

An Exploratory Study of Children's Indigenous Knowledge and Skills: Implication for Functional Learning.

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Abstract: *The local knowledge which is unique to the school children in the core indigenous areas of Moro local Government area of Kwara State is explored in a qualitative research using free flowing interview as well as observation of the way the children employed such knowledge in the areas of cattle rearing, planting and plant protection, harvesting of crops as well as charcoal making. Children aged between 5 and 12 years in two communities, Yeregi and Gaa Lanu who were actively involved in farming took part in the study. The study also examined gender stereotyping in the indigenous activities handled by children. Findings revealed that most of the children were experienced and highly knowledgeable in indigenous methods of farming, cattle rearing and charcoal making and that girls only learn to plant vegetables and milk cows while boys do the more masculine farming planting cash crops to sell and make profit. However, even though children could do all these chores, they could not explain why some steps are taken when they did them, an indication that the children need to learn to ask questions and find out why things are done when learning from their parents while parents also need to explain reasons why some actions are taken when their children are watching. For children to learn using the scientific method, theme-based curricula can be organized around the indigenous activities of the community using project-based learning to encourage children's stronger grasp of the system.*

Keywords: *farming, gender stereotype, indigenous knowledge, interview, observation, qualitative method.*

I. Introduction

Indigenous Knowledge (IK) has been described as wisdom needed to survive in a particular environment, Singh and Reyhner (2013). It is also the local knowledge that is unique to a given culture or society and very different from knowledge which is acquired in the university or any formal school. It is the dynamic information base of a society that is used for decision making (Warren 1991, Flavier et al 1995). IK is a field that has attracted a lot of interest in recent times due to its importance in the area of agriculture, herbal medicine, nutrition, child care and economics. Currently, over "80% of the world's population depends on indigenous healthcare based on medicinal plants" while Indigenous people employ at least 20,000 plant species for medicines and related purposes (Melchias, 2001 cited in Eyong 2007). All these are based on the notion that knowledge that is passed from generation to generation is local and unique to the particular community.

IK is said to be very useful for solving problems in the community and helps to make a community self-reliant. It is their asset to combating poverty and solving their economic problems. Moreover, indigenous information systems are dynamic, and are continually influenced by internal creativity and experimentation as well as by contact with external systems, (World Bank Group 2010). The presence of modern technology should not be allowed to dwarf IK among school children, rather, IK should continually be improved in indigenous communities using digital technology because the people are still completely reliant on it for survival. Furthermore, children as well as their families will benefit from a system which encourages them to rely upon and strengthen their own internal navigational system for reaching their own optimal development (Ball & McIvor 2005). A lot of research work in the area of indigenous knowledge and practices have been done by many researchers who worked among indigenous children of Mexico, Canada and many parts of South America. In The Netherlands, Non Governmental organization NUFFIC in 2002 also gave grants to farmers all over the world who use indigenous knowledge to make their farming more productive because it recognized these moves as good practices in farming, while the United Nations Economic Social and Cultural Organization (UNESCO) also recognizes indigenous knowledge as a form of organizational transformation. Incidentally, many of the farmers so rewarded are non-literate (Nakashima, D., Prott, L., Bridgewater, P., 2000). The effect of indigenous technology will be better felt if children are encouraged to practice their indigenous knowledge within a school curriculum that can develop a synergy with the modern technology in different areas such as agriculture, economics, health care and nutrition. The blending of the two types of knowledge and technology will go a long way in making the living conditions of the rural dwellers better while also empowering them financially. As children learn more about their indigenous practices in their school lessons they understand different ways of improving on the practices based on the new knowledge and skills acquired in school and this will in turn make them more productive as they go on with their day to day practices at home, the resultant effect being that they will be able to acquire knowledge and skills that will empower them, and reduce the poverty level of children in indigenous communities.

Indigenous knowledge and the Nigerian education

While many other nations have been looking into different ways of incorporating IK into their school curricula through different programmes, for example (Population Participation Curriculum and Instruction (PoPCI) in Ethiopia, Alaska Rural Systemic Initiative Project (AKRSI), Old Minto Camp in Alaska), Nigeria is not yet looking into how IK relates to children and the school system. This is in spite of the fact IK has been shown to be very crucial to the sustainable development of any nation, (World Bank 1997, Eyong 2007) as many of the financial, social, health and agricultural problems of the nation can be solved if indigenous people are given recognition and encouraged to use their knowledge as much as possible to improve their livelihood.

