

Practical Intelligence in Emerging Childhood: Implications for Quantitative Reasoning during Childhood Education in the Cultural Context of Fako Division

Dr Kate Tande, PhD

Developmental Psychology, Department of Educational Psychology, Faculty of Education

Abstract: This study set out to examine how child upbringing in the cultural context of development of Fako Division of Cameroon conceptualize quantitative reasoning as a form of practical intelligence and how this is important for the survival of children raised in this context. The main research question posited for the study was: Does the culture of the Fako people value behaviours indicative of quantitative reasoning for the emerging practical intelligence of the Child? Specific questions were also raised on the importance of measuring items, sharing and The theoretical framework for this study was the Vygotsky's theory on cultural constructivism. The survey research design was employed for this study with a triangulated approach. The purposive sampling method was used for collection of data. The multiple response set (MRS) adopted in the processing and analyzing of data that came in through the interview and questionnaires. Interviews involved 30 children, while a questionnaire was administered to 210 participants. The findings revealed that the people of Fako attach importance to behaviours indicative of quantitative reasoning behaviours and skills. The study found that behaviours indicative of quantitative reasoning include measuring, sharing, farming, fishing, cooking, respect, wrestling and running errands. Recommendations made include, a multiple based approach, indigenizing child psychology, integration of indigenous knowledge and formal education, introduction of age-appropriate chores into the curriculum, training of personnel and involvement of stakeholders in educational planning for children's education.

Keywords: Mokpe culture, practical intelligence, Mokpe Child, quantitative reasoning, quantitative skills

Introduction

Investigating conceptualizations of intelligence during childhood is extremely important because children need social, cognitive, physical, cultural and even spiritual skills to survive in their environment. Similarly, studies on the psychology of human intelligence in sub-Saharan Africa have revealed that the indigenous people of that geo-cultural region regard intelligence as having social and cognitive components (Mpofu, 2002). Most studies in this area also showed a greater valuing of practical rather than academic intelligence. In Cameroon like other developing countries, educators, parents, caregivers as well as other stakeholders always have different definitions and notions of what intelligence should be for the developing child. People always base their assessment and evaluation of children's intelligence on performances of tests and examination scores. Usually we base our decisions on behaviours associated with intelligence, such as logical thinking and reasoning, memory and even the ability to figure out things. This may not be appropriate for different cultural contexts because different cultures have cultural specificities, which validate the notion that culture may be related to context. In this study attempts are made at investigating the conceptualization of intelligence in the cultural context of Fako division in the South-West Region of Cameroon and how this is important for children raised in this cultural context.

Background to Study

Ensuring that children during childhood become responsible thereby being socially competent is an important goal in childhood education and development in the Cameroon milieu. Like their counterparts in other parts of Africa, children in Cameroon develop and are raised in a variety of cultural settings that influence the ways they think, act, play and solve problems. This is particularly so for children around the slopes of Mount Cameroon and the seaside areas of the Fako division. To go about their everyday activities and also succeed in later life, children need to be able to understand, interpret and apply practical intelligence (*kenj'a*) valuable for their survival in his/her cultural and social environment. During childhood, children are expected to develop intelligent behaviours valuable for survival in their cultural environments. More than any other stage in the lifespan, this developmental period is very significant in any culture or society because it brings in the complexity of the tasks that adult demand of their children. In the Africentric view of life stages, childhood is considered the third social stage of social apprentice and novice whereby children are initiated into social roles (Nsamenang, 2004). According to Nsamenang, they are expected to recognize, cognize and rehearse social roles.

This stage also represents a period of more sophisticated forms of problem solving in which different aspects of a problem or different points of view are weighed simultaneously (Cole & Cole, 1989). Children are expected to observe, practice and solve cognitive and social problems in their environment in order to adapt to the lifestyle of the community. Specifically, for the African child this stage is indispensable in everyday endeavour that matters to everyone in the community. For children of this age group, this stage confers linguistic, economic, social, moral and domestic privileges and responsibility to them. During this stage, language, mathematical thought and reasoning, and socio-emotional responsibilities also become prominent in children and they support one another. Children are also expected to be able to give detailed description of the roles of thought and language that are explanations of the intellectual factor of direct experiences with their socio-cultural milieus. They are normally likely to develop an understanding of other people's feelings and thoughts. They can use mathematical and quantitative reasoning skills to solve problems, especially problems tied to their immediate world whereby the objects for problem solution are physically present.

Children also find indigenous knowledge useful and also begin to imbibe the cultural scripts of adults to become useful and fully functioning in that society. Like their counterparts, children everywhere learn a cultural curriculum that enable them to participate in culturally defined ways of living, thinking, feeling, and behaving, mediated through their relationships with other generally more experienced cultural actors, particularly parents (Nsamenang, 2004). They learn to speak their languages, prepare traditional dishes and carry out home chores. They also observe and learn how to dance traditional music and dress in the traditional attires. Children learn to accept their societal roles, respect for elders and perform their moral and domestic obligations. The homes and church also, generally play the role of fostering necessary cultural values like respect, honesty etc, in children's lives, the school and home are privileged in this respect. They provide settings where children can interact for relatively long periods with siblings, peers, elders, neighbours, teachers and parents. Understanding emerging practical intelligence, shaping it and applying it in the most constructive and beneficial manner possible is a necessary precondition to achieving cognitive enhancement in childhood education in many African cultures.

Social Anthropological Background of the Fako people

The context of this intra-cultural research is based in Cameroon, precisely on the *Kpe or Mokpe* ethnic group of Fako Division. One of the high value ecosystems in Cameroon which has rich ecological value is around Mount Cameroon in the South West Region of Cameroon. That makes this ecological zone otherwise known as Bakweriland, promising and compelling as a vital site of cultural

environmental concern and analysis. The ethnic cluster which is autochthonous to the area under study has been variously referred to as the Kpe, Vakpe (singular mokpe), wakweli, Wojua and Bakweri. According to Ardener (1996), the Kpe occupy 104 villages which lie to the east and south-east of a line dividing the Cameroon Mountain along its axis.

