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The use of a two-eyed seeing approach to include Indigenous Knowledge in Early Childhood Care and Development in Ghana

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Globally, there are increasing demands to decolonize education. As a result, the integration of Indigenous Knowledges and worldviews into Early Childhood Education has become a pertinent issue. Few studies have examined methodological frameworks for integrating Indigenous Knowledges into early learning in Ghana. This article examined the integration of Indigenous Knowledge into Early Childhood Education at a rural primary school. A two-eyed seeing Indigenous methodology was employed to integrate the local Kasena Indigenous Knowledge into a Kindergarten 2 classroom environmental studies topics. The ages of the children ranged from 6-8 years. As the holders of Indigenous knowledge, two Kasena Indigenous Elders helped to integrate Indigenous Knowledge into topics by visiting the school to teach and take children out on outdoor learning activities. After this, in-depth interviews were held with research participants. This paper focuses specifically on the methodology employed and highlights some of the outcomes. The study found that adopting a two-eyed seeing approach challenged Western knowledges' dominance over Indigenous knowledges in early learning, provided a framework to guide practice for integrating Indigenous knowledges, and created awareness of the existence of an Indigenous worldview.

Keywords: two-eyed seeing, Indigenous knowledges, dominant Western knowledges, Early Childhood Education, Early Childhood Care and Development

INTRODUCTION

The domination of Early Childhood Education (ECE) curricula and pedagogy by dominant Western (DW) epistemology is an issue that has received considerable global attention from scholars (Ball, 2010; Dahlberg & Moss, 2005; Gergen, 1992; Nsamenang, 2005, 2007; Nsamenang & Tchombe, 2011; Pearson & Degotardi, 2009; Pence & Nsamenang, 2008; Pence & Shafer, 2006). Ghana (and, more broadly, sub-Saharan Africa) is not immune from the impact of DW knowledge (DW-K) on Indigenous knowledges (IK) in ECE (Abdulai, 2016; Donkor et al., 2013; Ng'asike, 2014; Nsamenang, 2008; Tackie-Ofosu et al., 2015).

In Ghana and sub-Saharan Africa, ECE is known as Early Childhood Care and Development (ECCD) (see Garcia et al., 2008). In a bid to recognize the importance of IK, several scholars have called for its inclusion in the curriculum and pedagogy of ECCD (Abdulai, 2016; Donkor et al., 2013; Ng'asike, 2014; Nsamenang, 2005, 2007, 2008; Nsamenang & Tchombe, 2011; Pence & Nsamenang, 2008; Pence & Shafer, 2006). Abdulai (2016), for example, called for the inclusion of more Indigenous games in Ghana's ECCD. These calls emerged not because the scholars doubted the importance of DW-K but because they realized that, for education to be effective, it must reflect the cultural realities of children (see Cole et al., 2010; United Nations International Children's Emergency Fund, 2004; United Nations, 2005). As Dei and Simmons (2011) queried, "what does it mean for educational philosophy to reside within conventional classrooms and as being devoid of the lived experiences of the learner?" (p. 98). More importantly for this paper, IKs have unique knowledges regarding sustainability. Dei (2000) observed that those who live in a place for a long time are those with the most understanding of how to live there sustainably.

Despite the surge in calls to integrate IKs into ECCD, there have been few studies examining the methodological framework for integrating diverse IKs into ECCD. Nadasdy (1999) noted many works continue to advocate the use of IKs and their integration into programs without proposing a method for achieving this. Given the power imbalances existing between IK and DW-K, scholars have cautioned against the danger of one area dominating the other (see Kim & Dionne 2014; McCarter et al., 2014; Sundar, 2002). The epistemologies that tend to be privileged are DW-K (see Kovach, 2009).

This study sought to examine the methodological framework that would enable the integration of Kasena IK and worldviews into the ECCD curriculum and pedagogy in the part of Ghana where the Kasena peoples live without further privileging DW-K. In this paper, the researchers present the lessons learnt from adopting a two-eyed seeing methodology to integrate Kasena's IK into ECCD. Note that IKs vary throughout Ghana given the country's variety in geography and peoples. The IK examined in this study is limited to the Kasena of Paga Buru Boania. The paper emerges out of doctoral research and received ethical approval from the University of Saskatchewan ethics office and the Ghana Education Service.