The Nigerian Primary school curriculum contains many topics that indicate that learning from the environment is important to children. However, the scope to be covered in the content and the methods used by teachers to teach these topics (which is still largely teacher-centred) may not adequately provide the kind of hands-on learning that will incorporate the children's level of IK (which they have acquired from home) with the content knowledge that they are expected to acquire in school in order to make the two functional within children's environment.

Unfortunately, when children cannot see the relationship between what they learn in school and what they do at home, they are likely to be confused. The home learning which looks more cumbersome and crude may gradually go into extinction as children will see it as old-fashioned, while they seek the modern attractive technology which may not be easily accessible to them.

The following research questions were raised for the study:

1. What indigenous knowledge do children possess in the area of Agriculture and economic activities?
2. How do children make use of these knowledge and skills?
3. Is there gender stereotyping in the acquisition and utilization of the knowledge?

This study is expected to lend prominence to children's indigenous knowledge embedded in the curriculum and enable classroom teachers to see value in such knowledge not only for adults but also for children. It is expected that this recognition of the importance of indigenous knowledge will further guide curriculum designers to include culturally and socially appropriate content into the curriculum for different types of children and encourage teaching and learning based on the theory of constructivism and not too strict on pedagogy.

In the area of economic activities, children gladly engage in indigenous knowledge to solve their financial problems early in life. They endure the hardship of many of these activities and even do some of the jobs as communal activities after school. They all have their goals for engaging in the activities (which in most cases are either family trades or vocations for which they have personally developed interest), moreover, research has revealed that cultural knowledge can help build resilience in young children (Department of Families, Housing, Community Services and Indigenous Affairs, 2009). Researchers in early childhood education may therefore want to look at the implication of these early economic activities on children's chosen future career since early involvement in economic activities may affect children's interest in pursuing academic knowledge.

II. Method

The local IK that is unique to the school children in the core indigenous areas of Moro local Government area of Kwara State is hereby examined. This paper presents the qualitative findings from the interviews with pre-school and school aged children and their parents particularly fathers. Using free flowing interview as well as observation of the way the children go about using such knowledge in the area of cattle rearing, planting, crop protection, harvesting of crops, charcoal making as well as making use of local herbs for health care. Free flowing or unstructured interviews were used in the study because of its informality which makes it to generate spontaneous responses. The spontaneity of responses help to elicit honest and sincere answers. However it is different from day to day discussion because it allows for probing. Also because children are involved, one has to relate with them in a relaxed and play like atmosphere to elicit information from them. Observation has been described as a systematic description of events, behavior and artifacts of the social setting in which a study is taking place (Anis, 2016). It is used in research as a tool for Children below and up to the age of eight years in two schools in two indigenous communities who were actively involved in farming took part in the study with only two of them being 12 years old. The study also examined gender stereotyping in the indigenous activities handled by the children.



Sampling

Parents of the children in the two communities were contacted through their teachers and arrangements were made for the researcher to watch the children on the different activities they engaged in after school hours. Before the days of observation, visits were paid to the parents to inform them of the purpose of the study and to seek their consent to allow their children to participate in the study and also take pictures. A parent, the father of one child who was a cowherd surprisingly said he would love us to put the pictures in face book and take them to foreign lands. Their responses indicated their support to the study and the use of cameras to record our observations. However, their verbal consent was taken and recorded with an audio recorder because they were non literate. Thirty children took part in the study these were made up of 25 boys and 5 girls. They were all between age 5 and 8.

Observation and Free Flowing Interview of Children

Children were observed and interviewed as they made charcoal and reared cattle while the young farmers were interviewed on their experiences in planting, taking care of the crops and harvesting

Farming

Children farmers (boys) were asked questions (In Yoruba language) regarding planting and the questions were:

How many of you go to farm?

Ans: everybody

Ques: what do you plant?

Ans: (boys) We boys plant yam, cassava, maize.

