



Impact of early childhood educators' pedagogical content knowledge on early graders academic success in the Sissala East Municipal



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Abstract

The study examined the impact of early childhood educators' pedagogical content knowledge on early graders academic success in the Sissala East Municipal. The target population for the research included all early childhood educators in the Sissala East Municipal in the Upper West Region of Ghana. This research employed multiple sampling techniques, which include: purposive, simple random, criterion sampling and lottery sampling techniques. The researcher selected all early childhood educators using purposive sampling. The total sample for the study was 164 early childhood educators. Self-developed questionnaire, interview guides and observation checklist were used for data collection. The quantitative data analysis was done using the Statistical Package for Social Sciences (SPSS) software version 20. The study revealed that majority of the respondents agreed that the pedagogical content knowledge of teachers and teachers' teaching-learning strategies significantly enhanced the performance of students. It is concluded that pedagogical content knowledge of teachers has an impact on learners' performance. The findings of this study will guide teacher preparation trainers and curriculum designers to correlate their relayed curriculum on how Language and literacy practices are and the extent of their implementation in the classrooms.

Keywords: academic success, curriculum designers, early graders, learners' performance, reading techniques, teaching-learning strategies



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Public Interest Statement

The National Association for the Education of Young Children (NAEYC, 2009) has indicated that early childhood educators serve as role models of developmentally appropriate practice as they provide knowledge about learners' developmental levels and the individual differences in their socio-cultural environment. However, preparation training provided for early childhood educators on subject area understanding about young learners and the way they learn is inadequate (Fillmore & Snow). Knowledge teachers acquire and apply in the early childhood classroom may not provide enough information on the individual learner's zone of proximal development in specific subject areas as proposed by Vygotsky (1978). The study will bring novelty and new practices in the teaching of literacy at the lower grade.

Introduction

Shulman (1986/7) asserts that teachers' content and pedagogy are treated as mutually exclusive domains. He, therefore, emphasizes that the practical consequence of exclusion was the production of teacher education programmes to focus on either subject matter or pedagogy. To streamline this irregularity, Shulman (1987, p. 8), recommended that PCK was the most important knowledge basis for teaching since teaching required the teacher to transform content knowledge into forms that were "pedagogically powerful and yet adaptive to the variation in ability and background presented by the students". Shulman (1987) proposed this knowledge to include understanding what teaching methods fit the content on the one hand and the other knowing how the elements of content can be transferred for effective teaching. This knowledge described is different from the general pedagogical knowledge that teachers share on other disciplines and also from the knowledge of a disciplinary expert (Faisal 2015). To Mahmoud and Seleim (2013) PCK deals with knowledge of strategies in teaching which consist of appropriate representations of concepts to address the students' difficulties and misconceptions to foster meaningful understanding. PCK is not just about knowledge in grammar and vocabulary, it incorporates the knowledge to deliver the content of a subject matter to learners in the most appropriate, effective, organised and tailored form (Parker & Oliver 2008, as cited in Faisal, 2015).

Andrews (2001) suggests that PCK should include teachers' communicative ability since language is taught through language. PCK should, therefore, include teacher's language awareness, subject matter, language competence and effective ways of transmitting these on the learner. Smith (2013) thinks that PCK should involve the representations and concepts formulations teaching strategies as well as knowledge of students and epistemological theories. This knowledge includes the understanding of learners' personal characteristics, motivation, learning styles, needs and the learners'

social and cultural background (Faisal 2015).

Mishra and Koehler (2006) described PCK as an intersection of content knowledge and knowledge of pedagogy. It thus indicates that PCK is not only a representation of content and pedagogy but rather involves an amalgamation of both content and pedagogy leading to the transformation of content into pedagogically powerful forms (Ando-Mensah, 2013). Pedagogical Content Knowledge as a construct can help develop English language teachers belief, understand how to explore their content knowledge and also how to deliver it into good instructions (Kulthsum, 2017). Shulman (1987) as cited in Kulthsum (2017) argued that having knowledge of the subject and the pedagogical methods, though necessary, was not sufficient in assessing the knowledge of an effective teacher. To depict the complex forms in which a teacher's content should be presented to learners, Shulman (1986) argued that pedagogical content knowledge is that knowledge that involves the teaching process which includes the best way of representing and formulating the subject matter that makes it comprehensible to others (Liu, 2013).