The notion of practical intelligence is not particular to the *Fako* child but also common among many tribes in Cameroon. This implies that children are labelled, assessed and evaluated based on how they perform and carry out activities in their homes, neighbourhood and community. These activities may be labelled cognitive or social depending on how, when and why they are performed

It is against this background that this researcher decided to embark on this challenging research endeavour aimed at highlighting those cultural behaviours and practices that are considered intelligible behaviours in *Kpe* children, and are useful for survival and problem solving. Practical intelligence requires that children interact to act and produce culturally intelligent behaviours necessary for overall success in living. They must interact with parents, siblings, teachers, peers, neighbours etc, through action-oriented activities.

Statement of the Problem

It is common among the ethnic group of the people of Fako Division in the south west region of Cameroon for children to possess “intelligence” which is critical in order to succeed in the school system. However the child needs to observe and acquire practical intelligence (*kenj”a*) that the people value even though at times with a little help from others. Sometimes children are labelled or even punished if they fail to comply with these expectations from home, the community and society. Based on the belief systems of the people, children are expected to engage in activities that involve action and doing. Practical intelligence involves action-oriented activities in domains such as taking responsibility, taking initiatives, resolving sibling and peer conflict, caring for others, running errands and reporting, budgeting, marketing and so on. By doing, these they develop self-esteem, become more industrious and learn the productive skills aimed at ‘*responsibilizing*’ them and making them adapt to their culture and be fully functional. Like other African children, the childhood stage confers cognitive, social, cultural demands transformed to privileges and aimed at responsabilizing the child of this age group. This means that different cultures dictate what knowledge and skills to be learnt. According to Nsameng (2004), each culture defines what it means to be intelligent, and cultivates it. He argues that the skills that are important to Western conceptions of intelligence and are assessed by current intelligent tests are less valued in other cultures like the African, and are not cultivated in the young of those cultures. This study therefore seeks to explore, determine, identify and reflect on how quantitative reasoning is conceptualized among the people of this cultural context and how it is important for the well-being of children raised in this society.

Purpose of the Study

The purpose of this intra-cultural study was to gain insight into how the people around Fako perceive, engage and give meaning to the concept of quantitative reasoning within their cultural context. It identifies the different behaviours to which people attach importance to, during the childhood years among children raised in Fako Division of the South-West Region. It also highlights the importance of these behaviours in problem solving and survival of children in this area along the slopes of Mount Cameroon and the seaside towns in the South West Region of Cameroon. This topic is relevant to important concerns of contemporary Cameroonians and children raised in similar contexts because there is a growing need to inculcate specific aspects of culture into the national school programmes and formal education. It is also significant because of the need to complement indigenous knowledge (IK) with formal schooling.

Main Objective of the Study

To investigate the importance of behaviours indicative of conformity with quantitative reasoning on the emerging practical intelligence of the Kpe child in childhood education

Guide Research Questions

1. Does the culture of the Fako people value behaviours quantitative skills indicative of quantitative reasoning for the emerging practical intelligence of the child
2. Does the culture of the Fako people attach significance to sharing behaviours indicative quantitative reasoning for the emerging practical intelligence of the Kpe Child?

Significance of the Study

This study will be beneficial to parents, teachers, caregivers, psychologists, educational practitioners and stakeholders who are involved in the childhood education enterprise and ensure that emphasis is placed on the significance of culture in children's development.

An in-depth investigation of this nature will bring out useful information for improving on the curricula and syllabus by reflecting the needs of the society and individual differences of childhood education.

The investigator hopes that this study will expose both psychologists and educators towards assisting in designing cognitive tasks embedded in cultural context.

In the final attempt, this researcher believes that the findings of this study it is will be valuable to the Ministry of Basic Education and related ministries and act as a reservoir for references on childhood education.

Justification of the Study

In the Cameroon context, there is no documented evidence to show that such a study on practical intelligence and quantitative reasoning has been carried out on children and the people. Secondly, the prevailing childhood educational practices operate with the view that intelligence can only be judged based on performance on academic oriented tests and examinations. Thus, there is predominance on performance than competence building on cultural knowledge, abilities and skills.

The school promotes and encourages one aspect of intelligence, whereas many exist in the family, home, neighbourhood and the community. When children leave school and go back home, neighbourhoods, villages, towns and even cities they discover that the skills they have are not anymore essential than other skills for surviving in the world. Such an over formalised and structured system makes the child to be culturally and cognitively disadvantaged later in life. Thus, there is justification for children to acquire knowledge, skills, abilities and competences in their cultural context necessary for survival in present and later life.

Due to the absence of research evidence and statistical data in this area, there is an urgent need for intervention based on empirical research. Such intervention will furnish psychologists and educators with data and information that will serve as a reference.

It is also intended that the knowledge and theoretical base of childhood education in Cameroon and beyond will benefit many other socio-cultural settings.

Theoretical Framework

Theory of Social Constructivism

Social constructivism emphasizes the importance of culture and context in understanding what occurs in society and constructing knowledge based on this understanding (Derry, 1999; McMahan, 1997). According to the socio-cultural approach, individuals inherit their environment as much as they inherit

their genes (Vasta, Miller & Ellis, 2004). These environments are organized by culture- the accumulated body of knowledge of a people encoded in language and embodied in beliefs, values, norms, rituals, physical artefacts, institutions and activities that are passed down from one generation to the next (Cole, 1996). Socio-culturalists believe that individual development must be understood in- and cannot be separated from its social/historical context (Cole, 1996; Rogoff, 2003).

