



TEACHER CAPACITY BUILDING FOR PLAY-BASED EARLY LEARNING IN GHANA AND SIERRA LEONE

QUANTITATIVE REPORT

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EXECUTIVE SUMMARY

Play-Based Learning (PBL) pedagogy is now recognized as a crucial approach for Early Childhood Education (ECE). The government of Ghana implemented the ECE policy in 2021 to sustain investments in pre-primary education made over the past decade and improve efficiency, equity and effectiveness in ECE. Despite government efforts, the effect of ECE on children's educational outcomes remains unclear owing to several factors. Inadequate infrastructure, limited training in PBL pedagogy, unavailability of Teaching and Learning Materials (TLMs) and financial constraints are some of the notable challenges. This quantitative report presents findings on the value of play-based learning in ECE classrooms (i.e. KG, Primary 1, 2 & 3) and the contribution of teachers' capacity to the success of PBL by addressing the following four (4) questions; How is the educational system adapting to the changes in the new early learning curriculum? How are education innovators in the early learning space influencing the early childhood education quality and uptake in Ghana and Sierra Leone? Can there be more cost-effective approaches to scaling up early learning activities through volunteer teacher programmes? and What is the value addition of play-based learning methods compared to schools which do not implement these, particularly in relation to early grade reading outcomes?

A quasi-experimental design was employed for the study to compare intervention schools and the control group. Intervention schools are the beneficiaries of the innovations by Right to Play (RTP) and SABRE Foundation for Ghana and Teach for Sierra Leone (TFSL) in Sierra Leone. The control group (non-intervention) are schools that have received any play-based innovation from any institution, both government and private. Overall, 600 schools and 1200 teachers were sampled for the study for both the intervention and control schools. In Ghana, 593 schools and 1,156 teachers were surveyed which gives a response rate of 98.8 percent for the number of schools successfully surveyed and 96.3 percent response rate for the number of teachers successfully surveyed. The Annual Status of Education Report (ASER) Literacy and Numeracy tool was utilized to collect data on learning outcomes of children. The final completed sample for Sierra Leone, was not satisfactory for the purpose of drawing any meaningful inferences. The data collection exercise in both countries was undertaken by trained enumerators using Computer-Assisted Personal Interviewing (CAPI) platform.

In terms of the school characteristics of the sampled schools, almost all the schools (99%) run the single shift schedule. Schools in the intervention group had approximately 10 classrooms and 3 classrooms for KG1-P3, while those in the non-intervention group had 8 classrooms and 2 for KG1-P3. 72 percent in the intervention group had appropriate seating arrangement for the ECE level compared to 58 percent for the non-intervention group. Utilities for the schooling convenience of children across both intervention and non-intervention schools were woefully inadequate. For instance, only 19 percent and 9 percent of the schools in the intervention group and non-intervention group respectively designated hygienic places for preschool. The average age of the teachers sampled was 37 years, with no significant difference between males and females and no significant difference between teachers in intervention schools and non-intervention schools. Teachers were predominantly female (81% in interventions schools and 63% in non-intervention schools). 56 percent of teachers in the intervention group have tertiary education, compared to 48 percent in the non-intervention group. Also, 39 percent of teachers

in the intervention group hold a diploma, while 46 percent in the non-intervention group have the same qualification. A little over 1 percent of teachers in both groups have a master's degree. 16 percent of teachers in the intervention group specialize in Early Child Education compared to 12 percent in the non-intervention group reflecting the low specialization in ECE. Majority of the teachers are class teachers who teach a wide range of subjects to a class, unlike subject teachers who teach only a specific subject that they have specialized.

The study findings demonstrate slow progress in the adaptation of the educational system to the changes in the new early learning curriculum based on the analysis of the school facilities and equipment for ECE as both intervention and control schools are poorly resourced in terms of the physical facilities, spaces and equipment for ECE. Intervention schools are slightly more endowed with more teachers as well as the number of professional teachers as compared to the non-intervention schools. Also, classroom sizes are significantly larger than the recommended class size for preschool and primary levels. Teachers in both the intervention and non-intervention schools had participated in a play-based pedagogy training programme in the last 3 years although more teachers in the intervention schools had participated in these trainings. Teachers have positive beliefs towards play-based learning classroom and integrate play-based learning activities in their teaching activities, although a substantial number (50%) do not appreciate the co-existence of play and learning (work). The adaptation of the educational system to the changes in the new early learning curriculum is inhibited by micro-level challenges such as the unavailability of play materials, poor classroom infrastructure, classroom set up incompatible with PBL learning, PBL approach considered too tiring and others. Infrastructure/logistics challenges, financial constraints, inadequate training and policy environment are the macro-level challenges stifling PBL implementation.

Findings about the role of education innovators in influencing early childhood education quality revealed that RTP and Sabre Education are the main organizations that support intervention schools to create resources for ECE and PBL implementation as well as the provision of direct classroom support. For the non-intervention schools, GES and development partners provide this support. RTP and Sabre were also identified as the main providers of support for teachers' continuous training in the intervention schools with some non-intervention schools (30%) also citing these innovators as the main providers of support for teachers' training. Overall, teachers indicated a positive perception of the impact of play-based pedagogy training received. An assessment of how well teachers are able to implement PBL revealed that most of them belong to the intervention schools. implying that the training provided by the innovators may have been more comprehensive and complete than that provided by other institutions which teachers in the non-intervention group participated.

On the value addition of play-based learning methods, children in the intervention schools outperformed non-intervention schools in the literacy and numeracy tests based on the Average Treatment effects on the Treated (ATT) analysis. Observation data suggest that the children from intervention schools significantly outperformed the children from the non-intervention schools in all four domains of language, reading, writing, and numeracy.

The cost influences on PBL are analysed using teachers' out-of-pocket payments for participation in Teachers Continuous Professional Development (TCPD) sessions and school-

level expenditure data on the implementation of PBL due to incomplete data on the overall cost of PBL implementation. Teachers paid between GH¢55 and Gh¢75 for face-to-face sessions and between Gh¢25 and Gh¢40 for online sessions for demand-driven training programmes provided by accredited Certified Service Providers. There was no significant difference in the amount paid by teachers in intervention schools and schools that had no intervention. Non-intervention schools spend more on providing teaching and learning resources for PBL in comparison to intervention schools. Cost and access to play-based materials undermine early childhood education. Government is the main provider of infrastructure for PBL across both intervention and non-intervention schools. Community support and the district assemblies 'provision of infrastructure for PBL in ECE schools is limited for both intervention and non-intervention schools. In both intervention and non-intervention schools, maintenance of PBL infrastructure is done by the schools and communities.

To address the challenges identified through this study, Government and development partners should invest heavily in school and classroom infrastructure and equipment for PBL at the ECE level for effective PBL. Government and education innovators who provide PBL infrastructure and TLRs should incorporate a sustainable strategy for the maintenance and replacement of the infrastructure. Provision of digital play materials such as tablets, laptops, television sets etc. for ECE should be considered by the government to complement play materials available locally. Human capacity investments through the promotion of specialization in ECE, assignment of support staff for KG teachers should be given policy attention for the success of PBL. School and community partnerships or collaborations should be considered to help address the local language challenge for ECE teachers. Alternative financing mechanisms for Continuous Professional Development (CPD) for teachers should be explored in light of the challenge of inadequate training despite the payment of CPD allowances to teachers. Schools should leverage funding from other government interventions such as the Ghana Accountability for Learning Outcomes Project (GALLOP), to support the capacity building of teachers in PBL approaches. Also, for inclusive PBL pedagogy, resources for special needs children must be made available to effectively aid teachers in including SEN children in the classroom.

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ACRONYMNS

ASER	Annual Status of Education Report
CPD	Continuous Professional Development
CSP	Certified Service Providers
ECCD	Early Childhood Care and Development
ECE	Early Childhood Education
GES	Ghana Education Service
JHS	Junior High School
KG	Kindergarten
PBL	Play-Based Learning
PTA	Parent Teacher Association
MOE	Ministry of Education
MOWAC	Ministry of Women and Children Affairs
NaCCA	National Council for Curriculum and Assessment
NTC	National Teaching Council
RTP	Right to Play
SMC	School Management Committee
TLR(s)	Teaching and Learning Resource(s)
TPD	Teacher Professional Development

SECTION 1: INTRODUCTION

1.1 Background and Context

Play is undoubtedly crucial in the development of every child. It is key to the way children learn with researchers positing that one of the best determinants of successful emotional development (Myers & Berk, 2014), intellectual development (Sylva, Melhuish, Sammons, Siraj-Blatchford, & Taggart, 2010) and the acquisition of social skills (Smith & Pellegrini, 2008). The importance of play as a prelude to formalized instruction has also been widely documented (Nolan & Paatsch, 2018; UNICEF, 2018). Essentially, play-based learning (PBL) is learning while playing. PBL is considered quite different from the more general definition of play, in that the precise definition of PBL and what activities qualify as PBL are still up for debate in the research community (Wallerstedt & Pramling, 2012). Nonetheless, two types of play have received the most attention in studies i.e. free play, which is directed by the children themselves (Fleer, 2011; Alfieri, Brooks, Aldrich, & Tenenbaum, 2011; Pyle & Danniels, 2017; Inkyung, 2020), and guided play, which is play with some amount of instructor instruction or engagement (Tarman & Tarman, 2011; Fisher, Hirsh-Pasek, Newcombe, & Golinkoff, 2013).

A high quality PBL can enhance children's readiness for school. This quality can be obtained by having highly qualified staff who can have a positive effect on educational outcomes and ensure students are shaped in the right way (Blanden, Del Bono, Hansen, & Rabe, 2022). Early childhood education and care teachers are therefore required to undertake several professional competencies leading to the development of skills that offers a high-quality learning atmosphere to children to help trigger creativity and lead to the attainment of their full potential (OECD, 2015; Keung & Cheung, 2019). These teachers are expected to develop the capacity for curriculum planning and exhibit a high level of proficiency in pedagogical practices which would help enhance the effectiveness of their teaching and their commitment to the child's learning needs. Evidence from the literature on professional development reveal that teachers' capacities significantly affect how well children are educated (Keung & Fung, 2021). These studies demonstrate that enhancing teachers' pedagogical and curriculum planning skills can improve their efficacy as teachers and their dedication to children's learning. This development of teachers' abilities is especially crucial for kindergarten education since kindergarten teachers are directly involved in assisting young children in achieving a balance development and laying the groundwork for lifelong learning (Brown, Scull, Nolan, Raban, & Deans, 2012). Therefore, improving teacher skills has a significant impact on kids' learning and development in addition to improving school performance and effectiveness.

Early childhood education (ECE) centers have been a feature of Ghana's educational system since Kindergartens (KGs) were added to some primary schools by Basel missionaries in 1843 (Agbenyega, 2008). The government of Ghana recognizes that the early years of a child's life is crucial for the national development, thus, Ghana's ECE policies have evolved over time. Prior to 2004, initiatives and strategies related to ECE were dispersed across various ministries and agencies. In 2004, the government launched the Early Childhood Care and Development (ECCD) Policy which provided a framework that supports a comprehensive and integrated approach to the development of children from birth to 8 years (MOWAC, 2004). In 2008,

Ghana added two years of pre-primary education i.e. kindergarten (KG) to its Free and Compulsory Universal Basic Education (fCUBE) system (MOE, 2018). This was to ensure that the country delivered on SDG 4.2 - universal access to quality early childhood education. In 2019, as part of the new primary curriculum called the Curriculum for Change and Sustainable Development (NaCCA and MOE, 2019), a play-based KG Curriculum was adopted. Play-based teaching is also emphasized in the new national teacher education curriculum framework, which was created as a component of the Pre-tertiary Education Curriculum and is being used in teacher-training programmes and schools of education to prepare pre-service teachers. Education innovators such as Sabre Education and Right to Play (RTP) also support teacher education in play-based pedagogy in selected schools.

In 2021, the Early Childhood Education (ECE) policy was implemented by government. The policy aimed at sustaining the significant investments made in pre-primary education over the last decade and improving the efficiency, equity, and effectiveness of early childhood education (ECE) to give all boys and girls an equal opportunity to be prepared for primary school (MOE, 2021). Despite the monumental efforts undertaken by government, the effect of ECE on children's academic and social learning development remains unclear (Bago et al., 2019). This may be attributed to several challenges including: inadequate infrastructure, inadequate classroom resources to enhance PBL, the lack of training or limited training in the PBL pedagogy, financing and provision of Teaching and Learning materials (TLMs), disparities in enrollment in the north and south of the country. In addition, while early childhood is defined as age 0 – 8 (Irwin et al., 2007; MOE, 2021), there is a dearth of studies which look at PBL beyond age five (Jay and Knaus, 2018).

The purpose of this study is to demonstrate the value of play-based learning in ECE classrooms (i.e. KG, Primary 1, 2 & 3) and especially the contribution of teachers' capacity to the success of PBL. The study therefore aims to address the following research questions:

Question 1: How is the new early learning curriculum with play-based approaches integrated into the pre-service and in-service teacher training programs?

Question 2: How is the educational system adapting to the changes in the new early learning curriculum?

Question 3: What innovations in play-based learning exist to support teacher capacity to implement play-based learning and what are the added value (e.g., volunteer teacher models and right to play models)?

Question 4: How are education innovators in the early learning space influencing the early childhood education quality and uptake in Ghana and Sierra Leone?

Question 5: Can there be more cost-effective approaches to scaling up early learning activities through volunteer teacher programs?

Question 6: What is the value addition of play-based learning methods compared to schools which do not implement these, particularly in relation to early grade reading outcomes?

This quantitative report provides answers to questions 2, 4, 5 and 6.

The research is structured in six main chapters. Chapter one outlines the introduction of the study including the purpose and research questions. Chapter two describes the study design and

research methodology, data collection and challenges of collecting the data. Chapter 3 describes the sample and chapters 4, 5 and 6 answer the research questions. Chapter 7 is the conclusion and recommendations of the study.

SECTION 2: SURVEY METHODOLOGY AND IMPLEMENTATION

2.1 Study design and methodology

The study adopted a quasi-experimental design to establish cause-and-effect relationship between programme and outcome variables. Unlike a true experiment, schools that have received the intervention are randomly sampled and a comparable non-intervention group are chosen based on non-random criteria from their respective eligible populations. The effect of the intervention on the treatment group is then tested using propensity score matching (PSM) techniques. The intervention schools are beneficiaries of the innovations by Right to Play (RTP) and SABRE Foundation for Ghana and Teach for Sierra Leone (TFSL) in Sierra Leone. The population for the control group, however, comprises schools that have received any play-based innovation from any institution, both government and private.

Intervention schools were obtained from RTP and SABRE in Ghana and TFSL in Sierra Leone, constituting the population for the treatment group. In the case of Ghana, a sample of beneficiary schools was drawn randomly from the population of beneficiary schools in a district. Similarly, non-intervention schools in a district, and outside the communities of beneficiary schools, which constituted the population for the control group in a district were also randomly sampled to constitute the non-intervention group. It is expected that the only difference between the treatment group and the control group will be the **play-based innovations** in the selected schools and in the cases of Sierra Leone, the presence of volunteer teachers at early childhood levels. The sample size determined for the study was 300. This translates into a total sample size of 600, constituting 300 schools for intervention group and 300 for control group. In each school the head teacher and two other teachers were interviewed. This gave a total of 1200 teachers and 600 head teachers.

2.2 Questionnaire design

The ASER Tool

The data on learning outcomes of children was collected using the Annual Status of Education Report (ASER) Literacy and Numeracy tools. The ASER tools test children's ability to read simple text and do basic arithmetic to provide evidence on whether children are learning in school. The tool focuses on the intent of assessing whether a student can read alphabets, words, paragraphs, and stories. Whether the student can solve basic arithmetic problems of number recognition, subtraction, and division. In administering the tool, the student must listen to the instruction, read, and speak aloud as per their ability, read, and write for the arithmetic problem solving. The tool caters to the need of assessing listening, speaking reading, and writing competencies. In the language tool one must listen to the instructions, read, and then speak out what has been read. In the arithmetic tool one must listen to the instructions, read the questions, either speak up the numbers recognized or write the answers as per his competency.

