INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH & DEVELOPMENT

ISSN: 2278 – 0211 (Online)

Secondary School Teachers' Conceptions Of Indigenous Knowledge: A Basis For Its Inclusion Into The Curriculum

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Abstract:
A survey was conducted, to examine a sample of 100 secondary school teachers' conceptions of Indigenous Knowledge in 8 randomly selected secondary schools in Harare, Zimbabwe. A pilot study was undertaken with 15 teachers. The data was analysed using the Statistical Package for Social Sciences (SPSS) Version 10. The study revealed that secondary school teachers have adequate understanding of Indigenous Knowledge. Using this knowledge, teachers could improve students' learning by drawing on local knowledge and language to illustrate concepts. Further research could be done on the content and methodological approaches of infusing Indigenous Knowledge into the curriculum.

Key words: *Conception, Secondary School Curriculum, Indigenous Knowledge.*

1.Background To The Study

Teaching and learning in schools presents a natural rallying point for tapping the Indigenous Knowledge present in all communities through its infusion into the school curriculum (Batibo, n.d.; Mavhunga, 2008; Chiromo; 2004). If teaching and learning are to accommodate Indigenous Knowledge, then teachers' conceptions of it are critical since they are the vehicle through which the importance of Indigenous Knowledge can be transmitted and get recognized by students as a vital component of the livelihood of traditional societies. This same sentiment was expressed by the Alaska Native Knowledge Network (ANKN), (1998, p. 3) when they wrote that,

By shifting the focus in the curriculum from teaching and learning about cultural heritage as another subject to teaching and learning through the local culture as a foundation for all education, it is intended that all forms of knowledge, ways of knowing and world views be recognized as equally valid, adaptable and complementary to one another in mutually beneficial ways.

While the above quotation refers to a different environmental context it is equally desirable in Zimbabwean schools. According to Mavhunga (2008), integrating the Native Zimbabweans' Indigenous Knowledge into the conventional school curriculum would enhance curriculum relevance and better understanding of concepts through the use of local languages, among other aspects of Indigenous Knowledge. It would also form a basis for connecting what students learn at school with their daily life at home. Therefore, there is need to find a place for Indigenous Knowledge in the current Eurocentric curriculum (Emeagwali, 2003).

Researches on indigenous knowledge and the school curriculum in Zimbabwe have focused on sociocultural beliefs and science teaching (Chiromo, 2004), indigenous knowledge and sustainable development (Viriri, 2009) and Africanising the school curriculum (Mavhunga, 2008) among others. This paper examines the extent to which Zimbabwean teachers, as classroom practitioners, know about Indigenous Knowledge.

Grenier (1998) views Indigenous Knowledge as knowledge that people in a given community developed, and continue to develop over time and is based on experience often tested over centuries of use, adapted to the local culture and environment, which is ever changing and dynamic. It is a complex set of knowledge and technologies existing and developed around specific conditions of populations and communities indigenous to a particular place.

'Traditional', 'native', 'local' knowledge and ethno-science are used synonymously with Indigenous Knowledge (Mapara, 2009). As a concept, Indigenous Knowledge delineates a cognitive structure in which theories and perceptions of nature and culture are conceptualized (Hobsbawn and Ranger, 1983). It is the sum total of knowledge and skills possessed by a group of people in a particular area, passed on from generation to generation. This repertoire of knowledge helps them to get the most out of their natural environment without necessarily disturbing the natural ecosystems (Grenier, 1998). For example, use of certain plants/trees like syzygium guineense (mukute) to identify an area with water so that they can dig a borehole (Munodawafa, 2006).

Traditional knowledge systems have great scope and have curriculum and pedagogical implications, which include, indigenous agricultural practices (e.g. indigenous indicators of seasons) (Dixon, 2005; Grenier, 1998; World Bank, 2005; id21 Global Issues, 2007; Mharapara and Shiel, 2000), soil conservation and water management techniques (Grenier, 1998; Dixon, 2005; id21, 2007), animals (zoology) and animal diseases (e.g. Traditional ethno-veterinary medicine), botany, human health (e.g. Herbal remedies for disease treatments) and craft skills (e.g. Indigenous tools, building materials, energy conservation) (Mapara, 2009; Grenier, 1998).

Grenier, (1998) also notes that Indigenous Knowledge offers methods of imparting content knowledge, for example story-telling, anecdotes, tsoro, improvisation, indigenous games and use of specialist resource persons. It is apparent that Indigenous Knowledge has relevance in both pedagogical and curriculum content aspects. Weeks (2003) cites Demmert (2001) who suggests that teachers must engage students in authentic and purposeful problem solving and investigating key concepts that are embedded in culturally relevant knowledge and tasks.