The constructivists argue that deep learning will occur only when the learner is actively engaged in operating, upon or mentally processing incoming stimuli (Chin & Williams, 2005). In short, constructivism focuses on knowledge construction, not knowledge reproduction (Herrington & Sanden, 2000). The important influence of children's social and cultural world on their cognitive development is an area that was not addressed by the Piagetian theory. One of the most prominent cultural constructivists was Vygotsky. Lev Vygotsky (1896- 1934) was a prominent proponent of the contextual perspective. Vygotsky's social-constructivists theory of development proposes that children's cognitive development is a function of their interaction with more skilled and more sophisticated partners (Herrington & Parke, 1992). Adopting a social constructivist approach Vygotsky emphasized the social context of learning and that knowledge is mutually earned or inborn.

Vygotsky's central focus is the social, cultural, and historical complex of which the child is part of (Papalia, Olds and Feldman, 2004). According to him the individual's development is a result of his or her culture. Development, in Vygotsky's theory applies mainly to mental development, such as thought, language and reasoning process. These abilities were understood to develop through social interactions with others (especially parents) and therefore represented the shared knowledge of the culture.

Vygotsky viewed cognitive development as a result of dialectical process, where the child learns through shared problem solving experiences with someone else, such as parents, teachers, siblings or peers. Originally, the person interacting with the child undertakes most of the responsibility for guiding the problem solving, but gradually this responsibility transfers to the child. Although these interactions can take many forms, Vygotsky stresses language dialogue. He placed great emphasis on spoken language, arguably the most critical tool that sets us apart from other species. He asserts that "speech is a very powerful psychological tool that lays the foundation for basic structures of thinking later in ones development". It is primarily through their speech that adults are assumed to transmit to children the rich body of knowledge that exists in their culture.

The role of social communication in cognitive development in children's learning is also stressed. To be effective, adult or peer communication must offer a support system or verbal scaffold that helps the child master new skills (Bruner 2000). Scaffolding is the temporary support that parents, teachers or others give a child to do a task until the child can do it alone. Vygotsky thought of scaffolding in learning like scaffolding used to build a bridge. The scaffolding provides support when needed, but it is adjusted and gradually removed as the bridge approaches completion. This researcher feels the above view is important in defining the child's experiences because the pedagogic agenda of schooling is lost when the cultural assumptions of the child are ignored. Children in such situations feel lost, have low esteem and some drop-out from school. Most of those who do so, but make it in their cultural settings through fishing, hunting, farming and pig rearing, do not regret their decision. Thus, Vygotsky's theory is considered appropriate for this research because it gives this study a broader interpretation and outlook in the area of child development.

Review of conceptual literature**Culture and childhood development**

Culture, context and child development are central concerns that have received attention from the disciplines of education and psychology during the last few decades. There is increasing importance of cultural context in psychology and education and it is now being viewed as a major determinant in shaping behaviour. Cole (1996), documents efforts by some psychologists to bring culture into the limelight, notably, Greenfield and Bruner (1996), It is clear that without an understanding of the consequences of culture, explanations for many central aspects of individuals behaviour will remain elusive.

Mokpe/ Kpe Cultural context

This refers to the villages and towns in Fako division in which a child is nurtured either in school or out of school. It is the context in which all action-oriented and shared activities are carried out, that is, either at home, at school or the neighbourhood.

Practical intelligence

It is used in this context to refer to the child's ability to be involved in doing, carrying out action-oriented activities, become aware of information, objects and situations in his cultural environment, and uses them effectively for his or her survival and in problem solving. It is an ethnically specific intelligence that contributes to the child's well-being.

kenj'a

It is used by the people in Fako to describe a child who is practically intelligent in the culture. The child has to be involved in action, creative and problem-solving activities. According to the people, the child is considered smart, has common sense and must possess a certain level of "home-training".

Childhood education

This refers to all educational orientations or experiences that the developing child is exposed to as she/he interacts with people and situations in their environment. For purposes of this research, it will include educational experiences which take place at school, at home or around the neighbourhood.

Quantitative reasoning

This refers to the ability of the child to understand and use quantification and measurement in practical situations during problem solving. For example the child always estimates and measure food, water, kerosene, oil and other useful objects in the community. In other instances children are involved in simple budgeting like making lists of items to be bought from the market. It is important at this stage because children during this period have a quantitative, measurement-oriented approach to many tasks and problems than younger children do (Flavell, 1985).

Pence and Nsamenang (2008) argue that the African context play a critical role in their own development, and have a responsibility for their own self education. According to them, indigenous pedagogy permits toddlers and youngsters to learn in participatory processes in the home, school, community, religious services, peer culture, and other activity settings through 'work-play activities', with little or no didactic support. Other psychologists contend that culture shapes and reflects a society's behaviour, understanding of the world, and attitudes and values. Culture in the Mokpe ethnic group comprises the learned behaviours, beliefs, attitudes that are characteristic of the people. It includes the arts, music, literature, and even the architecture of the people. Like many other African cultures, the Mokpe culture promotes collectivism, that is, the idea that the well-being of the group is important.

Children are expected to demonstrate competence, abilities and skills in life situations. A child who lacks knowledge and skills of what is expected of him/her is termed “dull, lazy, slow and not intelligent” by individuals. Such a child can develop a sense of inferiority if compared to children who easily accomplish tasks and other activities. Erikson believed that good teachers are capable of instilling in students a sense of industry rather than a sense of inferiority. Likewise if children are not giving the opportunity in trying their hands in “doing things”, constructing, exploring and so forth, but are made to watch adults perform these tasks they may develop a sense of inferiority.

Meanwhile, Tchombe (2005) examined a similar example where some Cameroonian children (7-12) as perhaps in other parts of Africa are usually involved in their parents business such as selling in the market, working in the farm, hunting etc. The direct active participation by children in these parental activities influences and enables them to understand some abstract principles and strategies. If for some reasons you bargain low with a child helping out in the store or shade in the absence of the parents, he tells you he will be selling at a loss because they paid higher for the commodity. This indicates an unconscious conceptualisation of the principles of profit and loss by the child. The Cameroonian indigenous education taught the child how to count using the fingers, objects and play local games. There are native names for numbers and children also learn different formulas used in games, dances, singing, drumming, tilling the soil and other useful activities in the environment. For example when they play games like hopscotch (“Tabala”), seven stones (seven-seven) their cognitive abilities are stimulated since they add, subtract, multiply and divide. As they make body movements in traditional dances they know the number of steps to make, how many times to clap and when and how to make other useful movements.