2.3 Recruitment and training

Recruitment and training of enumerators for collection of survey data was executed first in Sierra Leone and later in Ghana. This afforded opportunity not only to deal with fieldwork practical challenges sequentially and learn lessons, but also helped the team to adapt the data collection instrument more effectively and efficiently for the two countries. In both countries enumerators were trained on the overarching objectives of the PBL project to allow them to

fully appreciate and understand the survey questionnaire. Enumerators were also trained on the ethics of survey data collection, equipped with necessary skills for respondent engagement, and taken through the overall approach to fieldwork engagement and community entry techniques. As part of the training, enumerators were trained on how to handle, operate, and execute the digital version of the survey questionnaire. In both countries, the training duration was five (5) days.

2.4 Data Collection and Quality Control

As part of the measures to guarantee maximum quality of the data collected in terms of accuracy and reliability, very experienced enumerators and field supervisors were engaged in the two countries. The training ensured that high standards of data collection and management were maintained throughout the survey. Also, with the use of the Computer-Assisted Personal Interviewing (CAPI) platform, errors associated with data entry and involuntary skips were minimized, hence ensuring enhanced data quality. There was also a dedicated field and data management team who monitored the fieldwork activities to ensure that data collected conforms to quality standards. At the start of the actual data collection in both countries, data from the first two days of survey was reviewed for consistency and validity. This was to ensure that field staff did not deviate from what was required of them.

In Ghana, 593 schools and 1156 teachers were surveyed out of a total of 600 and 1200 targeted schools and teachers expected to be surveyed respectively. This gives a response rate of 98.8 percent for the number of schools successfully surveyed and 96.3 percent response rate for the number of teachers successfully surveyed. The total response rate is consistent with the response rate recorded between intervention and non-intervention schools, except to say that while all sampled schools and targeted teachers per school were successfully surveyed for the non-intervention schools, in the case of intervention school’s 90 percent and 97.7 percent of teachers and schools respectively were successfully surveyed. It is safe to conclude that the non-response rate is not large enough to disturb the analysis and conclusions that can be drawn from the Ghana data.

Table 2.1: Sample completion rate by Intervention status

Sample	Intervention	% Completed	Non-Intervention	% Completed	Total	% total
School	293	97.7	300	100	593	98.8
Teacher	540	90.0	600	100	1,156	96.3

2.5 Challenges

Four main challenges worthy of sharing were encountered:

1. Delay in data collection due to long strike action by teachers.
2. Frequent teacher movement/transfer within and across districts.

Teacher turnovers, including attrition, transfers and (re)postings is quite rampant and irregular in Ghana. It was realised during the data collection stage that some teachers in the intervention schools have not received any form of training for play-based learning. Conversely, a significant number of teachers in the non-intervention schools received

some form of training for play-based learning so not all teachers in the control schools have not been exposed to the PBL intervention. The effect of this challenge is to constrict the sample that is available for any valid matching assessment as envisaged. We therefore indicate strong caution in the interpretation of the average treatment effects.

3. Research fatigue: Teachers complained of constant request to participate in all manner of research endeavours becoming too frequent and fatiguing.
4. Teacher Professional Development (TPD) fatigue - frequent organisation of TPDs is exhausting and takes teachers away from the classroom.

SECTION 3: DESCRIPTION OF SAMPLE - SCHOOLS AND TEACHERS

3.1 Introduction

This chapter presents a description of the schools and teachers surveyed. It is divided into two subsections. The first subsection presents school characteristics. It highlights the type of school, the level, and location. It also covers the state of infrastructure and utilities available in the schools. The second subsection covers teacher characteristics, their academic and professional qualifications and the extent to which teachers have upgraded their qualifications in terms of pursuing higher studies.

3.2 School characteristics

3.2.1 Type of school, level and location

The type of school is seen in terms of whether the school is a single shift or double shift (double track) where others come in the morning and close at 12 noon to give way for a second batch. The double shift system was very popular in the 1980s and 1990s when school infrastructure was in serious deficit. Today the shift system is not entirely eradicated but quite uncommon. The data shows that only about 5 schools in the sample are still double or shift schedule type. Almost all the schools (99%) run the single-shift schedule. With regards to levels within a school, there are the preschool, kindergarten (KG), primary and Junior High School (JHS) levels. Because we are interested in early graders, 3 outcomes are envisaged. A school can be a preschool only (including nursery), kindergarten and primary only, Preschool-Primary-Junior high.

About 49 percent of schools in the intervention group had only KG and Primary level as against 79 percent among the non-intervention schools. Similarly, 46 percent of schools in the Intervention group had KG, Primary and JHS as against 18 percent in the non-intervention group. Having four levels of schools was in the minority for both the intervention and non-intervention schools as only 3 and 1 percent had preschool, KG, Primary and JHS. In terms of location of school 19 percent of schools in the intervention group were in urban towns while 17 percent of schools in the non-intervention group were in urban towns. It is also interesting to note that about 47 percent of schools from the Intervention group were in rural areas as against 50 percent in the non-intervention group.

3.2.2 The state of infrastructure in selected schools

The number of classrooms in a school plays an important role in the development of children in schools, as shown in Table 3.1. Schools in the intervention group had approximately 10 classrooms, while those in the non-intervention group had 8. The survey also found out if the seating arrangement was appropriate for the ECE level and it turned out that about 72 percent of schools in the intervention group was appropriate while 58 percent was also appropriate for the non-intervention group.

Table 3.1: School schedule, level and infrastructure

Indicator	Intervention	Non-intervention	p-value
School of schedule			
Single Schedule System	98.93	99.03	0.910
School level			
Preschool	-	0.65	
KG and Primary	51.71	79.55	0.001
KG, Primary, and JHS	45.21	18.18	0.001
Preschool, KG, Primary and JHS	3.08	1.62	0.209
School location			
Urban (Big town)	19.57	17.53	0.525
Urban (small town)	32.38	32.14	0.95
Rural	47.69	50.32	0.523
# of classroom school has	10.04	8.48	0.001
# of classrooms that are defective	4.97	4.33	0.019
# of classrooms that are uncompleted	0.81	1.13	0.028
# of classrooms that do not have enough furniture for all students	5.69	5.96	0.425
# of classrooms for ECE (KG1-P3)	3.36	2.22	0.000
Classroom seating arrangement appropriate for the ECE level (%)	72.24	58.77	0.001

3.2.3 Utilities for schooling convenience of children

In terms of utilities, 50 percent of the schools in the intervention group had access to piped water extended to the community, while 48 percent in the non-intervention group also had this access (Table 3.2). Additionally, 32 percent of the schools in the intervention group had access to piped water, compared to only 16 percent in the non-intervention group. Furthermore, it can be observed that 38 percent of schools in the intervention group have access to borehole water, while 36 percent in the non-intervention group have the same access. Hygiene is of utmost importance for individuals and particularly crucial for schools. In this regard, 52 percent of the schools in the intervention group had sufficient hygienic facilities for boys and girls, while 48 percent in the non-intervention group also had these facilities. Moreover, 19 percent of the schools in the intervention group designated hygienic places for preschool, compared to only 9 percent in the non-intervention group.

Table 3.2: Utilities (water, electricity, sanitation & hygiene)

Indicator	Intervention (1)	Non- intervention (2)	p-value (3)
Has pipe-borne water been extended to the community	50.89	48.7	0.596
School has access to pipe-borne water	32.74	16.56	0.00
School has access to borehole water	38.79	36.36	0.544
School has sufficient hygienic places of convenience for boys/girls	52.31	48.05	0.302
School has sufficient hygienic places designated for preschool convenience	19.57	9.42	0.000
National Electricity grid extended to this city/town/village in which school is located	94.31	94.16	0.938
School has access to electricity	77.22	62.99	0.001
Solar source of electricity	0.71	0.00	0.139
GRIDCO/ECG/NEDCO source of electricity	76.51	62.66	0.001
Generator source of electricity	0.00	0.00	

Electricity plays a vital role in daily activities and is also essential for schools. In the community in which the schools were located, 94.3 percent of the intervention group and 94.2 percent of the non-intervention group had access to electricity. Furthermore, 77.2 percent of the schools in the intervention group had access to electricity, while 62.9 percent in the non-intervention group also had access to electricity. Interestingly, none of the schools in either group used solar electricity. Lastly, when considering the source of electricity, 76.5 percent of schools in the intervention group and 62.7 percent in the non-intervention group had access to electricity from GRIDCO/ECG/NEDCO. Notably, none of the schools in either group used a generator as a source of electricity.

3.3. Teacher characteristics, academic and professional qualifications

Teacher characteristics is seen in terms of age, educational qualification, and teaching experience (Table 3.3). The average age of the teachers sampled is 37 years, with no significant difference between males and females and no significant difference between teachers in intervention schools and non-intervention schools. In terms of gender, 19 percent of teachers in the intervention group are male (females = 81%), while 37 percent in the non-intervention group are also males (females = 63%). This suggests the predominance of female teachers in both the preschool and lower primary levels. About 72 percent of teachers in the intervention group are married, compared to 80 percent in the non-intervention group.

Regarding the educational qualification, 56 percent of teachers in the intervention group have tertiary education, compared to 48 percent in the non-intervention group. Furthermore, 39 percent of teachers in the intervention group hold a diploma, while 46 percent in the non-intervention group have the same qualification. A little over 1 percent of teachers in both groups have a master's degree. Regarding subject specialization, 59 percent of teachers in the intervention group have General Education qualification compared to 63 percent in the non-

intervention group. Additionally, 16 percent of teachers in the intervention group specialize in Early Child Education compared to 12 percent in the non-intervention group. About 24 percent of teachers in both groups specialize in other subjects. Most teachers have extensive teaching experience, extending over 7 years in both groups, teaching at the early grade level and about 4 years of teaching in the present school.

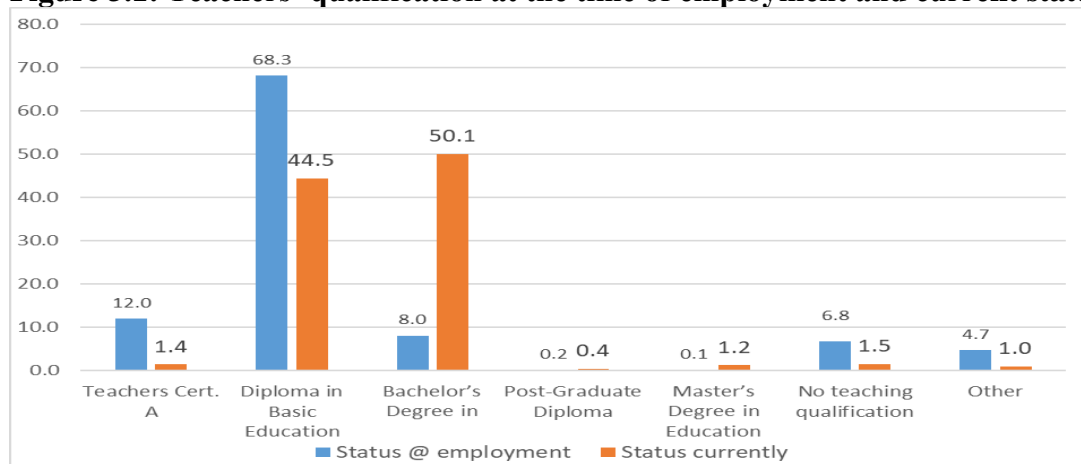
Table 3.3. Teacher characteristics

Indicator	Intervention	Non-intervention	p-value
Teacher is male	19.44	37.82	0.001
Teacher is a female	80.56	62.18	0.001
Teacher is married	72.22	80.36	0.001
Teacher's highest qualification			
Tertiary	56.48	48.54	0.007
Diploma	39.81	46.27	0.027
Master	1.67	1.46	0.778
Current Teaching Qualification			
Bachelor's degree in education	54.26	46.43	0.008
Current subject specialism			
General Education	59.44	63.8	0.129
Early childhood Education	16.3	12.18	0.045
Other subjects	24.26	24.03	0.926
Average years of teaching at early childhood level	7.79	7.38	0.243
Average years of teaching at early childhood level in this school	4.45	4.54	0.621
Average Age of teacher			
	36	37	
Rank in GES			
Snr Sup II	32.41	29.87	0.353
Snr Sup I	13.7	21.59	0
Principal Sup	34.44	30.68	0.173
AD II	14.81	11.36	0.082
AD I	2.04	2.11	0.931
N	540	616	

At the time of employment, a little over 68 percent of teachers had a Diploma in Basic Education (Figure 3.1) while 12 percent of teachers had teachers' certificate 'A' qualification as their highest qualification at the time of employment. Less than 1% had a Masters' degree and about 6.8% did not have any teaching qualification at all. The proportion of teachers who had teachers' certificate 'A' qualification at employment and those who had Diploma in Basic Education both decreased from 12 percent and 68 percent to 1.4% and 44.5 percent respectively, suggesting an improvement in the level of qualification. It is worth stating that the teachers' certificate 'A' qualification has faded out and therefore there can only be very few

teachers in the system still holding that qualification. The least a professional teacher is expected to hold in Ghana is the Diploma in Basic Education. We however see a significant increase in the percentage of teachers currently with a bachelor's degree. The number of teachers in that category increased from 8% at employment to 50 percent among current teachers. We also notice a marginal increase in the percentage of teachers who currently have a master's degree, as it has increased from a 0.1% to about 1.2% and the percentage of teachers who at employment had no teaching qualification have now decreased to about 1.5% from 6.8%. This also suggest that the majority may have obtained a bachelor's degree or master's degree.

Figure 3.1: Teachers' qualification at the time of employment and current status



In terms of intervention and non-intervention groups, 15 percent and 9 percent respectively, had teachers' certificate 'A' as their highest qualification at the time of employment. For the teachers who had Diploma in Basic Education at employment, 69.8 percent are in the intervention group while 66.9 percent are in the non-intervention group (Table 3.4). These percentages decreased for teachers in both intervention and non-intervention group. The proportion of teachers holding a diploma in basic education decreased to 41.5 percent and 47.1 percent from 69.8 percent and 66.9 percent respectively. Many more teachers now have bachelor's degree compared to the time of employment in both intervention and non-intervention groups. About 54 percent of teachers from the intervention had bachelor's degree in education compared to 46 percent from the non-intervention group. The survey data showed that close to 2 percent of teachers from the intervention group still have the teachers' certificate 'A' qualification as compared to 1 percent for the non-intervention group.

Table 3.4: Change in teachers' qualification from the time of employment and now

Qualification	Status at employment		Current Status	
	Intervention	Non-intervention	Intervention	Non-intervention
Teachers Cert. A	15.0	9.4	1.9	1.0
Diploma in Basic Education	69.8	66.9	41.5	47.1
Bachelor's Degree in	6.5	9.4	54.3	46.4
Post-Graduate Diploma	0.0	0.3	0.4	0.5
Master's degree in education	0.2	0.0	0.9	1.5
No teaching qualification	6.3	7.1	1.1	1.8
Other	2.2	6.8	0.0	1.8

Majority of the teachers are class teachers. Class teachers are individuals who have the main responsibility of guiding and supporting the subject-specific and social development of the pupils in a particular or designated class. They teach a wide range of subjects to a class, unlike subject teachers who teach only a specific subject that they have specialised. The data show that about 7% of the teachers teach two classes (KG 1 & 2), but the majority are class teachers. In terms of distribution of the general sample according to the targeted levels for the study, the sample seem to be equally distributed between preschool level and lower primary school level (Table 3.5)

Table 3.5: Proportion of teachers who teach at the lower level

What class do you teach currently	Intervention	Non-intervention
Kindergarten 1 only	16.1	14.3
Kindergarten 2 only	24.6	14.3
Kindergarten 1 & 2	7.8	7.0
Class 1	20.9	17.2
Class 2	17.8	21.1
Class 3	12.4	25.6
Others	0.4	0.5

SECTION 4. ADAPTING TO THE EARLY LEARNING CURRICULUM AND THE ROLE OF INNOVATORS

4.1 Introduction

This chapter discusses results of the survey in relation to objectives 2 and 3 of the study. The objective 2 looks at how the educational system is adapting to the changes in the early learning curriculum. The analysis highlights the availability and adequacy of school and classroom facilities and equipment for ECE. The analyses further feature teaching capacity, qualification, and conditions at the ECE levels. The section also analyses how teachers are prepared and are able to deliver Play-based learning through participation in Play-Based Learning Professional Development Trainings among others. The discussion also touches on the challenges impeding the implementation of play-based learning approaches in school and how to improve the integration of play into teaching and learning in schools.

The Objective 3 of the study looks at the role of education innovators in spearheading the adaptation of schools to the new early learning curriculum. The analysis of this objective covers the role of innovators in providing and supporting the provision of training and infrastructure for PBL.