Teacher's professional, social, and personal abilities are explored in the PCK domain. The knowledge such as subject matter, learners understanding and characteristics, teaching strategies are essential components to be possessed by the teacher in order to maintain students' learning success (Kulthsum, 2017). From the above description, it is evident that there is a connection between teachers' pedagogical content knowledge and effective teaching and learning. If early childhood educators in the Sissala East Municipal incorporate it very well in their schedules will help in achieving the goals and objectives the language and literacy curriculum seeks to achieve.

Literature Review

The Impact of Pedagogical Content Knowledge on Pupil's Language and Literacy Learning

Early childhood educators PCK is an important component that affects teaching and learning in the early grade. Shulman (1986) posits that the way teachers plan their teaching activities, organise classroom provide assignments, manages time, lessons and assess students form part of teachers PCK. In the opinion of Schneider and Plasma (2011), the success of a teaching and learning process that affects students' academic success relies on the effectiveness and efficiencies of the teachers. In providing teaching activities in the class, effective teachers take time to investigate what learners know and organise resources and activities to meet the needs of students. Adeyemo, Akintoye and Owolabi, (2011) posited that teachers are the facilitators in the classroom who guide students through the concepts expected to be learnt. As they guide the students, it helps in enhancing the realisation of the aims of the subject as well as the students' success. According to Feiman-Nenser (2001), as cited in Adedoyin (2011), a teacher who is knowledgeable and skilful makes the greatest impact on students learning outcomes.

Early childhood educators' in the Sissala East Municipal need to know many things such as pedagogy, subject matter, students' characteristics, and curriculum, which is embedded in the PCK. From the above presentations, it is clear that teachers PCK is an important factor for effective teaching, which directly affects students learning performance. Hill et al. (2005) assert that teacher' knowledge in a subject has a strong impact on pupils learning. As a result, professional developers plan their activities towards improving content knowledge.

Content knowledge

According to Shulman (1987), a person who assumed the role of a teacher must first demonstrate knowledge of their subject matter before they are able to support learners to learn with understanding. Every educational system's quality can be assessed based on the student's achievement, which is greatly influenced by the teachers' pedagogical content knowledge. Evidence on the impact of teacher knowledge on learner outcomes in Ghana is largely unclear. This is mainly due to the fact that teacher's content knowledge has rarely been captured in large scale, nationally representative surveys on learner achievement.

Carlisle, Kelcey, Rowan, and Phelps (2011) researched on teachers' knowledge about early reading and its effects on students and indicated that professional development has an effect on children reading achievement. The study reports that 16% of first grade teachers, 15% of second grade teachers and 23% of the third grade teachers as new teachers who took part in the study recorded significantly low scored on teachers knowledge on reading and reading practice (TKRRP) than teachers who had been exposed to reading first for more than 1 year. This report implies that continues professional development of early childhood teachers can improve teachers about how they teach and which in turn affect student's performances.

Spear-Swerling and Brucker (2004) found that teachers with higher knowledge of the linguistics foundation who taught students reading and other related aspects, the students achieved word reading better than those were taught by teachers with low scores, but the effect did not occur on students test scores on letter-sound correspondence, reading of irregular words and spelling. McCuthen et al. (2002) found that there is a positive correlation between teachers' linguistics knowledge and early grade (KG –Basic 3) wording achievement.

Cirino, Pollard-Dourodola, Foorman, Carlson and Francis (2007) in a study of early childhood educators' characteristics and language and literacy of bilingual early grade learners'. The study involved 141 kindergarten teachers. These teachers were asked to complete a questionnaire whiles the learners were tested on phonology and oral language. The results of the study indicated that teacher's content knowledge did not

relate to learners' outcomes.