Culture and emerging practical intelligence in quantitative reasoning in childhood

As our society becomes more information, skills dependent, and as technology becomes a part of everyday life there is an increased need for children to be quantitatively literate. Although the concept of quantitative reasoning has been a measurement goal from early in the 20th century (e.g., Thorndike et al., 1924), systematic treatment of quantitative reasoning as a cognitive process distinct from mathematics as content or curriculum did not begin to take shape until much later. What is new in modern thinking about quantitative reasoning is not its inclusion in the curriculum, since it has been there for the schooling of the elite for many years, but rather its inclusion in curriculum intended for the masses. In cooking for example, children are taught the proportionate mixture of ingredients to produce tasty food. Measurements in lengths, width and depth are done using the arms, chest and legs.

For the purpose of this study the construct of quantitative reasoning can be referred to as the ability to analyze quantitative information, including the determination of which skills and procedures can be applied to a particular problem in order to solve arrive at a solution. It is, therefore, not restricted to skills acquired in mathematical abilities, but includes close up reasoning abilities developed over time through practice in almost all educative, as well as in everyday activities such as estimating, measuring, budgeting and shopping. Like other aspects of cognitive development, quantitative reasoning in children improves with age. Children are expected to conform to behaviours that warrant them to measure, arrange, estimate and perform cognitive tasks that involve the use of quantification.

In the everyday life of the Cameroonian child, just like the Fako child she/he plays, cooks, fetches water and wood, goes to the farm, dances etc. He/she counts, estimates and measures objects and liquid. All these require both mathematical and quantitative reasoning. For example in preparing a simple pot of soup, the child at Six already knows what quantity of ingredients to use to make it taste well. He/she doesn't need any measuring equipment. He/she estimates the quantity of water and other ingredients like salt, onions, pepper, maggi, oil and many other valuable ingredient used especially as the typical African love spicy foods. Children also estimate time to start and finish a task and time to cover a walking distance, especially as they are always trekking to their destinations most of the time.

ISSN 2792-4025 (online), Published under Volume: 2 Issue: 6 in Jun-2022

Copyright (c) 2022 Author (s). This is an open-access article distributed under the terms of Creative Commons Attribution License (CC BY). To view a copy of this license, visit <https://creativecommons.org/licenses/by/4.0/>

In nearly all homes, children are expected to do some morning chores before going to school. A child knows that if I get up at 6 o'clock in the morning, I am supposed to fetch water and fill the containers, wash dirty plates and pots, bath myself and use at least thirty minutes to trek to school.

METHODOLOGY

Research Design

The study is a descriptive survey research design which makes use of data triangulation both quantitatively and qualitatively. This use of multi-method approach provides a systematic description that is factual and accurate. Multiple data sources such as the questionnaire with closed and open-ended questions were used to obtain diverse views on the above topic. The researcher adopted a triangulated technique not only because of its suitability for this study, but also because it afforded the advantage to explore varied parameters in the cultural context that the study permitted. This multi-method approach was aimed at provoking contrasts, similarities, comparisons or responses during the research process.

The Research Setting

This study was carried out in Fako division in the southwest region of the Republic of Cameroon. Fako division is located on the slopes of Mount Cameroon between latitude 4°3' and 4°21' north of the equator and longitude 9°9' and 9°21' east of the Greenwich meridian. The area also extends to the coast of the Atlantic Ocean. Administratively, there are four sub-divisions that make up Fako Division. The people of this division experience two distinct seasons, the rainy season and the dry seasons. The Mount Fako from which the division derives its name from is the main physical feature and it is about 13,350ft Or 4070metres above sea level. It is noted for its active volcanicity and is the highest mountain in West Africa.

Sample of the Study

The sample was made up of thirty Children from Fako division purposefully selected for the interview/self-reports. 220 participants were also purposefully selected for this study. After the first tendencies of the pilot study results, the researcher then administered 220 questionnaires to selected respondents. The selection of samples thus incorporated children, parents and teachers of different combinations of status, sex, age, marital status, family type, education and religious background.

Sampling Technique

The purposive sampling technique was considered appropriate for the selection of individuals and children for this study. The researcher used her own judgement regarding the participant from whom information will be collected. Based on her experience, the researcher identified those she considered had information she needed.

Instruments

The instruments used for data collection in this study included: children's self-Reports/ face-to-face interview, informal dialogue, field notes and questionnaire.

Interviews/Self-Reports: This is a structured face-to-face child friendly interview and self-report intended to solicit information from children on activities, tasks and responsibilities they are involved in. It was organized for thirty children of the ethnic group raised up in the Fako community. The self-reports were basically structured to collect information directly from the children to get their unique perspectives.

The Questionnaire: The design of the questionnaire was anonymous with no names written by the selected respondents. It was designed by the researcher to comprise three sections. Firstly, there is an introductory section, then section "one" which contain background and demographic information of

the respondents and finally section” two” containing questionnaire items on the components under investigation.

The questionnaire comprised of 45 closed-ended and open-ended questions distributed to 220 respondents, but the rate of returns was 21questionnaire. The questions ranged from those dealing estimation, measurement of quantities, space , games etc The questions were framed using simple language understood by each respondent.

Reliability and Validity of Instruments

The study first employed both face and content validity. In order to ensure face validity, the questionnaire was submitted for cross checking to some colleagues and lecturers of the faculty for scrutiny. A pilot study was also carried out with 30 parents and teachers with similar characteristics. The weighted mean of responses to questionnaire items were calculated. This gave rise to two sets of means of items. The Pearson –moment correlation coefficient of the two means was calculated in order to determine the reliability coefficient. Construct validity was also enhanced through review of the draft report by peers, participants and informants involved in the study.

