptualising education within an Ubuntu paradigm needs to ask whether this is the best or

the only role schoolteachers can have. An interesting experience from the study was that, through inviting community indigenous knowing into the classroom, teachers gave away their monopoly on knowledge for the duration of the respective lesson (Seehawer & Breidlid, 2021). Instead, they became facilitators and, in some instances, co-learners. This role of a teacher can easily be connected to Freire's liberating pedagogies that have been characterised as aligning well with Ubuntu (Abdi, 2022; Machakanja & Manuel, 2020; Seehawer, 2018b). Both Ubuntu and Freirean educational thinking transcends boundaries between "being, living learning and teaching" (Abdi, 2022, p. 2288). It facilitate pedagogies "that affirm the full personhood and the wellbeing rights of all" (Abdi, 2022, p. 2293). Both envision education systems that are "inclusive of both learners and educators" (Machakanja & Manuel, 2020, p. 693). helping learners' transition between the world of science and the world of school. Rethinking education in an Ubuntu paradigm may suggest that a schoolteacher's most important role may be that of a co-learner in a Freire-inspired sense and a facilitator of dialogue between epistemologies and Two-Eyed Seeing (Seehawer & Breidlid, 2021).

Conclusion

The present article has called for un-accepting knowledge hierarchies as taken-for-granted in South African school education. It set out to re-focus scholarly debates to consider epistemological assumptions when exploring the integration of knowledge systems in education. The article suggests an overarching rationale of re-installing Ubuntu as the foundation and aim of South African school education and discussed *why*, *how* and *what* questions against this framework. Central suggestion resulting from the discussion are to recognise the global importance of local indigenous practices, to reconceptualise the role of the schoolteacher as a facilitator of dialogue between epistemologies and to seek for epistemologically appropriate ways of capturing indigenous knowing in curricula and textbooks. These suggestions do not present exhaustive answers to the addressed questions. Rather, the ambition is to motivate further scholarly engagement – an engagement that can lead to developing a bold giant leap scenario for transforming South African school education as one response to interconnected epistemological, educational and colonial crises.

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Conflict of interest

The author declares no competing interest

Ethics statement

This article consists mostly of theoretical reflection. However, part of the reflection is based on an empirical PAR study (Seehawer, 2018a; Seehawer & Breidlid, 2021). Ethical clearance for the study was given both by the Norwegian Centre for Research Data and the Department of Education, Grahamstown District Office in South Africa. In addition, I sought, to the best of my ability, to align with local indigenous research ethics conceptualised within an Ubuntu research paradigm. This included approaching all schools and teachers in person, valuing the spoken word and obtaining oral prior to written consent (the latter being a formal requirement), as well as the teachers' choice not to be anonymised. Furthermore, it included co-designing the study together with the five teachers. This co-design process included focusing both on topics and activities that were relevant for the teachers – such as the notion of indigenous knowing being inferior knowledge or the relation between indigenous knowing and Christianity – and presenting the outcomes of our work to their colleagues and

friends. We also produced a booklet on knowledge integration which they could share with other teachers and schools in Makhanda. See Keane, Khupe & Seehawer (2017) for a critical reflection on the question who benefited from the study and in what ways. Operationalising an Ubuntu paradigm meant also understanding research as part of, rather than separated from, life and engaging as whole persons rather than as detached participants. Most importantly, it meant establishing trusting relationships with the five teachers – relationships that, in most cases, have endured until today, taking the form of friendship, co-authorship and ongoing academic collaboration. See Seehawer (2018b) and Seehawer, Nuntsu, Mashozhera, Ludwane & Speckman (2022) for critical reflections about relationality and ethical complexities of seeking to operationalise the study in an Ubuntu paradigm.

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