Cash, Cabell, Hamre, DeCoster and Pianta (2015) conducted a study on prekindergarten teachers' belief and knowledge about children's language and literacy development. The participants were recruited from large community kindergartens and Head Start programmes. Direct assessments of language and literacy skills were administered to all children in English because the majority of teaching in the study classrooms was conducted in English. The findings revealed that teachers' knowledge has a significant contribution to learner print concept and expressive language but found that there was not a significant association between prekindergarten teachers' belief about Language and literacy.

Pedagogical knowledge (PK)

Gabbonton (2008) conducted a study to compare PK on experienced teachers and novice teachers. The study selected novice teachers to teach adult learners of English. The results were collected and transcribed. The experienced teachers' results were collected by the researcher in an earlier study. The results of the two groups indicated PK was similar between the two groups. However, the experienced group demonstrated much more PK skills than novice groups in terms of learners' attitudes and behaviours. This implies working experience develops solid PK and makes it useful though programmes studied at the university or college contribute to teachers PK. The literature above indicates that teachers CK and PK have a great influence on learners' performance. This study will assess if the same could be true of early childhood educators in the Sissala East Municipal.

Methodology

The target population for the research included all early childhood educators in the Sissala East Municipal in the Upper West Region of Ghana. The target population is the aggregate of cases, about which the researcher would like to make generalizations (Polit & Hungler, 1999). Early childhood here is defined as pupils from Kindergarten one to basic three. The accessible population of the study was, teachers in five selected circuits in the Sissala East Municipal. The five circuits were chosen mainly on two grounds: first, the researcher considers five circuits as the accessible population which comprises 180 early childhood educators (KG- 1 to class 3) out of nine (9) circuits. The researcher utilized three instruments. The first is a questionnaire which sought early childhood educators' views on their educational background, content knowledge, and instructional strategies they use in teaching literacy. The second instrument was the interview where the research had the privilege to have a face to face interaction with participating teachers on their teaching, and the third was observation. The researcher observed teachers as they taught in the classroom in order to get empirical data about their content knowledge, knowledge of

instructional strategies, knowledge of learners, and how these instructional strategies influence children's performance. This research employed multiple sampling techniques, which include: purposive, simple random, criterion sampling and lottery sampling techniques. The researcher selected all early childhood educators using purposive sampling. The purposive sampling was considered suitable for this research because all the teachers teach language and literacy and perform a key role in children literacy development. The 180 participants was considered because Burns and Grove (2009) state that when sampling size is large enough, it will help the researcher identify relationships that exist among variables. Cohen et al. (2007) asserts that the larger the sample size, the greater its reliability and makes a more sophisticated statistics available for the researcher to use. The simple random sampling technique was used to select five circuits out the nine circuits. Names of circuits were written on pieces of papers and put in a container. A pupil was blindfolded to pick five circuits.

Data Collection Procedure

As part of the data collection procedure, the researcher wrote and presented a letter of consent to the Municipal Director of Education. This was to inform them of the purpose of the study, their expected roles, and their willingness to respond or not to and their identity protection. The permission letter was granted by the Municipal Director to conduct the study. The circuit supervisors and head teachers of the schools selected for the study were given the notice to allow the bearer of the letter to conduct the study in their various schools.

Findings/Results

The impact of early childhood educators’ PCK on learners

Table 1: Impact of Teachers PCK on Learners

Statements	Strongly Disagree		Disagree		Agree		Strongly Agree		N	Mean	Standard Deviation
	Freq	%	Freq	%	Freq	%	Freq	%			
Students practice reading high frequency words.	9	6.1	23	15.7	96	65.3	19	12.9	147	2.85	0.715
Students can read and write words as separate syllables	10	6.6	20	13.2	90	59.2	32	21	152	2.95	0.779
Students are able to copy letters, words in sentences	12	7.7	28	18.1	77	49.7	38	24.5	155	2.91	0.856
Students can identify sounds displayed on the board	4	2.6	7	4.5	93	60	51	32.9	155	3.23	0.653
Students have developed concept of print	9	5.7	14	8.9	80	51	54	34.4	157	3.14	0.804

