The Influence of Project-Based Learning Approach (PBLA) on the Development of Lifelong Learning Skills (LLLS) amongst Pupils in the North West Region of Cameroon

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Abstract: This study seeks to examine the influence of project-based learning approach (PBLA) on the development of lifelong learning skills (LLLS) amongst pupils in North West Region of Cameroon. The argument for this study was anchored on Vygotsky's Social Constructivism Theory, Dewey's theory of Experience and Bandura theory of cognitive development. The study used a survey research design and target population was comprised of teachers of nine selected public schools in the North West Region of Cameroon. The accessible population, from which the sample was drawn, constituted level one (classes one and two) teachers of nine selected public schools in the North West Region of Cameroon. A sample size of 33 respondents was derived using two non-probability sampling techniques (convenience and purposive). Closed ended questionnaire was used to collect data. The instrument was validated through a pilot study involving 10 teachers who were not part of the sample with an overall reliability index at a 0 to 1 scale. Data was analysed using descriptive and inferential statistics. Descriptive statistics include; frequency tables, percentages, means, standard deviations, minimum and maximum values. Also, dimension reduction was done using Principal Components Analyses and variables such as Lifelong Learning, Inquiry Based Learning, Collaborative Learning, ICT-Based Learning where forth normalized. Inferential statistics was done using Ordinary Least Square (OLS) Regression. Variance Inflator Factor was done to test collinearity among explanatory variables while Breusch-Pagan test was used to test for heteroscedasticity among the error terms. The post estimation techniques were used to verify if the OLS estimator does not violates any of it basic assumptions while the model stability was verified using R and adjusted R squared coefficients and the Fisher statistics. Findings showed that, there is a positive and significant relationship between inquiry-based learning, collaborative-based learning, and ICT-based learning and development of LLLS among pupils in the North West Region of Cameroon. The study concluded that, there is a positive and significant relationship between PBLA and development of LLLS among pupils in the North West Region of Cameroon. Based on the findings, recommendations were made to basic education.

Keywords: Project-based learning approach, inquiry-based learning, collaborative-based learning, ICT-based learning, lifelong learning skills

Introduction

Project-based learning (PBLA) is a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured upon complex, authentic questions and carefully designed products and tasks (Markham, 2003, p. 4). The project-progressive philosopher and educator, John Dewey, who founded an experimental school in Chicago in 1897 envisioned the school as having features similar to 'the workshop, the laboratory,

with the materials, the tools with which the child may construct, create, and actively enquire' (Dewey, 1900, pp. 173-174, as cited Zama & Endeley 2023,p.40). Project-based learning approach (PBLA), which built on John Dewey's work a century ago on experiential, hands-on, student-directed learning, clearly fits within the trend toward practice-based and experiential learning (Enjei, 2022). Project-based learning activities are long-term, interdisciplinary, and learner-centred and integrated with real-world issues and problem solving. This method fosters abstract tasks to explore and solve complex issues (Bell, 2010; Condliffe, 2016; Harmer & Strokes, 2014; Holmes, 2012; Iwamoto et al., 2016; Thomas, 2000). It promotes understanding of the underlying concepts rather than just practicing rote memory skills. Project-based learning approach uses projects as vehicles to encourage learner motivation and to provide means for demonstrating and explaining what they have learned. In PBL, the learners explore, make judgments, interpret, and synthesize information in meaningful and creative ways. Project-Based Learning is a good resort in honing the 21st century skills of the learners (Educational Technology Division, Malaysia, 2006). Ravitz et al. (2012) defined 21st Century skills as productivity and accountability, social and cross-cultural skills, creativity and innovation, critical thinking and problem solving, communication and collaboration, information, communication and technology literacy, flexibility and adaptability, initiative and self-direction, and leadership and responsibility. Project-Based learning promotes learning that results from the demonstration of performance where the learners are going to use the knowledge and skills they acquired. According to Harmer and Strokes (2014), PBL has key features which give its distinction: learning by doing, role of the facilitator, interdisciplinary, collaboration on group work, and an end product. The genesis of PBL is inquiry where children pursue knowledge by asking questions that triggered their natural curiosity (Bell, 2010).

Review of Related Literature

Conceptual Review

Inquiry-Based learning

The concept "inquiry," according to Exline (2004), is a quest for "truth, information or knowledge; seeking information by questioning" (p. 31). When learners identify a problem, they go through a process of inquiry. Individuals likewise go through a process of inquiry from birth till death. Babies on their part start making sense about their surroundings through their curious observations. Inquiry-based learning (IBL) is an educational strategy in which learners follow methods and practices to those of professional scientists in order to construct knowledge (Keselman, 2003). It can also be defined as a process of discovering new casual relationships whereby, learners formulate hypotheses and test them by conducting experiments and/or making observations (Pedaste et al., 2012). It is often considered as an approach of solving problems and involves the application of several problem solving skills (Pedaste & Sarapuu, 2006). In the process, learners often carry out a self-directed, partly inductive and partly deductive learning process by conducting experiments (Wilhelm & Beishuizen, 2003).