4.2 School facilities and equipment for ECE

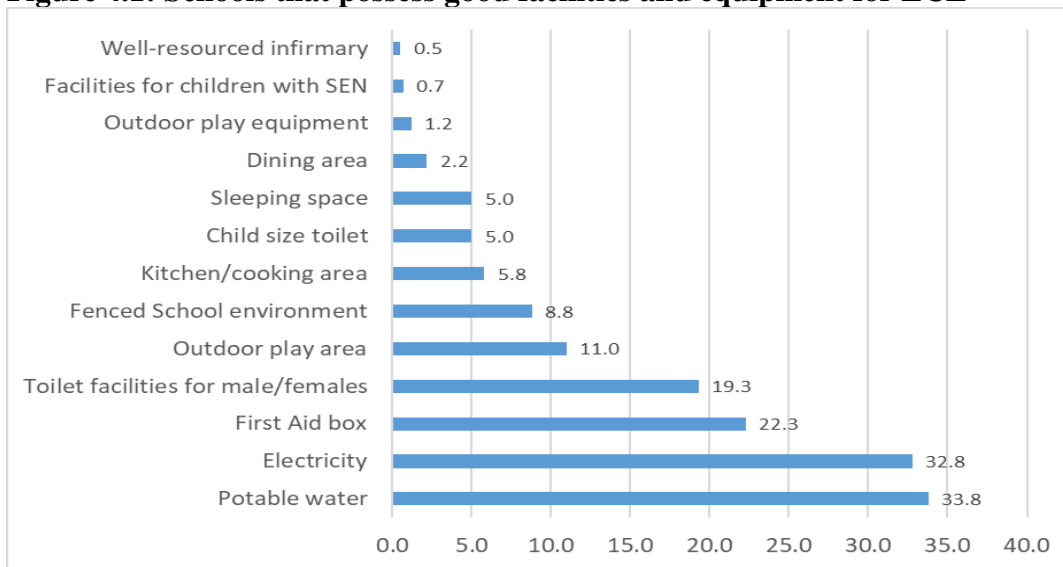
The general school environment in which play-based learning thrives can be categorized into physical and human environment. The physical environment includes the general school environment and learning related resources, while the human environment refers to the quality of teachers, supervision, and support from school leadership.

4.2.1 Physical facilities, spaces, and equipment for ECE

To foster a conducive learning environment, it is crucial to have certain necessary facilities and equipment available in the school. Some of the physical facilities of a school that support ECE, and play-based learning include physical space for playing, fence wall for physical security, facilities conducive for hygiene (toilets and urinals), dining area, potable water source, well-resourced infirmary among others. Figure 4.1 below presents a summary of statistics showing the percentage of schools that have various facilities and equipment conducive for ECE and PBL.

The data shows that the schools are slow at adapting to the early learning environment as many of them are severely under-equipped for ECE and PBL. Less than 1% of schools have well-resourced infirmaries and facilities for children with SEN. A well-resourced infirmary for ECE is a setting that is equipped to address the health and wellness needs of children. It is one that has or is connected to a registered nurse, has access to medical supplies, has regular check-ups, has emergency preparedness plans, and has a comfortable and child-friendly environment. A well-resourced infirmary is crucial for promoting the health and well-being of young children, providing prompt care when needed, and fostering a safe and supportive learning environment.

Figure 4.1: Schools that possess good facilities and equipment for ECE



The data also shows that less than 10 percent of schools provide child size toilets, equipment for outdoor playing, designated places for sleeping, or fencing for school compound. Particularly, fencing is important because it provides physical protection or security for children. It is an important requirement that ECE facilities provide physical protection to ensure that children are contained or restrained from wandering into potentially unsafe places and for prevention of accidents. The importance of fences in ECE schools lies in their ability to create a safe, secure, and well-managed environment for children to learn and play. Fencing is a regulatory requirement, but a significant majority of schools are not able to provide this.

Another crucial facility that is expected of schools providing ECE is, access to clean water. The data shows that about a third (34%) of schools have access to potable water. Potable water is a fundamental necessity for ECE, impacting children's overall well-being. It supports the development of good habits, promotes safety, and contributes to creating a conducive environment for learning and play. Ensuring easy access to clean and safe water is a key aspect of providing quality care and education for young children. In addition to ensuring that children are well hydrated while playing, access to clean water encourages children to engage in active play, while developing self-care skills, such as pouring their own water and learning about personal responsibility for hygiene and hydration.

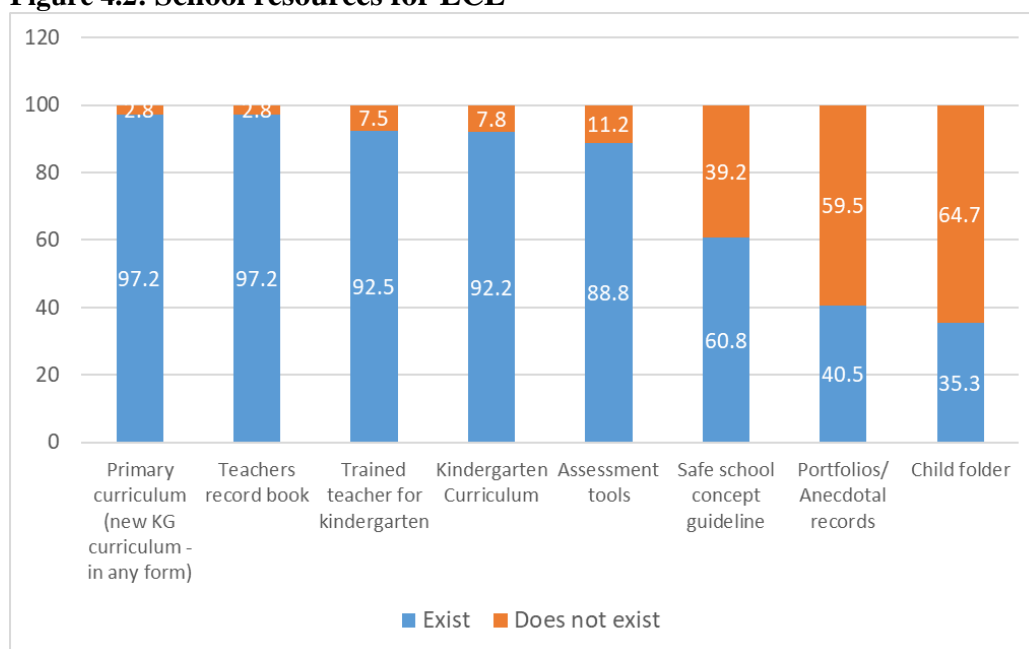
4. 2.2 Learning related resources for ECE in the school

There are a variety of learning-related resources that cater to the developmental needs of young children. These resources include learning kits and curricula, picture books, learning centres, outdoor play equipment, teacher's record books, assessment tools, portfolios, and child folders among others. Figure 4.2 below provides summary statistics of the percentage of schools that have some of the resources necessary for the developmental needs of young children.

The data shows that in over 90 percent of the schools surveyed, they have both the new and old KG curriculum and have the teachers' record books for ECE. Also, 88 percent of the schools have assessment tools designated for ECE. The Ghana Education Service (GES), with support

from UNICEF developed guidelines for ensuring safe schools (Safe school concept guidelines). About 60 percent of the schools confirmed that these guidelines exist in their schools. Two other very important resources for ECE are portfolios or anecdotal records and child folders. However, more than half of the schools surveyed do not have these resources. Indeed, 65 percent of schools do not have child folders. Children developmental portfolios and folders are valuable tools for educators and parents alike. They help track a child's development, identify areas for growth, and facilitate communication between teachers and parents. They can also be used during teachers meeting with parents to discuss a child's progress and to set educational goals.

Figure 4.2: School resources for ECE



4.3 Classroom facilities and equipment for ECE

The new early learning curriculum require facilities and equipment appropriate for PBL pedagogies are adequately provided and utilised in the classroom. In the classroom, facilities and equipment appropriate for ECE include play areas (indoor), child-sized chairs and tables, writing boards, child-sized bookshelves, and other specific facilities for SEN.

Figure 4.3 presents a summary of the proportion of schools that have various classroom facilities and equipment for ECE. The analyses look at whether the facilities exist and are in good condition or require improvement or an equipment does not exist at all. In terms of facilities for children with Special Education Needs (SEN), only about 4% of the intervention schools provided special facilities. The remaining, over 95 percent, do not have facilities for SEN. Another item that schools perform poorly on is the provision of child sized shelves for children. Nearly 90 percent of schools do not have child-sized shelves. The remaining 10 percent is split between exist in good condition (2.3%) or exist but needs improvement (8.3%).

Facilities and equipment such as indoor and outdoor play areas, handwashing facilities, good lighting and writing boards are other items that are provided by a good number of the intervention schools. For instance, about 60 percent of the intervention schools provide indoor play area, albeit 10 percent of the schools are in good condition while the remaining 50 percent of the 60 percent need improvement. Other facilities such as handwashing facilities, lighting, writing boards, and child sized chairs and tables are also being provided by a significant proportion of the intervention schools, albeit in a significant proportion of these schools, these facilities need improvement.

Figure 4.3: Classroom facilities and equipment for ECE

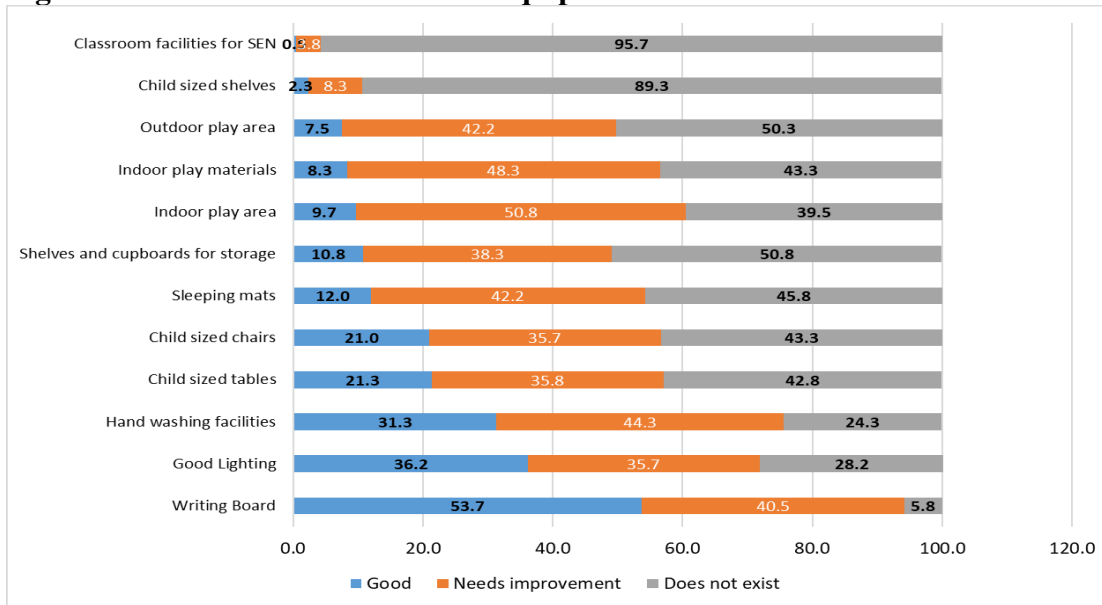
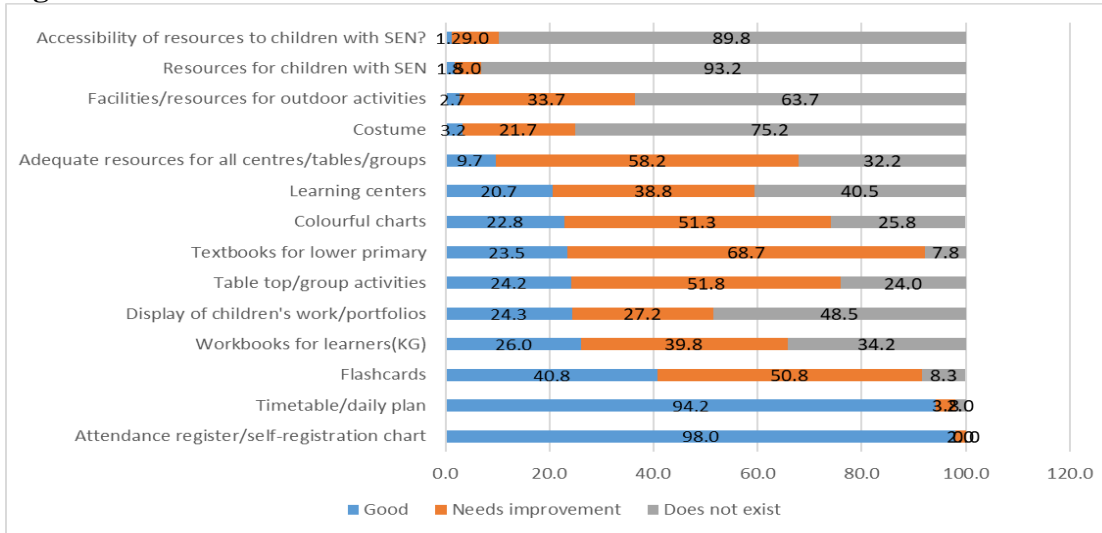


Figure 4.4 presents a summary of the provision of other resources in the classroom. These resources include charts and flashcards, timetables and daily plans, registers for children school attendance, costumes, and other resources specifically for SEN children. Most of the schools are not able to provide resources for children with SEN. The data shows that only about an average of 1.5% of schools provide resources for SEN. In the rest of the schools there are no resources to support the learning convenience of children with SEN.

Figure 4.4: Classroom resources for ECE



It is evident from the results that of the intervention school’s 65 percent provide child-sized chairs whereas only 34 percent of the schools in the non-intervention cohort provided child-sized chairs. Furthermore, children require shelves to store their belongings. In the non-intervention schools, only 21 percent of schools provided child-sized shelves, while 78 percent of schools in the intervention group provide child-sized shelves. A little over 40 percent of the schools in the non-intervention group possessed writing boards, whereas 58 percent of the schools in the intervention group provide writing boards.

Considering the number of books children have to carry to school, facilities, such as shelves and cupboards, are necessary. The survey results show that only 30 percent of the schools in the non-intervention group offered such spaces, while 69 percent of schools in the intervention group have requisite facilities. Both indoor and outdoor play areas are vital for recreational activity. In the non-intervention group, 51 percent of schools have indoor play areas, while 48 percent of schools in the intervention group provide this facility. In terms of out-door play areas, 28 percent of schools in the non-intervention group provide space, compared to 71 percent in the intervention group.

Appropriate lighting is crucial for children's well-being and learning. Among the non-intervention schools surveyed, only 34 percent of them possessed adequate lighting, whereas 65 percent of schools in the intervention group had adequate lighting. In terms of handwashing as an important aspect of hygiene, only 28 percent of schools in the non-intervention group provide this handwashing facilities, while 71 percent of schools in the intervention group provided handwashing facilities.

4.4 Teaching capacity, qualification, and conditions in the classroom

Teaching capacity refers to the quantity (number) and quality of teachers in a school. The data showed that a school had an average of 13 teachers. The intervention schools are slightly more endowed with an average number of teachers per school of 15 compared to 11 in non-intervention schools. There was no significant difference between the number of male and

female teachers at each school. However, the number of female teachers (seven) was slightly higher than the number of male teachers (six).

Preschools (comprising nursery and kindergarten) had an average of four teachers, with an average of three females and one male. Of this number, three are professionals and one non-professional (Table 4.1). In terms of intervention and non-intervention schools, there is an average of three professional teachers in intervention schools compared to two professional teachers in non-intervention schools.

Table 4.1: Qualifications of preschool teachers in a school

Teachers' qualifications and conditions	Intervention	Non-intervention
How many <i>professional</i> teachers are designated to preschool level (kindergarten)?	3	2
Of the teachers at the preschool level, how many possess professional qualifications equivalent to diploma in education or higher?	3	2
Of the teachers at the preschool level, how many possess academic qualifications below diploma?	1	1
How many <i>non-professional</i> teachers are designated for preschool level (kindergarten)?	1	1
Of the teachers at the preschool level, how many live in the same town or village as the school?	2	1
Of the teachers at the preschool level, how many have been in this school for not less than 3 years?	2	1

The average number of professional teachers in the lower primary category is 3 teachers, distributed at an average of 1 and 2 male and female respectively (Table 4.2). The difference in the number of professional teachers in intervention schools (3 teachers) and non-intervention schools (2 teachers) is marginal. There is an average of 1 teacher who is non-professional teaching in an intervention or a non-intervention school.