Note: The mean values, Strongly agrees (SA) =3.5 - 4.0= Agree (A) = 2.5 - 3.4, Disagreed (D) = 1.5 – 2.4, Strongly disagreed (DA) =1-1.4,

Results from Table 1 above shows that the majority of the respondents agreed that PCK did have an impact on learners' performance, 115(78.2.0%) with a mean score of 2.85(S Dev=0.715) of the respondents agreed that students practice reading high-frequency words for automaticity. Also, 134(85.4%) of the respondents agreed that students have developed the concept of print by identifying names of authors of books, turning pages of books from right to left etc. Given the mean score of 3.14 (S Dev=0,804) which means agreed, it implies that majority of the respondents have agreed that children can identify that print is read from right to left and top to bottom. 144 (92.9%) agreed learners identify sounds displayed on the board and from the environment. Relying on the mean score of 3.23(S Dev=0.553), it implies that the participants have agreed learners can identify letter-sound relationship when they see them on board or in print. The ratings for item #29 (students are able to copy letters, words in sentences) is 115 (74.2%) indicating that the respondents do agree learners are able to copy letters and words in sentences. It was anticipated that the percentage of responses to items # 29, #30 would have been greater for rating "strongly agree" but this is not the case for learners in the Sissala East Municipal. Generally, over 50% of the respondents agreed to the various statements on the impact of PCK on learners' performance. This implies that early childhood educators have adequate pedagogical content knowledge (PCK) and their practices in the classroom influence learners' academic performance. Early childhood teachers who have deep knowledge in pedagogy also understand how children learn and the way they develop good habits in thinking and learning. The findings of this study revealed that early childhood educators' in the Sissala East Municipal are in line with Shulman's (1987) suggestion that content knowledge is necessary for the work of the professional engaging in their practice within the classroom. Thus, content knowledge should theoretically influence practice. Also, Cunningham and Zibulsky (2000) and Goldschmidt and Phelps (2010) studies have revealed that teachers' knowledge in a subject area is much associated with learners academic gains, most particularly for the children who are low- performing. This is the case in the Sissala East Municipal that teachers' PCK has an influence on the learners.

Discussion

The researcher gathered qualitative data through interview and observation that would give greater meaning and understanding of the quantitative results and conclusions. The qualitative data that follows are intended to highlight various insights on how early childhood educators PCK influence the learners learning outcomes. The participating teachers were asked in the first question about how they would describe the phonological awareness, word recognition skills of the learners. Varied responses were offered to the query. These responses are exemplified as follows:

T4: *“if I ask them to mention the letters that begin their names; some of them are not able to mention, a good number of them still have challenges opening book pages well. This is the third term, but a lot of them cannot identify some of the letters of the alphabet.”*

T7: *“When you teach them, half of the class are able to identify words.*

T4: *Some are forming three letter words and some of the others copying sentences are leaving space between their words, some are not.”* She added *“A few are adding spaces between their sounds which are just beginning sounds and I have one that just writes random letters”*

T9: *“My children can use sounds to form two and three-letter words and can segment the sounds when I write them on the board ...some don’t know any sounds yet so they cannot hear the sounds to stretch words .”*

This shows pupils are realizing that print has meaning and carries a message. The major issues inherent in the replies of respondents indicate that children at the early stages in the Sissala East Municipal are yet to acquire major literacy skills such as reading simple sight words, letter-sound identification concept of print and other literacy skills necessary for the literacy development. These findings are in line with Carlisle et al., (2009) study, which also failed to find a relationship between teachers’ content knowledge and students’ literacy growth. The findings of the present study are consistent with these two studies with respect to literacy content knowledge. Other studies have found content knowledge to influence classroom practices in the primary grades (McCutchen et al., 2002, McCutchen et al., 2009; Spear-Swerling & Brucker, 2004) and when returning to the theory guiding the study, Shulman (1998) suggests that content knowledge is necessary for the work of the professional with educators engaging in their practice within the classroom. Thus content knowledge should theoretically influence practice. The results reflected the desire to implement more direct instruction in the Language and literacy curriculum that will fit for all children. On the second question about how they determine if learners have developed print awareness names and letters that begin their names. The responses are exemplified as follows:

T5: *“They cannot identify authors’ names, they can identify their own names, and they cannot identify characters and can identify letters that begin their names.”*

T4 *“ I am able to know if my children have developed print awareness when they hold books correctly, turn pages from left to right, read from top to down. But they are not able to do that well.”*

The researcher further inquired the respondent on “How will you describe the writing habits of their students?”. The participants’ responses were categorized as pupils writing ability and preparing to be independent writers.

Writing abilities

Writing abilities refers to the various skills learners are able to perform when writing. They are also what teachers observe learners do in the process of writing and in their previous work. T2 teaches basic two (2) and described her students writing as:

“I write on the board for them to copy. I have some two pupils who will copy exactly as I have written but some of them will copy by putting the letters and words together, no space”

T8: “Some of the pupils cannot write. Sometimes you are forced to assist the child to write by holding the hand which is also unethical”

T5: The pupils need my support as much as possible. Some are still struggling to copy, that’s what they need. They need a little support to get started”

T10: “Well, this is K2. We are in the third term, some can’t even write their names so they are not writing anything. Some just scribble”

The responses from the interviewees indicate that the pupils have not still grasp writing skills. This was evident from the respondents that “some cannot even write their names, others copying with no spacing”, But there is also evidence some are trying to achieve independent writing from a participant “*I have some two pupils who will copy exactly as I have written*”.

Preparing pupils to be independent writers

The participants’ responses did not indicate they are putting in measures to get pupils to become independent writers.

T10: I keep their previous writings in portfolios but I really don’t revisit to check if the children are making progress.

T3: I don’t ask my class three children write on their own, read their own writing. Actually we are not giving them the skills to write independently.

This revelation indicates that learners right from the foundation are equipped with the skills of writing. Hence their poor writing skills indicated the reports by (World vision, 2018; Early Grade Reading Assessment report (2013; The National Education Assessment of Ghana,

2016). To verify the impact of early childhood educators PCK on learners’ performance, observation of lessons was made on certain issues such as children develop phonological awareness, word recognition, print concept, vocabulary skills, children can turn pages of books, listen attentively, carry out instructions correctly, children can identify their names and copy words , sentences correctly. It was observed through the observation checklist provided that in some of the lessons, the competences were well, and some were very well. Though some of them were not well, on average, it was better. Creswell (2014) stated that additional data could be collected when the researcher has difficulties handling the discrepancies in order to confirm results or otherwise. Going by this premise and to further assess the impact of teachers PCK on learners, the researcher collected samples of 100 entries of pupils works from KG one and KG two on one part and 100 entries from basic one to three. For the KGs in terms of recognizing and writing the English letters of the alphabet the figure below showed how the learners fared in their class works. (See below in figure 3)