In IBL environments, learners learn better by creating meaningful knowledge through repetitive questioning, active learning, reflection, and sharing activities in the Project-based learning approach. Some of these activities include: repetitive cycles of data gathering, meaning-making, reflection, and testing of results by examining evidence; doing experiments; using reason and logic; receiving input from peers and teachers; and revising as necessary (Mergendoller et al., 2006). To support the repetitive nature of the PBL concept in the classroom, learners should also assist in giving, receiving, and using peer feedback (Grossman et al., 2019). Teachers can simplify the PBL process by conducting formative evaluation and providing repetitive cycles of feedback and revision during inquiry, creation, and production (Kolodner et al., 2003).

Collaborative-Based Learning

Collaboration-based learning (CBL) has become a twenty-first-century trend. The need in society to think and work together on issues of critical concern has increased (Austin, 2000) shifting the emphasis from individual efforts to group work, from independence to community (Leonard & Leonard, 2001). Collaborative learning is a broad term for a 'variety of educational approaches involving joint intellectual effort by learners, or learners and teachers together. In most collaborative learning situations, learners work in groups of two or more, mutually searching for understanding, solutions, or meanings, or creating a product' (Luna, 2015). In the CBL environment, the learners are challenged as they are expose to diverse views from peers, and are required to articulate and defend their opinions. By so doing, the learners create their own unique conceptual frameworks rather than relying on some readymade frameworks (Enjei, 2022). In a CBL setting, learners have the opportunity to converse with peers, present and defend ideas, exchange diverse beliefs, question other conceptual frameworks, and are actively engaged (Srinivas, 2011).

According to Luna, (2015), collaboration is a twenty-first century paradigm that shifts learning from teacher or lecture-centred settings to collaborative settings. With the development of new ICTs innovative forms of collaboration are also emerging (Leadbeater, 2008). Collaborative learning, therefore, is the intentional grouping and pairing of learners so as to achieve a learning goal (Smith & MacGregor, as cited in Barkley et al., 2014). These authors added that collaborative learning is a broad term for a 'variety of educational approaches including mixed intellectual effort by learners, or learners and teachers together.

ICT-Based Learning

Information and Communication Technology-based learning refers to the process of incorporating, integrating or aligning ICT educational technologies in to pedagogy and their usage to enhance teaching and learning (Behnan, 2012). Operationally, ICT based learning is defined as integrating or embedding or incorporating ICT in the learning process rather than teaching ICT as a separate subject. ICT based learning in education generally means technology-based teaching and learning process that closely relates to the utilization of learning technologies in schools (Luna 2015). The use of ICT in the classroom is vital because it contributes a lot in the pedagogical aspects in which the application of ICT will lead to effective learning with the help and support from ICT elements and components (Jamieson-Procter et al., 2013). Almost all subjects ranging from mathematics, science, languages, arts and humanistic and other major fields can be learned more effectively through technology-based tools and equipment (Luna, 2015). Also, ICT provides the supplementary support for both teachers and learners where it involve effective learning with the help of computers to serve the purpose of learning aids (Jorge et al., 2003).

Theoretical Review

John Dewey's Theory of Experience (1938)

John Dewey, believed in groups of people coming together to solve problems harmoniously through a process of "discussion, debate and decision making" (Gutek, 2014). Dewey was a pragmatist, progressivist, educator, philosopher and social reformer. His beliefs about democracy, community, problem solving, guided the development of his social and educational philosophies. According to Schiro (2012), Dewey believed that education was a "crucial ingredient in social and moral development" (P. 174). Progressive education according to Dewey should include socially engaging learning experiences that are appropriate to develop young children (Dewey, 1938).

Flinders and Thomton (2013) assert that to Dewey, effective education is as a result of social interactions and that the school settings should be considered a social institution. Dewey considered education to be a "process of living" (Flinders & Thomton, 2013; Gutek, 2014). Dewey assert that schools and classrooms should represent real life situations, allowing children to

participate in learning activities in a flexible and interchangeably variety of social settings (Dewey, 1938; Gutek, 2014). To Dewey, a classroom is a social entity for children to learn and harmoniously solve problems as a community. In these classrooms, children are viewed as unique individuals; learners can be found busy working, constructing their own knowledge through personal meaning, rather teacher-imposed knowledge and rote learning (Schiro, 2013).The relationship between Dewey's theory of experience and IBL is established on Table 1.