Kothari (1995) alluded to the fact that Indigenous Knowledge is socially desirable, economically affordable and sustainable. Scoones and Thompson (1994) supported this when they pointed out that Indigenous Knowledge is still an underutilized resource in development activities and it needs to be intensively and extensively studied. In the same vein, Viriri (2009:132) cites John Madeley (2004) who lamented that "Indigenous Knowledge is the largest single knowledge resource not yet mobilized in the development enterprise." This implies that all institutions of society, the school included, need to be cognizant of the important role Indigenous Knowledge can and should play in community and national development.

Demmert (2001:37) highlights the motivational value of Indigenous Knowledge in the teaching and learning process when he points out that, "When native students' cultural affiliation is valued in the classroom, motivation for learning is highest." Thus infusing Indigenous Knowledge in the curriculum may enhance learning.

Research thus points out the relevance of Indigenous Knowledge in any society underscoring the need for educators, teachers in particular, not only to be aware of Indigenous Knowledge but to have significant knowledge of it. It is therefore important that teachers first understand the relevant Indigenous Knowledge both at the level of concepts and principles.

The present study derives its motivation from both literature and the researchers' own experiences as classroom practitioners. It is aimed at determining the conceptions teachers have of Indigenous Knowledge. The study sought to address the following research questions:

- What knowledge of Indigenous Knowledge do secondary school teachers have?
- How do the teachers' definitions of Indigenous Knowledge differ?

2.Research Methodology

2.1.Research Design

The researchers used a survey to determine the conceptions teachers have about Indigenous Knowledge. By their nature, surveys are used to determine peoples' feelings, attitudes, opinions, conceptions about something (Burns, 2000; Creswell and Plano Clark, 2007; Rudestam and Newton, 2007). The design is both qualitative (open ended items) and quantitative (closed items on a 5-point Likert scale) in nature so that the weaknesses of one paradigm are covered by the strengths of the other. This is a form of triangulation at the methodological level (Schumacher and McMillan, 1993).

2.2.Instruments

The questionnaire required respondents to reflect on their understanding of Indigenous Knowledge and indicate on a five point Likert scale the extent of their agreement with conceptual and content statements on Indigenous Knowledge. The scale from 1 to 5 represents Strongly Agree, Agree, Not Sure, Disagree, and Strongly Disagree respectively. The questionnaire also included an open-ended item which elicited respondents' own definitions of Indigenous Knowledge.

The questionnaire was constructed following the model used in the Traditional Cosmology Test (TCT) and Characteristics of Science (COS) on the Nature of Science and Indigenous Knowledge Systems (NOS/IKS) questionnaire by Ogunniyi, Jegede, Ogawa, Yandika and Oladele (1995). Some items from the Psycho-socio-cultural issues in Science and Mathematics Education (PISME) questionnaire by Ogunniyi (2004) were also used. Assumptions underlying science and Indigenous Knowledge systems were adapted from the PISME questionnaire. Beliefs and world views about the nature of Indigenous Knowledge were modified from the TCT and COS questionnaire on NOS/IKS. Before the questionnaire was administered, a pilot study was conducted with 15 teachers similar to the

actual respondents in order to check its qualities of measurement, appropriateness and clarity. The pilot study group did not experience any difficulties in understanding the items.

2.3.Population And Sample

From a target population of 31 secondary schools in Harare, eight public secondary schools were purposively sampled for the study. This sampling technique, "serves the real purpose and objectives of the researchers of discovering, gaining insight and understanding into the chosen phenomenon" (Burns, 2000:465). The study sample consisted of 100 teachers (60% male and 40% female) and all were university graduates with teaching qualifications and a minimum of three years of teaching experience. As a percentage, the selected schools represent 25.8% of the total number of schools. This is large enough to be representative of the target population and enables the results to be within the range of the 5% tolerable error (Anderson, 1990).

2.4.Data Presentation And Analysis

The Statistical Package of Social Sciences (SPSS) Version 10 was used for data coding, processing and analysis. Interpretative analysis, a qualitative approach to data analysis which entails data coding, selection of emerging themes and establishing relationships between themes was also used (Burns, 2000). Frequencies of subjects' responses to statements on Indigenous Knowledge were obtained through SPSS.