Data Analysis Plan

In the interview data analysis, the researcher tape-recorded interviews/self reports from thirty children. The interviews took place in the homes and classrooms of the interviewees or in other secure and quiet places. Since most of them were shy, interviewees were encouraged to speak in the language in which they were most comfortable. They preferred responding in pidgin considered an in-group language among the people of this community. The analysis of the transcribed data of the interviews/self reports for these children involved identifying key categories and themes that emerged from the data for each of the research questions. The children’s interviews or self report was classified into categories and after the interview the statements from the children were analyzed in detail, line- by-line according to themes. The quantitative data were subjected to descriptive and inferential statistical analysis using Statistical Package for the Social Sciences (SPSS) (Version 12). This software is generally used for descriptive data analysis, exploratory statistics and comparisons between groups .

PRESENTATION OF RESULTS

Table 1- Specifications of the Interview Codes and Construct

<u>Emerging practical Intelligence</u>	<u>Interview Constructs</u>
--	-----------------------------

Themes on quantitative reasoning:

Quantitative skills-----measuring items and objects in required sizes, estimating distance, time, shapes etc

Sharing skills----- sharing food, slicing meat, fish, objects

Verification of Results

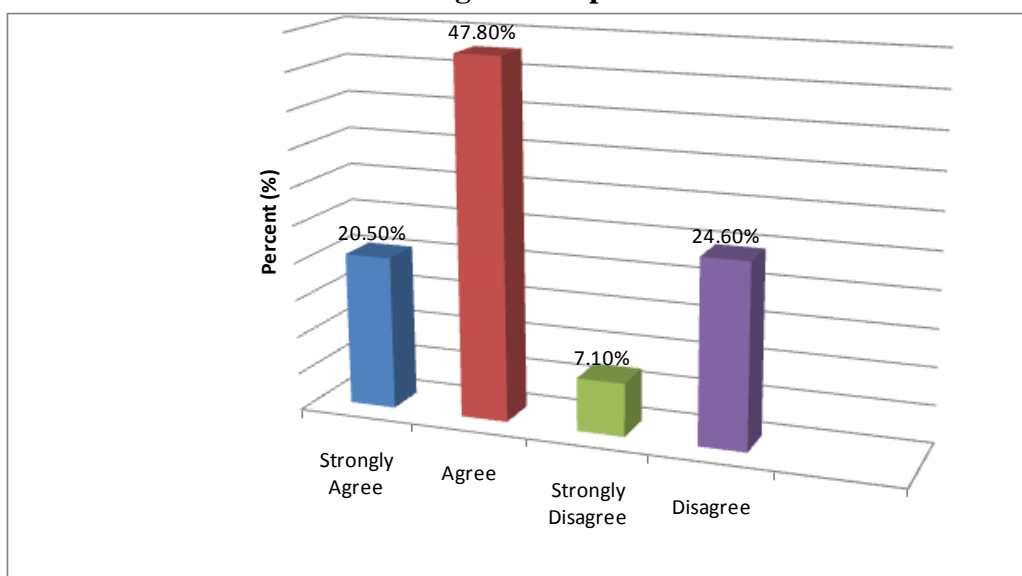
The main research question sought to find out if the cultural context of development attach great importance to behaviours indicative of conformity with quantitative reasoning for the emerging practical intelligence of the Child?

Table 1: Weighting of Indicators using MRS based on the number of responses from respondents on QR of the child

Quantitative Reasoning	Strongly agree	Agree	Strongly disagree	Disagree	Total
Can practically tell objects that weigh more than others	113 (54.3)	82 (39.4)	3 (1.4)	10 (4.8)	208 (100.0)
Can properly measure quantity of oil to use for cooking	25 (12.1)	97 (46.9)	19 (9.2)	66 (31.9)	207 (100.0)
Uses exact measurement of ingredients when cooking e.g. salt, pepper, oil etc	13 (6.2)	93 (44.5)	25 (12.0)	78 (37.3)	209 (100.0)
Use normal quantity of water when boiling foods like cocoyam's, rice, plantains	17 (8.2)	122 (58.7)	14 (6.7)	55 (26.4)	208 (100.0)
Shares food equally among siblings (brother and sisters)	27 (12.9)	91 (33.3)	18 (8.6)	74 (35.2)	210 (100.0)
Knows the different in quantity of food served for father and mother	88 (42.3)	100 (48.1)	6 (2.9)	14 (6.7)	208 (100.0)
Can slice meat and fish in required sizes	16 (7.7)	111 (53.6)	18 (8.7)	62 (30.0)	207 (100.0)
Aggregated score using MRS	299 (20.5%)	696 (47.8%)	103 (7.1%)	359 (24.6%)	1457 (100%)

According to the aggregated score 299 (20.5%) are for 'strongly agree', 696(47.8%) for 'agree', 103(7.1%) for 'strongly disagree' and 359(24.6%) are for 'disagree'.

Figure 1: Bar chart describing aggregated score based on respondents responses on quantitative reasoning of the Kpe child.



The bar chart above gives a graphical display of the final result of respondents' responses according to percentages. It shows the rating in percentages respondents' responses on level to which they strongly agree, agree, disagree and strongly disagree to the concept of MA. This ties with the aggregated scores presented on the frequency table.

Table 2- Weighting of indicators responses from respondents on quantitative reasoning of the child collapsed into two categories

Quantitative Reasoning	Agree	Disagree	Total
Can practically tell objects that weigh more than others	195 (93.8)	13 (6.3)	208 (100.0)
Can properly measure quantity of oil to use for cooking	122 (58.9)	85 (41.1)	207 (100.0)
Uses exact measurement of ingredients when cooking e.g. salt, pepper, oil etc	106 (50.7)	103 (49.3)	209 (100.0)
Use normal quantity of water when boiling foods like cocoyam's, rice, plantains	139 (66.8)	69 (33.2)	208 (100.0)
Shares food equally among siblings (brother and sisters)	118 (56.2)	92 (43.8)	210 (100.0)
Knows the different in quantity of food served for father and mother	188 (90.4)	20 (9.6)	208 (100.0)
Can slice meat and fish in required sizes	127 (61.4)	80 (38.6)	207 (100.0)
Aggregated score using MRS	995 (68.3%)	462 (31.7%)	1457 (100%)

The table shows that a higher percentage have 'agree' to most of the items (68.3%) as compared to those who disagree (31.7%).