KNOWLEDGE DOMINATION AND THE NEED FOR A METHODOLOGY

The bringing of DW-Ks and IKs together poses challenges. One of these challenges is the possibility of further entrenching the already existing unequal power relations between the two groups of knowledges (Nadasdy, 2007 as cited in Bohensky & Maru, 2011). In other words, the integration of the two knowledges may lead to DW-K further dominating over IK. This is especially likely in a situation where the educational system already privileges DW-K over IK; as Kovach (2009) acknowledged, "how we make room to privilege both, while also bridging the epistemic differences, is not going to be easy" (p. 29). It is, therefore, important to know how the already existing educational system privileges one knowledge system over the other.

The Ghanaian situation

In Ghana, the ECCD curriculum encourages teachers to adopt Indigenous epistemologies and to employ informal experiences that children bring from the home and community into school (Ministry of Education, 2006). Additionally, mother tongue and a few Indigenous cultural activities, such as games, songs, and stories, have been added to topics (Ministry of Education, 2019). But, because there is no methodological framework for integrating IK into ECCD, teachers have been largely left on their own to figure out what IK exists in their community and how they might incorporate it into their teaching. This fairly random approach reinforces the power imbalance between IK and DW-K. For example, the researchers observed that in the teaching of religion in Boania Primary School, children were taught more DW-K (Biblical content and prayers) than traditional Ancestral worship, even though the curriculum states that children be taught both ways of worshiping God (see Ministry of Education, 2019). Thus, without guidance on how to determine what type of IKs to include in ECCD and how to do it, the curriculum ends up privileging DW-K over IKs since most DW-Ks are easier to access because they are available in written from, such as the Bible, unlike the unwritten Kasena Indigenous worship. Even the ECCD curriculum has no section showing how traditional Kasena worship is conducted. Couple this with the fact that there is little to no opportunity to invite Elders into classrooms to help teach IKs, Kasena spirituality, such as the pouring of libations, an important activity that connects the community of Boania to the land, is not taught and is, even, marginalized.

Thus, indirectly, the ECCD curriculum has made more room to privilege DW-Ks over IKs and contributes to the already existing belief that traditional worship is satanic and DW-Christian religion is better (see Okeke et al., 2017). This supports Nadasdy (1999) and Sundar's (2002) cited in McCarter et al., 2014) arguments that power imbalances can lead to further discrimination against IKs. The researchers observed the same trend of privileging DW-Ks over IKs in the teaching of environmental education in early learning. Hence, alternative methodological frameworks are needed to help weave different IKs into formal education in Ghana.

Two-eyed seeing methodology

To reduce the privileging of DW-Ks, the researchers adopted a two-eyed seeing methodology developed in the Canadian context. The concept of "two-eyed seeing" grew out of the teachings of the late chief Charles Labrador of the Acadia First Nation in Nova Scotia, Canada (Greenwood et al., 2015, p. 17). Acadian First Nation scholars, Albert and Murdena Marshall, (Bartlett et al., 2012) formalized the concept for educational purposes. The concept is currently seen as a "guiding principle for walking in two worlds" (Greenwood et al., 2015, p. 17).

The two-eyed seeing methodology espouses the idea that IKs and DW-Ks can co-exist in an educational setting. Metaphorically, children learn to see from one eye with the strengths of IKs and from the other with the strengths of DW-Ks, and students are encouraged to use both eyes together for the benefit of all (Bartlett et al., 2012). According to Martin (2012), two-eyed seeing holds the view that no one perspective is right or wrong; all views are seen to contribute something unique and important. As a result, conflicts between the two ways of knowing are avoided since "differences are recognized and embraced" (Martin, 2012, p. 35). This approach is "an inclusive

philosophical, theoretical and methodological approach" (Marsh et al., 2015, p. 3-4), because it adopts both DW-Ks and IKs not as two conflicting worldviews but as two distinct epistemological systems that can exist side by side (Bartlett et al., 2012; Iwama et al., 2009). It emphasizes that teachers develop a relationship of mutual cultural respect, wherein the benefits of both worldviews are acknowledged as beneficial in the teaching processes (Iwama et al., 2009).