Table 4.2: Qualifications of lower primary teachers in a school

Teachers' qualifications and conditions	Intervention	Non-intervention
How many <i>professional</i> teachers are designated to primary 1 to 3?	3	3
How many have ECE qualifications?	1	1
How many <i>non-professional</i> teachers are designated to primary 1 to 3?	1	1
Of the teachers at class 1 to 3, how many have been in this school for not less than 3 years?	2	1

Average class size

The average class size is above 40 pupils for both preschool and lower primary levels. Table 4.3 below shows the distribution of the number of pupils in a class across all the grades at both preschool and lower primary levels. The numbers are significantly larger than the recommended class size for preschool and primary levels. The current regulation on the recommended class size for preschool is not to exceed 30 pupils and that of the primary school is 35 (President’s Committee on Education, 2002)¹. The data show that nursery level has an average of 46 pupils in a class while the kindergarten level has between 33 and 40 pupils in a class. There is however no significant difference in terms of number of boys and girls in a class.

Table 4.3: Average class size

Grade	Boys	Girls	Total
Nursery 1-2	24	22	46
KG 1	20	20	40
KG 2	17	16	33
Prim 1	19	19	38
Prim 2	21	19	40
Prim 3	21	20	41

As indicated, the numbers in the lower primary level are similarly larger than the recommended class size of not greater than 35 pupils. As shown in table 4.3 above, all the classes (Primary 1 – 3) have numbers higher than the recommended average.

4.5 Teachers participation in Play-Based Learning Professional Development Trainings

Teachers are expected to take steps to improve both their content and pedagogical knowledge and skills over time through regular participation in Teacher Continuous Professional Development (TCPD) programmes. Professional Development (PD) refers to the process by which teachers maintain and enhance their knowledge, skills and experiences gained as they work beyond the initial training (NTC, 2020). PD activities involve the development of qualities that are required by teachers to carry out their professional and technical duties during their teaching career. It is an integral component of teacher development. In Ghana, these include training and education programmes organized within or outside the school environment, which have been approved by the National Teaching Council (NTC) or the National Council for Curriculum and Assessment (NaCCA) as being relevant to the teaching profession and meeting prescribed standards.

TCPD activities can be supply or demand driven. Supply driven programmes are provided by government sources (NTC, NaCCA, GES, etc.) at no cost to teachers.² Such TCPDs typically

¹ The recommended class size for junior high schools is 25 and the secondary level is 40 students in a class (President’s Committee on Education, 2002).

² In an academic calendar with three terms (Trimester) teachers have minimum of three supply driven trainings per term making a total of Nine (9) trainings per year and Twenty-Seven (27) per the 3-year PD cycle. Similarly, teachers at the levels where academic calendar operates for two terms (Semester basis) shall have a minimum of Six (6) supply driven PDs for a semester, making a total of Twelve (12) per year and 36 per the 3-year PD cycle.

contain programmes that accompany new policies and innovations to be implemented by teachers. Demand-driven, on the other hand, are TCPD programmes provided by NTC-accredited individuals, institutions, and agencies. NTC-accredited providers are referred to as certified Service Providers. These are individuals or organizations whose training contents have been approved by the NTC as relevant for teachers. In most cases, teachers are required to pay out-of-pocket training programme fees. In such situations, teachers have the right to decide on which one they want to attend. However, teachers are required to access proportionally from supply or demand-driven perspectives. In the next subsection, we establish the spread of knowledge of play-based learning pedagogy among teachers.

4.5.1 Teachers' participation in play-based learning training

The data shows that 68.7 percent of the sample have participated in a play-based pedagogy training programme in the last 3 years. In terms of intervention and non-intervention, 76.7 percent of the teachers in the intervention group sample have participated in play-based learning pedagogy, whereas 61.7 percent in the non-intervention group sample have participated in a play-based learning programme (Table 4.4). The average number of play-based trainings a teacher participated in the last 3 years is 3 in the intervention and 2 in the non-intervention group. With respect to the nature of the trainings, 65.9 percent of the teachers in the intervention group and 49.8 percent in the non-intervention group participated in the standard base curriculum training. In addition, 69.4 percent of teachers in the intervention group and 56.5 percent of the non-intervention group indicated that training was ECE related. The nature of the trainings received suggest that these teachers may have received the standard base curriculum training conducted by the GES/NaCCA in addition to the training provided by the innovators.

There are also other organisations that organise TCPD trainings following the liberalisation of the CPD landscape by the NTC. From the study's findings, 30 percent of the teachers in the intervention confirmed that their most recent training was organised by the GES/MoE against 44 percent of the non-intervention group. For 11.1 percent of the sample from the intervention group, their most recent training was provided by Education Partners while 15.6 percent of the non-interventions group also identified Education Partners as the providers of their most recent training. Education partners are non-state organisations that work with state agencies to provide support in education. Mostly these include international organisations such as UNICEF, USAID, World Vision, Plan Ghana among others. In the context of this study Sabre Education and Right to Play (RTP) are classified as education innovators.

Sabre and RTP account for 30 percent and 24 percent respectively of the teachers in the intervention group who received trainings in the most recent past. A substantial proportion of teachers (17%) in the non-intervention group indicated that they received their most recent training from RTP³. About 10 percent and 17 percent of teachers from the intervention and non-intervention schools respectively also indicated that they received their most recent

³ This may have happened because some of the trainings were conducted online without any particularly strict restriction of entry. Targeted beneficiary teachers may have shared the link with friends from other places. The second reason is the matter of movement of teachers due to transfers. It may be the case that these teachers received the training while they were in the targeted schools but moved after the training.

training from other places. As indicated earlier, following the liberalisation of the CPD landscape, a number of individuals and organisations have received accreditation from NTC to provide CPD services for teachers. These Certified Service Providers (CSP) operate in a manner similar to the free market economy, where their services are purely demand-driven, and their success depends on their ability to negotiate with District Directors of Education, teacher union leaders, School Improvement Support Officers (SISO) among others to buy their products.

Table 4.4. Teacher capacity building for Play-Based Early Learning

Indicator	Intervention	Non-intervention	p-value
Participated in play-based learning training	76.67	61.69	0.001
Average number of play-based trainings participated in the last 3 years	3.4	2.4	
Training was Standard Based curriculum training	65.93	49.84	0.001
Training was through ECE related	69.44	56.49	0.001
Which organization organized the Training			
GES/MoE	30	44.48	0.001
Education partners	11.11	15.58	0.026
Sabre Education	30.93	0.65	0.001
RTP	24.44	17.86	0.006
Others	9.81	17.7	0.002
Source of funds for training			
Out of pocket	90.91	76.27	0.001
Capitation grant	0.00	15.25	0.001
CPD Allowance	9.01	5.08	0.001
Others, specify	0.00	3.39	0.001
N	414	380	

The services of the CSPs are not free but paid for directly by teachers. The results in the table above show that almost all the teachers in the intervention group paid for their trainings out-of-pocket. This is because, while direct out-of-pocket payment for play-based training account for 91 percent, payment from CPD allowance account for 9%. It bears stating that the CPD allowance is the amount teachers receive as professional development to support their demand for professional enhancement programmes. The CPD allowance is a one-off payment at the rate of Gh¢1200 and Gh¢800 per annum for professional and non-professional teachers respectively.

4.6 Teaching Beliefs, Attitudes and Practices of Play-Based Pedagogy

Effective implementation of any innovation depends on implementers' beliefs and attitudes towards the innovation. Teachers' teaching beliefs and attitudes are critical mediators between what is intended by programme (policy) designers and what is enacted in the classroom. Where teachers teaching beliefs and attitudes are positive and strong, uptake is likely to be high and implementation effective. But where their beliefs and attitudes are weak and indifferent, uptake

will be low, and implementation affected by imaginary challenges. In other words, teachers' beliefs, attitudes, and practices determines the quality of implementation of play-based learning in the classroom.

4.6.1 Beliefs of teaching and about PBL

A nine-item questionnaire was used to assess teachers teaching beliefs generally and towards play-based learning classroom (see table 4.5). Teachers were required to provide their answers to the statement on a continuum of strongly agree (1) to strongly disagree (5). All statements with a negative denotation were recast to align with the other items. The results on all the items show that teachers generally have positive beliefs towards play-based learning classroom. All the items had over 60 percent of teachers in both intervention and non-intervention schools either agreeing or strongly agreeing. The only item that scored a split approval is the belief that *“Thinking and reasoning processes are more important than specific curriculum content such as play”*. This reflects the split construction of ‘work’ (learning) and play referred to earlier and the inability of educators to fully appreciate the role of play in enhancing learning at the early childhood level. About 50 percent of teachers do not appreciate the co-existence of play and learning (work) or better still learning through play. This reflects two main things, one being the lack of a clear consensus about the intended outcomes of early childhood education. The first however is that this reflects the effect of the division (lack of convergence) between the policy environment and the communities of implementation.

The push for holistic child development through greater access to quality learning through play within our educational system is not new. The challenge has been translating policy into practice. This is because there is always a wedge between the intention of designers of policies and programmes and what is appreciated by implementers. The disadvantages of a top-down approach to policy design are numerous and very well documented. Therefore, the situation where innovations are designed from the top without the input of members of the communities of implementers can only lead to a low appreciation of the actual intent of the innovation. As Parker et al., (2022) proposed, a more promising path is to encourage policy goals to be interpreted among and between the communities of practice that will be charged with putting those principles into practice.

The current attitude of stakeholders is to conceptualize learning through play. However, little attention is given to defining what quality learning looks like and what outcomes of learning are expected. The push for evidence-informed practice within the field of education hinges on the ability to generate and access evidence of the effectiveness of an instructional practice in facilitating student academic achievements. There is therefore a tendency to favour outcomes such as achievements in literacy and numeracy, where there are well-established means of assessing progress, rather than the broader skills associated with learning through play. This may explain, in part, the uncertainty on the part of teachers who are deliberating whether *thinking and reasoning processes are more important than specific curriculum content such as play*. Others have argued that play is *nice but non-essential* for learning and development and that *thinking and reasoning processes are more important*. That is where Parker et al., (2022) proposed that there is the need for stakeholders at all levels—research, policy, system, and school—to contribute to the collective decision-making about the outcomes being pursued,

how to best facilitate those outcomes within the different contexts of the education system and how to reliably measure those outcomes.

Table 4.5: Teachers agreed to the following belief statements about teaching

Teaching beliefs	Intervention	Non-intervention
Children learn best when they are able to find the solutions to the problem, they are confronted with through play	98.89	98.86
An effective teacher must always be ready to exhibit the right way to solve a problem	98.72	99.03
I feel that I am making a significant educational difference in the lives of my students through play	97.78	98.74
I usually know the kind of play my students need and want to engage in	88.74	93.02
All in all, I am satisfied with my job as an ECE teacher	88.52	90.10
My role as a teacher is to facilitate students' own inquiry	87.96	91.72
It is better when the teacher – not the student – decides what activities are to be done (responds recast)	74.44	76.14
A quiet classroom is generally needed for effective learning (responds recast)	68.33	74.19
Thinking and reasoning processes are more important than specific curriculum content such as play	51.67	55.52

4.6.2 Teachers' attitude towards play-based learning

Teachers' attitudes towards play-based learning and how to engage pupils during play hours was examined using a 10-item module (see table 4.6). Teachers reacted to the item statements using the strongly agree (1) - strongly disagree (5) continuum. All statements with a negative denotation were recast to align with the other items. More than 70 percent of teachers from both intervention and non-interventions schools either agreed or strongly agreed to each of the 10 items, demonstrating that majority of the teachers have a positive attitude towards play-based learning approaches. Particularly, nearly all teachers; intervention (98.5%) and non-intervention (99.2%), affirmed that they "*integrate games and songs in classroom learning activities*" This suggest that all teachers integrate play-based learning activities, one way or the other, in their teaching activities.

Another practice that received a positive reaction worth noting is the teachers' attitude towards using observation as an approach to assessing learners: *Learners' participation in play is assessed through observations to determine learning outcomes*. Among the teachers from both intervention and non-intervention schools, 96.7 percent and 97.6 percent respectively agree or strongly agree to the use of observation to assess learning outcomes. One item that further validates teachers' attitude and appreciation of play-based learning classrooms is the response to a statement that sought to establish their attitude towards gender-neutrality and avoid reinforcing gender stereotypical conduct: *I allow all learners to play with toys of their choice despite their gender*. Recent studies have suggested that toy preference among children is highly gendered (Wang et al. 2023). Proponents of play-based learning culture are however

advocating for gender-neutral play products for children. The positive attitude is thus indicative of teachers' acceptance of this culture. The data shows that 77 percent and 79.7 percent of teachers from both the intervention and non-intervention groups respectively strongly agree that learners be allowed to play with toys of their choice regardless of their gender.

Table 4.6. Teachers who agree to the following statements of attitude about teaching

Attitudes towards teaching and about play-based learning	Intervention	Non-intervention
I integrate games and songs in the classroom learning activities	98.52	99.19
As a teacher, I plan all lessons to strengthen the learning experience of my students	98.52	98.7
I interact with learners during play to enhance safe play	98.33	98.21
Learners' participation in play is assessed through observations to determine learning outcomes	96.67	97.56
Teachers should put a variety of interesting activities out during free choice time and then let children make their own activity choices	96.48	95.94
Teachers should encourage children to pick up their toys (with adult help) during clean-up time	87.96	89.45
When a child takes a toy from another child, teachers should observe and see what happens.	82.59	80.68
When many children in the class lose interest during story time, teachers should stop and go on to something else	79.26	73.54
During group time, teachers should encourage children to sit and listen most of the time	77.22	81.82
I allow all learners to play with toys of their choice despite their gender	77.04	79.71

4.6.3 Appropriate actions expected of teachers in the play-based learning classroom

The quality of implementation of play-based learning pedagogies in the classroom is further determined by the routine practices and actions of teachers that support children's learning sessions. There are 10 actions identified as appropriate that have been put into a 10-item questionnaire (see table 4.7). Teachers were required, on a continuum of strongly agree (1) to strongly disagree (5), to indicate how they relate to each of the 10-items. Except for two items that received approval from less than 80 percent of the teachers (from both intervention and non-intervention schools), the rest of the items received approval from more than 90 percent of the teachers. This essentially means that the teachers strongly related with all the items.

One way to help children with communication and comprehension is by restating children's comments to you. Restating pupils' comments is an active form of communication which helps them to develop and enhance their vocabulary. This is a practice that is encouraged in play-based learning. For the statement, '*When children talk to me, I restate their comments*', 67 percent of teachers from intervention schools and 80.7 percent from non-intervention schools affirmed. This active form of communication increases the chances that children will retain the

information. It also gives children more language that may help them be able to elaborate on what they have said the next time they have to say something to their teacher or any other person. It further helps in their language development and critical thinking.

Best practice requires that play-based learning classrooms are kept clean and safe for play. Teachers, with the help of support staff, are therefore expected to keep the classrooms tidy after every play activity. Child development psychologists and play-based advocates, however, encourage the involvement of children in the cleaning and tidying of the classroom after a lesson. It is therefore one of the most important practices that teachers are expected to ‘help children remember to clean up as they finish their activities’. To this statement, 97.8 percent of teachers from intervention schools and 98.1 percent of teachers from non-intervention schools approve of it. Involving children in cleaning up play classrooms after use gives them discipline and a sense of responsibility and pride as they grow older.

A teacher in a play-based classroom is expected first and foremost to be a co-player, a parent before finally being a teacher. As a co-player, the teacher is expected to get down to the playing couch with children. Teachers were asked for their view on *getting down on the floor and playing with children*. Among the teachers from intervention schools, 78.2 percent approve of it as an appropriate best practice. Among the teachers from the non-intervention school’s 86.4 percent of them approve of the practice. Getting down on the floor helps children feel more connected to the teacher and the learning process. Teachers co-playing with children provides an opportunity for them to practice communicating, which helps to develop their social and emotional skills. Children also practice social interactions, such as taking turns, sharing, and cooperation.