Ques: who makes the mounds for you?

Boys: we make them.

Ques: what? How many mounds can you make?

Ans: (One boy) I can make 200 Others: yes we make 200.

Ques: When do you plant yams?

Ans: In the 10th and 11th months of the year (October and November).

Ques: what are the things that may not allow the plants to grow well

Ans: rodents, apes, insects.

Ques: What do you do to the pests?

Ans: we set traps for the rodents and the apes.

Ques: what about the insects?

Ans: we kill them with insecticides.

Ques: the traps, who sets them?

Ans: we do (they went on to explain different ways of setting the traps and how efficient each type of trap is).

The boys were able to answer the questions regarding their farming activities , they could explain the planting seasons, demonstrated how they plained and weeded their farm and the reasons for weeding. They also explained how traps were set to kill animals that destroyed their crops and how they harvested and preserved their crops.

The girls were not very active, they did not answer many of the questions as the boys did.

When asked how they sold their products, the boys said that their parents sell the crops on market days and that the proceeds were used for buying their school needs.

The girls did not answer these questions at all but the boys said girls also sold their vegetables on market days. On their knowledge of medicinal plants, boys named some plants that were used for some ailments such as the neem plant which was said to be used for treating malaria, however, they said that they usually went to the hospital whenever they were sick which is an indication that the indigenous knowledge in the area of healthcare was gradually being replaced with western medicine. However, in the event of snake bite and other attacks by animals or insects while on the farm or at home, both boys and girls said that their fathers suck the venom and apply local herbs. They all did not know what the herbs were made of but they insisted that the herbs were more potent than hospital medicines.

Charcoal making

One child, Soy, whose father volunteered to allow us watch him demonstrated charcoal making which was done in many steps over six days. Soy started by arranging the wood. (He was almost 8 years old and had just enrolled at the mobile school being organized by the Kwara State University for the community). He arranged the wood so well without anybody teaching him though his father watched from a distance since we insisted that we wanted to see what the child was capable of doing by himself. Other children were gathered around him watching and as the older ones were not around there was no instruction given to him at all. The younger ones merely watched him at this stage. When asked why he was arranging the sticks and not allowing any space between them he merely looked at us and did not say a word, we then asked the father who told us that it was because the sticks had to close up otherwise the soil that would be poured on the leaves would seep through and put out the fire underneath and the wood would not burn and turn to charcoal. After arranging the wood, he covered everything with fresh leaves. At this stage the younger observers had their contributions on the places where he needed to put leaves and when we asked them why he should add more leaves they gave their own reasons – so that the soil will not find its way to the bottom and put off the fire though Soy himself could not find an answer. The next stage was left till the following day because it was a job too big for only Soy, he needed the assistance of the big boys and so we were told to come back the following day at a time when the big boys would have arrived from school. The next day, the big boys were around but Soy started covering the wood and leaves with soil using a very big hoe which appeared too big for him yet he handled it with such dexterity that we just watched him with amazement. The big boys also took their hoes and all of them covered the leaves in no time. Whenever they made mistakes. He corrected them and they took to correction usually commenting that after all it was his charcoal so they would make it the way he wanted.

The younger fellows also had their own say and sometimes their advice was heeded, for instance, it was a five-year-old girl who called their attention to a hole that needed to be closed with soil and how they should not yet cover the fire because the supporting wood had not “cracked.” All the children had witnessed charcoal making before then as they said one thing or the other (during the preparation of the charcoal) that indicated that they knew all the steps taken to make charcoal.



For instance the very young ones were telling them the next steps and precautions to take such as “the wet leaves are not enough yet, Heh!! This charcoal may not turn out well there is space here, fill it with fresh leaves “

Apparently they have all watched charcoal making over and over again and so they were used to the steps. However, the questions on why they had to use fresh leaves to cover the wood, use both dry and fresh wood and why they had to cover the entire wood and fresh leaves with soil were not answered by the young children, the older ones in secondary school and their fathers were able to explain reasons for such actions.

Cattle rearing- The boys that reared cattle were all very timid, they were not willing to talk and the few information given were given reluctantly. They could not explain reasons for the actions they performed especially when the cow wanted to bring forth a calf. One of their fathers had to insist that they should talk to me before they did, but they were very excited when I showed them Amad's picture in my smart phone. Amad too was very happy, hethen responded as follows:.