Quantitative results on the research question

The weighting of responses indicate that for quantitative reasoning, respondents responded more to the following concepts, 'can practically tell objects that weigh than others(93.8%)' knows difference of food served for father/mother(90.4%)' and 'uses normal quantity of water when boiling foods like cocoyams, rice' (66.8%) etc. The other percentages for the responses then follow with relatively high proportions ranging between 56.2 and 61.4%.

The summary results, (table 1) also revealed a total result of 20.5% for strongly agree, 47.8% for agree, 7.1% for disagree and 24.6% for strongly disagree. The final result on table 2, shows that quantitative reasoning has a total of 68.3% for agree and 31.7% for disagree.

Qualitative data: Analysis of interviews and open-ended questions for the research question

Table 3: **Indicators/concepts raised by respondents on QR in interviews and open-ended questions on quantitative reasoning of the child**

Quantitative reasoning abilities of the child raised during interviews/open-ended questions		
A	Estimate capacities and loads	Estimate the quantity of water to fill buckets, Quantities of foodstuff or wood he/she can carry comfortably over a certain distance, water or wine
B	Measuring items	Kerosene, food stuff, water, rationing food
C	Harvesting	Ready crops, re-planting
D	Fishing	Fish, crabs, shrimps, lobsters
E	Picking	Used papers, leaves, dirt, emptying trash cans
F	Scaling/Smoking fish	Scaling, slicing, smoking fish, sunning
G	Cooking	Cocoyam, rice, soup, kwacoco, ekwang
H	Caring/tethering domestic animals	Pigs, fowls, pigs, goats, sheep
I	Caring for siblings	Feeding, bathing juniors, cuddling,
J	Farming	Making ridges, burning grass, estimating the number of grains to plant in a hole, planting different species of seedlings
K	Appreciation/discernment ability	Can differentiate rough and smooth, clean and dirty, fit and unfit

N.B. Not all codes here are generated from the questionnaire; some were deduced or inferred from existing concepts

Positivism transition

The weight of concepts/responses is measured by their frequencies and proportions using Multiple Response Set Approach

Table 3: **Percentage based on respondents' responses and cases on QR of the child.**

Quantitative reasoning			
Estimate capacities and loads	32	4.2	15.8
Measuring items	45	5.9	22.2
Fishing	1	0.1	0.5
Scaling/Smoking fish/food preservation	1	0.1	0.5
Cooking	9	1.2	4.4
Caring/tethering domestic animals	6	0.8	3.0
Caring for siblings	1	0.1	0.5
Farming	7	0.9	3.4
Appreciation/discernment ability	7	0.9	3.4

Open-ended Questions, were analyzed using the MRS. Indicators with high number of response include, measuring items, estimating capacities and load and cooking.

Discussion of findings

The weighting of responses indicate that for quantitative reasoning, respondents responded more to the following concepts, 'can practically tell objects that weigh than others(93.8%)' knows difference of food served for father/mother(90.4%)' and 'uses normal quantity of water when boiling foods like cocoyams, rice' (66.8%) etc. The other percentages for the responses then followed with relatively high proportions ranging between 56.2 and 61.4%.

The summary results, also revealed a total result of 20.5% for strongly agree, 47.8% for agree, 7.1% for disagree and 24.6% for strongly disagree. The final result on table 1, shows that quantitative reasoning has a total of 68.3% for agree and 31.7% for disagree. The results revealed that the entire cross tabulated cases were also higher than the calculated p-value of 0.005. This indicates that there were no significant differences between responses of respondents.

Among other major indicators of quantitative reasoning cited, the interviewees and respondents believe that, "measuring items (22.2%)" and "estimating capacity and loads (15.8%), "cooking (4.4%)" and "farming (3.4%)" are all important indicators of practical intelligence in the cultural context in which the child is raised. The qualitative data revealed interesting indicators of behaviours indicative of quantitative reasoning. These include estimation of capacities and loads, Measuring items, sharing food equally, fishing, food preservation, caring for domestic animals, caring for siblings, farming and appreciation abilities.

The statistics also revealed interesting findings. Based on the MRS approach, the aggregated scores on table 1 reveal a percentage of (20.50%) for strongly agree, 47.8% for agree, .24.6 % for SD and 7.1 % for disagree. The collapsed table 2 paints a clearer picture where by a greater proportion of 61.4% are for agree and 38.6 % for disagree.

Generally, the percentages from our data, revealed that parents, teachers and even children, attach great significance to behaviours indicative of practical intelligence in childhood. This implies that all aspects of quantitative reasoning, raised in this study are particularly valuable to the childhood education process. However, this can only be useful and complete if it is considered a joint venture between all the stakeholders in the education enterprise. Educating a child in most African contexts takes cooperation and involvement from educators, parents, families, peers and the community. There is a common saying, "an intelligent child is the pride (happiness) of the village". This implies that although practical intelligence may be valuable in raising children, it may not be the sole responsibility of the home but the entire community, because it is not only the parents who can benefit from a successful child. The researcher is therefore saying that, school has to complement its role with other stakeholders such as the parents, the peers and the community. Research has shown the greater the family and community involvement in schools, the greater the learners' achievement. This is evident in research findings, including this study, which uphold the African indigenous knowledge systems has something to contribute to the growth of the child.