Table 1: *relationship between experience theory and inquiry-based learning.*

Components of experience theory	Inquiry-based learning
Real world experience	Learners do not memorize information from the outside world; they rather construct personal interpretations of the world based on their own experiences.
Schools as social institution	Learners learn and solve problems together as a team. They construct their own knowledge through personal meaning, rather than teacher-imposed knowledge and teacher directed activities.
Learning by-doing	Learners learn by engaging in practical activities and solving problems through hands-on activities.

Source: Developed by researchers (2022) from Zama & Endeley (2023, p.40).

Vygotsky (1978) Social Constructivism Theory

The Social Constructivism Theory (SCT) is propounded by Lev Vygotsky. Vygotsky argues that learning and development do not materialize in predetermined stages, nor does the individual needs to adapt to and/or approach the process alone. To him, learning is a collaborative activity wherein the environment influences the individual, and learning propels development (Secore, 2017). Hence, SCT emphasizes the central idea that learning and development is a social, collaborative activity (Vygotsky, 1978). This is in contrast to Jean Piaget who focused on cognitive development as an individual process. The teacher in Vygotsky's theory, serves as a facilitator and guide rather than a director and builder of learning (Kibinkiri, 2014). Vygotsky emphasizes the importance of peer to peer interaction, teachers and parents in order to build knowledge. In addition he made emphasis on the importance of tools such as language and computers to mediate knowledge construction (Zama & Endeley 2023). In a contructivist learning environment, learners collaborate and engaged in active research and become managers of their own learning. Therefore, learners must be given opportunity to process information, ask questions (inquiry-based learning), to solve problems and to make decisions (Zama & Endeley 2023). The relationship between SCT and inquiry-based learning is illustrated on Table 2.

Table 2: *Relationship between SCT and collaborative-based learning*

Components of SCT	Collaborative-based learning
Zone of proximal development	Pupils master concepts and ideas that they cannot understand on their own with the assistant of peers.
Scaffolding	Pupils interact to do tasks with one another during the teaching learning process
Level of potential development	The point at which the learner is capable of progressing through collaboration with peers under the guidance of the teacher.

Source: Developed by the Researcher (2023) from theories of learning (Zama & Endeley, 2023, PP.58-60).

Jerome Bruner's Cognitive Development Theory (CDT)

Bruner (1956) cited in Santrock (2004) emphasized the concept of discovery learning by encouraging teachers to give learners more opportunities to learn on their own. Integrating ICT into pedagogy can influence this concept of discovery learning couple with the fact that it is learner centred. In Bruner's view, discovery learning encourages learners to think for themselves and discover how knowledge is constructed. It equally satisfies their natural curiosity and inquiry. Project-based learning facilitates discovery learning by providing learners with stimulating activities that activate their natural curiosity and spur learners to make inquiry, work in teams and bring solution to authentic problems.

According to Srinivas (2011), learners should be guided and given the opportunity to collaborate among peers, present and defend ideas, exchange diverse beliefs and make inquiry and discover knowledge for themselves. Discovery teaching style indicates a continuous and reciprocal relationship between the teacher and the learner. Project-based learning can equally facilitate guided discovery learning in which learners are encouraged to construct their understanding with the assistance of teacher guided questions and directions. Jerome Bruner's theory of learning has influenced the development of the Learner Centred Design to instruction. According to Brunner (1961) cited in Zama & Endeley (2023), education is not to impart knowledge, but rather to facilitate to facilitate a child's thinking and problem solving skills which can then be transferred to a range of situations. Education should also develop symbolic thinking in children. The role of the teacher should not be to teach information by rote learning, but instead to facilitate the learning process (Zama & Endeley 2023). The relationship between CDTtheory and ICT-based learning is illustrated on table 3.

Table 3: *Relationship between Cognitive Development Theory and ICT-based learning*

Components of Cognitive Development	ICT-based learning
Readiness	Instruction must be concerned with the experiences and contexts that make the learner willing and able to learn,
Spiral organization	Instruction is structured in a way that learners can easily grasp the content.
Extrapolation	Instruction is designed to facilitate extrapolation and or fill in the gaps.
Discovery learning	Learners construct their own knowledge by organizing and categorising information using the coded system.

Source: Developed by the Researcher (2023) cognitive learning theories (Zama & Endeley, 2023, PP.54-55).

Statement of the Problem

All learning approaches advocates for a dynamic translation of the written curriculum into classroom practices. When all major components of a curriculum (objectives, content, learning experiences and assessment and evaluation) are not met, the purpose of education is thwarted as prescribed in sustainable development (SDG)4 which aims at "ensuring inclusive and equitable quality for all" (UNESCO, 2000). Moreover, the vision statement of the 2018 Cameroon primary school curriculum corresponds with the prerequisite of quality education as stipulated in the UN 2030 agenda. This agenda is applicable to all member states of the United Nations and Cameroon is a member. The new pedagogical document has been designed to develop in pupils lifelong learning skills through PBLA, hoping that learners will be able to cope with the different educational options available to them upon completion of primary schools (MINEDUB, 2018). In addition, the 21st century economy demands for youths who are grounded with lifelong learning skills for proper integration into the global economy. To bring these anticipated changes into reality, there is urgent need for effective curriculum implementation demanding the use of an

appropriate teaching-learning approach as an essential part of the curriculum development process.