2.5.Teachers' Conceptions Of Indigenous Knowledge

Teachers were asked to indicate the extent of their agreement with propositional statements made about Indigenous Knowledge.
Table 1: Teachers' Conceptions of Indigenous Knowledge.
Strongly Agree–SA: Agree–A: Not Sure–NS: Disagree–D: Strongly Disagree –SD

The responses concerning teachers' understanding of Indigenous Knowledge indicate that they possess adequate conceptual knowledge of Indigenous Knowledge. A closer analysis of the responses on critical statements about Indigenous Knowledge in Table 1 shows this strong agreement namely; Indigenous Knowledge is dynamic (90%), Indigenous Knowledge is the same as traditional knowledge (80%), Indigenous Knowledge is a wealth of knowledge important for survival (86%), Indigenous Knowledge relates to traditional beliefs and lifestyles of people (85%), Indigenous Knowledge is passed by societies as accumulated, useful or important knowledge related to their existence (83%) and Indigenous Knowledge is passed from generation to generation by word of mouth or learned by experience (91%).

2.6.Teachers' Own Definitions Of Indigenous Knowledge

Data on teachers' definitions solicited through the open ended items of the questionnaire were categorized under emerging themes and then labeled as groups A-E as shown in Table 2.
Table 2: Teachers' definitions of Indigenous Knowledge.

Emerging categories of responses indicate that teachers' definitions of Indigenous Knowledge share many common concepts and are therefore, not mutually exclusive. Definitions in groups A-D (100%) all include knowledge as an element of Indigenous Knowledge; groups A, B and D (79%) have culture, values and beliefs as an integral part of Indigenous Knowledge; groups A, B and C (69%) cite life practices and experiences as part of Indigenous Knowledge and finally groups A, C and D (82%) indicate that Indigenous Knowledge is part of a specific community or group of people. Only 4% (Group E) claimed no knowledge of Indigenous Knowledge. The study also shows that the teachers' definitions of Indigenous Knowledge reflect their conceptions of it; therefore their knowledge of Indigenous Knowledge is not superficial.

3.Discussion

The major focus of this study was to determine teachers' conceptions of Indigenous Knowledge since they should be conversant with Indigenous Knowledge if they are to apply or employ it meaningfully in teaching and learning. Therefore, the findings of this study have important pedagogical implications, since some researchers like Berkowitz (2001), Emeagwali (2003) in Falola (2004), Shiva (1993, 1997) quoted in Van der Veldern (2004), Mavhunga (2008) and Viriri (2009) among others, have amply shown the need for the incorporation of Indigenous Knowledge into mainstream curriculum.

The study has indicated that 75% of the teachers agreed that local languages are part of Indigenous Knowledge while 73% also agreed that language is an important creative force in Indigenous Knowledge. This has shown that teachers recognize that local languages are an integral part of Indigenous Knowledge. Therefore the teachers' understanding of local knowledge and its language, places them in a position where they are able to accommodate different learners' learning styles. This happens if they are able to code switch and explain difficult concepts in local languages, where necessary, so as to enhance pupils understanding of concepts. Umo (2008: 24) also supported the power of language by saying that,

Language is seen as a liberating force for human reasoning for it
frees human mind from total dependency…….When one lacks
Language power, he is lost in communication; expression of feelings,
Thoughts, ideas, interpretation, understanding, socialization, etc.
and the individual is unable to exploit the experiences of life…..

A. Mazrui, cited in Tarugarira (2009:194), claims that no country has ever attained advanced technology, 'by depending on a foreign language while looking down upon its own indigenous languages'. Folds (1987) in Munodawafa (2006) also noted that Australian schools which did not recognize the Indigenous Knowledge of Aborigines, contributed much to the destruction of cultural communities in which they were situated, particularly as resistance resulted in failure to learn skills, which enable community members to overcome their dependent status.

Since Indigenous Knowledge was seen to be culture-specific (agreed=74%) and critical to culture (agreed=74%) as per results for variables Ag and Ah shown in Table 1 respectively, teachers may take advantage of the culturally embedded knowledge and integrate it into their teaching. This is in line with Emeagwali (2003:260) in Falola (2004)'s views as she argues that,

> Incorporating African Indigenous Knowledge systems may serve to diminish the structures of intellectual dominance and dependence associated with colonial education and may remove the distortion, trivialization and neglect of otherwise valuable traditions and cultural activities of the indigenous people.