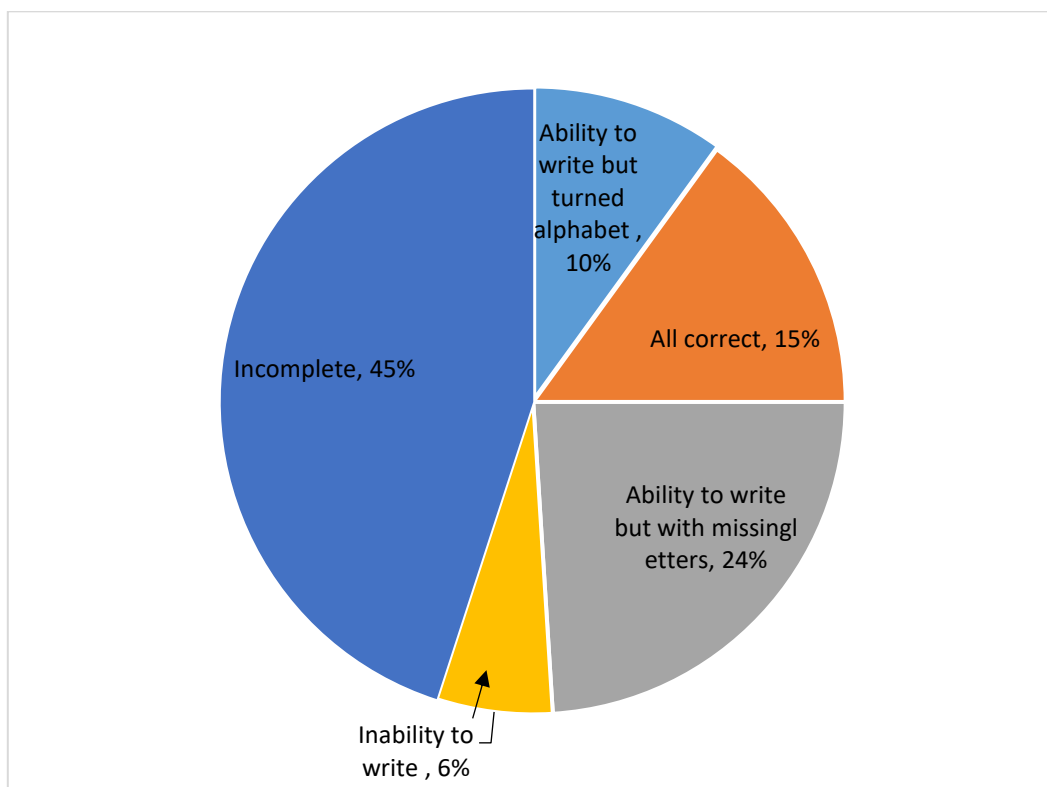


Figure 1: Samples of pupils’ works on alphabet knowledge

The results from the pie chart indicated that 10% of the learners were able to write but turned alphabet. 15% could write and identify all the English alphabet and with their corresponding sounds competently and correctly. Those who were able to write the 26 letters from A to Z but with missing letters constituted 24%. 6% could not write at all. Finally, 45% could write but could not complete in writing all the letters and saying the sounds. (See

sample below for pupils' sampled works).

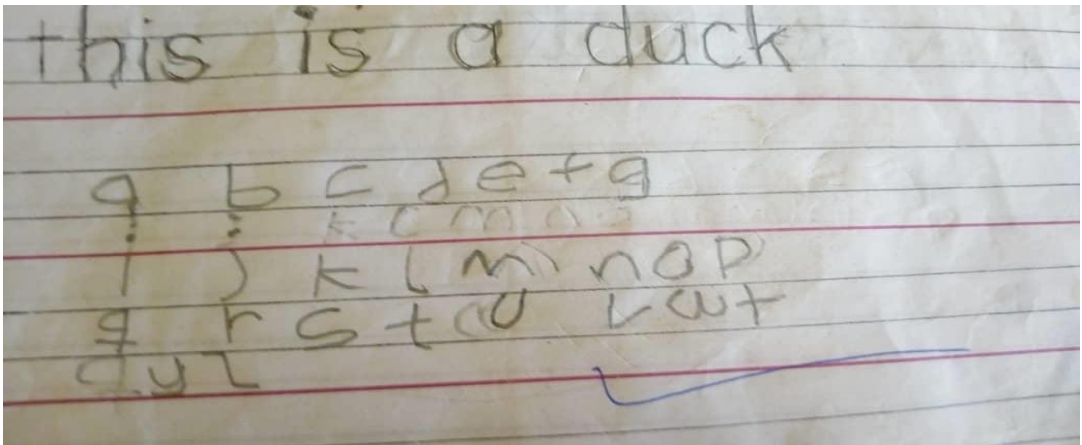


Figure 2: All correct (KG2)
Complete writing but mixing letters (KG 2)