In contrast, the curriculum that has been designed with the aim to guide the development of knowledge, skills, attitudes, values, competences in learners for problem solving and to lay the foundation for learning with emphasis on Science, Technology, Engineering, and Mathematics (STEM) is available to curriculum implementers. Project-based learning approach is one of the recommended means of achieving the above expectations in a learner. It is a pragmatic approach to learning in which learners create their own knowledge through meaningful tasks (MINEDUB, 2018). It is in this light that the researcher seeks to investigate the relationship between PBLA and development of LLSs among pupils in the North West Region of Cameroon.

Main Research Hypothesis

H_0: There is no significant influence of PBLA on the development of LLSs among pupils in the North West Region of Cameroon

Specific Research Hypotheses

H_{01}: There is no significant influence of IBL on the development of LLSs among pupils in the North West Region of Cameroon.
H_{02}: There is no significant influence of CBL on the development of LLSs among pupils in the North West Region of Cameroon.
H_{03}: There is no significant influence of ICT-based learning on the development of LLSs among pupils in the North West Region of Cameroon.

Research Methodology
This study was carried out in selected public primary schools in the North West Region of Cameroon. The study used a survey research design. The target population was comprised of teachers of nine selected public schools in the North West Region of Cameroon. The accessible population, from which the sample was drawn, constituted level one (classes one and two) teachers of nine selected public schools in the North West Region of Cameroon. A sample size of 33 respondents was derived two non-probability sampling techniques (convenience and purposive). Closed-ended research questionnaire was used to collect data. The instrument was validated through a pilot study involving 10 teachers who were not part of the sample with an overall reliability index at a 0 to 1 scale. Data was analysed using descriptive and inferential statistics. Descriptive statistics include; frequency tables, percentages, means, standard deviations, minimum and maximum values. Also, dimension reduction was done using Principal Components Analyses and variables such as Lifelong Learning, Inquiry Based Learning, Collaborative Learning, ICT-Based Learning where forth normalized. Concerning inferential statistics was done using Ordinary Least Square Regression. Variance Inflator Factor was done to test collinearity among explanatory variables while Breusch-Pagan test was used to test for heteroscedasticity among the error terms. These posts estimation techniques were used to verify if the OLS estimator does not violates any of it basic assumptions while the model stability was verified using R and adjusted R squared coefficients and the Fisher statistics.

Presentation of Findings

Table 1: Summary of Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Lifelong Learning Skills Index from PCA	33	.7575758	.4351941	0	1
Inquiry-Based Learning Index from PCA	33	.9393939	.2423058	0	1
Collaborative Learning Index from PCA	33	.7575758	.4351941	0	1
ICT-Tools Index from PCA	33	.9090909	.2919371	0	1

Source: Author's Conception, (2022)

Summary of descriptive statistics was obtained through the normalization of indexes constructed using Principal Component Analysis (PCA), a statistical technique used to reduce the dimensionality of variables. These indexes includes; lifelong learning skills, inquiry-based learning, collaborative learning and ICT-based learning. Normalization of ratings means adjusting values measured on different scales to a notionally common scale, often prior to averaging. The findings indicate that the synthetic index from PCA on lifelong learning on average is 0.7575758 with the deviation of 0.4351941 taking values between 1 and 0 respectively. Lifelong learning indicates a low variability among the sample explaining also that the deviation is closer to the mean. This means that 43.5% of participants on lifelong learning are able to interpret basic concepts, capable of applying information literacy; learners are capable of developing techniques for goal attainment. In terms of attitudes toward lifelong learning, the low variability in the sample also means that learners are motivated to learn when working in teams.

Quantitatively, the synthetic index on inquiry-based learning index was constructed using PCA and on average was 0.9393939 with the deviation of 0.2423058 an indication there is low variability on inquiry-based learning. This implies that 24.2% increase in that there is stimulation of curiosity among learners, assistance of learners in the construction of questions, evaluating learners studying process guiding on how to present findings. Also, the synthetic index on collaborative-learning index was constructed using PCA and normalized to range the values between 0 and 1 respectively. The findings showed that on average collaborative-learning on average 0.7575758 with the standard deviation of 0.4351941 indicating a moderate variability in the sample. This implies that 43.5% share ideas with colleagues for the realization of educational goals, assign group works to leaners, interdepend on others as teaching/learning is concern.