Importantly, a two-eyed seeing approach seeks to avoid knowledge domination and assimilation by recognizing the best from both worlds (Hatcher et al., 2009). Martin (2012) stated that the approach values differences and contradictions rather than the "melding of diverse perspectives, which can result in the domination of one perspective over the others" (p. 31). A two-eyed seeing methodology also recognizes IKs and Indigenous education philosophies on their own terms, as valid ways of teaching and learning, equal to their Euro-American counterparts (Simpson, 2002). Kapyrka and Dockstator (2012) observed that irrespective of the philosophical differences between DW-Ks and IKs, there exists a window of opportunity to employ the two together. Equally, Martin (2012) stated, "as a concept that values both Western and Indigenous ways of thinking, two-eyed seeing embraces diverse understandings of reality" (p. 32).

However, for the two-eyed seeing methodology to work, teachers must be supported in their training and in the communities they go to for accessing local Elders. Also important is Integrating IKs into the curriculum and pedagogy of teacher-training programs as well as producing teaching and learning materials in Indigenous languages. Curricula, teaching methodology and teacher training should be based on Indigenous worldviews and cultural protocols. Holistic, experiential, and oral pedagogies must be emphasized. In addition, funds should be made available so that Elders can be provided honoraria to support teachers in teaching IKs.

In Ghana, there exist other Indigenous methodologies, such as the Sankofa postcolonial methodology (see Eshun, 2011) which could have been adapted by the study. However, the researchers adopted the two-eyed seeing approach because it explicitly addresses the power relationship between IK and DW-K, thus preventing the further privileging of DW-K over IK.

THE STUDY

In responding to the repeated calls to Indigenize ECCD in Ghana and sub-Saharan Africa, the study into the integration of IK into ECCD took place in Boania Primary School of the Upper East Region of Ghana. The school is in the village of Paga Buru Boania, a peasant farming community with about 109 houses (Ghana Statistical Service, 2014). The community had a total population, in 2010, of 1,331 people of which 646 are males and 685 are females (Ghana Statistical Service, 2014). It is seven kilometers east of Paga, the Kasena-Nankana West District capital. Boania falls within the Sudan Savannah vegetation zone, which consists of grasslands interspersed with short and drought-resistant trees, such as the acacia, baobab, shea trees, neem trees among others (Awedoba, 2000). Climatically, the community is "characterized by six months of a single rainy season with a prolonged dry, cold and hazy harmattan season" (Boafo et al., 2019, p. 2).

The ECCD curriculum is the same for all public schools in Ghana. But the selection of a rural school for this study is influenced by Masuku Van Damme and Neluvhalani's (2004) assertion that, although it is fast diminishing in Africa, remnants of IK still exist in rural areas of the continent. The chosen district, Kasena-Nakana Western District, was chosen because it is likely to still have a functioning IK and only two ways of seeing things; that is, about 79% of its population is rural (Ghana Statistical Service, 2014), making it likely that IK could still be robust and, because Boania was colonized by DW-Christians, it has minimal Islamic influence and is likely to have only two (DW-Christian and African Indigenous) ways of seeing.

In addition, Boania was chosen because one of the researchers (Acharibasam) is a long-term resident of the community. The relationship between the community and the researcher led to the recognition of the need to consider the role of Kasena IK in decolonizing ECE in the community. By reclaiming local cultural knowledge and reconnecting with Ancestral teachings of the community of Boania, the researcher validates and centers IKs in ECE.

As noted above, an Indigenous research methodology, in the form of a two-eyed seeing approach, was adopted for this study and it is from this perspective that the lessons are presented below. Twelve research participants were selected from the Boania Primary School and community; these participants were observed in instructional situations and were interviewed. The participants included: two Elders, one Kindergarten 2 (KG2) teacher, and nine pupils (KG2, ages 6-8 years) from the school. Research participants were selected purposively in this research. Sharan (1988) stated that purposive sampling assumes that one wants to discover, understand, gain insight into a particular topic; therefore, one needs to select a sample from which one can learn the most. Photo elicitation (Hurworth, 2012) was employed to facilitate interviews with pupils. Pupils were shown pictures of ECE activities and asked to speak on how IK and DW-K facilitated learning under ECE.

