

Indigenous Play/Game and Developing Executive Functioning During Late Childhood

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How to cite this paper: Etta Roland Daru | Joseph Lah Looh | Charles Teke Ngenwih | Arreybesong Ako Ettah "Indigenous Play/Game and Developing Executive Functioning During Late Childhood" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-3 | Issue-5, August 2019, pp.302-314, <https://doi.org/10.31142/ijtsrd25306>



IJTSRD25306

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ABSTRACT

Indigenous play is a traditionally conceive art of art or representation of a culture. The impact of indigenous play/game on executive functioning could enrich both sociocultural and cognitive science-oriented research. This study examined indigenous play/game and developing executive functioning of children during late childhood in Eyumojock. The main research objective was to determine the influence of indigenous play/game on the executive functioning of children during late childhood in Eyumojock. From the research objective research hypothesis was formulated. A mixed method research design was adopted for this study. A total of 300 children (age range 09-11 years) served as participants in the study while 50 children and 10 parents took part in focus group discussion and interview. Data were collected with the use of questionnaires, Focus Group Discussion (FGD) and interviews. Inferential and Descriptive statistical techniques were used to analyze data. Open-ended questions were analyzed using thematic content analysis. As for the quantitative data, a pre-designed EpiData Version 3.1 (EpiData Association, Odense Denmark, 2008) database which had in-built consistency and validation checks was used to enter the data. Chi-square was used to analyze the quantitative data and a thematic content assessment was used to analyze qualitative data. From the findings, it was realized that there was a significant relationship between indigenous play/game activities children engage in and the development of executive function (Omnibus Tests of Model Coefficient: $\chi^2=52.597$; $P=0.000$). The results revealed that culture significantly correlate with various dimensions of executive functioning. Again, findings reveal that executive functioning is significantly affected by indigenous game. Furthermore, the findings from this present study show that culture provides a framework for our behavioral and affective norms. This implies that it is necessary to utilize the results of this study to implement programs or courses in education that will inform people about the relevance of culture in the development of executive abilities in children. Following the findings of this study and based on the study problem, it was discovered from the variables under study that a good proportion of children in eyumojock community are seen to be appreciative of their culture in their own development and which in turn affects their executive functioning.

KEYWORDS: indigenous play/game, executive functioning, childhood

INTRODUCTION

Executive function (EF) is a collection of effortful top-down cognitive skills that facilitate goal-directed behaviour, predicts developmental outcomes across academic, social-emotional, behavioural, and health domains (Blair & Razza, 2007; Miyake, 2000; Riggs, Jahromi, Razza, Dilworth-Bart, & Mueller, 2006; Riggs, Spruijt-Metz, Chou, & Pentz, 2012). Despite the moderate heritability of EF, early experience exerts a strong influence through parenting, attachment, and the household environment (Bernier, Carlson, Deschênes, Matte-Gagné, 2012; Hughes & Ensor, 2009). Executive function development is particularly influenced by early experiences (running errands, house chores among others) as it permits the structuring of the child's thinking as he/she engages in these activities. As stipulated by the earliest executive function researchers Vygotsky and Luria, influences of familial context (e.g., expressiveness, skill

scaffolding) are inexorably linked to neuropsychological skill development (Bodrova, Leong, & Akhutina, 2011; Schroeder & Kelley, 2009). However, pathways through which diversity in families' cultural and cross-cultural identities affect executive function during childhood have received limited consideration. This is particularly surprising given that a number of processes that intersect with, but are notably distinct from EF (e.g., emotion regulation; self-regulation), have received substantial attention in developmental cultural research and reviews (Brown, Craig, & Halberstadt, 2015; Keller & Otto, 2009; Li-Grining, 2012; Matsumoto, Yoo, & Nakagawa, 2008; Trommsdorff, 2009).

Delineating the impact of culture on executive function could enrich both sociocultural and cognitive science-oriented research (Deater-Deckard, 2014). From a sociocultural

perspective, investigating how executive function is influenced by cultural environmental factors could establish the key “ingredients” through which individuals’ behaviours and thinking come to reflect their culture. From a cognitive science perspective, identifying mechanisms through which environments shape developing brains would help explain individual differences in EF and inform assumptions about the universality and diversity of “normative” development. Current EF research rarely includes assessments of culture, and cultural research typically does not incorporate the measurement of EF. This study investigates indigenous play/game on the executive functioning of children in late childhood (9-11 years old) with particular attention to children in Eyumojock of Cameroon. In this regard, specific components of culture such as indigenous play/games activities children engage in (seven stones), cultural value system (respect for authority/elders), traditional dance (Monikim), and secret society (Ekpa) are examined in relation to the role they play in fostering executive function development among 9-11 years children. In this light, this chapter presents the background to the study, statement of the problem, objectives of the study, research questions, hypotheses, justification of the study, significance of the study, scope of the study and the operational definition of terms.

Statement of problem

What influence does indigenous play/game have on the executive functioning of children during late childhood? Most academicians acknowledge that cultural activities have an influence on the executive functioning of children but the extent to that has being an open question. There have been a continual decrease in the use of cultural tools in the training of children in our traditional community. Knowledge about cultural activities and its usage in recent times is extremely limited especially in the Cameroonian context and without this knowledge it is difficult to educate and empower children into the fullness of their realities and in turn improving executive functioning abilities. Specifically, cultural practices provide real-world environments in which children can develop executive functioning skills. Although cultural activities have a significant impact on the development of executive functioning in children, the use of these cultural activities and strategies (indigenous games, respect for elders, beliefs among others) for educating and socializing children is gradually declining in African societies. Earlier among Eyumojock people, children learned different social and cognitive skills from indigenous games/play, apprenticeship, survival and problem solving skills in close groups (secret societies), traditional value systems and traditional dance through parents or adults who engaged them in these activities as they were raised. This is not the situation today. In recent times, the practice is seen as outmoded and antiquated with the coming of gadgets like television, radio, mobile phone, parents and children prefer to focus on these than on traditional heritage. In modern times, information and communication technologies seem to have made so many inroads into African traditions relegating traditional lore, values and mores into the background. Indigenous game/play like seven stones, value systems (respect for authority), traditional dance (Minikim), secret society (Ekpa) which have the potential to be used as educational tools, are rarely exploited at home or schools. Through experience in primary and secondary education, I have observed that not much emphasis is attached to this cultural resource. This is unfortunate because many young

people grow up without knowledge and appreciation of their cultural way of thinking which largely promotes executive functioning (planning, problem solving, and working memory) and socializing. If this situation is not addressed, African cultures stand the chance of losing these crucial means of preserving their cultural values and wisdom. Hence this study seeks to investigate the effect of culture on the executive functioning of children in late childhood in Eyumojock society.