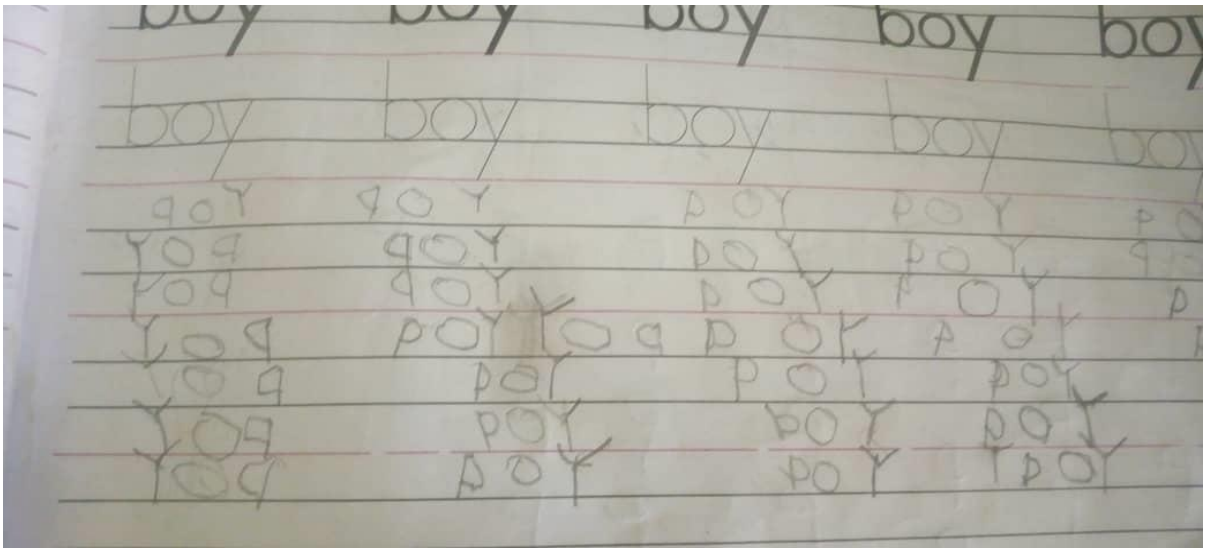


Figure 3: Reverse letters (KG 2)

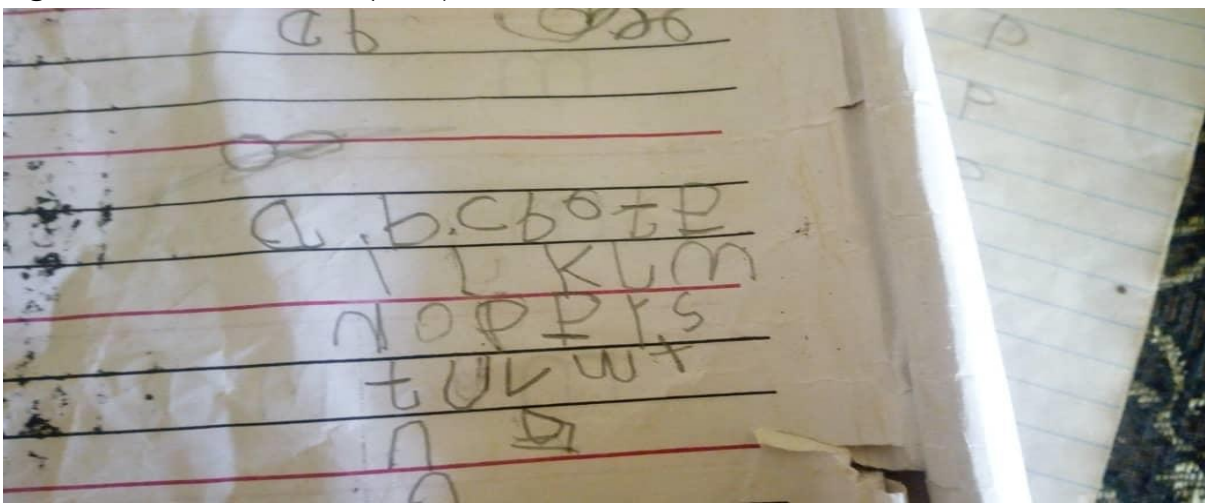


Figure 4: Sequential writing of letters of the alphabet but with turning letters e, f q (KG 2)