First, the researchers interviewed the two community Elders and the KG2 teacher on what they knew about IKs and how they thought it could be included in ECCD curriculum and pedagogy. After the interviews, the researchers, two Elders, and the teacher met to discuss the curriculum and how they would teach the children. Second, a plan was developed to incorporate this knowledge into classroom topics (mostly environmental studies topics) in the KG2 curriculum. These topics included: living and non-living things (including animals, domestic and wild); water, air, plants, gardening (including types of soil and gardening, making the soil fertile for gardening); light – day and night (including natural and artificial sources of light); changing weather conditions (including positive and negative effects of weather conditions); and "my local community" (Ministry of Education, 2019). This was done with the help of the two Elders from January 2020 to March 2020. The Elders were invited to the school once a week until the end of the research period to teach the children IKs (through outdoor learning activities) based on the environmental studies topics in their curriculum. Kim and Dionne (2014) suggested that when integrating IK into education, it is essential to create a venue for true experts to share their knowledge directly with learners. The Elders were engaged in a one-off doctoral study project from January 2020 to March 2020. The researchers met with the Elders to discuss the topics before each visit, but the Elders taught the concepts and topics their way. The researchers observed in the classroom on the days the teacher taught the topics and observed when the Elders taught

the topics from January 2020 to March 2020. On each of these field activities (once a week) and during class lessons, the researchers filled out the participant observation forms and took photos. Observation notes became part of the data. Given that the study involved a potentially vulnerable group (children), the teacher took part in some of the outdoor learning activities with the class to observe and monitor the safety of the class and to reduce potential risks. Hence, she observed most of the Elders' teachings.

A thematic analysis was adopted to analyze data. Thematic analysis is "a form of pattern recognition within the data, where emerging themes become the categories for analysis" (Fereday et al., 2006, p. 82). The analysis process began with transcribing interviews, coding, and categorizing codes into themes. Themes were deductively selected based on how they helped answer the research questions of the study (Braun & Clarke, 2006). This was done by using NVivo 12 Plus, computer software that facilitated the coding of data and organizing it into themes. Identified themes were discussed with research participants to ensure the themes truly represented their views. Participant observation data were used to support the themes identified in the interview data. Some of these themes are presented below as lessons from the study.

LESSONS

The two-eyed seeing methodology connected learning to children's local context. Many students from rural and Indigenous communities do not abandon their IKs when they start formal schooling, rather, they try to make connections between DW-Ks and IKs (Fakudze, 2004; Fakudze, & Rollnick, 2008; Jegede, 1995; Ogunniyi, 1995). As a result, efforts have been made to connect what is taught in schools to children's home environments. By creating an opportunity for IKs and DW-Ks to be taught, children's learning met local realities because knowledge taught was context-related or place-based. Some of the concepts the Elders taught were phenomena the children saw daily and connected to them. For example, the children already knew how to process shea butter (an occupation that employs most of the women), making the learning connections fairly easy. The researchers observed more participation in outdoor learning activities even from students who did not participate much in class. The researchers observed that children who normally did not speak or answer questions in class were more engaged during the outdoor learning activities with the Elders. The students might have been more engaged because they were already familiar with the content, or because they saw that this learning was more relevant to their lives, or because the outdoors was more stimulating.

Similarly, I identified curriculum and pedagogical implications with the adoption of the two-eyed seeing methodology. In the Elders' teaching of IK, all forms of knowledge were taught holistically, thereby avoiding what Nadadsy (1999) referred to as compartmentalization of IK. Maurial (1999) stated, "one important basis of an Indigenous worldview expressed through Indigenous Knowledge is holisticity" (p. 63). Based on this, forms of knowledge are not divided into different disciplines. For example, the Elders employed religion and spirituality to explain environmental studies topics. Van der Walt (1997 cited in Thabede, 2008) argued that "African thought exists and differs from Western thought in that Western thought generally ignores the spiritual dimension of phenomena and focuses on the visible, measurable physical reality" (p. 235). However, forms of knowledge were divided into different subjects in the ECCD

curriculum. As a result, the teacher did not employ religion and spirituality in teaching environmental topics. Having been greatly influenced by DW-Ks, ECCD curriculum views religion and the environment as separate subjects. Again, the teaching of IK was not based on a single activity. For example, while the class was on the way to the tamarind tree under which Boania Primary School first started, the male Elder took time to identify different farms and the types of plants that were grown on them. Similarly, while on the way to the river to dig for water, the female Elder took time to identify elephant grass with the children, reinforcing a topic she had taught the previous weeks. The teaching of some IKs was also time-bound. Activities such as going to the forest to collect fuelwood, shea nuts, and the harvesting of termites are normally done in the morning.