Literature review

Culture

Culture in the traditional Ejagham community is understood as a way of life of the people. This premise confirms the fact that there can be no people without a culture. To claim that there is no society without a culture would, by implication, mean that such a society has continued to survive without any form of social organisation or institutions, norms, beliefs and taboos, and so on; and this kind of assertion is quite untrue. That is why even some Western scholars who may be tempted to use their cultural categories in judging other distinctively different people as “primitive”, often deny that such people have history, religion and even philosophy; but cannot say that they have no culture Idang (2015).

Hall (1959) opined that the cultural context in which human communication occurs is perhaps the most defining influence on human interaction. Culture provides the overall framework wherein humans learn to organize their thoughts, emotions, and behaviours in relation to their environment. Although people are born into a culture, it is not innate. Culture is learned. Culture in a typical Ejagham setting teaches one how to think, conditions one how to feel, and instructs one how to act, especially how to interact with others—in other words, how to communicate. In many respects, the terms communication and culture can be used interchangeably. Yet the influence of culture on human interaction is paradoxical. As we conduct our daily lives, most of us are unaware of our culture; however, culture influences our every thought, feeling, and action Hall (1959).

In my view, culture as a social construction has received considerable attention in developmental science. As it has entertained a growing data generation, as scholars continue to explore and make meaning to its implication in human development. From literature consulted, there have not been any single, unified definition of culture. As different scholars have coined and adopted varied definitions as it sooth their context. As such, it is context specific in terms of beliefs, value systems, and ceremonies, among others. As broadly as the concept of culture is, it has made substantial influence on human development –child development. Most scholars generally, agree in defining culture as a community with a shared system of practices, activities, meanings and artefacts, in virtue of a common socio-demographic profile (Keller, 2013; Keller, Borke, Chaudhary, Lamm, & Kleis, 2010; Greenfield, 2009).

The practice of Indigenous play/game

Warren (1991) has defined indigenous knowledge as the basis for decision making at the local level. Such decisions have a bearing on key issues such as societal norms and values, socio-economic issues such as socialisation of the young, food production, processing and preservation as well as natural resources management. This shows that it differs from that type of knowledge that universities, research institutions and private companies generate. To this end,

Nyota and Mapara (2007) have remarked that indigenous knowledge is that Knowledge that is commonly owned and shared among the inhabitants of a particular community. That is, idea that is easily understood and used by members of a particular locality for some purpose. Similarly, Flavier (1995:3) has defined it as “The information base for a society which facilitates communication and decision-making”. Indigenous information systems are dynamic and are continually influenced by internal creativity and experimentation. These words make it clear that indigenous knowledge systems is not a fossilized type of knowledge but a knowledge that is constantly adjusting to the immediate needs of its community as the need arises.

According to Mosimege and Onwu (2004), indigenous knowledge among which is traditional game is an all-inclusive knowledge that covers technologies and practices that have been and are still used by indigenous and local people for existence, survival and adaptation in a variety of environments. Such knowledge is not static but evolves and changes as it develops, influences and is influenced by both internal and external circumstances and interaction with other knowledge systems. Children involved in traditional games are usually quiet as they concentrate to master the moves of the game and in turn improve on their executive functioning.

World Bank, (1998) Indigenous knowledge provides the basis for problem-solving strategies for local communities. Indigenous knowledge is an underutilized resource in the development process. Learning from indigenous knowledge, by investigating first what local communities know and have, can improve understanding of local conditions and provide a productive context for activities designed to help the communities in general and individuals in particular. Understanding indigenous knowledge can increase responsiveness to engaging children in constructive activities and in turn improve on their executive functioning (World Bank, 1998). Sharing indigenous knowledge within and across communities can help enhance cross-cultural understanding and promote the cultural dimension of human development. In the emerging global knowledge economy a country's ability to build and mobilize knowledge capital, is equally essential for sustainable development as the availability of physical and financial capital (World Bank, 1997). The basic component of any country's knowledge system is its indigenous knowledge. It encompasses the skills, experiences and insights of people, applied to maintain or improve their livelihood.

Indigenous game/play is part of the lives of the indigenous rural children; their livelihood depends almost entirely on specific skills and knowledge essential for their survival Ghosh and Manna (2014). Accordingly, for the development process, indigenous game/play is of particular relevance as it accompany children throughout their development process as it assist in cognitive development and in turn executive functioning abilities and equally entertain these folks. Indigenous knowledge is not yet fully utilized in the development process. Conventional approaches imply that development processes always require technology transfers from locations that are perceived as more advanced. This has led often to overlooking the potential in local experiences and practices Ghosh and Manna (2014).

In my view, as children engage in a variety of indigenous play/games, they use a number of terms in the game. Here is

an opportunity that caregivers can use to correct, introduce and highlight some of the executive abilities (such as planning, time management, problem solving, logical reasoning and counting) that are part of the game. Learners should be encouraged to use the language of mathematics while playing the game so that the understanding of concepts can be equally noted.

Nyota and Mapara (2008), in their survey study on Shona traditional children's games and play songs and indigenous way of knowing found out that, Shona traditional children's games and plays songs as indigenous ways of knowing is fore grounded. This depicts the culture in empowering young people, and eventually permitting them to assume behavioural positions (which is an important strand in executive behaviour). They high light how lessons and cognitive skills valued in Shona culture are embedded in these games and play songs. These lessons and skills are centred on issues such as good behaviour, hard work, total commitment, competition and unity of purpose. One is demanded of these skills even in this industrialised world. The paper thus asserts that the skills and values learnt through these games and play songs prepare the youngsters to take up their adult roles. The games and play songs also provide interactive apprenticeships which the learner child is given guidance to learn and perform these skills and lessons (Nyota and Mapara, 2008).

The games also provide the children with opportunities for mastery of play (mastery is an important strand in cognitive development and in turn executive functioning). They have the opportunity to continue practicing a skill until they are proficient at it. This enables them to gain self-confidence and self-esteem. Berger highlights that the children's games are more than just games when she observes the misconception that most researchers have about these activities. She says, “Most researchers of young children believe that play is the work of childhood” (Berger 2000:306) cited in Nyota and Mapara (2008). The importance of practice is something that the Shona value a lot. The value that is placed on practice is captured in the proverb, “Charovedzera charovedzera, gudorakakwira mawere kwasviba”(Practice makes perfect).