This also implies that teachers are, in fact, able to use local languages such as ChiShona and SiNdebele among other local languages, to augment their teaching where possible, and thus facilitate students' learning. According to Tarugarira (2009:196),

> Research findings throughout the world have however demonstrated that it is possible to teach all subjects in the curriculum through the medium of indigenous languages and that for a country to develop technologically; it should use its indigenous languages.

Though the teachers showed that Indigenous Knowledge is information that is not documented and is passed through word of mouth and learnt through experiences, 70% of them agreed that Indigenous Knowledge is the basis of decision making in societal issues such as agriculture, education and health as supported by Hobsbawn and Ranger (1983).

The research shows that teachers realize that Indigenous Knowledge is adapted to a specific group of people and that each ethnic group has its own Indigenous Knowledge which is different from other ethnic groups. This implies that for teachers to effectively use Indigenous Knowledge in the curriculum they should know the socio-cultural set-up (Chiromo, 2004) and languages of specific ethnic groups (Batibo, n.d.) from which their students are drawn, since each ethnic group has its own language and culture. It is then important for teachers to further tap the Indigenous Knowledge that is propagated from generation to generation by word of mouth and through experiences in these local communities. These may include conservation, farming practices, sustainable development and exploitation of resources and use of medicinal plants.

In this study, teachers as role models and transmitters of knowledge to students have undoubtedly demonstrated that they have a very deep understanding of Indigenous Knowledge. Therefore, if teachers know Indigenous Knowledge and its importance to local societies, it becomes easier for the current Zimbabwean school curriculum to be integrated with Indigenous Knowledge (Munodawafa, 2005). This is because they are already aware of Indigenous Knowledge and its importance to the local people, so they will take it seriously and use it properly to teach. Thus knowing how much of Indigenous Knowledge teachers know helps stakeholders to comfortably re-engineer the current Eurocentric curriculum so that it becomes relevant to the local Zimbabweans. Basing on Lawton (1975)'s definition of curriculum Mavhunga (2008: 41) noted the significance of Indigenous Knowledge and wrote that,

> …..any curriculum that is deemed relevant should essentially be based on a selection from people's culture, certain aspects of their way of life, certain kinds of knowledge, certain attitudes and values. Africa has its own cultures and its own Indigenous Knowledge and technological systems that can form the bases for Africanising the school curriculum. Africanising the school curriculum ……..means making the curriculum meet the needs, interests and aspirations of the African people as determined by Africans themselves.

Therefore, another important pedagogical implication is that teachers need to have a conceptual knowledge of Indigenous Knowledge which is germane to the area in which they operate (content) in order to effectively teach (methodology and teaching aids). The teachers also need to view Indigenous Knowledge as a vital tool in the teaching and learning process, a tool that does not only enhance classroom learning, but one that situates teaching and learning in a viable, relevant and dynamic context. Kenya, India (NUFFIC-CIRAN, 2001) and Australia (Folds, 1987) in Munodawafa (2006) are examples of countries that have recognized the potency of Indigenous Knowledge. These countries' education policies have embraced Indigenous Knowledge systems. The result has been phenomenal improvement in the technological development of these countries and the betterment of their people's standards of living.

The above view has also been supported by Batibo (n. d.) in his study in Botswana with the San and Khoe speaking communities, where he noted that Indigenous Knowledge could be tapped to enrich the school curriculum. This would make the school more relevant to the learners, particularly at the formative stage and also provide the much required relationship with the children's cultural and physical environment. Batibo (n.d.)'s findings also concur with Chiromo (2004)'s recommendations to science educators in Zimbabwe that teachers should take into account the learners' socio-cultural background (Indigenous Knowledge) and use it as the starting point of their teaching.

Almost all teachers (96%) gave meaningful definitions of Indigenous Knowledge as shown in Table 2. Their definitions however varied semantically as reflected in the following examples:

> Traditional and cultural knowledge passed from generation to generation by certain people in specific areas. (Teacher Number 9)

> A dynamic body of knowledge important to the survival of a specific society that is passed from generation to generation by word of mouth or lived through experience. (Teacher Number 83)

> This is knowledge that is found in a community and it is passed from generation to generation. It is not documented, is culture specific and is based belief systems. (Teacher Number 89)

Teachers' awareness of Indigenous Knowledge and its value can save as a strong base for its integration in teaching and learning. This understanding and appreciation of Indigenous Knowledge by teachers is critically important for assisting students develop concepts in various subjects.

4.Conclusion

This study has revealed that secondary school teachers possess a sound and common conceptual understanding of Indigenous Knowledge. Their definitions of Indigenous Knowledge differed semantically; however the underlying concepts are adequate as a basis for including Indigenous Knowledge into the curriculum.