The two-eyed seeing approach allowed the children to see how the two knowledge systems are taught. Martin (2012) stated, "As a concept that values both Western and Indigenous ways of thinking, two-eyed seeing embraces diverse understandings of reality" (p. 32). The two Elders drew from an Indigenous ontology and epistemology to teach concepts. It was observed that the ontology and epistemology of the Kasenas of Boania varied from that of the teacher and what was contained in the ECCD curricula. This became apparent through the teachings of the two Elders. How the Kasenas of Boania viewed and related to nature and the land was different from what was contained in the KG2 curriculum. In the context of Canada, Wilson (2008) stated that for Indigenous Peoples ontologically, it is not the reality that matters but their relationship with the reality that counts. There was no clear separation between the people of Boania and nature. As the male Elder commented, "no ceremony or activity can begin without pouring a libation" (male Elder, participant observation notes, February 11th, 2020), which is seeking permission from the land. Similarly, Marshall et al. (2010) commented in the context of Canada that "From an Indigenous perspective, humans are inseparable from the rest of creation" (p. 174). Additionally, children were taught to appreciate both ways of seeing reality as equally important.

For places that have gone through generations of DW colonization and epistemological dominance, this methodology may hold a key to decolonizing education. By creating the platform for the knowledges to be taught side by side, it challenged DW-Ks on several learning concepts. Hence, a certain level of awareness and respect was created for IKs in both the teacher and children. This was evident in the Elders' teaching regarding the importance of relationships. For example, the baobab and tamarind trees are considered part of the family by the community. Because of their long-life spans (see Patrut et al., 2007; Swart, 1963), it is believed the boababs and tamarinds have personal relationships with human family ancestors. Hence, they cannot be treated as just trees but rather as part of the family and community, and sacred. Teaching children to view trees as family members and to behave sustainably towards them is completely different from what the ECCD curriculum addresses regarding trees (see Ministry of Education, 2019). In the curriculum, trees, as is typical in DW-Ks, are resources. Again, while outdoors, the researchers observed that both Elders emphasized that trees gave things (such as fruits, leaves, and herbs) freely to the community. This way of seeing reality is not present in the ECCD curriculum either (see Ministry of Education, 2019).

As a methodology, therefore, two-eyed seeing served as a framework to guide the teacher's practice. The researchers identified that integrating IK into ECCD requires an overarching guiding principle or framework such as two-eyed seeing. As Greenwood et

al. (2015) noted, the approach serves as a "guiding principle for walking in two worlds" (p. 17). It provided a guide on how to integrate IK into individual topics and made the invitation of Elders into classrooms easier. As the KG2 teacher noted: "It (two-eyed seeing approach) helps by providing a platform to teach IK and Western Knowledge side by side for the children to realize both are important" (teacher, interview [1] transcript, February 1st, 2020).

Interestingly, the two-eyed seeing methodology adopted called into question the DW definition of a teacher. The process gave children a different perspective on who a teacher is. Owuor (2007) concluded that "the Western-based schooling system recognizes teachers' professionalism as central in facilitating the process of classroom knowledge construction" (p. 28). In this sense, the teacher is held as the epitome of knowledge, especially in rural communities. Owuor believed that this was the main reason why traditional Elders with a vast amount of knowledge are not used in classrooms. As Owuor (2007) observed, "This does not provide any space for classroom dialogue in which the experiences of members of local communities such as the role of Elders can be incorporated in formal classroom knowledge construction" (p. 28). By having the Elders teach classroom concepts side by side with the teacher, the children gained a different view of who a teacher was. This was confirmed during one of our outdoor learning activities when one of the pupils (whose grandmother happened to be the female Elder) said "I did not know my grandmother was a teacher" (pupil-4, participant observation notes, February 3rd, 2020).