Table 4:7: Teachers who agree to the following actions in play-based learning classroom

Appropriate actions of teachers in PBL	Intervention	Non-Intervention
I talk with children in order to enhance their play	97.78	97.08
I help children remember to clean up as they finish activities	97.78	97.08
I show children the appropriate way to use play materials	96.67	96.43
I make suggestions for how to use material	95.93	95.13
I help children use play materials	95.74	96.43
When I describe what children are doing, I give extra information	95.56	93.99
I help children find activities to play with	95.19	97.08
I get involved in children's dramatic play	94.63	93.99
I get down on the floor and play with children	78.15	86.36
When children talk to me, I restate their comments	67.04	80.68

4.7 Challenges impeding the implementation of PBL approaches in schools

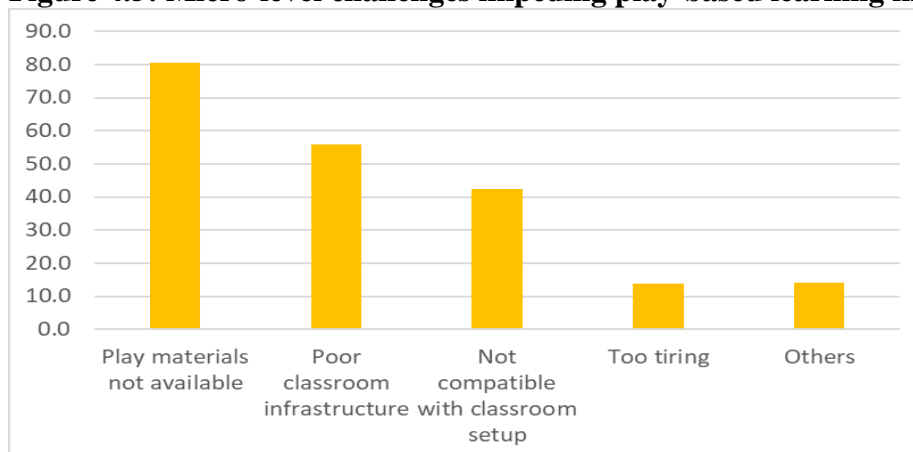
Despite growing support for play-based learning, coupled with the evidence that several benefits accrue to play-based learning, implementation in low-income countries is bedevilled with series of challenges. The challenges that inhibit implementation of play-based learning can be broadly conceived at the micro level and macro level. At the micro level these challenges relate to the immediate conditions for teaching and learning (school conditions, classroom conditions and teacher and parent perceptions). At the macro level are challenges that relate to broader questions of infrastructure, finance, technical and policy.

Micro-level

Generally, at the micro-level, the most pronounced challenges that impedes implementation of play-based learning pedagogies in the classroom include lack of play materials, poor classroom infrastructure and lack of compatibility of play-based learning with classrooms set-up (see figure 4.5). In sharing their perception about the challenges of play-based learning, 80 percent of all respondents identified unavailability of play materials as the first and major challenge to play-based learning being put into practice. Many training service providers have tried to introduce teachers to the use of local materials to produce locally appropriate play products for play-based learning. These efforts have not been very successful because of the variety and diversity of the play products that are required. The local materials can be adapted to produce very few items but not sufficient to produce most of the items in the syllabi of children play books.

The second challenge identified by the teachers is the unsuitability of classroom infrastructure for play-based learning in Ghana. Age-appropriate classroom infrastructure is sine quo non for play-based learning. A play-based learning classroom environment is first and foremost one that is playful, gender-responsive, attractive to children and builds their confidence. Nearly 6 out of 10 teachers identified poor classroom infrastructure as a challenge to the implementation of play-based learning. Related to poor classroom infrastructure is the general classroom setup. More than 4 out of 10 teachers surveyed identified the classroom setup as incompatible with play-based learning. The classroom setup includes the space, ventilation and lighting which together constitute a very important component of process quality for facilitating play-based learning.

Figure 4.5: Micro-level challenges impeding play-based learning in the classroom



In addition to the given options of infrastructural and human resource base challenges, the teachers further identified other conceptual and practical challenges (see box 1). The first two challenges mentioned: large class size and small classroom space relates to inadequacy of suitable infrastructure for play-based learning. We have established earlier that the average class size is above 40 pupils for both preschool and lower primary levels, significantly higher than the recommended 30 pupils to a class. Class sizes are disproportionately larger in rural areas, where infrastructure for nursery and kindergarten is nearly non-existent, compared to urban areas. Respondents also mentioned inadequate teachers, particularly support staff, as a challenge to the implementation of play-based learning. Best practice requires two educators to take care of a class of early graders. There should typically be a teacher and support staff. The President's Committee on Education (2002) recommended that each kindergarten class should have one trained teacher and one attendant. In line with this recommendation, the Early Childhood Education policy made provision for the position of support staff at the early childhood education level (Ministry of Education. 2021). Nearly two decades after the Committee's report, kindergartens in Ghana operate without support staffs.

The support staffs are service staff who are expected to assist KG teachers undertake the numerous responsibilities of facilitating play-based learning in the classroom. Support staffs essentially are expected to work as instructional assistants, maintenance support, caregiving support, and general service support. This study however shows that the support staff structure of the policy, at best, has not taken off. In other words, there are no support staffs employed in the surveyed schools. This is a major challenge to the implementation of play-based learning pedagogies in the classrooms. This is because, children by their nature are rowdy and will always require more than one teacher to facilitate learning through play.

The teachers also indicated that play-based learning is not amenable to inclusive classrooms. Dealing with children with special needs in a play-based learning classroom is difficult and, in some instances, impossible. Regarding the presence of children with special needs, 36.6 percent of the teachers indicated that they had children with special needs in their classes. Teachers mentioned, in particular, learners who have hearing difficulties (deaf learners) as children who miss out on important concepts being introduced through play.

Related to the challenge of dealing with special needs children is the challenge of language as the medium of instruction. This is one of the issues around early childhood education that has received intense debate among educationists, psychologists, and other child development experts. The *President's Committee on Education, in dealing with the question of the medium of instruction at the early childhood level*, noted, in particular, the multiplicity of local languages, lack of teaching and learning materials in the local languages, and inadequate number of local language teachers as challenges that will not allow a radical shift to the use of only the local language as the medium of instruction. The Committee recommended a gradual process towards eventual reliance on the local language as the medium of instruction at the lower level.

Box 1: Additional challenges identified by teachers

- Large class sizes
- Small classroom space
- Inadequate teachers (support staff)
- Inadequate time
- Deaf learners are not grasping the concepts through play
- Dealing with children with Special Education Needs
- Lack of community support
- Religious belief and the practice of PBL approach:
- Mixing of boys and girls for play activities
- Language barrier
- Need more training on PBL to attend

Box 2: Local language as medium of instruction at the early grade level**Recommendations**

Given the serious limitations in the implementation of the local language policy, the Committee recommends that:

1. Either the local or English language should be used as a medium of instruction at the kindergarten and lower primary as appropriate.
2. Where teachers and teaching and learning materials are available, local languages must be used as the medium of instruction.
3. Within a period of five years, the Ministry of Education and the GES should make the necessary preparations for a more effective implementation of the use of local language as a medium of instruction. This should include: The training of more local language teachers and the provision of teaching and learning materials.
4. As much as possible teachers posted to teach at this level should be familiar with the local language.
5. Emphasis should be on the production of more teachers in various local languages. In posting teachers to teach at the kindergarten and lower primary, their local language competence should be taken into consideration.

(President's Committee on Education, 2002)

In furtherance of the Committee's recommendations, the ECE Policy (Ministry of Education, 2021) made two major provisions in respect of the use of the local language as a medium of instruction. The first provision is that, as much as possible, the KG teacher should be able to use at least one Ghanaian language as a medium of instruction. A second provision in the ECE Policy is that school leaders and management be sensitized on the need to recruit attendants (support staff) who can communicate in the play language of the pupils in their community.

Indeed, the President's Committee on Education (2002) recommended that within the next 10 years, a nursery attendants training centre should be established in each of the ten regions. Two decades after the Committee's recommendation nursery training centres are not visible as recommended; two years after the launch of the ECE Policy, kindergartens in Ghana continue to operate without the full complement of the support staff; and local language as a medium of instruction remains a major impediment to play-based learning implementation.

Lack of community (parental) support and negative religious beliefs and practices associated with PBL approach were two other challenges that affect implementation of play-based learning in schools. The ECE Policy recognises community support as a major tool for the success of ECE in Ghana. Indeed, the ECE Policy framework recognised family and community engagement as one of six action areas for the policy. The theory of change of the ECE Policy includes that “**If** structures for effective and efficient planning and management of the KG sub-sector is established; ... **and** family and community are engaged to understand the relevance of KG and play their roles in their child's education; ... **then** the objectives and goals of the ECE Policy will be achieved.” The evidence on the role of families and communities in the education of young children is well documented. It however appears that not much has been done to sensitize parents and communities to understand and appreciate the value of play in relation to learning.

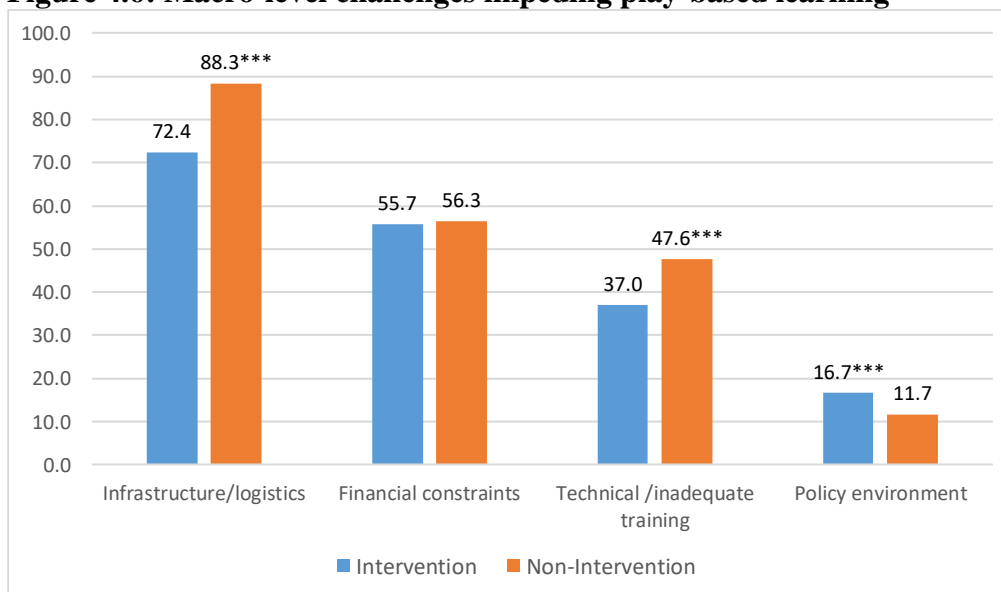
It is important to state that play is differently conceptualised as a practice in education or in the classroom for that matter. Play is mainly culturally constructed as an activity that is valued for its recreation benefits to children. Conversely, learning is conceptualised as formal education with a focus on academic achievement. This leads to parents putting pressure on teachers to ensure that children excel in numeracy and literacy and therefore teachers over-emphasize rote learning to achieve parental academic expectation. Related to the lack of support from parents and communities is the challenge associated with negative religious beliefs being an impediment to PBL practices. In some religions and cultures girls do not mingle or play with boys. Therefore, in communities where this is an issue, play-based learning cannot be implemented as it will elicit reluctance from children and resistance from parents.

Macro-level

At the macro-level, the challenges to play-based learning pedagogy have been grouped into infrastructural, financial, technical and policy (see Figure 4.6). Infrastructure covers classroom resources, playing grounds, furniture, and buildings. Technical challenges refer to both technological and human capacity, including pedagogical expertise and training for teachers. The policy related challenges include curriculum design, expected outcomes and assessment approaches. 72.4 percent of teachers from the intervention schools compared to 88.3 percent from the non-intervention schools identified infrastructure as the major impediment to play-based learning. This was followed by 55.7 percent and 56.3. percent from intervention and control respectively identifying financial constraints as a major impediment to play-based learning. Also, 37 percent from the intervention schools identified Technical (inadequate training) challenges as a major challenge compared to 47.6 percent for the non-intervention schools.

The proportion of teachers identifying infrastructure as a major challenge to play-based learning is significantly larger in the non-intervention schools than the proportion of teachers from intervention schools who identified infrastructure as a challenge. The significant difference may be attributed to the fact that intervention schools have received some support from innovators or development partners. Otherwise, the lack of infrastructure as a challenge at the early childhood level is well documented. At the time of mainstreaming early childhood education into the formal education structure, the President’s Review Committee on Education (2002) recommended a 10-year period for government to provide the needed resources including infrastructure for the sector. More than two decades, there is still no identifiable government programme to invest in the provision of infrastructure for early childhood education. The early childhood education sector continues to rely heavily on the benevolence of individuals, religious and non-Governmental Organizations, and community support to provide infrastructure.

Figure 4.6: Macro-level challenges impeding play-based learning



4.8 How to improve the integration of play into teaching and learning in schools

Teachers were asked about how they could improve the integration of play into teaching and learning in schools. The recommendations range from teacher responsibilities, management responsibilities to parental support. The results show consensus among teachers in both intervention and non-intervention schools about the need for teachers, management, and parents to perform varied responsibilities to ensure the integration of play-based learning in schools. (see table 4.8). The dominant recommendation, however, is the need for teachers to be trained on how to effectively implement play-based approaches in the classroom. This suggest that teachers find value in play-based learning and are willing to implement play-based pedagogies in the classrooms. They however acknowledge the need for more capacity building to be able to effectively implement the innovation.

Table 4:8: Teacher’s recommendations for improving PBL outcomes in schools

	Intervention	Non-intervention
Teachers must be trained on how to effectively implement play-based approaches in the classroom.	99.8	98.7
Teachers must provide effective supervision and care during play activities	99.6	98.7
Teachers must model play and introduce learners to new play opportunities	98.5	98.5
Teachers must be deliberate, purposeful and take thoughtful decisions and actions to promote children’s innate drive for independent learning.	98.5	95.1
Teachers must ensure proper time management so that there is enough time for children to play	98.0	97.2
Parents must cooperate with teachers in the incorporation of play into the teaching and learning environment	94.4	96.9
Heads of schools must provide appropriate indoor and outdoor play-safe environments	92.0	95.6

The second important item for integration is the need for parents to cooperate with teachers in the incorporation of play-based learning into the teaching and learning environment. Over 94 percent and 96 percent of teachers from intervention and non-intervention schools respectively agree on the need for parents to cooperate with teachers in the implementation of play-based learning in schools. Teachers are also in agreement that for effective integration of play-based learning in schools, heads of schools must provide appropriate indoor and outdoor play-safe environments for play-based learning. As was discussed earlier, teachers have indicated the fact that some headteachers do not support the implementation of play-based learning in the schools. This lack of support may be direct or indirect, including a lack of willingness to allocate resources (e.g. capitation grant) to provide indoor play materials for early grade teachers. It must however be noted that basic schools generally have no identifiable avenue to generate income internally and the capitation grant is not so dependable.

4.9 Role of education innovators in influencing early childhood education quality

4.9.1 Introduction

Innovators are individuals or organisations that help to identify new ways of doing things to solve existing challenges. Innovators open new lines of research or introduce new technologies to deal with existing problems. Unlike development partners, innovators are sector specific and concentrate their energies, resources, and expertise on finding and championing innovative ways of doing things. Education innovators are typically non-governmental organizations working in the education sector in partnership with government to introduce and implement new and innovative approaches to solving problems in a new and simple way to promote equitable, effective and efficient schooling outcomes. Some education innovators in Ghana include Right to Play (RTP), Sabre Foundation, World reader among others, who often leverage research, technology, and other creative methodologies with the aim of improving schooling outcomes.

In the ECE landscape, education innovators engage in the provision of teacher capacity building and ICT-mediated teaching and learning among others. Other innovators also support early learning, literacy and numeracy development, provision of resources etc. In this subsection, the discussion covers the role of education innovators in influencing the implementation of the new early learning curriculum. This is in answer to research question 3 of the study which examined the role of education innovators in spearheading the adaptation of schools to the new early learning curriculum. The analysis covers the role of innovators in providing and supporting the provision of training and infrastructure for PBL.