Essentially, this indigenous game teaches youngsters to have an understanding of some aspects of their biophysical environment. The children were expected to learn to identify different types of trees and other plants. This indigenous way of knowing was useful and still is since it can become handy when identifying trees and plants that are used for different purposes such as building, firewood, medicines and herbs, fruits as well as edible roots and tubers. They also learned to identify poisonous plants. Such knowledge implies respect and learning to be at peace with one's environment. It also means that as they will start exercising restraint in the cutting down of trees. The play song teaches responsible citizenship.

The present study equally addresses specific executive functioning abilities: planning and problem solving. Notwithstanding, the current study also motivated by the use of these traditional items as methods and tools of teaching and learning especially in Cameroon's rural community as well as in some urban schools. Acquah, Sackey-Sam, and Annan (2015), in a case study investigating the Use of Indigenous Musical Games and Songs in Developing the Total Well Being of the Child in Ghana resulted that, to support the development of creativity

through music, the musical activity needs to be applied in children. It is evident from the study that Musical games have the potential to provide the basis for the total wellbeing of the child. When children play music, they use various means to express ideas (in this way they are exploring their cognition). It helps children develop the artistic vision and provide the appropriate means of self-expression. Almost all children's songs and games by their nature have in-built training devices. In the context of the games, the Ghanaian child is introduced to many facets of his cultural milieu. He learns some basic skills of work, dance, music, social etiquette, self-defense, morality and battle strategies through musical games thereby affecting his way of thinking, feeling and manipulating things. Musical games depending on the gender type, text and the activity involved can be assessed and used by teachers in the classroom. Variety of games help a child to feel that he/she makes a difference as he/she can give some effect on the world around him/her. It is worth stating that each of the games discussed has an instructional potential in one or two or all of the three

domains of human learning, the cognitive, psychomotor and affective.

Methodology Research design

The study employed a sequential explanatory research design whereby both quantitative and qualitative techniques were used in the study. To begin with, in order to collect quantitative data, a questionnaire made up of close ended items was used in conducting this study. In addition, in order to collect qualitative data, a Focus Group Discussion Guide and an Interview Guide made up of open ended items were also used to complement the questionnaire. In essence the findings from interviews helps explain findings from the questionnaire; findings that may not be identified if one approach was used alone. Undertaking the study sequentially was found to be a sensible and practical way of undertaking the research, where the questionnaire was undertaken first followed by the interviews. It allowed for clarity of collection of data, analysis and evaluation.

Participants Sample

The sample of this study was made up of 300 children (late childhood) and 10 parents selected from 10 villages in the Eyumojock sub-division, South West region of Cameroon. See table 2 below:

Table 1: Representation of sample by Zones/villages of investigation

Zones	villages	Number of participants (children)	Percent (%)	Number of participants (parents)	Percent (%)
Zone 1	Akak Etinkem	40	13.3	2	20
		34	11.3		
Zone 2	Babi Babong	20	6.6	2	20
		54	18.0		
Zone 3	Bajo Bakoko	20	6.7	2	20
		25	8.3		
Zone 4	Araru Ewelle	19	6.3	2	20
		26	8.7		
Zone 5	Njeke Nkogho	30	10.0	2	20
		32	10.7		
Total		300	100	10	100

Procedure

Sampling technique

Both Purposive and convenience sampling techniques were used to select respondents for this study. In getting respondents for the study children consented through volunteering to be part of the study after been schooled on the relevance of the study. This was so because it was difficult to assemble children due to the fact that schools haven't a stable calendar in the community. The purposive sampling technique was used to select participants for the study because the researcher needed children who were within the ages nine and eleven years and parents who are available. In this light, data were collected from 300 late childhood children from ten communities and 10 parents from five villages in the Eyumojock sub-division, South West Region of Cameroon. The rationale for using the purposive sampling technique to select participants for this study was that only children were chosen for the study. More so, the convenience sampling technique was also used because of the absence of statistics on the identity and location of late childhood children in the area. This explains why the Eyumojock Sub-Division was chosen for the study as it was easy for the researcher to get to the area. Another reason for the choice of Eyumojock sub-division was as a result of the fact that little to no empirical work has been carried out on the topic culture and executive function development.

Method of data processing and analysis

Instruments

A triangulation of instruments was used to conduct this study. The data was collected with the aid of 4-point Likert scale questionnaire, interview and Focus Group Discussion Guides. To collect quantitative data a 4 point Likert scale was use. The questionnaire is made up of closed ended items. For each of the items, respondents were required to state how they feel about each item by stating whether they strongly agree (SA), agree (A), disagree (D) or strongly disagree (SD). The questionnaire was made up of two parts. Part one contained items on respondent personal characteristics such as; sex, age, duration of stay in the village, respondent schooling status, respondent class, and by respondent village.

Part two contained items pertaining to the variables of the study. With regards to the indicators of culture; Section "A" contained items and measures pertaining to the indigenous game (seven stones) that children engage in, Section "B" contained

items and measures pertaining to the values children uphold within homes and Section “C” contained items and measures pertaining to traditional dance (monikim); Section “D” contained items and measures pertaining to secret society (Ekpa) children enroll in, Section “E” contained items and measures pertaining to inhibition among children and Section “F” contained items and measures pertaining to working memory and problem solving among children.

Measure

The measures of the current study are discussed here below:

Indigenous play/game

Children’s indigenous play/game skills were measured with a 4 point likert scale. The 4 point Likert scale was made up of 10 items. Items were scored on a scale of (1) = strongly agree, (2) = agree, (3) = disagree, (4) = strongly disagree. Sample items included “I play seven stones with my friends, We have to follow the rules of the game, I usually have the wish or zeal to win the game, When playing, I plan the next move and strategies, while keeping all the rules in mind, I considers what my opponent’s next move will be, based on the move he is taking and the fact that the player must follow certain rules, I think a lot and keep vigilant and visualize the move of my opponent, I enjoy forming teams of two or more members to compete against another, I interact and communicate friendly with my peers when playing the game, I accept my defeat and congratulate my opponent or the winner and I am patient and very concentrated when playing to avoid mistake”.