Using the two-eyed methodology also impacted the teacher's pedagogical practice. Having followed the children on some of the outdoor learning activities with the Elders, she started to employ the concept of nature giving things (medicine, fruits, shade, and food) freely to the community in her teachings. In a later teacher-taught lesson on photosynthesis, the teacher emphasized how trees gave oxygen freely to the community. In her final interview, she admitted that the Indigenous approach to teaching adopted by the Elders made concepts more relatable and easier for children to understand. Before this research, she did not think about nature that way. The teacher commented, "Indigenous Knowledges are sometimes such that they come with stories that make lessons easier to grasps" (teacher, interview [1] transcript, February 1st, 2020).

As well, the methodology connected the teacher more to the community. Having been taught about the land, the history of the community, and the school, the teacher commented that learning about the land and the history of the school has given her a deeper understanding and connection to the community. She stated:

> I am not from Boania and so I did not know about the Land and the history of the school. This has given me a greater understanding and anytime I ride my motto-bike by the tamarind tree under which the school first started, I see it differently now. (teacher, interview [2] transcript, March 19th, 2020)

Every community has a system of knowledge, which is based on its history, teachings, and environment. The way that people see and understand their environment (their ontology), and the way they organize this information, valuing some information more than others (their epistemology), is wrapped up in their knowledge system. Dei (2000, 2012) noted IKs have different aspects that are derived from different sources and is passed down from the more experienced members of the community to younger

generations. This knowledge can either be received from the spiritual realm or based on empirical observations of natural phenomena (Castellano, 2000). IKs are generally personal, subjective, orally communicated, based on trust, and there are no claims to universality; they are holistic, and relational (Dei, 2000). For the Kasena of Paga Boania, IK is integrated and spirits are consulted; many entities that would be considered to be mere resources for capitalism in DW-Ks are valued members of the community (see the example of the baobab trees above), and there is deep understanding of the local environment.

Although there are fundamental differences between IK and DW-K, the two-eyed seeing methodology made the handling of conflict easier. Dei (2000) concluded:

> [T]o integrate Indigenous Knowledges into Western academies is to recognize that different knowledges can coexist, that different knowledges can complement each other, and also that knowledges can be in conflict at the same time. (p. 120)

In other words, conflict is inevitable once different knowledges are brought together but it does not mean they cannot coexist. Importantly, the children showed they were capable of managing this conflict by adopting different strategies.

Different hypotheses have been offered (in the context of science education) as to how children handle knowledge conflict when IK is integrated into educational programs (see Fakudze & Rollnick, 2008). These hypotheses were also applicable in this study. First is the Cultural Border Crossing Hypothesis proposed by Aikenhead (1996). Cultural border involves "crossing borders from the subcultures associated with sociocultural environments into the subcultures of science" (Aikenhead, 1996 as cited in Fakudze & Rollnick, 2008, p. 81). The second hypothesis is the Collateral Learning Hypothesis proposed by Jegede (1995). This is "a process whereby a student constructs, side by side and with minimal interference and interaction, scientific and traditional meanings of a simple concept during/after a learning process" (Jegede, 1995 as cited in Fakudze & Rollnick, 2008, p. 81). The third is the Contiguity Learning Hypothesis proposed by Ogunniyi (1995). Ogunniyi (1995 as cited in Fakudze & Rollnick, 2008) defined this as "the process whereby the co-existing traditional and scientific worldviews dynamically compete, supplant, or dominate one another in/after the learning process, depending on the worldview template serving as a frame of reference in a given context" (p. 81). The last hypothesis is the Cognitive Border Crossing Learning Model offered by Fakudze (2004). This combines the other three hypotheses to explain how students handle knowledge conflict.

Children employed different hypotheses to handle conflicting concepts. The researchers used the living and non-living things dichotomy to assess how the children handled the conflict by showing children pictures of a stone, one as taught in class as a non-living thing and another on a shrine (with food, bloodstains, and chicken feathers on it), which the children saw when the class visited the chief's palace. The children agreed with the teacher's teaching that a stone was a non-living thing. However, they also indicated that a stone on a shrine was a living thing because it was different from other stones. Pupil-9 (8-years), for example, commented "that stone can talk and eat because it is a shrine stone. It always speaks to the people" (Pupil-9 interview transcript, March 23rd, 2020). Similarly, Pupil-2 responded, "that was a shrine stone and it is different from other stones" (Pupil-2 interview transcript, March 22nd, 2020).