4.9.2 Provision of facilities for ECE and for PBL

Education innovators provide support for the implementation of the new early learning curriculum in the area of provision of facilities and resources. They do this by directly providing Teaching and Learning Resources (TLRs) or by helping schools (teachers) to create resources for PBL using local materials. Table 4.9 below provides a summary of institutions that provide resources for ECE. The results show that among the intervention schools, about 80 percent of them mentioned innovators (Sabre and RTP) as the main institutions that support them to create resources for ECE and PBL implementation. Only 7% of intervention schools identified GES as the institution that supports them with the creation of resources for PBL. GES and development partners are however prominent among the non-intervention schools.

In terms of direct provision of classroom support, 71 percent of the schools in the intervention cohort mentioned the education innovators as providers of direct support. The GES was mentioned by 16 percent of intervention schools. However, in the non-intervention schools, 47 percent identified GES and 30 percent identified development partners as provider of classroom support. This is a testament of the complementary role of education innovators in the provision of education to the population. The support of education innovators frees the government of significant resources which can then be applied in other places where there is no intervention by innovators.

Table 4.9: Main sources of support for resources for schools

Source of resource support	Intervention	Non-intervention	P-value
Which institution support resource creation			
GES	7.47	31.82	0.001
NaCCA	0.36	7.14	0.001
Education partners	7.12	38.96	0.001
Sabre Education	51.96	0.65	0.001
RTP	27.4	13.96	0.001
Individual schools	0.71	4.22	0.007
Which institution provide classroom support			
GES	16.37	47.4	0.001
NaCCA	0.71	4.87	0.003
Education partners	5.69	30.19	0.001
Sabre Education	43.06	0.32	0.001
RTP	28.11	10.71	0.001
Individual schools	1.78	3.25	0.26

4.9.3 Provision of capacity building for play-based learning

A school's ability to implement PBL depends not only on availability of physical facilities, equipment and learning resources, but more crucially the human resource with the training and attitude to implement the new innovative pedagogy. The survey results show that education innovators in Ghana play a crucial role in supporting the implementation of the new early learning curriculum through the provision of capacity building programmes for teachers.

First, the role of innovators in the provision of support for teachers' professional development (continuous training) is considered. The data shows that in nearly 80 percent of the schools classified as intervention schools, innovators such as RTP and Sabre have been identified as the main providers of support for teachers' continuous training. Even among the schools classified as non-intervention schools, 26 percent of them identified innovators as the main providers of support for teachers' training. Table 4.10 presents a summary of providers of capacity building for teachers on PBL. Government's (GES) role in supporting teachers' continuous professional development reduces significantly after pre-service training. The data shows that only 11 percent of schools in the intervention group identified government as the provider of support for teachers' continuous training.

Secondly, the data shows that in the recent training on PBL that intervention schools benefitted, 79 percent of the schools indicated that the training was provided by innovators (RTP & Sabre), 33 percent received training from GES/MoE, while about 7% indicated that the training was provided by other development partners. In the schools classified as non-intervention schools, about 50 percent of them mentioned GES/MoE as the provider of the recent training on PBL while 20 percent mentioned development partners as the provider of the training. In about 26 percent of schools classified in this study as non-intervention schools, innovators were identified as the provider of the training.

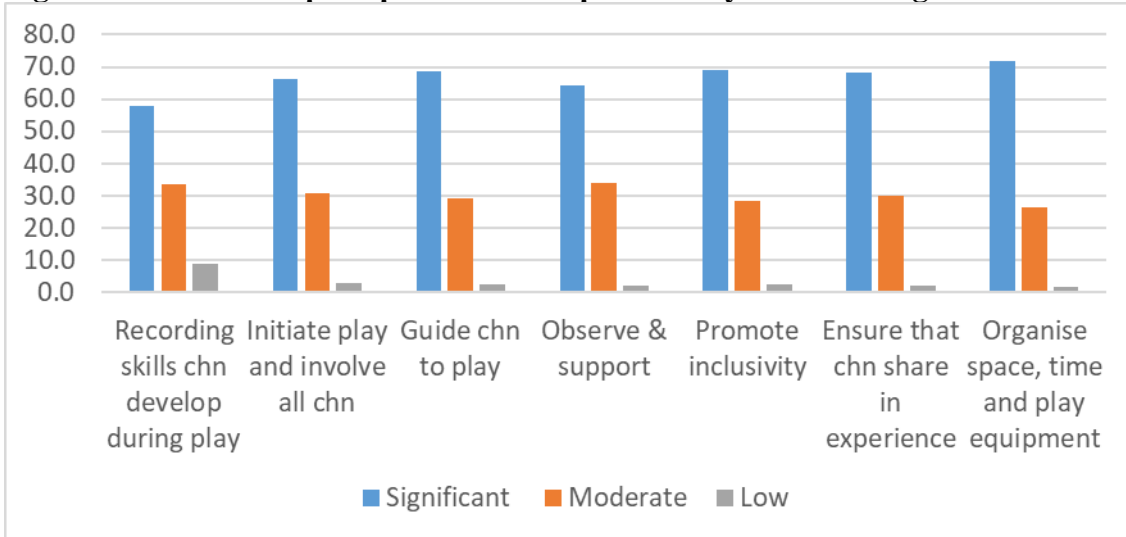
Table 4.10: Institutions that provide capacity building for ECE PBL

Providers of capacity building	Intervention	Non-intervention	P-value
<i>Which institution support teachers' training</i>			
GES	11.03	35.71	0.001
NaCCA	0.36	5.84	0.001
Education partners (UNICEF, USAID, etc.)	4.27	27.92	0.001
Innovators (Sabre, RTP etc.)	79.72	25.65	0.001
Individual schools	0.02	0.32	0.34
<i>Who provided the recent training on PBL</i>			
GES/MoE	33.1	50.97	0.001
Right to Play	28.83	26.30	0.494
Sabre Education	50.53	0.01	0.001
Individual schools	1.78	2.27	0.673
Personal	0	0.32	0.34
Other Education partners	7.12	20.13	0.001

4.9.3 Teachers' perception of the impact of play-based training received

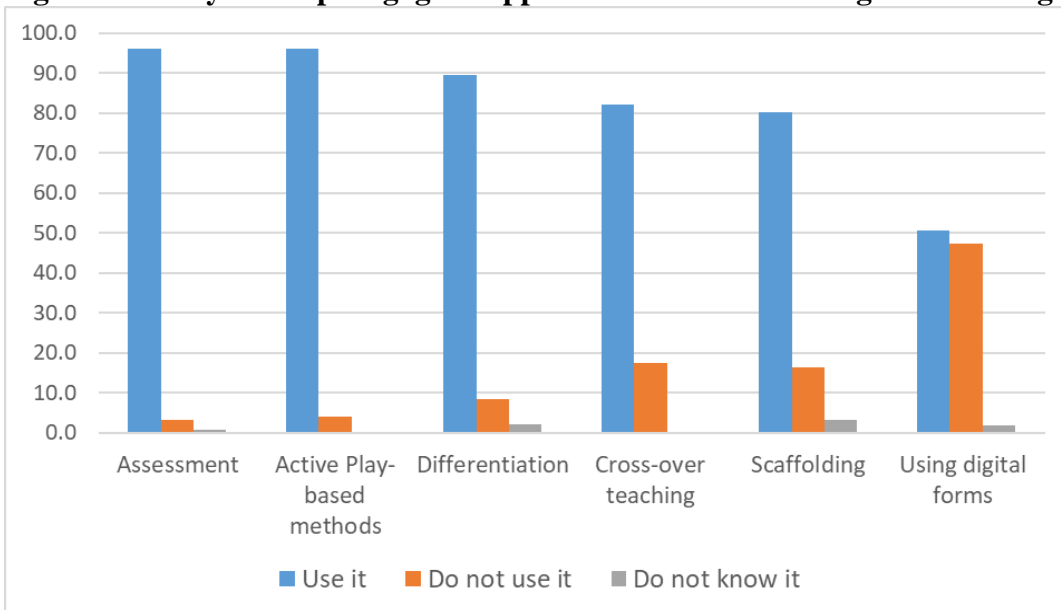
The next assessment of the role of education innovators in supporting the implementation of the new early learning curriculum looks at how teachers value the training they received on PBL. The assessment was done on a range of items. These include teachers' ability to manage and organise the environment and equipment for play-based learning, how to ensure that children share in experiences, how to promote inclusive environment, how to initiate play among children etc. The result is presented in figure 4.7. Overall, teachers indicated a positive perception of the impact of play-based pedagogy training received. For all the items outlined, an average of six out of ten teachers interviewed asserted that the training had a significant impact on their ability to perform these tasks.

Figure 4.7: Teachers' perception of the impact of Play base training received



Teachers who indicated that they had participated in PBL training were further asked to indicate if they could implement pedagogical approaches that are relevant and specific to PBL in their teaching and learning process. Some early learning approaches included scaffolding, differentiation, crossover teaching (involving exhibitions, taking trips, project works, etc.), and digital integration. The summaries in figure 4.8 show that majority of the teachers who participated in play-based learning pedagogy training are able to implement all of the approaches identified. The only item that less than half of the respondents indicated that they could do is digital integration.

Figure 4.8: Play based pedagogical approaches used in teaching and learning



Digital integration in play-based learning is the ability to incorporate digital tools, technologies, and resources into play-based educational activities for children. Digital integration includes the use of interactive learning apps and games, digital storytelling, coding and robotics, interactive whiteboards and smart tables and many others. The low uptake of digital integration is due to two main factors. First is the lack of the requisite digital facilities and equipment in the schools for use. Secondly, most teachers at the early grade level are "technologically inexperienced" and therefore are not able to adopt these new approaches to early learning.

Notwithstanding the fact that early childhood education provides a window for introducing children to creative and educational uses of digital technology, Ghana is far from taking advantage of this opportunity. Digital tools are generally lacking, and there is no contextually developed digital content specifically designed for early childhood education in Ghana. Considering that children's environments are already affected in every respect by ICT, opportunities must be created in the earliest years for children to explore. Children must start using computers and programmed toys to support their learning. Children need the opportunity to explore and play with computers and other forms of ICT, such as videos and other online content. This will serve as the foundation for a more structured use of applications later in life. Similarly, early grade teachers must be supported to build their computer skills, as this could go a long way to ensure uptake and deployment of digital integration.

4.9.4 Teachers ability to implement Play-Based Learning pedagogies

Finally, in this section, teachers who participated in PBL training were asked to indicate how well they implement certain PBL specific practices in their teaching. These include the ability to organize the learning space, time, and play equipment to inspire different kinds of play, ensuring that children share experiences as a starting point for play and allow play themes to be developed, and promoting an inclusive environment in the classroom (see table 4.11). Most teachers who can exhibit these skills are from intervention schools. Across all eight items identified as critical skills in the practice of play-based learning pedagogy, more than half of the teachers who were conversant with these skills and always practiced them belonged to the intervention group.

A very important play-based learning practice is the ability to organize space, time, and play equipment to inspire different kinds of play. About 63.7 percent of the teachers who indicated that they are conversant with this and always practice it were from the intervention groups compared to about 36 percent from the non-intervention group. Another important practice is recording the skills that children develop during play activities. Teachers from the non-intervention group, who always practiced this skill, accounted for 40 percent of the total, while teachers from the intervention group accounted for 60 percent. Similarly, for a practice such as promoting an inclusive environment in the classroom, 56 percent of the teachers who always practice it are from the intervention schools, while the non-intervention schools account for 43.8 percent of these teachers.

The results suggest that the training provided by the innovators may have been more comprehensive and complete than that provided by other institutions which teachers in the non-intervention group participated. While trainings provided by government agencies such as the GES, NaCCA etc. are usually general in nature and one-off, CPDs provided by innovators are project-based and turn to be comprehensive in scope and detailed in implementation. That explains why teachers from intervention schools appear being able to implement the various practices associated with play-based learning compared to teachers from the non-intervention schools, majority of whom received their training for play-based learning from government agencies.

Table 4.11: How well do you practice the following in your classroom

PBL Practices	Intervention	Non-intervention	P value
Organize space, time, and play equipment to inspire different kinds of play	63.69	36.31	0.001
Ensure that children share in experiences as a starting point for play and allow play themes to be develop	54.63	45.37	0.184
Promote inclusive environment in your classroom	56.23	43.77	0.001
Involve all children in play	55.16	44.84	0.001
Observe, analyse, support, participate in and enrich the play on children's terms	60.51	39.49	0.001
Supervise the children and guide them if the play lead to unhealthy patterns of interaction	54.44	45.56	0.011
Initiate play and work proactively	56.43	43.57	0.004
Recording the skills children might have developed during play activities.	59.89	40.11	

SECTION 5: COST-EFFECTIVENES AND COST INFLUENCES ON PBL

5.1 Introduction

Assessments of the cost-effectiveness of TPD programmes require information on financial costs, opportunity costs, and impact data, both direct and indirect. It is important to note that, without accompanying impact data, no conclusions can be made about the cost-effectiveness of interventions (Adamba, Castillo-Canales, Chhorn Lin et al., 2023). Financial cost data can be classified as either investment (one-time) or recurrent cost for the purpose of scalability (Adamba, Castillo-Canales, Chhorn Lin et al., 2023). Investment cost related to TCPD includes cost elements that are fixed and life-long and typically incurred at the beginning of a programme. These include programme design, administering/training, and evaluation. Recurrent costs are related to the regularly occurring cost elements. In the context of PBL, recurring costs are related to the cost of providing pedagogical resources for PBL and maintaining these resources in schools.

TCPD investment cost data are generally not readily available, as obtaining same can be complicated because of the multiplicity of parties, agencies, and interests involved in implementation. The investment cost element that can be obtained in the context of PBL TCPD is the cost of training from the perspective of teachers, which is one time. The recurrent cost can be obtained by relying on direct expenditures from implementing schools and teachers. Under the circumstances of incomplete data, this section is analysed using teachers' out-of-pocket payments for participation in TCPD sessions and school-level expenditure data on the implementation of PBL.

5.2 Cost of participation and implementation of Play-Based Learning

At the micro-level, providing TCPD to teachers is associated with three main cost barriers. The first is cost as a barrier to teacher participation. The second is cost as a barrier to uptake by teachers who have received training by utilizing new knowledge. The third is cost as a barrier to the implementation of new knowledge at the school level for the benefit of learners. Government-provided programmes (supply driven) are generally free of direct out-of-pocket payments. This is because most of the government provided TPDs programmes are packages that accompany new policies, curricula, and innovations, and teachers are required to be trained on the new programmes. However, following the introduction of the point-based promotion system, which requires teachers to accumulate points through demand-driven TCPD, there are a number of NTC-accredited service providers, Certified Service Providers (CSPs), who have proliferated the TCPD landscape providing one form of CPD or the other to teachers at a fee. These NTC-accredited CSPs are individuals, institutions, and agencies that engage in the provision of demand-driven TCPD programmes.

With respect to these demand-driven programmes, teachers are required to pay a fee to participate. The fee is negotiable and is generally between GH¢55 and Gh¢75 for a face-to-face session and between Gh¢25 and Gh¢40 for an online session. The field data shows that for teachers who recently participated in PBL-related TCPD, the investment cost of training per TCPD session was Gh¢65 (Table 5.1). There was no significant difference in the amount paid by teachers in intervention schools and schools that had no non-intervention. Among the intervention school sample, over 90 percent of those who paid to participate in the most recent

play-based session paid out-of-pocket. Among non-intervention schools, about 76 percent of those who paid to participate in the most recent play-based session paid out-of-pocket.

The size of the out-of-pocket payment for TCPD is better seen when it is analyzed in terms of the various ranks of teachers and the required training to build points for promotion. Assuming for a Rank 1 teacher who requires 60 points in a Professional Development (PD) cycle (three years) to be promoted, he is required to accumulate a third of the points in a year (20 points) through participation in professional development training. Each training programme, whether rank-based, mandatory, or recommended is accorded two marks. This means that the teacher will need to attend at least ten TCPD sessions in the year. If we assume for the sake of discussion that such a teacher must pay for all 10 TCPDs, it means he has a bill of Gh¢650 to obtain 20 points for the year. This increases to Gh¢1029, Gh¢1083, and Gh¢1192 for the last three ranks (rank 8, rank 9, and rank 10), who must attend at least 16, 17, and 18 TCPD sessions, respectively, in the year.