On the section on indigenous play 10 item were listed and possible scores range from 1 to 4 were higher score indicates indigenous play/game skills. The internal consistency was not violated for all the conceptual components including the Integrated Value Mapping (IVM). The reliability was generally very satisfactory, at 0.879. This therefore indicated that children understood the items and were objective in their responses. The variances were generally very small, close to 0, as to 0.027, implying that we were more likely to experience highly skewed distributions of responses. In another sense, children were more likely to be homogenous in their perceptions or viewpoints.

Table 2: Reliability analysis for the study

Conceptual components	Cronbach's Alpha	Variance	N _{cases}	N _{items}
Indigenous play/game	0.879	0.027	300	10
Executive functioning	0.908	0.003	300	12
IVM	0.961	0.019	300	52

The internal consistency was not violated for all the conceptual components including the Integrated Value Mapping (IVM). The reliability was generally very satisfactory, ranging from 0.877 to 0.961. This therefore indicates that children understood the questions and were objective in their responses. The variances were generally very small, close to 0, as ranging from 0.004 to 0.027, thus implying that we are more likely to experience highly skewed distributions of responses; in the other sense, adolescents are more like to be homogenous in their perceptions or viewpoints.

Results

Characterizing the executive functioning of children

Table 3: Children’s characterization of their executive functioning

Issues	Stretched				Collapsed	
	SA	A	D	SD	A	D
Executive functioning (Working memory)						
Traditional games improves brain activity	45.7% (137)	40.3% (121)	11.7% (35)	2.3% (7)	86.0% (258)	14.0% (42)
I learn concentration	43.7% (131)	42.3% (127)	12.7% (38)	1.3% (4)	86.0% (258)	14.0% (42)
Involves time management	38.7% (116)	43.7% (131)	16.3% (49)	1.3% (4)	82.3% (247)	17.7% (53)
Engage in planning	44.3% (133)	39.0% (117)	14.3% (43)	2.3% (7)	83.3% (250)	16.7% (50)
MRS (Working memory)	43.1% (517)	41.3% (496)	13.8% (165)	1.8% (22)	84.4% (1013)	15.6% (187)
Executive functioning (Inhibition)						
Items	SA	A	D	SD	A	D
I learn patience in playing	48.0% (144)	38.0% (114)	9.0% (27)	5.0% (15)	86.0% (258)	14.0% (42)
Indigenous play/game initiates strategic planning	32.3% (97)	53.7% (161)	10.0% (30)	4.0% (12)	86.0% (258)	14.0% (42)
Indigenous play improves on remembering other facts	36.7% (110)	48.0% (144)	14.3% (43)	1.0% (3)	84.7% (254)	15.3% (46)
Value systems improves skills on time management	42.0% (126)	44.0% (132)	12.0% (36)	2.0% (6)	86.0% (258)	14.0% (42)
MRS (Inhibition)	39.8% (477)	45.9% (551)	11.3% (136)	3.0% (36)	85.7% (1028)	14.3% (172)

Executive functioning (Problem solving)						
Items	SA	A	D	SD	A	D
Play/game improve social communication skills	53.0% (159)	38.0% (114)	6.0% (18)	3.0% (9)	91.0% (273)	9.0% (27)
The games and play songs also provide interactive apprenticeships which the learner child is given guidance to learn and perform these skills and lessons	37.7% (113)	50.7% (152)	9.7% (29)	2.0% (6)	88.3% (264)	12.0% (36)
Social play increase language power and creativity of the participant	44.7% (134)	43.3% (130)	10.0% (30)	2.0% (6)	88.0% (264)	12.0% (36)
Traditional dance routine facilitate effective circulation and in turn thinking	42.7% (128)	44.7% (134)	10.0% (30)	2.7% (8)	87.3% (262)	12.7% (38)
MRS (Problem solving)	44.5% (534)	44.2% (530)	8.9% (107)	2.4% (29)	88.7% (1064)	11.3% (136)
MRS (Executive functioning)	42.4% (1528)	43.8% (1577)	11.3% (408)	2.4% (87)	86.3% (3105)	13.8% (495)

Children's characterization of the executive functioning (working memory) as they engage in traditional games which intend improves brain activity had indicated SA 45.7% (137), A 40.3% (121), D 11.7% (35) SD 2.3% (7), and as collapsed A 86.0% (258) and D 14.0% (42), while children's characterization of executive function as they learn concentration had SA 43.7% (131), A 42.3% (121), D 12.7 (38), SD 1.3% (4) and as collapsed A 86.0% (258) and D 14.0% (42). Equally their characterization of executive functioning (working memory) as they animated on involves time management shows SA 38.7 % (116), A 43.7% (131), D 16.3% (49), SD 1.3% (4) and as collapsed A 82.3% (247) and D 17.7% (53). Similarly, children animated children's characterization of executive function as they engage in planning weighs SA 44.3% (133), A 39.0% (117), D 2.3% (7) and as collapsed A 83.3% (250) and D 16.7% (50). In a nut shell executive functioning (working memory) as indicated by children had weight with A 84.4% (1013) and D 15.6% (187).

Similarly children's characterization on inhibition as indicated on I learn patience in playing 48.0% (144) strongly agree, 38.0% (114) agree, 9.0% (27) disagree, 5.0% (15) strongly disagree and as collapsed 86.0% (258) agree and 14.0% (42) disagree. While children indicated on indigenous play/ game initiates strategic planning as 32.3% (97) strongly agree, 53.7% (161) agree, 10.0% (30) disagree, 4.0% (12) strongly agree and as collapsed 86.0% (258) agree and 14.0% (42) disagree. Again, their characterization on indigenous play improves on remembering other facts weights 36.7% (110) strongly agree, 48.0% (144) agree, 14.3% (43) disagree, 1.0% (3) strongly disagree and as collapsed 84.7% (254) agree and 15.3% (46) disagree. Equally, children's characterization on value systems improves on remembering other facts indicates 42.0% (126) strongly agree, 44.0% (132) agree, 12.0% (36) disagree, 2.0% (6) and as collapsed 86.0% (258) agree and 14.0% (42) disagree. Children generally were open to the elements of inhibition with weight of 85.7% (1028) agree and 14.3% (172).