Discussion of Research Findings

Specifically, the objective of this study was to examine and highlight:

The value attached to behaviours indicative of Quantitative reasoning;

The main research question was aimed at highlighting the importance of behaviours indicative of conformity with quantitative reasoning on the emerging practical intelligence of the child in childhood education. The data on quantitative reasoning also revealed 68.3% for agree and 31.7% for disagree. Following responses from respondents and responses from the children, it was realized that children perform tasks and duties which warrant them to exhibit a level of quantitative reasoning. The qualitative data revealed interesting indicators of behaviours indicative of quantitative reasoning. For

example, the acquisition of the concept of a unit measure makes it possible for older children to make exact quantitative measurements (Flavell, 1985). Together with their greater knowledge of mathematics, this knowledge probably leads them to approach many tasks and problems with more quantitative, measurement-oriented set than is true of younger children. From a Piagetian perspective, the child reaches the concrete operational stage of reasoning by the age of 7. This suggests that children at this developmental stage are able to reason mathematically and quantitatively through concrete applications and not through abstract rules.

A closer look at Banhardt and Kawagley's (2005) model on the ice berg reveal similar features of quantitative reasoning in deep culture to those around Fako Division and Cameroon as a whole. They emphasize the need for education to go beyond the surface and folk cultures and reach the deep culture, which is also vital to this research. That way we may manage to bring out people's ways of living and other aspects into the formal school curricula for the benefit of the pupils and our communities. The argument advanced here is that each of the items in the deep culture is a rich body of complementary knowledge and skills that, if, properly hybridized with the formal school curriculum could strengthen the quality of educational experiences for learners.

Quantitative reasoning according to the researcher include, estimation of capacities and loads, measuring items, fishing, food preservation, sharing food, caring for domestic animals, caring for siblings, farming and appreciation ability. These are all part of the culture which education has to deal with. Failure to perform these tasks or do so poorly places a child in a position of labeling from both parents and members of the immediate community. These indicators are important because the child at the early stage is always measuring liquid like oil, Kerosene, water and other ingredients used for cooking. She/has to share food and make sure that the quantity is equal to the age or status each member in the family has.

Thus the second objective stated for this study was realized.

In sum, one can comfortably argue that based on the findings, practical intelligence is highly prized and valued in the cultural context of the growing child. This is consistent with the Vygostkian theory which shows many changes in children's thought processes and behaviour centering around this age-group are related to the cultural background. This has been echoed by authors who argue that some abstract abilities are available to children at the concrete operational period which can be attributed to environmental and cultural influences (Tchombe, 2005). Bruner (2005) also sees cultural experiences as vital in determining and shaping growth. The researcher believes that the cited examples readily fit the Vygotskian perspective which says that the surrounding culture support child's learning. This underscores the importance of considering the cultural context in our evaluation of children's cognitive development (Rogoff, 1990).

Contributions to knowledge and psychological research

The findings of this study reveal that there is a gap between the formal education system and the indigenous system where practical intelligence is valued. This research also highlights the fact that intelligence is culture context dependent. This calls for culturally sensitive planning and implementation of programmes that affect children's well-being. There is a dire need for conceptualizing and repositioning of the curriculum to suit the African context. As Endeley & Zama (2021) puts it, in the face of rapid changes that would affect curricula in no small measure, there are wake up calls for reconceptualising the curriculum of the 21st century.

This researcher advocates for the creation of a Multiple Path-way Education (MPE) framework. This will be a "with-in" the same school programmes with many learning areas such as supportive social spaces. Children who cannot continue or cope with general education programmes will be encouraged to branch-off to any of the MPE programmes.

ISSN 2792-4025 (online), Published under Volume: 2 Issue: 6 in Jun-2022

Copyright (c) 2022 Author (s). This is an open-access article distributed under the terms of Creative Commons Attribution License (CC BY). To view a copy of this license, visit <https://creativecommons.org/licenses/by/4.0/>

It is also necessary to come-up with an integration mechanism that will enable the formal and indigenous systems to function together. This will entail extracting important details from both systems to come up with what has been termed “hybridized” education.

It will be important to continue with and co-ordinate the teaching and learning of knowledge, skills, values, norms through the use of local languages especially at the early childhood stages of education. This will be championed by custodians of special traditional skills and knowledge like elders, models and notables. This will also encourage the teacher-parent partnership that has to exist in the education of children.

It will be important to introduce learning and teaching of local skills in mother tongue or local languages especially at the early stages in education. This will encourage the use of local languages and enhance the standardization of indigenous languages. Local knowledge (indigenous knowledge) needs to interface with global scientific knowledge, each drawing on the other to effect sustainable adaptation to natural and socio-economic environments.

Educational reforms should engage a child-rights-approach (CRA) where children’s input has a real effect on decisions about their lives. Children should be able to choose and learn what they think is best for them and not what is considered best by the teacher or parents. They should however be able to choose from what is available in their environment and take indigenous knowledge into consideration in order to make learning more relevant.

Recommendations for Child Psychology and Education

The home must provide an enabling environment and contribute in the education of the child. Children as early as three years the child must be “*responsibilized*” and become involved in problem solving skills and running of the household. He or she can run errands, fetch water, pick dirt around and even care for younger siblings. Although this may highlight the economic or utilitarian value of having children, whereby children contribute to the household economy and chores, in the African context children are considered practically intelligent, smart and responsible.

The government need to train personnel, provide regular in-service training, and organize workshops and refresher programs aimed at inculcating knowledge, hands-on-minds-on activities, competences, skills and values considered valuable by the community.

The Ministries of Basic and Secondary education and related Ministries should increase access to quality continuing education programmes as another avenue of educational provision for young learners and out-of-school youths. The educational system should adopt a multiple paths education (MPE) which will include learning areas such as academic, technical, vocational, special, gifted and talented to enable children learn practical and occupational skills and competences. Such a comprehensive programme must be undertaken in cooperation with other institutions of society, sister Ministries and seek to maintain strong ties with parents and community.