Ques: The sound you made when you were taking the cows out which made the cows to stop, what does it mean and why did the cows stop?

Ans: (by a younger cowherd) the cows must stop and they will not move past the cowherd when they hear the sound.

Ques: can you repeat the sound?

Ans: (All the young cowherds together) they all made the sound and the cows stopped moving immediately.

Ques: How do you know if a pregnant cow is ready to give birth to its young?

Ans: No response.

Ques: when in the bush with the cows, If any wild animal attacks how do you defend the cows?

Ans: No response but he pointed to the long cutlass tied to his arm and the father smiled.

At this point we decided to ask the father the remaining questions pertaining to care of the cow and helping the pregnant cow to bring forth the young ones. the father said Amad had done that several times and in case the cow was having difficulty bringing forth its young the boy would take a new razor blade (which he also carries in his arm) and cut the cow's vulva so that the calf can be delivered safely.

The data collected from the interviews were analyzed using text since most of the responses were given as we watched children doing the different activities and as they all, in the informal setting of their homes interacted with the researchers. The researcher asked questions while the research assistants recorded the children's responses. Electronic recorders were also used to record in order to ensure that nothing was left unrecorded. As some children were conducting the activities other children were discussing and giving suggestions as to what to do. Findings revealed that most of the children were experienced and highly knowledgeable in indigenous methods of farming, cattle rearing and the use of local herbs to solve health problems though the use of orthodox medicine was becoming popular among them and they seem to prefer this to local herbs when treating common ailments. Girls learn to plant vegetables and milk cows while boys do the more masculine farming such as planting cash crops to sell and make profit. This implies that gender is a very important factor in the type of indigenous knowledge and skills children are exposed to.

The data were analyzed in themes using text. The data collected from the interview was analyzed using the discussion and drawing inferences from the findings.

Research findings

The research questions were answered as follows:

1. What indigenous knowledge do children possess in the area of Agriculture and economic activities?

Agriculture

Children were able to plant cash crops such as yam and cassava as well as food crops such maize and vegetables they knew when to plant, how to prevent rodents from destroying the crops and how to harvest. They can plant, understand the weather and seasons and their indication for planting or harvesting, they eat plenty of vegetables and fruits as they produce them in the farms but they also eat a lot of carbohydrates since most of the cash crops are carbohydrates. The cowherds showed their ability to rear the cattle and take care of them unsupervised. They were really skilled in the art of cattle rearing. Those who engaged in making charcoal also did it very well with no supervision though it was usually a communal work, all the other children learned by watching and the older ones helped when the work became too difficult for the younger ones, however, every child knew the steps to take in making the charcoal.

Herbal medicine

Children knew what to do with herbs to the extent of treating snake bites. They knew the herbs to use when they are sick to treat different ailments. Children were however quick to mention the names of orthodox medicine when asked what they did when they fell sick. They said they used panadol and went to the hospital. On further probing, children mentioned the herbs used to treat malaria, cuts, snake bites and said they could identify them in the bush.

Economic activities

Findings revealed that as young as the children were, they possess a lot of indigenous knowledge. The knowledge is used to solve different types of problems ranging from hunger to economic problems. The girls plant vegetables and sell in markets, they also keep local fowls such as guinea fowl and chicken, while the boys engaged in more masculine farming activities as planting maize, yam and cassava, also the charcoal is done by the boys while the cowherds are also boys. These children sell their wares in cattle and use the proceeds to buy their school materials and other needs. The father of the boy who made charcoal said that the proceeds from the charcoal is used to buy fowls and when the boy sells the fowls he will use the proceeds to buy sheep and when he has enough sheep he will sell them to buy a calf which is the ultimate goal of making charcoal. Every boy aspires to own cow heads and become rich.

Findings revealed that most of the children were experienced and highly knowledgeable in indigenous methods of farming, cattle rearing and the use of local herbs to solve health problems though the use of orthodox medicine was becoming popular among them and they seem to prefer this to local herbs when treating common ailments. Girls learn to plant vegetables and milk cows while boys do the more masculine farming such as planting cash crops to sell and make profit. This implies that gender is a very important factor in the type of indigenous knowledge and skills children are exposed to.