Children mostly perceived that problem solving in play/game as it improves social communication skills with proportion as collapsed of 91.0% (273) agree and 9.0% (27) disagree, where by 53.0% (159) strongly agreed, 38.0% (114) agree, 6.0% (18) disagree, 3.0% (9) strongly disagree. A proportion of 88.3% (264) acknowledged that games and play songs also provide interactive apprenticeships which the learner child is given guidance to learn and perform these skills and lessons and 12.0% (38) disagree, where by 37.7% (113) strongly agree, 50.7% (152) agree, 9.7% (29) disagree, 2.0% (6) strongly disagree. Closely followed as collapsed 88.3% (264) indicated that Social play increase language power and creativity of the participant while 12.0% (36) disagree, where by 44.7% (134) strongly agree, 43.3% (130) agree, 10.0% (30) disagree and 2.0% (6) strongly disagree.

Those that highlighted the fact that Traditional dance routine facilitates effective circulation and in turn thinking as collapsed with 87.3% (262) agree and 12.7% (38) disagree, whereby 42.7% (128) strongly agreed, 44.7% (134) agreed, 10.0% (30) disagree, 2.7% (8) strongly disagree. By and large children adhered to problem solving as collapsed with weight of 88.7% (1064) agree and 11.3% (136). Whereas, multiple response set on executive functioning indicated as collapsed 86.3% (3105) agree and 13.8 % (495) disagree.

Table 4: Children's characterization of their working memory skills

			Working memory		Total
			Agree	Disagree	
Gender	Male	N	515	93	608
		%	84,7%	15,3%	
	Female	n	498	94	592
		%	84,1%	15,9%	
Total count			1013	187	1200

$$\chi^2=0.07; df=1; P=0.796.$$

Children's characterization of their executive functioning (working memory) as perceived by male has a proportion of 515 (84.1%) agree and 93 (15.3%) disagree making a total of 608, while a female proportion of 498 (84.1%) agreed and 94 (15.9%) making a total of 592. There was no significant difference in working memory ability between male and female adolescents ($P>0.05$).

Table 5: Children's characterization of their Inhibition tendency

			Inhibition		Total
			Agree	Disagree	
Gender	Male	N	526	82	608
		%	86,5%	13,5%	
	Female	N	502	90	592
		%	84,8%	15,2%	
Total count			1028	172	1200

$$\chi^2=0.07; df=1; P=0.795.$$

A proportion of 526 (86.5%) male agreed and 82 (13.5%) disagreed making a while, a proportion of 84.8% (502) female agreed and 15.2% (90) disagreed as perceived characterization of children's executive functioning (inhibition). There was no significant difference in inhibition ability between male and female children ($P>0.05$).

Table 6: Children's characterization of their problem solving skills

			Problem solving		Total
			Agree	Disagree	
Gender	Male	n	542	66	608
		%	89,1%	10,9%	
	Female	n	522	70	592
		%	88,2%	11,8%	
Total count			1064	136	1200

$$\chi^2=0.01; df=1; P=0.934.$$

Children's characterization of their executive functioning (problem solving) indicated 542 (89.1%) of male agreed and 66 (10.9%) of female disagreed. While a proportion of 522 (88.2%) of female agreed and 70 (11.8%) of female disagree. There was no significant difference in problem solving ability between male and female children ($P>0.05$).

Table 7: Children's characterization of their Inhibition tendencies

			Executive functioning		Total
			Agree	Disagree	
Gender	Male	N	1583	241	1824
		%	86,8%	13,2%	
	Female	N	1522	254	1776
		%	85,7%	14,3%	
Total count			3105	495	3600

$$\chi^2=0.07; df=1; P=0.795.$$

On the characterization of children's perception of executive function indicated a proportion of 1583 (86.8%) of male agreed and 241 (13,2%) of male disagreed. Similarly, a proportion of 1522 (85.7%) of female agreed and 254 (14.3%) of female disagreed. There was no significant difference in executive functioning potential between male and female children ($P>0.05$). Children in their focus group discussion emphasize their executive functioning skills and activities within their group.

Decision making: As far their participation in decision-making is concerned, in most instances, they participate in decision making though not all the time for many of them.

The executive functioning skills that facilitate their development were described as followed:

- Planning;
- Problem solving;
- Respect for elders/respect for tradition/obedience;
- Hard work.
- The children display maturity in their relation with others
- Children become constructive and active;
- Children are brave, flexible, well-coordinated;
- Children's actions are well planned.

Children stated that these executive function skills help one to overcome and cope normally with the difficulties that they face in these ways: They are flexible; they are smart/ active; they are quick to bring solutions to problems; Quick in thinking/smart; Plan well/ good problem solvers; they are accurate estimators; and Dancing in itself is a skill.

Children acknowledged that working memory affects children's functioning in the community in the sense that to be able to act/function you should be able to manipulate facts/knowledge in memory, as such memory plays an instrumental part in executive functioning.

Children however were not convinced of the effect of an effective working memory on their executive functioning.

They also perceived that maintaining inhibitory control foster executive functioning in that:

- Permit you to complete task
- Resist distraction
- Concentrate
- Becomes a tool of empowering and educating
- Occupies them and keep them out of trouble, because they will be busy with this activities/ invest time in constructive activities/they learn braveness

They were generally of the opinion that cultural activities assist them in problem solving and managing other difficulties and help them to overcome and cope normally with the difficulties that they face. Other potentials were:

- They are consistent;
- They can set goals and attain it;
- They can plan event and anticipate results;
- They can solve problem.

Within the cultural activities that children belong too, they could maintain mature behavioural control and emotional connections with adults and peers in the sense that they are thought respect/ and how to manage their emotions/they learn patience.

In line with the responses to the question on to what extent the societies reflect the executive functioning development in children, participants of the interviews generally indicated that, “the community strength is based on their cultural heritage”. In addition, one of the interviewees stipulated that:

Based on her experience in the community for 35 years, the activities children engage in are a continuity of the legacies ancestors have left behind and parents have trained and introduced their children to do and be a part of. Thus all the above activities that children engage in are highly encouraged and tolerated by members of the community because the above activities enable children to be; hardworking, creative, learn how to collaborate and tolerate each other, understand the culture, exchange ideas, invent new ways of solving problems, and dependable and helpful to each other especially in times of crisis and need.

With regards to the responses to the question on how and to what extent does a cultural activity help children in developing executive function skills, FGD participants mostly indicated that:

Cultural groups and particularly secret society is a vital tool in formation and remodelling of acceptable behaviours in their community. In which children become messengers of their communities and watch out for one another. Children typically display adaptive behaviours (caring, hardworking, management skill among others) which are a manifestation of executive functioning skills.