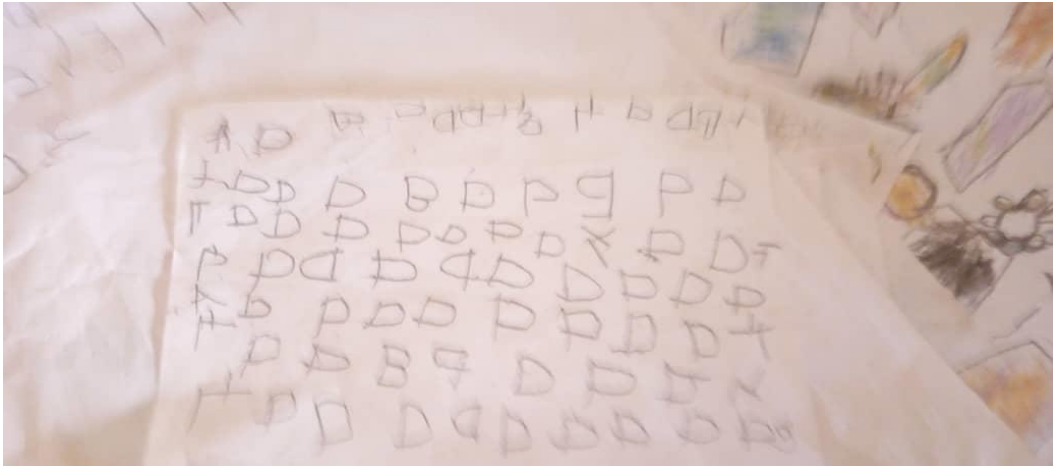


Figure 5: Inability to write (KG1)

The writing challenges these learners have exhibited is as a result teaching strategies the early childhood educators' use. The evidence from the observations and interactions with the early childhood teachers in the Sissala East Municipal have shown that many of the teachers could not identify essential literacy skills children should develop from Kindergarten one through to primary three (3). From the observation, it was clear most of the teachers do not have in-depth knowledge on how to impart knowledge on the young ones — the level to which they articulated the skills and their role in helping children develop these skills varied. In addition to examining whether teachers possess the right content and pedagogical knowledge, it was also evident that early childhood educators' poor content knowledge and their classroom literacy practices had an effect on children literacy growth as a good number of learners could not identify letter-sound relation, sight words, read two to three-letter words which are foundational skills to literacy. These realisations are in congruence with the report presented by the Early Grade Reading Assessment report (2013), The National Education Assessment of Ghana (2016) and more recently, World Vision Ghana (2018) and Ministry of Education (2018) which indicated that children from the Upper West Region by the end of primary two could not yet read with comprehension and write either in their Ghanaian language or in English. It was interesting to realise this from the observation because the majority of the teachers had the required professional qualification necessary to be able to teach effectively and deliver the curriculum content as expected. On the contrary, it was observed that some of the teachers, though had the professional qualification; they did not have command over the subject matter. This was so because some of them were not specially trained as early childhood educators.

Conclusion

Results from the quantitative data revealed that young learners could read high-frequency words, copy letters and simple words and identify letters with their corresponding sounds. On the other hand, the qualitative results turn out completely different from the quantitative results. The qualitative results indicate learners could not practice reading high-frequency words for automaticity and have not fully developed the concept of print by identifying names of authors of books, turning pages of books from right to left. The learners have developed phonological awareness. The learners are in the third term of the academic year, yet a good number of them could not copy letters of the alphabet sequentially from A to Z. Some could not copy simple sentences correctly.

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