5.Recommendations

From the above conclusions, the researchers recommend the inclusion of Indigenous Knowledge in Zimbabwe's secondary school curriculum in the following three main ways: content, methodology and teaching aids as already revealed in this study. There is a need therefore, to amend the current educational policies to accommodate Indigenous Knowledge in the secondary school curriculum.

Learning outcomes in various subjects could be identified in Indigenous Knowledge with respect to content, teaching aids and methodology. The content could specifically include local Indigenous Knowledge in all subject topics, for example traditional methods used to treat livestock in agriculture. The methodology could incorporate, resource people, for example, elderly community people knowledgeable in various aspects of subject topics. Teaching aids could include artifacts of local phenomena related to topics and concepts.

The results of this research are not readily generalisable due to small sample size used from Harare urban schools only. Similar researches may be undertaken at national level with large samples. Continuous research and dialogue on approaches and attendant issues on infusing Indigenous Knowledge into the curriculum are imperative; these could particularly look into how Indigenous Knowledge content, methodology and teaching aids could be infused into the secondary school curriculum.

	POSSIBLE RESPONSES	**SA**	**A**	**NS**	**D**	**SD**
	STATEMENTS ON INDIGENOUS KNOWLEDGE	%				
Aa	Indigenous Knowledge is dynamic knowledge that people in a given community have developed over time.	49	41	6	3	0
Ab	Indigenous Knowledge is the same as traditional knowledge.	26	44	11	13	4
Ac	Indigenous Knowledge is a large body of knowledge and skills that has been developed outside formal educational system.	33	43	10	10	1
Ad	Local languages are part of Indigenous Knowledge.	29	46	4	13	7
Ae	Indigenous Knowledge is an important part of the livelihood of people in poor countries only.	20	11	7	34	27
Af	Indigenous Knowledge is an important part of the livelihood of people in rich countries only.	6	10	9	38	37
Ag	Indigenous Knowledge is culture- specific.	28	46	10	13	1
Ah	Indigenous Knowledge is a critical part of culture.	31	43	10	12	2
Ai	Indigenous Knowledge is knowledge that is not documented.	26	27	12	26	5
Aj	Indigenous Knowledge is adapted to a specific group of people.	18	44	9	21	6
Ak	Each ethnic group has got its own Indigenous Knowledge which is different from other ethnic groups.	24	53	5	17	1
Al	Indigenous Knowledge is the basis of decision-making in societal issues such as agriculture, education and health.	23	47	8	14	5
Am	Western science and Indigenous Knowledge is one and the same thing.	6	14	11	48	21
An	Indigenous Knowledge is obtained through the scientific method.	5	22	9	42	21
Ao	Indigenous Knowledge is documented knowledge.	7	13	14	44	21
Ap	Indigenous Knowledge generalizations have rational and logical dimensions.	12	42	23	15	7
Aq	Facts within are tested.	6	30	21	32	8
Ar	Facts within Indigenous Knowledge are experiential.	9	36	21	25	6
As	Language is important to the acquisition of Indigenous Knowledge.	17	43	2	27	10
At	All events in Indigenous Knowledge have natural causes.	17	32	25	24	1
Au	Language is an important creative force in Indigenous Knowledge.	18	55	7	15	4
Av	Indigenous Knowledge is a wealth of knowledge important for survival.	40	46	3	8	0
aw	Knowledge explanations of Indigenous Knowledge relate to traditional beliefs and lifestyles of people.	34	51	4	6	1
Ax	Indigenous Knowledge is based on questioning and discovering answers.	13	45	28	12	2
Ay	Indigenous Knowledge is passed by societies as accumulated, useful or important knowledge related to their existence.	36	47	12	4	0
Az	Indigenous Knowledge is passed from generation to generation by word of mouth or learned by experience.	40	51	5	2	2

Table 1

Group	Definition of Indigenous Knowledge	No.	%
A	Knowledge, Society, Community, Culture, Beliefs, Language Tradition, Life practices	34	34
B	Life experiences, Skills, Local language, Local environment (resources), Societal values and ethics.	17	17
C	Knowledge passed from one generation to another, Specific group, Adaptation to and exploitation of an area (environment), Making a living	14	14
D	Undocumented oral knowledge, Traditional and cultural knowledge passed from generation to generation, Specific society, Belief systems and community.	31	31
E	Indeterminate, not sure, I don't know.	4	4

Table 2

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