In accordance to the responses to the question on the how and to what extent does cultural activities help children in developing executive function skills, FGD participants generally specified that, “cultural activities help children in developing executive function skills as a result of developing adaptive and resilient behaviours”, which help them in the following ways:

- They can constructively carry on discussion
- They pick up house whole managerial skills
- They learn arts and craft
- They can defend themselves in the midst of adversity

Table 8: Children's characterization of their engagement in indigenous play/game activities

Issues	Stretched				Collapsed	
	SA	A	D	SD	A	D
I play seven stones with my friends	55.7% (167)	30.3% (91)	6.0% (18)	8.0% (24)	86.0% (258)	14.0% (42)
We have to follow the rules of the game	32.7% (98)	53.3% (160)	10.0% (30)	4.0% (12)	86.0% (258)	14.0% (42)
I usually have the wish or zeal to win the game	50.3% (151)	31.3% (94)	7.3% (22)	11.0% (33)	81.7% (245)	18.3% (55)
When playing, I plan the next move and strategies, while keeping all the rules in mind	38.7% (116)	47.3% (142)	10.0% (30)	4.0% (12)	86.0% (258)	14.0% (42)
I considers what my opponent's next move will be, based on the move he is taking and the fact that the player must follow certain rules	25.7% (77)	54.7% (164)	16.7% (50)	3.0% (9)	80.3% (241)	19.7% (59)
I think a lot and keep vigilant and visualize the move of my opponent	42.3% (127)	47.7% (143)	7.0% (21)	3.0% (9)	90.0% (270)	10.0% (30)
I enjoy forming teams of two or more members to compete against another	50.0% (150)	35.7% (107)	8.3% (25)	6.0% (18)	85.7% (257)	14.3% (43)
I interact and communicate friendly with my peers when playing the game	44.7% (134)	44.3% (133)	8.0% (24)	3.0% (9)	89.0% (267)	11.0% (33)

I accept my defeat and congratulate my opponent or the winner	23.7% (71)	43.3% (130)	19.7% (59)	13.3% (40)	67.0% (201)	33.0% (99)
I am patient and very concentrated when playing to avoid mistake	47.7% (143)	40.0% (120)	6.0% (18)	6.3% (19)	87.7% (263)	12.3% (37)
MRS	41.1% (1234)	42.8% (1284)	9.9% (297)	6.2% (185)	83.9% (2518)	16.1% (482)

$N_{cases}=300$; $N_{responses}=3000$

Looking at the above table component by component, on the collapsed section 14.0 (86.0%) of the participants overwhelmingly agreed that the first component “I play seven stones with my friends” is very important for the development of executive function; meanwhile 42 (14.0%) disagreed to this indicator. On the stretched pertaining to the first component “I play seven stones with my friends” 55.7% (167) strongly agreed, 30.3% (91) agreed, 6.0% (18) disagreed and 86.0% (24) strongly disagreed. Again, on the second component “we have to follow the rules of the game”, 258 (86.0%) of the participants agreed that the component is very important for the development of executive function, while 42 (14.0%) disagreed to it on the collapsed section. On the stretched pertaining to the component 32.7% (98) strongly agreed, 53.2% (160) agreed, 10.0% (30) disagreed and 4.0% (12) strongly disagreed.

Similarly, on the third component “I usually have the wish or zeal to win the game”, 245 (81.7%) of the respondents agreed on its validity for the development of executive function, while 55 (18.3%) disagreed to it on the collapsed section. On the stretched pertaining to the component 50.3% (151) strongly agreed, 31.3% (94) agreed, 7.3% (22) disagreed and 11.0% (33) strongly disagreed.

In addition, on fourth component “when playing, I plan the next move and strategies, while keeping all the rules in mind” had 258 (86.0%) of the respondents who agreed that the component is very important for the development of executive function, whereas 42.0 (14.0%) disagreed over its importance on the collapsed section. On the stretched pertaining to the component 38.7% (116) strongly agreed, 47.3% (142) agreed, 10.0% (30) disagreed and 4.0% (12) strongly disagreed.

On the fifth component “I considers what my opponent’s next move will be, based on the move he is taking and the fact that the player must follow certain rules” had 241 (80.3%) of the respondents who agreed that the component is very important for the development of executive function, whereas 59 (19.7%) disagreed over its weight on the collapsed section. On the stretched pertaining to the component 25.7% (77) strongly agreed, 54.7% (164) agreed, 16.7% (50) disagreed and 3.0% (9) strongly disagreed. Similarly, on the sixth component “I think a lot and keep vigilant and visualize the move of my opponent” had 270 (90.0%) of the respondents who agreed that the component is very important for the development of executive function, whereas 30 (10.0%) disagreed over its weight on the collapsed section. On the stretched pertaining to the component 42.3% (127) strongly agreed, 47.7% (143) agreed, 7.0% (21) disagreed and 3.0% (9) strongly disagreed.

Equally, on seventh component “I enjoy forming teams of two or more members to compete against another” had 257 (85.7%) of the respondents who agreed that the component is very important for the development of executive function, whereas 43.0 (14.3%) disagreed over its importance on the collapsed section. On the stretched pertaining to the component 50.0% (150) strongly agreed, 35.7% (107) agreed, 8.3% (25) disagreed and 6.0% (18) strongly disagreed.

Likewise, on the eighth component “I interact and communicate friendly with my peers when playing game”, 267 (89.0%) of the respondents agreed on its validity for the development of executive functioning, while 33 (11.0%) disagreed to it on the collapsed section. On the stretched pertaining to the component 44.7% (134) strongly agreed, 44.3% (133) agreed, 8.0% (24) disagreed and 3.0% (9) strongly disagreed.

Also, on the ninth component “I accept my defeat and congratulate my opponent or the winner”, 201 (67.0%) of the respondents agreed on its validity for the development of executive functioning, while 99 (33.0%) disagreed to it on the collapsed section. On the stretched section pertaining to the component 23.7% (71) strongly agreed, 43.3% (130) agreed, 19.7% (59) disagreed and 13.3% (40) strongly disagreed.