The findings further showed that the synthetic index on ICT-based learning index was constructed using PCA and on average was 0.9090909 with the standard deviation of 0.2919371 which was an indication of low variability in the data. This implies that up to 29.2% indicated that design instruction is in line with the intended objectives of ICT curriculum; regularly adopt subject matter to suit learners' interest. In another dimension, participants are able of using diverse teaching strategies such as modelling, reflection, questioning, gesticulation, observation when teaching with ICT-tools.

Table 2: Pairwise Correlation for Collinearity Testing

	LLLS	IBL	CL	ICT-B	APB
LLLS	1.0000	..	..	..	..
IBL	0.2820	1.0000	..	..	..
CL	0.1523	0.6614	1.0000	..	..
ICT-B	0.2820	-0.1250	-0.1890	1.0000	..

Source: Author's Conception, (2022)

It could be noted from the pairwise correlation matrix that the leading diagonal correlation coefficients stood at 1.000 indicating that each variable is perfectly collinear to itself. Worthy to note is the fact that the correlation coefficients are all less than 0.75 between the explanatory variables. This shows that there was the absence of problems of collinearity among the explanatory variables. Therefore, these variables can be included in a regression model as separate variables. The correlation table indicated that Inquiry-Based Learning (IBL) has a positive but moderate correlation (0.2820) with Life Long Learning Skills (LLLS). Concerning Collaborative-Based Learning (CBL), we observed that it has a positive but weak correlation (0.1523) with LLLS. Also, findings showed ICT-Based Learning has a positive and moderate correlation (0.2820) with LLLS as indicated by the Pearson Correlated Coefficient.

Verification of hypothesis using Ordinary Least Square Estimation Techniques

Project-Based Learning Approach and Lifelong Learning Skills amongst Pupils

Table 4: Ordinary Least Square Results

Life Long Learning Skills Index from PCA	Coef.	Std.Err.	t	P>t
Inquiry-Based Learning Index from PCA	.5078164***	.0787661	6.45	0.000
Collaborative Learning Index from PCA	.1655072**	.0336527	4.92	0.053
ICT-Tools Index from PCA	.0065491	.0355061	1.22	0.270
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of (LLLS) chi2(1) = 2.48 Prob > chi2 = **0.1152** Mean VIF=**1.69**	Number of obs =**33** F(11, 22) =**4.69** Prob > F =**0.0000** R-squared =**0.5979** Adj R-squared =**0.5864** Root MSE =.41476			

Source: Authors' Conception, (2022)   Note: *** p<0.01, ** p<0.05, * p<0.1
Interpretation of Findings and Test for Hypotheses

Ha1: Inquiry-based learning has a significant influence on the development of lifelong learning skills.

The regression analyses indicated that inquiry-based learning has positive effect on lifelong learning skills of the pupils. A marginal increase in IBL by one unit will lead to 0.5078164 increases in lifelong learning skills among the class 1 and 2 pupils in the selected Divisions in the NWR of Cameroon. Everything being equal, the findings is statistically significant by 1%. Following the positive relationship that exist between inquiry-based learning and lifelong learning skills among the pupils, we reject the null hypotheses which states that IBL has no significant effect on lifelong learning and accept the alternative hypothesis which states that inquiry-based has a positive and significant effect on lifelong learning skills among class 1 and 2 pupils in Mezam, Momo and Menchum Divisions in the NWR of Cameroon.

Ha2: Collaborative-based learning has a significant influence on the development of lifelong learning skills among pupils.

In another dimension, the findings showed that quantitatively, collaborative-based learning has a positive and significant effect on lifelong learning skills among pupils i.e. a marginal increase in CBL by 1 unit will lead to 0.1655072 increases in lifelong learning skills everything being equal which is statistically significant at 5% level. In line with the findings, it can be concluded that, we reject the null hypotheses which state that collaborative learning has no significant effect on

lifelong learning skills among pupils in Mezam, Momo and Menchum Divisions of the North West Region of Cameroon. Considering the significance level of this objective that is 5% level, we accept the alternative hypotheses which state that collaborative-based learning has a positive and significant effect on lifelong learning skills among class 1 and 2 pupils in the selected Divisions of the NWR.

Ha3: ICT-based learning has a significant influence on the development of lifelong learning skills among pupils.

The findings further indicated that ICT-based tools have a positive effect on lifelong learning skills. Everything being equal, a marginal increase in ICT-based learning by 1 equal to 0.0065491 increases on lifelong learning which is statistically insignificant. Given the low variation of changes in ICT-based learning to changes in lifelong learning skills among pupils, and the insignificant effect that ICT-based learning has, we reject the null hypothesis which says that ICT-based learning has no significant effect on lifelong learning among class 1 and 2 pupils in Mezam, Momo and Menchum Divisions of the NWR of Cameroon. We will therefore look in depth to the matter before conclusions are made.