Table 5.1 Cost of participation in TPD and the source of payment for participation

Cost of participation	Intervention schools	Non- Intervention schools	Test
Did you pay to participate in the most recent play-based training?			
Yes	11 (2.7%)	59 (15.5%)	<0.001
No	403 (97.3%)	321 (84.5%)	
Source of payment			
Out of pocket	10 (90.9%)	45 (76.3%)	0.464
Capitation grant	0 (0.0%)	9 (15.3%)	
CPD Allowance	1 (9.1%)	3 (5.1%)	
Others, specify	0 (0.0%)	2 (3.4%)	
How much did you pay	74.5 (46.715)	65.4 (32.421)	0.429

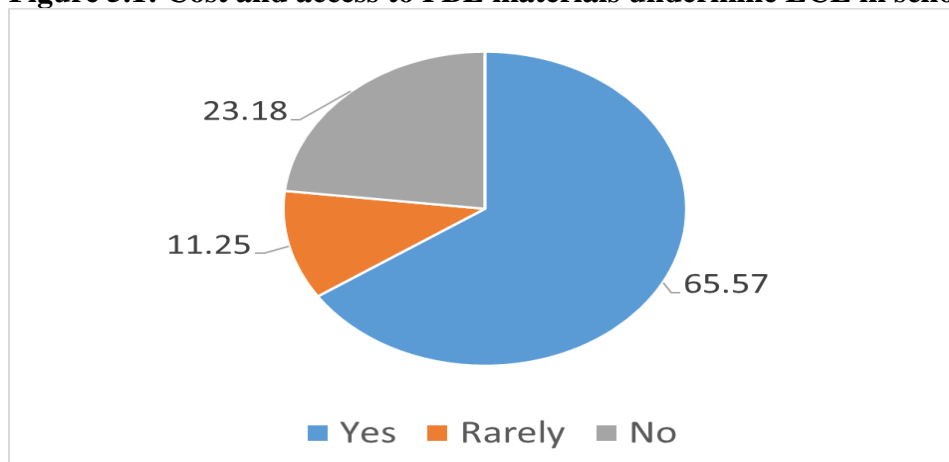
The next level of the cost analysis is the cost of providing teaching and learning materials for PBL. One of the reasons why new teaching and learning interventions fail to have an impact is that the introduction of the new ideas is not often accompanied by adequate resources for implementation. In most cases, district education offices and schools are left to grapple with implementation challenges after training is completed. The data suggest that schools spend on average Gh¢285 a month, providing teaching and learning resources for PBL (Table 5.2). In a term, a PBL-implementing school spent approximately Gh¢515 providing PBL teaching and learning resources. The average was higher in non-intervention schools than in intervention schools. Non-intervention schools spend an average of Gh¢534.8/term and Gh¢1,222.2/year providing teaching and learning resources for PBL. This contrasts with Gh¢490 and Gh¢890, spent by schools in the intervention sample to provide teaching and learning resources for PBL.

Table 5.2: Cost of providing TLR for PBL

Frequency	Innovator schools	Non-Innovator schools	Average
Cost per month	339.6	228.6	284.1
Cost per term	496.4	534.8	515.6
Cost per year	890.0	1,222.2	1,056.1
Total	575.3	661.8	618.6

Figure 5.1 shows that 65.6 percent of school respondents affirm that cost and access to play-based materials undermine early childhood education. This is significant and a major impediment to the implementation of PBL in ECE.

Figure 5.1: Cost and access to PBL materials undermine ECE in schools



The cost of providing PBL is further discussed in terms of who is supporting the schools with infrastructure and pedagogical (teaching and learning resources) resources. The data shows that government is the substantial provider of infrastructure for PBL (Table 5.3). However, a significantly larger number of schools among the non-intervention group (58.4%) indicated that GES/MoE is the main provider of infrastructure for PBL. Among the intervention schools, 44 percent indicated GES/MoE as the main provider of infrastructure for PBL. In schools where innovators have intervened directly, 56.6 percent identified innovators as the main providers of infrastructure. This is a testament to the complementary role of education innovators in enhancing access to education and equity. The intervention of education innovators releases the government of the burden of having to spread its resources thinly across the country.

Table 5.3. Provision and maintenance of infrastructure for PBL in schools

Indicator	Intervention	Non-intervention	p-value
<i>Who provides the main infrastructure for Play-based Learning in your school</i>			
<i>GES/MoE</i>	44.13	58.44	0.000
<i>Education partners (e.g. UNICEF, USAID, etc.)</i>	8.54	31.17	0.000
<i>Innovators (Sabre, RTP etc.)</i>	56.58	10.71	0.000
<i>Individual schools</i>	19.22	15.26	0.204
<i>Communities/SMC/PTA</i>	21.35	15.58	0.071
<i>Other</i>	14.23	12.99	0.659
<i>District Assembly</i>	12.10	15.58	0.223
<i>Who maintains the infrastructure provided for Play-based Learning in your school?</i>			
<i>GES/MoE</i>	18.51	32.14	0.000
<i>Education partners (e.g. UNICEF, USAID, etc.)</i>	2.85	12.34	0.000
<i>Innovators (Sabre, RTP etc.)</i>	28.83	3.57	0.000
<i>Individual schools</i>	50.89	58.12	0.079
<i>Communities/SMC/PTA</i>	40.93	29.55	0.004
<i>District Assembly</i>	8.19	4.87	0.102
<i>Others</i>	7.83	7.47	0.869

Community support in terms of provision of infrastructure for PBL in ECE schools is significantly limited. In the intervention schools only about 21 percent and about 15 percent of non-intervention schools mentioned the community (SMC/PTA) as a provider of infrastructure for PBL. The role of district assemblies in the provision of infrastructure for PBL is equally limited. Indeed, the contribution of individual schools through their own efforts is in some instances larger than the contribution of the district assemblies.

In terms of maintenance of the infrastructure provided for PBL, the burden seems to be on individual schools and communities (SMC and PTAs). In both intervention and non-intervention schools, 50.9 percent and 58.1 percent of schools, respectively, indicated that the maintenance is provided by the schools themselves (Table 5.3). This explains the assertion by the 65.6 percent of the schools that cost significantly undermines the implementation of PBL in ECE. Only about a third of schools that have innovator presence indicated that maintenance of infrastructure is provided by innovators, and 18 percent indicated that maintenance is from the government. In innovator-intervened schools, communities (SMC/PTA) were identified by 40.9 percent of schools as the second most important provider of maintenance support.

Two other questions relating to cost to be addressed relates to who provides the teaching and learning resources and who maintains these resources for PBL. The provision and maintenance of TLRs for PBL constitute a part of the recurrent cost. Among the schools that have innovators, 72.9 percent indicated that innovators are the main providers of TLRs. This compares with 28.8 percent who identified the government (GES/MOE) as the main provider

of TLRs (Table 5.4). Some schools provide TLRs from their own resources (38%), and in about 28 percent of schools, TLRs are provided by teachers themselves. In non-innovator-intervened schools, 55.2 percent identified the government (GES/MOE) as the main provider of TLRs, significantly larger than 28.8 percent of schools that identified government as the main provider in innovator-intervened schools.

Table 5.4. The main provider of TLR and maintenance of PBL

Indicator	Intervention	Non-intervention	p-value
Who provides teaching and learning resources for play-based learning in your school			
<i>GES/MoE</i>	28.83	55.19	0.000
<i>Education partners (e.g. UNICEF, USAID, etc.)</i>	11.74	34.74	0.000
<i>Innovators (Sabre, RTP etc.)</i>	72.95	12.01	0.000
<i>Individual schools</i>	38.08	31.82	0.112
<i>Communities/SMC/PTA</i>	19.93	12.66	0.017
<i>Parent</i>	9.25	8.77	0.837
<i>Headteachers/Teachers</i>	28.11	20.78	0.038
<i>Others</i>	6.76	11.36	0.053
Who maintains/replaces teaching and learning resources for play-based learning in your school			
<i>GES/MoE</i>	17.08	41.56	0.000
<i>Education partners (e.g. UNICEF, USAID, etc.)</i>	4.63	13.96	0.000
<i>Innovators (Sabre, RTP etc.)</i>	33.81	3.57	0.000
<i>Individual schools</i>	64.77	69.16	0.259
<i>Communities/SMC/PTA</i>	28.11	16.56	0.001
<i>Others</i>	8.54	5.52	0.151

The second question concerns the provider of TLRs maintenance for PBL. It would appear in all instances that the schools are left to provide for the maintenance and replacement of TLRs that they have been provided for PBL. In both innovator-led schools and non-innovator schools, 64.8 percent, and 69.2 percent respectively, indicated that individual schools are the main providers of maintenance and replacement of TLRs. This indicates that in most cases, the government, innovators, and community, among others, may provide the TLRs, but the maintenance of the same is in the hands of the schools themselves. This perhaps explains the annual expenditures of Gh¢890 and Gh¢1222 on the provision of PBL in innovator-led and non-intervened schools, respectively.

SECTION 6: VALUE OF PLAY-BASED LEARNING IN EARLY CHILDHOOD EDUCATION

6.1 Introduction

This chapter answers Objective 6 of the study: What is the value addition of play-based learning methods compared to schools that do not implement play-based learning methods, particularly in relation to early grade reading and numeracy outcomes? The results of the impact of play-based learning on children's developmental outcomes were measured using the Annual Status of Education Report (ASER) Literacy and Numeracy tools and the KG Assessment tool. The ASER tool tests children's ability to read simple texts and perform basic arithmetic tasks. ASER tools on reading and arithmetic focus on assessing whether a student can read alphabets, words, paragraphs, and stories. Whether the student can solve basic arithmetic problems of number recognition, subtraction, and division. The student must listen to the instruction, read, and speak aloud as per their ability to read and write for arithmetic problem-solving. The KG Assessment tool is an observational tool with a checklist completed while observing the child during everyday activities. Four main domains were observed using this tool. These include language skills, reading, writing, and numeracy.

The effect of play-based learning training on learners in schools was evaluated using Propensity Score Matching (PSM) technique. PSM is a quasi-experimental approach that is preferred when random assignment of treatment to subjects is not feasible. The nature of this study, assessing the impact of an intervention that has already been implemented, means that we were only able to compare treatment and control schools on some observed characteristics. Given this, PSM allows us to compute the probability that given some characteristics, a school among the non-intervention schools has a similar probability of being included in the intervention schools. In other words, PSM relies on the assumption that, conditional on given observable characteristics, untreated schools can be compared to treated units, as if the treatment has been fully randomized. Since the focus is on determining the effect of the training on the schools that received the training, the average treatment effects on the treated (ATT) technique will be used.

6.2 Recognition and reading ability

The basic literacy assessment consisted of two parts: recognition and reading abilities. With respect to the recognition of letters, 55 percent of the children from the intervention group could recognize at least five letters correctly compared to 53 percent of the children from the non-intervention group (Table 6.1). In terms of word recognition, 51 percent of children from the intervention schools could recognize at least five words correctly compared to 48 percent of children from the non-intervention group. In terms of reading ability, 26 percent of children from the intervention group could read at least two sentences correctly compared to 22 percent from the non-intervention group, 36 percent of children from the intervention group could read five sentences correctly, and 38 percent of children from the non-intervention group read five sentences correctly.

Table 6.1: Assessment of children performance in literacy test

Literacy ability	Intervention	Non-intervention	Test
Can child recognize at least 5 letters correctly			
Yes	55.3	53.0	0.392
No	44.7	47.0	
Can child recognize at least 5 words correctly			
Yes	51.2	48.7	0.524
No	48.8	51.3	
Can child read at least 2 sentences correctly			
Yes	26.5	22.7	0.022
No	73.5	77.3	
can child read at least 5 sentences correctly			
Yes	36.7	38.2	0.498
No	63.3	61.8	

The ATT analysis shows that the proportion of children from the intervention group who can read at least two sentences correctly is higher by about 3 percentage points, holding all relevant confounders stable compared to the non-intervention schools, albeit with a modest significance level ($p < 0.05$). Similarly, the number of children who could read at least five sentences correctly from intervention schools was 11 percentage points higher than that of children from non-intervention schools (Table 6.2).

Table 6.2: Impact on literacy

Indicators	ATT	Standard errors	T
Child can read at least 2 sentences correctly	0.017*	0.047	0.356
Child can read at least 5 sentences correctly	0.107*	0.06	1.764
Child can recognize at least 5 words correctly	-0.052	0.082	-0.637
Child can read at least 5 words correctly	0.007*	0.098	0.071

Notes * 0.05, Standard errors are clustered at the school level

Basic numeracy and calculation competence

The basic numeracy and calculation competence of learners were assessed in two parts: number recognition and basic calculations. In this assessment, the children were expected to be able to recognize at least four out of five numbers. Children who fail to achieve this are

classified as at the ‘initial stage.’ The results showed that 70 percent of the children in the intervention group and 64 percent of the children in the non-intervention group were at the initial stage of numeracy ability. When it comes to the addition and subtraction of two digits, 38 percent of the children from the intervention group were able to perform the addition and subtraction of two digits, compared to 34 percent of the children from the non-intervention group who were able to do the same. In terms of the ability to divide and multiply involving two digits, 27 percent of the children from the intervention group were unable to perform division and multiplication of two digits, while 19 percent of the children from the non-intervention group were unable to perform as well. Conversely, 72 percent of the children in the intervention group were able to perform division and multiplication of two digits, compared to 80 percent of the children in the non-intervention group (Table 6.3).

Table 6.3: Assessment of children performance in numeracy test

Numeracy competence	Intervention	Non-intervention	Test
Initial	70.2	64.3	0.245
Child is at 0-20 level	29.8	35.7	
Addition and Subtraction of 2 digits			
Unable to perform addition and subtraction of 2 digits	61.7	65.9	0.029
Able to perform addition and subtraction of 2 digits	38.3	34.1	
Division and Multiplication of 2 digits			
Unable to perform division and multiplication of 2 digits	27.1	19.6	0.001
Able to perform division and multiplication of 2 digits	72.9	80.4	

The ATT analysis shows that the proportion of children from the intervention group who can perform addition and subtraction of 2-digit numbers is higher by about 3 percentage points (Table 6.4), holding all relevant confounders stable compared to children from non-intervention schools. Similarly, the number of children from intervention schools who can divide and multiply two digits correctly is 11 percentage points higher than that of children from non-intervention schools.

Table 6.4: Impact on numeracy

Indicators	ATT	Standard errors	T
Child’s Numeracy competence	-0.158	0.167	-0.95
Child can do Addition and Subtraction of 2 digits	0.029*	0.053	0.547
Child can do Division and Multiplication of 2 digits	0.107*	0.047	2.291

Notes * 0.05, Standard errors in are clustered at the school level

6.3 Observation of learners' language, reading, writing and numeracy ability

Learners were also observed for language, reading, writing, and numeracy skills in and out of the classroom. At KG2, the observation data suggest that the children from intervention schools significantly outperformed the children from the non-intervention schools in all four domains of language, reading, writing, and numeracy.

At the KG 1 level, significant differences were found in writing and numeracy between the intervention and non-intervention groups (Table 6.5). For instance, a significantly large proportion of children in the intervention schools (56.7%) could identify and describe objects by color, size, and name compared to the proportion of children from non-intervention schools (41.4%) who could do the same. Similarly, a significantly large proportion of children from the intervention schools (62.5%) can use number names, counting in sequence to find out 'how many, matching numbers to objects (1-9)' compared to the proportion of children from the non-intervention schools (35.5%) who could do that.

In terms of writing skills, a large proportion of children from the intervention schools (47.2%) could write their own names without copying, compared to children from non-intervention schools (36.9%). Similarly, a larger proportion of children from the intervention schools could engage in a variety of gross motor (39.5%) and fine motor (25.4%) activities compared to children from non-intervention schools (30.1% and 18%, respectively).