Finally, looking at the tenth component “I am patient and very concentrated when playing to avoid mistake”, 263 (87.7%) of the respondents agreed it was important for the development of executive function, whereas 37 (12.3%) disagreed over its importance. On the stretched section pertaining to the component 47.7% (143) strongly agreed, 40.0% (120) agreed, 6.0% (18) disagreed and 6.3% (19) strongly disagreed. In conclusion, taking into consideration the MRS (aggregated score) a majority of the participants (83.9%) agreed that children’s engagement in indigenous play/game is a very important indicator in fostering the development of executive function as opposed to (16.1%) of the participants that disagreed on its importance and on the stretched section on MRS 41.1% (1234) strongly agreed, 42.8% (1284) agreed, 9.9% (297) disagreed and 6.2% (185) strongly disagreed.

Based on the responses on the question in your opinion do children learn executive function skills from indigenous game/play? Most of the participants indicated that children do learn a whole lot of skills from indigenous play. Bearing in mind the responses to the question on some of the indigenous game/play Participants generally indicated that: some of the indigenous games include: seven stones, three stones, playing with mud, “tabala”, among others

Taking into account the responses to the question on what are some of the executive function skills children learn from these indigenous games? Participants generally indicated that: indigenous games have been an instrumental developmental tool for the children. As it has aided them in developing their cognitive, social and even emotional development in the following ways:

- Solitary play fosters the development of mental activity
- Fosters collaboration and cooperation in group play
- Promotes problem solving ability
- Fosters strong ties among play mates

With regards to the responses to the question on the effectiveness of the different activities that children engage in, participants of the interviews generally indicated that, “most of the time the above activities that children engage in, enables them to raise awareness on community ills, put up their esteem and build skills that goes a long way to enable them to solve the difficulties they face”, in the following ways:

- Indigenous play activities are recreational thus enabling them to relax and keeps them occupied and they live healthy and avoid crime.
- In collaborating with each other through the different activities that they engage in, they learn skills and develop their working capacities
- When they worship/fellowship together they learn and improve upon their morals and spiritual lives.

Table 9: Children’s characterization of their engagement in indigenous play/game activities with respect to gender

		Engagement in indigenous play/game activities		Total
		Agree	Disagree	
Gender	Male	N	1263	257
		%	83.1%	16.9%
	Female	N	1255	225
		%	84.8%	15.2%
MRS		2518	482	3000

χ^2 -test: $\chi^2=0.680$; $df=1$; $P=0.409$.

Male and female children had the same level of involvement in indigenous play/game activities ($P>0.05$). In effect 83.1% of male agreed and 16.9% disagreed their engagement in indigenous play/game activities while 84.8% of females equally agreed and 15.2% disagreed.

Table 10: Model fitting information and model explanatory power predicting the effect level of indigenous play/game activities children engage in (seven stones) on the executive functioning of children

Omnibus Tests of Model Coefficient	Likelihood Ratio test		Explanatory/predictive power of the model (Pseudo R-Square) based on Cox & Snell*		
$\chi^2=52.597$	$\chi^2=51.473$		0.161		
df=10 P=0.000	df=10 P=0.000				
Wald	B 0.769	S.E. .124	Wald 38.402	Df 1	Sig. .000

*Dependent variable: Executive functioning

If the overall influence of children’s engagement in (seven stones) on their executive functioning was significant, but how do individual predictors contribute to this effect? Using Wald statistics, the answers were as depicted on the table below.

Table 21: Wald statistics depicting the influence of predictive indicators of indigenous play/game activities children engage in (seven stones) on the executive functioning

Engagement in indigenous play/game activities children engage in (seven stones)	B	S.E.	Wald	Df	Sig.
I play seven stones with my friends	.306	.310	.973	1	.324
We have to follow the rules of the game	-.103	.220	.221	1	.638
I usually have the wish or zeal to win the game	.141	.229	.382	1	.537
When playing, I plan the next move and strategies, while keeping all the rules in mind	-.409	.279	2.152	1	.142
I considers what my opponent’s next move will be, based on the move he is taking and the fact that the player must follow certain rules	-.485	.327	2.207	1	.137
I think a lot and keep vigilant and visualize the move of my opponent	.719	.304	5.607	1	.018
I enjoy forming teams of two or more members to compete against another	-.302	.236	1.646	1	.200
I interact and communicate friendly with my peers when playing the game	1.121	.280	16.048	1	.000
I accept my defeat and congratulate my opponent or the winner	.023	.196	.014	1	.906
I am patient and very concentrated when playing to avoid mistake	.275	.192	2.051	1	.152

Out of the 10 indicators making up the predictive components of children engagement in indigenous play/game activities (seven stones), two emerged as critically predicting their executive functioning; they were:

I think a lot and keep vigilant and visualize the move of my opponent: The positive sign of Beta (B) indicates that the more children think a lot and keep vigilant and visualize the move of my opponent, the better their executive functioning.

I interact and communicate friendly with my peers when playing the game: The positive sign of Beta (B) indicates that the more children interact and communicate friendly with their peers when playing the game, the better their executive functioning. The effect of indigenous play/game activities children engage in (seven stones) on the executive functioning of children was appraised using Logistic Regression Model. The variability explained by this model was significant (Omnibus Tests of Model Coefficient: $\chi^2=52.597$; $P=0.000$) and this was supported by the Likelihood Ratio test (Overall statistics: $\chi^2=51.473$; $P=0.000$) and the Wald statistics ($P=0.000$). The Explanatory Power (EP) / Predictive Power was 16.1% (Cox & Snell R Square=0.161). The hypothesis stated above was then rejected; therefore implying that the more children are engage in (seven stones), the better their executive functioning as testified by the positive sign of the Standardize Coefficient Beta (B).

Discussion

Indigenous play/game activities and the executive functioning of children

The first objective of this study was to find out whether the indigenous play/game children engage in fosters the development of executive function during late childhood. After testing the indicators of the component, it was realized that, there is a significant relationship between the indigenous play/game children engage in and the development of executive function. The above findings indicate that, children during late childhood in Eyumojock subdivision Southwest region of Cameroon, actively engage in indigenous play with fellow peers, which include; (seven stone, tabala, pretend play) among others. More so, it was also realised that all the aforementioned activities are enriching and lucrative. In this regard, participating and collaborating together in such activities was discovered as very important in fostering the development of executive functioning (working memory, inhibition and problem solving) among children during late childhood and thus enable them to be able to overcome and cope normally with the difficulties that they face.