Discussion of Findings

Inquiry-Based Learning and Lifelong Learning Skills

Inquiry-based learning develops students' critical thinking skills because it helps students to develop interpreting, analysing, evaluating, inferring, explaining, and self-regulation skills which are the core critical thinking skills (Facione, 2011; Hilsdon, 2010). In our context, following the effect of inquiry-based learning on lifelong learning skills it was observed that there was a positive and significant relationship between the enquiry-based learning and lifelong learning skills. Meaning that the context, in which inquiry-based learning is formed, has a positive impact on the pupils. These dimensions were viewed in terms of orientation, conceptualization and conclusion. In terms of orientation, class 1 and 2 teachers stimulated curiosity in learners through problem statement, by doing; these teachers also ask thoughts provoking questions to the pupils. The findings also indicated that teachers have a good mastery of concepts related to any problem and likewise assist learners on how to construct questions. The last part of inquiry-based learning entails guide on how to present findings and evaluate learners' study process which is a well-conceived matter among the teachers. The findings of this study are therefore said to have met with the basics of inquiry-based learning in Mezam Momo and Menchum Divisions of the North West Regions of Cameroon. The findings showed that inquiry-based learning has a positive and significant effect on lifelong learning skills among the pupils which is statistically significant at 1% level. Therefore, this study is related to Pedaste et al., (2012) who said that inquiry-based learning is a process of discovering new casual relationships, whereby, the learners formulate hypotheses and test them by conducting experiments and/or making observations.

More, the findings of this study are in line with Rejeki (2017) who mentioned that inquiry-based learning is useful in promoting lifelong skills and enables learners to continue the quest for knowledge throughout life. Similarly, Lee (2014) stated that inquiry-based learning is an analogy for communicative approach. We can also expand our findings to the works of Wale and Bishaw, (2020) who mentioned that using inquiry-based learning in writing lessons, students can develop critical thinking skills, and learn how to generate and organize ideas through investigation or/and discussion to find out alternative ideas, and produce sound written papers. Accordingly, students who used inquiry-based learning techniques in their language learning are better achievers because they have an active role in choosing the writing topics, and on developing the outcomes of their own investigations. More, the finding is also in congruence with the findings of Vizioli and Kaminsky (2017), as cited in Len and Tieme (2020, p. 56), who opines that problem identification, problem definition, problem solving strategy, organizing information, resources allocation,

monitoring problem solving, and evaluating problem solving, improve learners' creativity and ability in solving problems.

Similarly, studies conducted by Ash and Kluger-Bell (2012); Byker et al., (2017); Ahmad et al. (2014) discovered that learners preferred and performed much better with confirmation level of inquiry compared to guided, structured and open inquiry because teachers provide every needed conditions and allow the student the freedom to learn independently in the confirmation level. In the same vein, Ghaemi and Mirsaeed (2017) investigated the impacts of inquiry-based learning approach on critical thinking skill of EFL students, and revealed that doing inquiry-based activities in EFL classroom increased the critical thinking ability of the students. Finally, Naryanti (2017) who conducted an action research to explore the extent to which inquiry-based learning method can improve grade eight students' ability in writing a descriptive text find out that inquiry-based learning method is able to improve the students' descriptive writing skills. The students concerned actively in the learning process, especially in conveying their opinions, asking and responding questions, and enthusiasm in producing written texts. We can therefore conclude that we are 99% confident that inquiry-based learning is affective measure to increase lifelong learning skills in Mezam, Momo and Menchum Divisions of the North West Region of Cameroon as the findings are empirically verified.

Collaborative-Based learning and Lifelong Learning Skills

Collaborative-Based Learning (CBL) is an important strategy to foster critical thinking, learner's autonomy, and self-decision among pupils. It does not just mean doing the project in a group, but it is a highly advanced level of psychological situation, which triggers the latent mental faculties among the participants. It needs expertise to implement it in our classrooms. To make collaborative learning a success, it should be supported by various collaborative methods and techniques. The effect of collaborative learning on lifelong learning skills in class 1 and 2 pupils in Mezam, Momo and Menchum Division of NWR of Cameroon was viewed in four aspects; communication, interaction, social skills and group self-evaluation. For the realization of these goals, teachers in class 1 and 2 have developed a communication approach to share ideas with colleagues for the realization of educational goals in NWR. This is a good communication approach to collaborative learning which at the same time is called a face-to-face interaction as mentioned by Lai (2011). The findings showed that there was a significant, positive and relatively strong relationship between collaboration learning and the development of lifelong learning skills among pupils. The positive sign of the correlations value also implied that learners are more likely to acquire lifelong learning skills when teachers effectively work as a team. This is in line with Laal and Laal (2012) as they highlight that collaboration has become a twenty-first century paradigm. Societal need to unanimously think and work together on issues of critical concern has increased shifting the emphasis from individual efforts to group work, from independence to community (Leonard & Leonard, 2001).