There is a need for indigenizing the psychology of human intelligence in sub-Saharan Africa, through programmatic research (Mpfu, 2004). This researcher is also of the opinion that the indigenization and integration of the psychology of human intelligence could be greatly enhanced if training programmes in psychology in Africa were more sensitive to the local cultural environment. In that connection, the establishment of a consortium on research in human development in Africa could support the indigenization effort by facilitating the training of a crop of researchers with a greater consciousness of local meanings and values. Psychologists like Mpfu, Nsamenang, Serpell, Dawes and Grigorenko argue that there is tremendous potential in developing a psychology of human intelligence that is true to sub-Sahara Africa. Greater success with that enterprise has the potential to positively influence indigenization in other areas of education and psychology.

Conclusion

This emic investigation into the cultural context of childhood development in Fako Division of Cameroon has indicated that childhood education in most African settings emphasize *responsibilization* of the child in the social, cognitive, physical and spiritual domains. It corroborates similar Africentric studies by Serpell, Berry, Grigorenko, Tchombe, Bruner, Nsamenang, Dasen, Irvine and Sternberg on the importance of culture on the development of intelligence. It has revealed several themes and indicators that warrant further attention. Like the biblical saying which says, train a child to follow the right path and he will live upon it when he is older. This is rewarding in the sense that when caregiver commence child upbringing with “home-training skills” early in life, there are cognitive and socio-emotional benefits.

In all, the psychology of intelligence is necessary in thinking and planning of curriculum at all levels (Tchombe, 2005). Thus parents contributions, teachers and stake holders input will go a long way to help children learn the ways of their culture necessary for problem solving and survival. This will protect children against today’s vices by inculcating the right values, norms, abilities, competences and skills. Like the emerging constructivist perspective of Vygostky, that this study stems from, practical intelligence is valued in our culture and should be inculcated into the teaching-learning process.

References

1. Barnhardt, R. & Kawagley, O. A. (2005). “*Indigenous Knowledge Systems and Alaska Native Ways of Knowing*”. *Anthropology and Education Quarterly* 36(1): 8-23.
2. Bruner, J.S.(2005). *The process of education*. Harvard University Press: Massachussets..
3. Carraher, T.N., Schliemann, A.D. & Carraher, D.W. (1988). *Mathematical concepts in everyday life*. *New Directions of Child Development*, 41.71-87.
4. Cole, M., & Engestrom, Y. (2005). *A Cultural Historical Approach to distributed cognition*. In G. Solomon (ed). *Distributed cognitions: Psychological and educational considerations* (pp. 1 – 96). Cambridge: Cambridge University Press.
5. Endeley, M. & Zama, M. (2021), *Perspectives in Curriculum Studies*. Spears Books. Denver.
6. Erikson, F. (1997). Culture in society & in educational practices. In T.A. Banks & C.A.M. Banks (Eds.). *Multicultural education: Issues & perspectives* (pp.32-60) Boston: Allyn & Bacon.
7. Flavell, J.H. (1995). *Cognitive Development*. New Jersey: Prentice Hall Inc.
8. Grigorenko, E. L., Geissler, P. W., Prince, R., Okatcha, F., Nokes, C., Kenny, D.A., Bundy, D. A., & Sternberg, R. J. (1999). *The organization of Luo conceptions of intelligence: A study of implicit theories in a Kenyan village*. Submitted for publication.
9. Mpofu, E. (2008). Being intelligent with Zimbabweans: A historical and contemporary view. In R. J. Sternberg, (Ed.). *International handbook on the psychology of human intelligence*. NY, NY: Cambridge University Press.
10. Mpofu, E. (2002). *Indigenization of the psychology of human intelligence in Sub-Saharan Africa*. In W. J. Lonner, D. L. Dinnel, S. A. Hayes, & D. N. Sattler (Eds.), *Online Readings in Psychology and Culture* (Unit 5, Chapter 2), (<http://www.ac.wvu.edu/~culture/index-cc.htm>), Center for Cross-Cultural Research, Western Washington University, Bellingham, Washington USA.
11. Nsamenang, B.A (2010). *Contemporary Issues in Early Childhood*. Volume 11 number 1, 2010, www.worlds.co.uk/CIEC.

12. Nsameng, B.A.(2004).*The Teaching-Learning transaction: an Africentric approach to educational psychology*. Bamenda: HDRC Publications.
13. Ogbu J.U (1994)From cultural differences to differences in cultural frames of reference in P. Greenfield & R .R Cooking(Eds) ,N J: Erlbaum
14. Pence, A & Nsameng, B (2008). *A case for early childhood development in sub-Saharan Africa*. Working paper No.51. The Hague, The Netherlands: Bernard Van Leer Foundation.
15. Rogoff, B. (1990, 2003). *Apprenticeship in thinking: Cognitive development in social context*. New York: Oxford University Press
16. Irvine, S. H. (1972). The African contribution to new thinking about intelligence. In S. H. Irvine, & J. T. Sanders (ed.), *Cultural adaptation within modern Africa* (pp. 97-102). New York: Teachers College Press.
17. Serpell, R. (1977). Estimates of intelligence in a rural community in eastern Zambia. In F. M. Okatcha (Ed.). *Modern psychology and cultural adaptation* (pp. 179-216). Nairobi: Swahili Language Consultants and Publishers.
18. Serpell, R. & Boykin, A. W. (1994). Cultural dimensions of cognition: A multiplex, dynamic system of constraints and possibilities. In R. J. Sternberg (Ed.). *Thinking and problem solving* (pp. 369-408). New York: Academic Press.
19. Tchombe, T.M. (2004). *Psychological Parameters in Teaching*. Yaounde: Presses Universitaire d’Afrique.
20. Thorndike, E. L., Cobb, M. V., Orleans, J. S., Symonds, P. M., Wald, E., & Woodyard, E. (1924). *The psychology of algebra*. New York: The Macmillan Company.
21. Vygotsky, Lev Semonovich(1896-1934), MIA: Encyclopaedia of Marxism: Glossary of people, <http://www.marxists.org/glossary/people/v/y/htm>