The above findings are consistent with the findings of Ghosh and Manna (2014), Indigenous game/play is part of the lives of the indigenous rural children; their livelihood depends almost entirely on specific skills and knowledge essential for their survival. Accordingly, for the development process, indigenous game/play is of particular relevance as it accompany children throughout their development process as it assist in cognitive development and in turn executive functioning abilities and equally entertain these folks. Indigenous knowledge is not yet fully utilized in the development process. Conventional approaches imply that development processes always require technology transfers from locations that are perceived as more advanced. Ghosh and Manna (2014), holds that this has led often to overlooking the potential in local experiences and practices.

Fomba (2011) further found that, through the above real life activities, children accept risks, share, discuss, tolerate, employ creativity and learn how to manage immediate and extended real life conflict. As a way of communal work life, the practice of *n'sih* (peer work) has the potential of catalysing social intelligence and collaborative attitudes in the young. With community actions, young peers are curious and excited to socialise and participate in communal work activity as a rite of passage, while generating learning in different contexts for the development of work skills necessary in exploiting available community resources.

In line with the current findings Van der Stoep and Louw (1981) describe play as an entertaining action or relaxation that takes place according to rules. Kirkby (1992) states that games can help learners to develop mathematics skills and in turn executive functioning skills. Educators are challenged to find ways in which games can be used to develop and

enhance executive functioning. This may be motivating to learners when they enjoy playing the game. For example, in a game, participants have to follow the rules of the game or come to a consensus on how the rules can be amended. Each player wishes to win the game while simultaneously having the same interpretation of the rules as the opponent. This is in line with problem solving, as certain rules have to be followed in solving a particular problem. Each player plans the next move and strategies, while keeping all the rules in mind. At the same time the player considers what the opponent's next move will be, based on the move he is taking and the fact that the player must follow certain rules. The player in fact visualises these moves. These activities are similar to problem solving where one has to arrive at a solution according to proven rules. In some cases participants can form teams of two or more members to compete against a person or a team, also comprised of two or more members.

Similarly, the games also provide the children with opportunities for mastery of play (mastery is an important strand in cognitive development and in turn executive functioning). They have the opportunity to continue practicing a skill until they are proficient at it. This enables them to gain self-confidence and self-esteem. Berger highlights that the children's games are more than just games when she observes the misconception that most researchers have about these activities. She says, "Most researchers of young children believe that play is the work of childhood" (Berger 2000:306) cited in Nyota and Mapara (2008). The importance of practice is something that the Shona value a lot. The value that is placed on practice is captured in the proverb, "Charovedzera charovedzera, gudorakakwira mawere kwasviba" (Practice makes perfect).

In same light the above findings are also consistent with the findings of Nyota and Mapara (2007) who remarked that indigenous knowledge is that knowledge that is commonly owned and shared among the inhabitants of a particular community. That is, idea that is easily understood and used by members of a particular locality for some purpose, in this case children involve in play easily understand themselves. Similarly, Flavier (1995) has defined it as the information base for a society which facilitates communication and decision-making. Indigenous information systems are dynamic and are continually influenced by internal creativity and experimentation. These words make it clear that indigenous knowledge systems is not a fossilized type of knowledge but a knowledge that is constantly adjusting to the immediate needs of its community as the need arises.

In support of the above findings Mosimege and Onwu (2004), reiterate that indigenous knowledge among which is traditional game is an all-inclusive knowledge that covers technologies and practices that have been and are still used by indigenous and local people for existence, survival and adaptation in a variety of environments. Such knowledge is

not static but evolves and changes as it develops, influences and is influenced by both internal and external circumstances and interaction with other knowledge systems. Children involved in traditional games are usually quiet as they concentrate to master the moves of the game and in turn improve on their executive functioning.

World Bank (1998) equally supports the above finding that indigenous knowledge provides the basis for problem-solving strategies for local communities. Indigenous knowledge is an underutilized resource in the development process. Learning from indigenous knowledge, by investigating first what local communities know and have, can improve understanding of local conditions and provide a productive context for activities designed to help the communities in general and individuals in particular. Understanding indigenous knowledge can increase responsiveness to engaging children in constructive activities and in turn improve on their executive functioning (World Bank, 1998). Sharing indigenous knowledge within and across communities can help enhance cross-cultural understanding and promote the cultural dimension of human development. In the emerging global knowledge economy a country's ability to build and mobilize knowledge capital, is equally essential for sustainable development as the availability of physical and financial capital (World Bank, 1997). The basic component of any country's knowledge system is its indigenous knowledge. It encompasses the skills, experiences and insights of people, applied to maintain or improve their livelihood.

In addition, these findings are also consistent with the findings of Nsamenang (2011), who found out that, most African children are compelled by their impoverished circumstances to struggle to create a comforting environment by using indigenous knowledge and creating amazing things. The evidence for such ingenuity is better sought within African traditional societies and cultures. The indigenous culture is a trigger and central support of executive functioning in African children. In Cameroon, most of children's "work" is undertaken with peers in child-to child social networks and exchanges with older siblings and peer mentors as child protectors rather than with parents or teachers. The cultural activities offers opportunities for children to play, "work", and learn together, free from parental supervision and adult control. The freedom of the cultural activities promotes creativity and challenges children to cultivate prosocial values and altruism on their own terms, to defer to more competent peers, to address and resolve conflicts, and to notice needs of younger ones and serve them (Nsamenang and Lamb, 1995).

In the same light, based on the findings of this study, children in the Eyumojock sub division, Southwest region of Cameroon, engage in indigenous play/game in order to entertain themselves, socialize, learn skills and cope normally with the difficulties that they face. Through group efforts and collaborating with each other in the different activities that children conduct in Eyumojock sub division, they are able to share ideas, develop skills and competencies, learn from each other and help each other when he or she is facing any difficulty. Similarly, Sepell (2011) also found out that, cooperation is an important resource for promoting, socially responsible intelligence as he discovered that children were able to teach themselves effectively within groups and at same time were agents of health promotion.

Finally, according to Vygotsky (1978) sociocultural theory, both the child's capabilities and the nature of the contexts in which the child lives will influence competence which is an important strand of executive functioning. Although a child must act to demonstrate competence, it is also true that environments and activity settings, such as the play group afford competence. A child can perform better at performing different activities and tasks at a more advanced level with structure and support provided by a proficient peer and adult, a process known as scaffolding, enabling a child to function at the growing edge of his or her capabilities (Vygotsky, 1978).

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