These two responses represent the Collateral Learning Hypothesis (Jegede, 1995), a process whereby a student constructs, side by side, and with minimal interference and interaction, scientific and traditional meanings of concepts during and after a learning process (Jegede, 1995 as cited in Fakudze & Rollnick, 2008). By this, the students hold onto both belief systems that the stone is a non-living thing in the context of classroom environmental studies and, at the same time, think a stone on a shrine is a living thing.

The researchers employed a second scenario, one regarding the use of the right and left hand. Among the Kasena of Boania, it is culturally disrespectful for a child to use the left hand to give or receive a gift from either a colleague or Elder. Hence, children are taught, both in school and at home, not to use the left hand to give or receive gifts. The researchers asked pupils what they would do if their teacher insisted (in the school environment) on them using the left hand instead of the right. Pupil- 9 responded, "I will use the left hand in school and the right hand at home" (Pupil-9 interview transcript, March 23rd, 2020).

The response can be explained by the Cultural Border Crossing Hypothesis, which involves crossing borders from the subcultures associated with sociocultural environments into the subcultures of science (Aikenhead, 1996 as cited in Fakudze & Rollnick, 2008). The Contiguity Learning Hypothesis proposed by Ogunniyi (1995) is also applicable to this scenario where the two teachings (teacher's teaching in school and traditional teaching at home) compete, supplant, or dominate one another in/after the learning process, "depending on the worldview template serving as a frame of reference in a given context" (Fakudze & Rollnick, 2008, p. 88).

Significantly, the researchers observed that the two-eyed methodology further revealed and challenged DW-Ks domination over IKs. Kovach (2009) argued that "From a decolonizing perspective, the use of conceptual frameworks to reveal privileged epistemologies can work towards instigating change" (p. 43). As indicated above, DW-Ks currently dominate IKs in the ECCD curriculum. By creating an avenue to teach the two knowledges side by side and not privileging one over the other, DW-Ks' position as the only valid knowledge was challenged. It became clear to the children that there were other valid ways of understanding nature. Also, it took environmental education outdoors and, instead of only textbooks, the land became the source of knowledge. None of the things taught by the Elders could be found in the children's textbooks. This context-based learning further diminished DW-Ks' power over the knowledge taught.

CHALLENGES AND CONCLUSIONS

In contributing to the global discussion on decolonizing education, this paper assessed the ongoing domination of ECCD by DW-Ks in Ghana (and, more broadly, Africa). There have been several calls for ECCD to include Indigenous worldviews. However, no approach or guiding principle (such as the two-eyed seeing Indigenous approach or land-based education principles) has been offered to guide the integration of Indigenous worldviews into ECCD curricula and pedagogy. Therefore, for this research, the researchers adopted a two-eyed seeing Indigenous approach to integrating IK into ECCD. The researchers learnt that taking a two-eyed seeing approach prevented the further privileging of DW-K over IK.

There are other factors that inhibit the Indigenization of ECCD in Ghana and Africa (see Ng'asike, 2014; Nsamenang, 2005; 2007; 2008; Nsamenang & Tchombe, 2011; Pence & Nsamenang, 2008; Pence & Shafer, 2006). However, in this paper, the researchers focused particularly on the lack of methodological framework. In the process, the researchers encountered a few challenges to adopting the two-eyed seeing approach and observed some benefits.

The first challenge is that it may be difficult to adopt this methodology in communities with more than two ways of seeing. Scholars (Mazrui, 1986; Nsamenang & Tchombe, 2011) have observed that education including ECE in some African communities falls under three overarching educational systems. These include the Indigenous African educational system, the Islamic-Arabic educational system, and the DW-Christian educational system based on Euro-American education models. Communities with these three influences may find it difficult to adopt this approach due to having to bring in different sets of Elders.