2. How do children make use of these knowledge and skills?

The children's indigenous knowledge is put to use in diverse ways to solve their financial problems and being rural communities, the knowledge is used for survival. The children learn the activities from their fathers and therefore use the skills to provide for their needs. The IK in charcoal making is used by the children for raising money for their needs. Parents said that the money realized from the charcoal is used to buy fowls and when the fowls lay and hatch their eggs the number of the fowls increases. The fowls are sold and the money realized is used to buy sheep. The sheep is also kept for some time and sold. The money is then used to buy a calf. Once a child has a calf, he is on his way to becoming rich because in this part of Nigeria wealth is measured by the number of cow heads one has.

As children were interviewed on their farming activities and observed doing the charcoal, they used words that adults used which implied that their reasoning is higher than their age. They know names of plants and animals in their environment and relate with other adults the way adults relate with them. Throughout our observation of these children's activities we did not see them quarrel or fight, even when the little ones were a bit naughty they were just instructed to leave the place and they also obeyed. The impact on the cultural values on their behavior was very strong. They respected their elders and were never rude to them. The charcoal making was seen as a communal work therefore everybody ensured it succeeded. This is a team spirit that usually characterizes the traditional community in Yoruba land and most indigenous communities.

3. Is there gender stereotyping in the acquisition and utilization of the knowledge?

Gender and indigenous knowledge acquisition

The findings of this study reveal that girls were not allowed to learn the more profitable vocations as they were regarded as the weaker sex, this was reflected in the fathers' responses whereas the mothers sadly expressed their feelings that they were not empowered but made to milk cows and sell the cheese. This may mean that the female members of these communities will be completely dependent on their male counterparts for survival for a very long time. The school may have to intervene by encouraging both sexes to take part in all activities in school during projects and other school learning activities. It also shows that the mothers were not comfortable with the types of jobs they were allowed to do, they would want to do more.

III. Discussion

The findings were discussed in themes

Children's knowledge of farming and indigenous herbal medicine

Findings revealed that most of the children were experienced and highly knowledgeable in indigenous methods of farming, cattle rearing and the use of local herbs to solve health problems. However, the use of orthodox medicine was becoming popular among them and they seemed to prefer this to local herbs when treating common ailments.

Gender and indigenous knowledge and skills

Girls learned to plant vegetables and milk cows while boys do the more masculine farming such as planting cash crops to sell and make profit. This implies that gender is a very important factor in the type of indigenous knowledge and skills children are exposed to. When girls are allowed to try their hands on activities that heretofore was a male dominant job and made to see that there is nothing that a woman cannot do, she may also want to embark on such and show that she also can do it and succeed like the men.

In indigenous communities in Nigeria, women are looked down upon and are not empowered because the men want to make them perpetually dependent on them for everything. The children also continue in these gender roles and even in school, they continue to think about their sex when required to take up some responsibilities. The mothers were not comfortable with the types of jobs they were allowed to do, they would want to do more. This is an indication that women want to be empowered and not dependent on men for survival all the time.

Indigenous knowledge and scientific knowledge

children who were interviewed as they made charcoal and as they were with their cattle made very few responses which showed that even though they were able to plant, make charcoal, make money by selling the products, they still did not know why they had to take some steps in the process of making the charcoal or helping the cow to have its calf. The young cowherd could not explain why he took some steps in the delivery of cows and why he had to cut the cow with new razor blade. He only said the cutting would make the cow deliver her baby safely and if he did not cut it the baby could die, apparently he had watched his father doing it several times without asking questions from the father and the father had not attempted any explanation of the reason why some steps are taken. He too learnt it from his own father without asking any questions. This method of transmitting information does not promote high thinking skills and should be changed.