More, findings also revealed that teacher collaborates with other colleagues and learners for the attainment or realization of educational goals. This is in line with Lai (2011) who argued that collaboration through mutual engagement with others are very important for the successful attainment of goals. He further argued that, collaborative interactions are characterized by shared goals, symmetry of structure, and a high degree of negotiation, interactivity, and independence that facilitates set goals. Respondents equally revealed that they are responsible for tasks entrusted, though they work as a team in school. This is also supported by the finding of Luna (2015, p. 6) who stated that, when learners collaborate with peers, they discuss ideas and challenge the ideas of others, and try out new ideas, exchange different points of view, question others, seek clarifications, and participate in higher order thinking skills such as managing, organizing, critical analysis, problem resolution, and the creation of new learning and deeper

understanding. Leadbeater (2008) stresses that 'learning is best done with people rather than to or for them. It is more effective when learners are participants rather than merely recipients' (p. 19). However, collaborative learning improves student participation in formative assessment (self, individual and group assessment) and increases attendance (Laal et al., 2013; Trilling & Fadel, 2009, p. 107).

Moreover, findings again showed that, respondents mutually agree, engage, coordinate, participate and evaluate efforts in solving classroom and individual problems together. The findings further indicated that teachers assign group work to learners, which permit learners to discuss their experiences among their individual groups. When teachers create team work, there is social transferability of skills among learners. While teachers evaluate learners' performance during group work as earlier mentioned, collaborative learning significantly affect lifelong learning skills among class 1 and 2 pupils. This finding is in line with a group of studies that explored design-based cooperative/collaborative learning, and reported a significant impact of collaborative activities on student learning outcomes (Lou et al., 2001; Chou and Min, 2009; Lee, 2007; Puzio and Colby, 2013; Wright et al., 2013).

Furthermore, instructional methodologies focusing on the development of lifelong learning skills employ collaboration to promote critical thinking skills because collaborative activities engage learners in an interactive approach to learning (Luna, 2015). The social context manifested in collaborative group activities elevates thinking, learning, and problem- solving to an observable status (Leabeater, 2008), making learners' metacognitive processes apparent. In a collaborative learning setting, learners have the opportunity to converse with peers, present and defend ideas, exchange diverse beliefs, question other conceptual frameworks, and are actively engaged (Srinivas, 2011). From the findings, it was concluded that collaborative learning has a positive and significant effect on developing lifelong learning skills among pupils everything being equal. This finding was empirically verified and is in line with theories and past works therefore we recommend the findings for policy purposes.

ICT-Based Learning and Lifelong Learning Skills

Information and Communication Technology (ICT)-based learning refers to the process of incorporating, integrating or aligning ICT educational technologies in to pedagogy and their usage to enhance teaching and learning (Behnan, 2012). Operationally, ICT based learning is integrating or embedding or incorporating ICT in the learning process rather than teaching ICT as a separate subject. Findings showed that there was a positive and strong significant relationship between ICT-based learning and the development of lifelong learning skills among pupils of class 1 and 2 in Mezam, Momo and Menchum Divisions of the North West Region of Cameroon. The positive sign of the correlations value also implied that learners are more likely to acquire lifelong learning skills when teachers effectively integrate ICT in the teaching learning process. This is supported by Enjei (2022) who argued that dramatic changes in global economies over the past five years have been matched with the transformation in technology and these are all impacting on education, the workplace and home life. To cope with the increasing pace and change of modern life, learners need new life skills for flexibility such as ICT skills.

More, Redecker et al. (2011) cited in Luna (2015, p.8) suggest that a mix of different technologies will transform learning by offering a diversity of learning activities, tools and materials, and by providing tools that enable continuous monitoring, and support diagnostic, formative and summative assessment. McLoughlin and Lee (2010, p. 28) also highlighted that, as web-based multimedia production and distribution tools incorporating text, audio, photo and video capabilities continue to grow, teachers at all levels will be faced with new opportunities to integrate social media and technologies into teaching, learning and assessment. Further, McLoughlin and Lee (2007) stress that more, richer and engaging pathways to learning are

available now than ever before; however, these opportunities demand that both teachers and learners experiment with new tools to explore their potential for enabling choice, creativity, participation, personalization, productivity and self-direction for learners (p. 672).