The second challenge is that two-eyed seeing cannot work without equal respect for both knowledges. As Bartlett, Marshall, and Marshall (2012) observed, for the two-eyed seeing methodology to work there must be an acknowledgment that Indigenous and Western science need one another. The challenge, however, is that the educational policy, especially ECCD policy in Ghana, is influenced by human capital theory. Thus, it seems there is not yet an acknowledgment at the national level that IKs can help the country in its quest towards becoming a "developed" nation. Thus, currently, formal education in Ghana is loaded with mechanisms that favour DW-Ks over IKs. Based on this, Adjei (2007) concluded that DW-Ks have become "the cultural capital by which individuals could access employment in both state and private organizations in Ghana" (p. 1048). Adjei went on to state, "I concede that because of material rewards that come with colonial education, it is quite difficult to ask local learners to abandon Western Knowledge" (p. 1050). Like other scholars (see, Abdulai, 2016; Adjei, 2007; Dei, 2000; 2004), the researchers observed a high demand for more IKs to be integrated into formal schooling, but with national policy on education influenced by the human capital theory, Indigenization of formal schooling in Ghana is unlikely to happen soon.

The third challenge is pedagogy. Navigating between a child-led learning pedagogy adopted by the Elders and a less child-led teaching pedagogy employed by the teacher was a challenge in the outdoor learning environment. The Elders' teachings were more casual, practical, less structured, and gave children the freedom to explore nature at their own pace. The children did not raise hands before answering questions and had opportunities with the Elders to play and climb trees. By contrast, the teacher's teachings in class were more structured and children raised hands before they answered questions. The researchers observed that the teacher tried (using corporal punishment) to maintain the same "discipline" she is used to in the classroom environment when she followed the class on outdoor learning activities with the Elders. She thought the children were sometimes overplaying rather than paying attention. However, the Elders had no problem with the children playing and did not employ any form of corporal punishment throughout the course of the study. Although the ECCD curriculum emphasizes child-led teaching and learning, the researchers believe more teacher training programs are needed to enhance the uptake of child-led teaching approaches.

The last important thing to note when employing a two-eyed seeing methodology is that times and seasons influence the teaching of certain types of IKs. Hence, when

integrating IK into the curriculum using this methodology, special attention needs to be paid to the types of IKs that can be taught. This study took place in the dry season. Hence, it was difficult to get certain crops like the kenaf plant [*Hibiscus cannabinus*] and to process it into bast fibre, since these are mostly grown in the rainy season.

Irrespective of these challenges, the researchers argue that a methodology such as the two-eyed seeing Indigenous approach is needed in the context of Ghana to facilitate the integration of IKs into ECCD. This study shows how Indigenizing formal schooling in Ghana can happen. The adopted approach not only provided a framework to guide teachers but also revealed multiple ways of learning about the environment, arguably a requirement to achieving sustainability. The Indigenous ontology and epistemology on which the two Elders drew from to teach environmental topics showed there was no clear separation between the people of Boania and nature. Therefore, everything is related and is family. As Marshall et al. (2010) commented in the context of Canada, "from an Indigenous perspective, humans are inseparable from the rest of creation" (p. 174). This was also found in the community's relationship with the sacred trees and other forms of creations. There is a belief that harming sacred beings will bring curses on the entire village. By contextualizing teachings and highlighting how close the community's relationship is to nature, the Elders' teaching "reshapes abstract understandings of nature and land" (Seawright, 2014, p. 570). Children were, therefore, exposed to an Indigenous worldview which may ultimately foster their relationship with nature. France (1997, as cited in Hart, 2010, p. 1) argued "our worldviews affect our belief systems, decision making, assumptions, and modes of problem-solving".

The researchers' aim in this study is to contribute to the broader conversation on how to decolonize ECE. The results of this study are not generalizable and were not intended to be because the study took place in one rural village in northeastern Ghana, with a unique IK. However, the strength of two-eyed seeing is not in generalization but rather in transferability; readers are encouraged to transfer the parts of the lessons presented in this paper if they are applicable to their contexts. One important lesson is that teachers can draw on local Elders to adapt the lessons here for specific situations. Teachers, due to their training and cultural attitudes forming who they are and what their role is, will struggle with modifying the ECE curriculum and pedagogy to demonstrate that IK and DW-K are equal. In this study, the research was able to bring IKs into the ECE curriculum for only three months; this is unlikely to achieve Indigenization. The process is a journey and requires addressing systemic and structural conditions, including the institutional challenges, possibilities and implications for promoting IK education.

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