The only children who could explain why some actions were taken were the young farmers who planted crops. They were able to explain how they knew the time to plant and how crops were protected from rodents, monkeys and other animals though they also did not know why they had to set the traps the way they did. They were also able to demonstrate different ways of setting traps to kill the animals that destroyed their plants. This may also reveal that the method used by parents to pass on the IK needs a lot of modification and improvement for children to really be able to continue to pass on the knowledge to others and also to use it in the context of today's education such as developing high thinking skills and problem solving skills. Children should be encouraged to ask questions while learning and parents too should ask questions to find out whether children really understand what they are doing. Children will greatly profit from a theme based curriculum using project based learning which will engage them in in-depth study of the different areas of learning. Adequate learning in the use of implements for farming including the modern implements is very important for their work to be made easier and more enjoyable so that they can be more interested in doing the local jobs and not run after white collar jobs which may not be forthcoming all the time. All subjects in the curriculum should be related to the indigenous knowledge of the child and should expand such knowledge so that learners will be able to incorporate modern technology with their indigenous knowledge of planting and harvesting situation. The school has a lot of intervention to do to encourage both sexes to take part in all activities in school during projects and other school learning activities. It also shows that the mothers were not comfortable with the types of jobs they were allowed to do, they would want to do more.

Indigenous knowledge and children's economic empowerment

This ability to use indigenous knowledge in day to day activities encourages all children to be gainfully employed as early as five years old. They were always with at least one parent and would always learn from whichever parent they stayed with. Children possess at least one skill early in life and this skill ensures that no matter what happens, they were always employed

Implication for Teaching and Learning

Indigenous knowledge is prior knowledge which children bring into the new learning and serves as building blocks for more knowledge (World Bank 2010). This experiential knowledge, when recognized and used by the teacher to build new knowledge, not only motivates children, but also enables them to see that their own indigenous experiences are not in any way inferior to or at variance with the academic work which they do in school. They also see the relevance of their knowledge to school work and are happy that their experiences are functional even in the larger society.

Curricula for young indigenous children could be developed or adapted so that they correlate with the children's live experiences, cultural and linguistic background, and evolving capacities, as this best serves the overall development of young children (Bernard Van Leer foundation 1983- 1990). The curriculum being used by the Nigerian primary schools, though related to the environment, needs to recognize the peculiarity of each community and therefore include the use of themes and project-based instructional methods to bring out the best in the children's learning.

This may of necessity, entail the retraining of teachers in the use of theme- based curricula as well as methods of teaching that promote hands on activities. Unfortunately, this is relatively new to the Nigerian educational system. This project work will engage all the children and remove gender specific activities so that children are encouraged to take on whatever activity that interests them. Children will also be taught the value of asking questions when they are learning. This can be demonstrated by the teacher while parents too can be encouraged to explain their activities and make their children ask questions so that they can actually understand what they are learning. Children should also be encouraged to play in school because according to Quintanilla (2009) as they play, they question and investigate, advancing their social, emotional, physical and intellectual development, as full actors in their own development.

Many successful farmers in the community could be invited to share their experiences with the children. They will be encouraged to ask children questions and answer children's questions. Children will also be instructed beforehand to ask questions in every area. The different departments in the universities who are offering courses in the different areas that are related to children's indigenous knowledge could visit children during their projects or invite them to see agricultural products as they are also being made in the university.

The teaching and research farm of the Department of Agriculture of Kwara state university could serve as a place where children conduct project work in different modern methods of cattle rearing, cow milking and other farming activities which they can blend with their own indigenous knowledge. These experiences enable children to see the importance of preserving their indigenous knowledge and at the same time improving on them to bring forth better results, this way, children's knowledge and skills become more robust and fruitful to solve their problems and empower them better than their parents, they are also able to take such knowledge home and share with their parents as they engage in the different agricultural activities.

On the issue of early exposure to economic activities, though according to Brooker and Woodhead (2010), a child has the right to be protected from danger which may arise from the work they do to generate some income, when children are exposed to money generating activities they learn many skills as we can see in this study and they also learn to take up responsibilities especially in poor rural and urban communities. The children who took part in this study enjoyed working to make money because they begin to learn to be self reliant and they are not likely to be unemployed when they finish school because they have learnt to generate money even as children. Finally, teachers in Nigeria may need to be retrained in methods of incorporating indigenous education into the curriculum since according to Thaman (2000), it is the teacher who will have to bridge the cultural gaps in students' learning, through improved contextualization of curriculum and instruction.

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