Further, findings revealed that teachers exploit ICT tools and materials in planning, designing and preparing lessons in line with intended objective of ICT curriculum. Equally, findings revealed that teachers regularly fit in ICT in their teaching learning process and regularly adopt subject matter to suit learners' needs. This is supported by Huah (2001) who opined that many countries now have a good understanding of ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing and numeracy (UNESCO, 2000). Integrating ICT into pedagogy is aimed at addressing the need to a knowledge society and a technology literate workforce for the twenty-first century. There is therefore a need for basic education to adopt an information-literacy curriculum; and learners and learners have a need to develop their ICT and thinking skills and responsibility for their own learning Huah, 2001).

Furthermore, findings revealed that teachers use software applications to search various learning experiences based on learners' interest. This is in line with the view of Kent & Facer (2004) who argued that teachers are knowledgeable on how and when ICT should be used. They argued that Information and computer technology (ICT) entails the use of computers, the internet, and electronic delivery systems such as radios, televisions, projectors among others, and is widely used in today's education field. Even though, in this case, teachers do not use software applications such as projectors, television during the teaching learning process but rather they use only computers and software applications such as Web browsers like Microsoft word, Excel, Google chrome, spreadsheet software to search relevant materials for the teaching learning process. This contradicts the view of Kent and Facer (2004) who added that school is an important environment in which learners participate in a wide range of computer activities, while the home serves as a complementary site for regular engagement in a narrower set of computer activities. This is because teaching of ICT is limited in most schools because of the absence of computer labs and other advance technological related materials. Teachers faced difficulties as most primary schools do not have ICT centres and equipment. Therefore, teachers find it difficult to effectively implement ICT into pedagogy since ICT is more of theory than in practice.

Similarly, findings such as that of Coban and Goksu (2022), found that when engaged with online VR, participants are more involved with motivation and perceived sociability than when engaged in a web-based environment. Similarly, Jiang and Zhang (2020) stated that sociability activities in the digital world strengthen students' social space and collaborative contacts. It is clear that practically, ICT-based learning is not effective to an extent in primary schools of Mezam, Momo and Menchum Divisions. The study of ICT-based learning requires the use of web equipment. The effects of lifelong learning on society and how it interacts with technology can improve social inclusion, active citizenship, individual growth, competitiveness, and employability. Cronholm, (2021). Moreover, ICT is being considered a powerful tool for instruction, educational change and reform but whereas this study has revealed that teachers of primary one and two are not really verse with technological knowledge. As such they need professional development in the area of technology so as to better enhance lifelong learning skills of their pupils. A number of previous studies have shown that appropriate use of ICT in pedagogy can harness the quality of education and connect learning to real-life situations (Lowther et al. 2008).

Conclusion Jand Recommendation
The study investigated the role of project-based learning on the development of lifelong learning skills of pupils in Mezam, Momo and Menchum Divisions in the NWR of Cameroon. The findings showed that inquiry-based learning, collaborative-based learning have a positive and significant effect on lifelong learning skills amongst pupils. The findings also showed that ICT-

based learning has a positive but insignificant effect on LLLS amongst class 1 and 2 pupils. The findings were in line with a plethora of past scientific works on PBL and LLLS which added credit to our findings. The global significance of the model used was significant at 1% indicating that we are 99% confident to accept the main alternative hypotheses which stated that PBL has a significant effect on LLLS amongst pupils in the selected Divisions of the NWR of Cameroon. In this aspect, we conclude that PBLA in the North West Region promotes lifelong learning skills amongst pupils in the primary educational system though it had challenges and weaknesses most especially at the implementation level but we highly recommend these findings to policy makers and stakeholders at the Divisional, Regional and National level.

I. The findings showed that there was moderate variability in inquiry-based learning toward lifelong learning skills among pupils. This means that teachers do not practically respect the basic principles governing IBL such as orientation, conceptualization and conclusion. The findings therefore recommend that teachers should regularly have in-service training on how to create curiosity in learners and how to provoke learners to ask questions. This will help teachers to be verse with the approach and will also enable learners to acquire lifelong learning skills.

II. Collaborative learning has a positive and significant effect on LLLS among pupils, though founded on aspects such as communication, interaction, social skills and group self-evaluation it is recommended that teachers should learn how to collaborate with their colleagues since some teachers master the PBL than others. There should be a paradigm shift from individual efforts to group work, from independent to community so that learners can easily develop lifelong learning skills that can facilitate their integration into the society.

III. ICT-based is a challenge to PBL, it is recommended that the government through the Ministry of Basic Education should provide didactic materials and equipment which will be used in the assessment of class 1 and 2 pupils. The findings recommend that teachers who are mediators to the transmission of ICT-based knowledge should acquire specific trainings on this domain so much so that they should be able to transfer the knowledge in the pupils. More, policy makers should add courses like technology and classroom dynamics; Project-based learning didactics to teacher training colleges programs so as to enhance new teacher roles.

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