Table 6.5: Observation of KG2 learners' language, reading, writing and numeracy skills

Skills	Intervention Mean(sd)	Non-intervention Mean(sd)	p-value
Oral language skills			
Proportion of children who can express their feelings and ideas -	47.625 (25.375)	42.800 (26.383)	0.266
Reading skills			
Proportion of children who can tell their own short stories about a picture.	32.408 (26.676)	37.800 (34.384)	0.273
Proportion of children who can identify selected sounds in given words.	38.625 (24.653)	39.160 (34.102)	0.909
Proportion of children who can 'read' 3 or more words on display in the classroom.	48.592 (27.881)	41.620 (31.458)	0.155
Proportion of children who can listen to stories and be able to respond to basic questions	43.183 (25.339)	33.720 (20.111)	0.020
Writing skills			
Proportion of children who can engage in a variety of gross motor activities e.g. Can throw a ball to knock down a target at a distance.	39.500 (29.829)	30.060 (21.961)	0.045
Proportion of children who can engage in a variety of fine motor activities e.g. Can screw and unscrew a bottle lid.	25.417 (24.602)	18.020 (22.721)	0.070

Proportion of children who can write own name with no copy.	47.233 (28.106)	36.860 (29.395)	0.032
Numeracy skills			
Proportion of children who can identify and describe objects by colour, size and name	56.700 (28.854)	41.420 (21.497)	<0.001
Proportion of children who can use number names, counting in sequence to find out ‘how many, matching numbers to objects ‘ (1-9).	62.517 (28.903)	35.500 (25.555)	<0.001
Proportion of children who can classify objects and count the number of objects in each category.	13.967 (22.016)	7.520 (12.776)	0.054
Proportion of children who can compare lines and other shapes that are the same and different	42.808 (26.441)	34.380 (21.624)	0.048
Proportion of children who can extend non numerical patterns	44.492 (29.577)	38.340 (27.162)	0.208

SECTION 7: CONCLUSION

7.1 Introduction

Play-based learning pedagogy is not new, but one of the most difficult to implement approaches to developing young minds in school. In Ghana, at the integration of preschool into the mainstream basic education structure, the use of play-based individual and group activities was indicated as critical for the overall personal development of children. Implementation of this recommendation has been very slow for three main reasons: lack of material resources, inadequate human capacity, and the structure of the educational system itself, which is grade, centred. A number of development partners have stepped into the early learning space to support with provision of resources and build capacity of teachers to be able to implement play-based learning in schools. However, in a context where individual achievements are celebrated, coupled with an educational system structured around results and grading, teaching, and learning approaches have traditionally separated work and play. This has resulted in significant challenges for teachers to engage pupils in play while ensuring that they make progress against a set of curricula and assessment goals. This construction has engendered enormous challenges for teachers, who shuffle in an imaginary conflict between mandated curricula and play-based instructional practices. This has been the state of early childhood learning in many developing countries. Efforts in Ghana and Sierra Leone to develop new curricular to ensure the implementation of play-based learning have been supported by development partners and innovators in the education space. Using both qualitative and quantitative approaches, this study set the following research questions to help understand efforts at *building teachers' capacity to enhance early learning -through child focussed and play-based approaches in Ghana and Sierra Leone*:

1. How is the new early learning curriculum with play-based approaches integrated into the pre-service and in-service teacher training programmes?
2. What innovations in play-based learning exist to support teacher capacity to implement play-based learning and what added value are these making (e.g., volunteer teacher models and right to play models)?
3. How is the educational system adapting to the changes in the new early learning curriculum?
4. How are education innovators in the early learning space influencing the early childhood education quality and uptake in Ghana and Sierra Leone?
5. What is the value addition of play-based learning methods compared to schools which do not implement these, particularly in relation to early grade reading outcomes?
6. Can there be more cost-effective approaches to scaling up early learning activities through volunteer teacher programmes?

7.2 Summary

Adaptation of the educational system to the new early learning curriculum

School and Classroom facilities and equipment for ECE

The survey revealed slow progress in the adaptation of the educational system to the changes in the new early learning curriculum based on the analysis of the school facilities and equipment for ECE. Schools are poorly resourced in terms of the physical facilities, spaces

and equipment for ECE (well-resourced infirmaries, facilities for SEN, child size toilets, equipment for outdoor playing, designated places for sleeping, or fencing for school compound, etc.). Schools are doing better with regards to learning related resources for ECE such as learning kits and curricula, picture books, learning centres, outdoor play equipment, teacher's record books, assessment tools, portfolios, and child folders. However, child folders are not available in majority of the schools to help track children's development. This limits the ability of teachers and parents to effectively monitor the progress of children. Classroom facilities for ECE are either non-existent or in need of improvement. Very few classroom facilities are in good condition. Facilities for SEN are very limited and non-existent in most schools.

Teaching capacity, qualification, and conditions in the classroom

The intervention schools are slightly more endowed with more teachers as well as the number of professional teachers as compared to the non-intervention schools. Also, classroom sizes are significantly larger than the recommended class size for preschool and primary levels.

Teachers' participation in Play-Based Learning Professional Development Trainings

Teachers in both the intervention and non-intervention schools had participated in a play-based pedagogy training programmes in the last 3 years although more teachers in the intervention schools had participated in these trainings. The organizers of the TCPD trainings included GES/MoE, education partners, RTP, Sabre Education and others. Out of pocket payments by teachers emerged as the main source of funding for the TCPD trainings. Generally, teachers have positive beliefs towards play-based learning classroom even though a substantial number (50%) do not appreciate the co-existence of play and learning (work) or better still learning through play. Beyond the beliefs towards PBL, all teachers also integrate play-based learning activities, one way or the other, in their teaching activities.

PBL Implementation Challenges

The adaptation of the educational system to the changes in the new early learning curriculum is further inhibited by both the micro-level and macro-level challenges identified in the survey. Micro-level challenges include the unavailability of play materials, poor classroom infrastructure, classroom set up incompatible with PBL learning, PBL approach too tiring and others. Macro-level challenges identified include infrastructure/logistics, financial constraints, inadequate training and policy environment.

How to improve the integration of play into teaching and learning in schools

There is consensus among teachers in both intervention and non-intervention schools about the need for teachers, management, and parents to perform varied responsibilities to ensure the integration of play-based learning in schools. However, teacher capacity building in the form of training in effective implementation of play-based approaches in the classroom emerged as the dominant recommendation.

Role of education innovators in influencing early childhood education quality

Provision of facilities for ECE and for PBL

The majority of the intervention schools cited education innovators such as RTP and Sabre Education as the main organizations that support them to create resources for ECE and PBL

implementation as well as the provision of direct classroom support. For the non-intervention schools, GES and development partners provide this support.

Provision of capacity building for play-based learning

RTP and Sabre were identified as the main providers of support for teachers' continuous training in the intervention schools. Even among the schools classified as non-intervention schools, a good number of them (30%) identified innovators as the main providers of support for teachers' training. Overall, teachers indicated a positive perception of the impact of play-based pedagogy training received. Majority of the teachers who participated in play-based learning pedagogy training are also able to implement all of the pedagogical approaches that are relevant and specific to PBL in their teaching and learning process, although digital integration is low. An assessment of how well teachers are able to implement PBL revealed that most of them belong to the intervention schools, indicating that the training provided by the innovators may have been more comprehensive and complete than that provided by other institutions which teachers in the non-intervention group participated.

Recognition and reading ability, Literacy and Numeracy

Children in the intervention schools slightly outperformed their colleagues in the non-intervention schools with regards to recognition and reading abilities. Children from the intervention schools also outperformed non-intervention schools in the literacy and numeracy tests based on the ATT analysis. Observation data suggest that the children from intervention schools significantly outperformed the children from the non-intervention schools in all four domains of language, reading, writing, and numeracy.

Cost effectiveness and cost influences on PBL

Teachers are required to pay fees to participate in the demand-driven training programmes provided by the NTC-accredited CSPs. Teachers pay between GH¢55 and Gh¢75 for a face-to-face session and between Gh¢25 and Gh¢40 for an online session with no significant difference in the amount paid by teachers in intervention schools and schools that had no intervention. Schools spend on average Gh¢285 a month, providing teaching and learning resources for PBL. Non-intervention schools spend more on providing teaching and learning resources for PBL in comparison to intervention schools. The majority of school respondents (65.6%) affirmed that cost and access to play-based materials undermine early childhood education. The government is the substantial provider of infrastructure for PBL across both intervention and non-intervention schools. However, in non-intervention schools GES/MoE is identified as the main provider of PBL infrastructure while intervention schools identified education innovators as the main providers of infrastructure. Community support and the role of the district assemblies in terms of provision of infrastructure for PBL in ECE schools is significantly limited for both intervention and non-intervention schools. In both intervention and non-intervention schools, maintenance of PBL infrastructure is done by the school and communities (SMC and PTA). Innovators are the main providers of TLRs among intervention schools while GES/MoE are the providers of TLRs in non-intervention schools. Schools are left to provide for the maintenance and replacement of TLRs that they have been provided for PBL.

7.3 Recommendations

The slow progress in the adaption of the educational system to the new learning curriculum is mainly because of the infrastructure, logistics and capacity-related challenges identified in this survey. The following recommendations are proposed as remedial actions that are critical for the effective implementation and uptake of PBL in schools:

- Heavy investment in school and classroom infrastructure and equipment for PBL at the ECE level by Government and development partners is required for effective PBL.
- Government and education innovators who provide PBL infrastructure and TLRs should incorporate a sustainable strategy for the maintenance and replacement of the infrastructure in consultation with school authorities and communities to ensure facilities are in good condition for school children.
- Provision of digital play materials such as tablets, laptops, television sets etc. for ECE should be considered by the government to complement the play materials that teachers are expected to mobilize locally. This is critical to help prepare children for the digital world and expose them early enough to ICT tools and pique their interest in available technologies.
- Human capacity for ECE is critical for the success of PBL. The Ministry of Education and the Ghana Education Service should devise innovative approaches to promote the uptake of ECE specialization by teachers to beef up the low numbers of teachers trained in ECE.
- The Ghana Education Service should address the lack of support staff for KG teachers to ensure there are adequate instructors in KG classrooms for effective PBL pedagogy as this is currently lacking.
- PBL will thrive better with the full support of parents and communities. School authorities should therefore devise ways of engaging parents and communities to ensure their active participation in school activities including volunteering in the classrooms, helping to provide local play materials, and helping to bridge the language challenge for ECE teachers who cannot speak the local languages required to engage their pupils in PBL.
- The emergence of inadequate training as a challenge despite the provision of CPD allowance calls for a review of the current approach to the financing of CPD training. The annual payment of CPD allowance as part of teachers' salaries may not be achieving the desired results.
- Schools who benefit from other government interventions such as the Ghana Accountability for Learning Outcomes Project (GALLOP), should be encouraged and if possibly directed by the MoE to devote some of the funds for the capacity building of teachers in PBL approaches.
- Resources for special needs children must be made available to effectively aid teachers in including SEN children in the classroom.

This quantitative study has provided evidence of the gradual adaptation of the educational system to the new early learning curriculum, the role of educational innovators in influencing early childhood education quality, the value addition of play-based learning methods and the cost influence on PBL. The micro and macro-level challenges identified are stifling the effective update of PBL. These challenges need to be addressed to enable teachers deliver PBL approaches as required so that children can benefit fully from ECE.

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APPENDICES

A1. Teachers who attended CPD within the past three years, by T/C

	Non-intervention 616 (53.3%)	Intervention 540 (46.7%)	Test
Have you attended any continuous professional development (CPD) within the past 3 years			
Yes	503 (81.7%)	445 (82.4%)	0.74
No	113 (18.3%)	95 (17.6%)	
How many CPD(s) trainings have you attended within the past three years?	2.978 (1.855)	2.791 (2.434)	0.181
How much have you spent in the last 3 years participating in CPD(s) training pro	175.153 (573.668)	203.546 (1,241.589)	0.645

A2. Teachers who attended CPD within the past three years, by gender

	Male 338 (29.2%)	Female 818 (70.8%)	Test
Have you attended any continuous professional development (CPD) within the past			
Yes	283 (83.7%)	665 (81.3%)	0.328
No	55 (16.3%)	153 (18.7%)	
How many CPD(s) trainings have you attended within the past three years?	3.049 (2.151)	2.823 (2.143)	0.137
How much have you spent in the last 3 years participating in CPD(s) training pro	131.802 (131.812)	212.602 (1,127.187)	0.23

A3. Teachers who attended CPD within the past three years, by location

	Northern 565 (48.9%)	Eastern 591 (51.1%)	Test
Have you attended any continuous professional development (CPD) within the past			
Yes	448 (79.3%)	500 (84.6%)	0.019
No	117 (20.7%)	91 (15.4%)	
How many CPD(s) trainings have you attended within the past three years?	3.051 (2.043)	2.746 (2.228)	0.029
How much have you spent in the last 3 years participating in CPD(s) training pro	152.438 (253.665)	220.776 (1,281.888)	0.268

A4: Observation of KG1 learners' language, reading, writing and numeracy skills

Skills	Intervention Mean(sd)	Non-intervention Mean(sd)	p-value
Oral language skills			
Proportion of children who can express their feelings and ideas -	47.625 (25.375)	42.800 (26.383)	0.266
Reading skills			
Proportion of children who can tell their own short stories about a picture.	32.408 (26.676)	37.800 (34.384)	0.273
Proportion of children who can identify selected sounds in given words.	38.625 (24.653)	39.160 (34.102)	0.909
Proportion of children who can 'read' 3 or more words on display in the classroom.	48.592 (27.881)	41.620 (31.458)	0.155
Proportion of children who can listen to stories and be able to respond to basic questions	43.183 (25.339)	33.720 (20.111)	0.020
Writing skills			
Proportion of children who can engage in a variety of gross motor activities e.g. Can throw a ball to knock down a target at a distance.	39.500 (29.829)	30.060 (21.961)	0.045
Proportion of children who can engage in a variety of fine motor activities e.g. Can screw and unscrew a bottle lid.	25.417 (24.602)	18.020 (22.721)	0.070
Proportion of children who can write own name with no copy.	47.233 (28.106)	36.860 (29.395)	0.032
Numeracy skills			
Proportion of children who can identify and describe objects by colour, size and name	56.700 (28.854)	41.420 (21.497)	<0.001
Proportion of children who can use number names, counting in sequence to find out 'how many, matching numbers to objects' (1-9).	62.517 (28.903)	35.500 (25.555)	<0.001
Proportion of children who can classify objects and count the number of objects in each category.	13.967 (22.016)	7.520 (12.776)	0.054
Proportion of children who can compare lines and other shapes that are the same and different	42.808 (26.441)	34.380 (21.624)	0.048
Proportion of children who can extend non numerical patterns	44.492 (29.577)	38.340 (27.162)	0.208

A5: School facilities for early childhood education and play-based learning

Facilities	Good	Needs improvement	Does not exist
Potable water	33.8	27.8	38.4
Electricity	32.8	39.4	27.8
First Aid box	22.3	53.7	24.0
Toilet facilities for male/females	19.3	59.3	21.6
Outdoor play area	11.0	48.3	40.7
Fenced School environment	8.8	10.2	81.0
Kitchen/cooking area	5.8	25.2	69.0
Child size toilet	5.0	8.5	86.5
Sleeping space	5.0	22.5	72.5
Dining area	2.2	5.2	92.7
Outdoor play equipment	1.2	26.0	72.8
Facilities for children with SEN	0.7	4.8	94.5
Well-resourced infirmary	0.5	2.2	97.3

A6: School facilities for early childhood education and play-based learning

Indicator	Intervention (1)	Non- intervention (2)	p-value (3)
Kindergarten Curriculum exist	97.15	87.66	0.001
Primary curriculum (in any form) exist	97.51	96.75	0.585
Safe school concept guidelines exist	72.24	50.00	0.001
Assessment tools - checklist exist	95.37	83.12	0.001
Children's folders exist	55.87	17.86	0.001
Portfolios/ Anecdotal records exist	66.90	17.21	0.001
Teachers record book exist	98.58	95.78	0.043
Trained teachers for kindergarten exist	96.09	88.96	0.001

A7: Organization/institution that trains ECE teachers on Play-based learning

Organisation/institution	Northern	Eastern	Total
GES/MoE	49.73	57.87	53.89
NaCCA	4.07	15.91	10.12
Education partners (e.g. UNICEF,USAID, etc.)	20.18	39.76	30.19
Sabre Education	1.06	51.61	26.9
RTP	66.37	0.17	32.53
Individual schools	1.06	8.97	5.1
Others	4.25	6.26	5.28

A8: Innovators most effective in improving ECE education in your school through Play-based learning

Teacher training	Northern	Eastern
GES/MoE	54.89	45.11
NaCCA	29.41	70.59
Education partners (e	29.7	70.3
Sabre Education	0.84	99.16
RTP	99.65	0.35
Individual schools	16.67	83.33
Other	35	65
Resources creation/development		
GES/MoE	56.21	43.79
NaCCA	38.64	61.36
Education partners (e	46.9	53.1
Sabre Education	0.43	99.57
RTP	99.54	0.46
Individual schools	26.67	73.33
Other	36.11	63.89
Service provision/classroom support		
GES/MoE	57.28	42.72
NaCCA	48	52
Education partners (e	38.1	61.9
Sabre Education	2	98
RTP	99.53	0.47
Individual schools	9.76	90.24
Other	28.57	71.43