

UNIVERSITY OF CAPE COAST



EFFECT OF PROBLEM BASED LEARNING ON SENIOR HIGH  
SCHOOL STUDENTS' ACADEMIC PERFORMANCE

SALIFU ISSIFU ABUGBILLA

2023

UNIVERSITY OF CAPE COAST



EFFECT OF PROBLEM BASED LEARNING ON SENIOR HIGH  
SCHOOL STUDENTS' ACADEMIC PERFORMANCE

BY

SALIFU ISSIFU ABUGBILLA

Thesis submitted to the Department of Business and Social Sciences  
Education, College of Education Studies, University of Cape Coast, in partial  
fulfillment of the requirements for the award of a Master of Philosophy degree  
in Accounting Education.

MARCH 2023

## DECLARATION

### Candidate's Declaration

I hereby declare that this thesis is the result of my original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature:  Date: .....

Name: Salifu Issifu Abugbilla

### Supervisor's Declaration

I hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Supervisor's Signature: ..... Date: .....

Name: Professor Joseph Tufuor Kwarteng

## ABSTRACT

The study examined the effect of problem-based learning on students' performance in manufacturing accounts in senior high schools in Ghana using quasi-experimental design, test as data collection instrument, 139 students from two schools, comprising 63 students in the experimental group and 76 students in the control group, were selected using multi-stage sampling procedures to participate in the study. The data obtained were analyzed using frequencies, percentages, means, standard deviations, independent sample t-tests, and multivariate analysis of variance. The study results showed that problem-based learning is a practical learning approach in helping students learn challenging topics such as manufacturing accounts. The results further revealed that the problem-based learning approach significantly impacts students' understanding of manufacturing accounts and considers gender and individual differences as it affects both male and female performance in practically the same way. It is recommended that curriculum developers incorporate Problem-based learning as part of the recommended teaching methods. Aside from those, in-service training in the form of seminars and workshops should be organized by stakeholders of Education, such as Ghana Education Service, among others, to provide in-service education to practicing teachers on the need to use problem-based learning teaching manufacturing accounts in their schools.

**KEY WORDS**

Manufacturing accounts

Problem-based learning (PBL)

Academic performance

Student-centred learning

Instructional methods

Teaching accounting



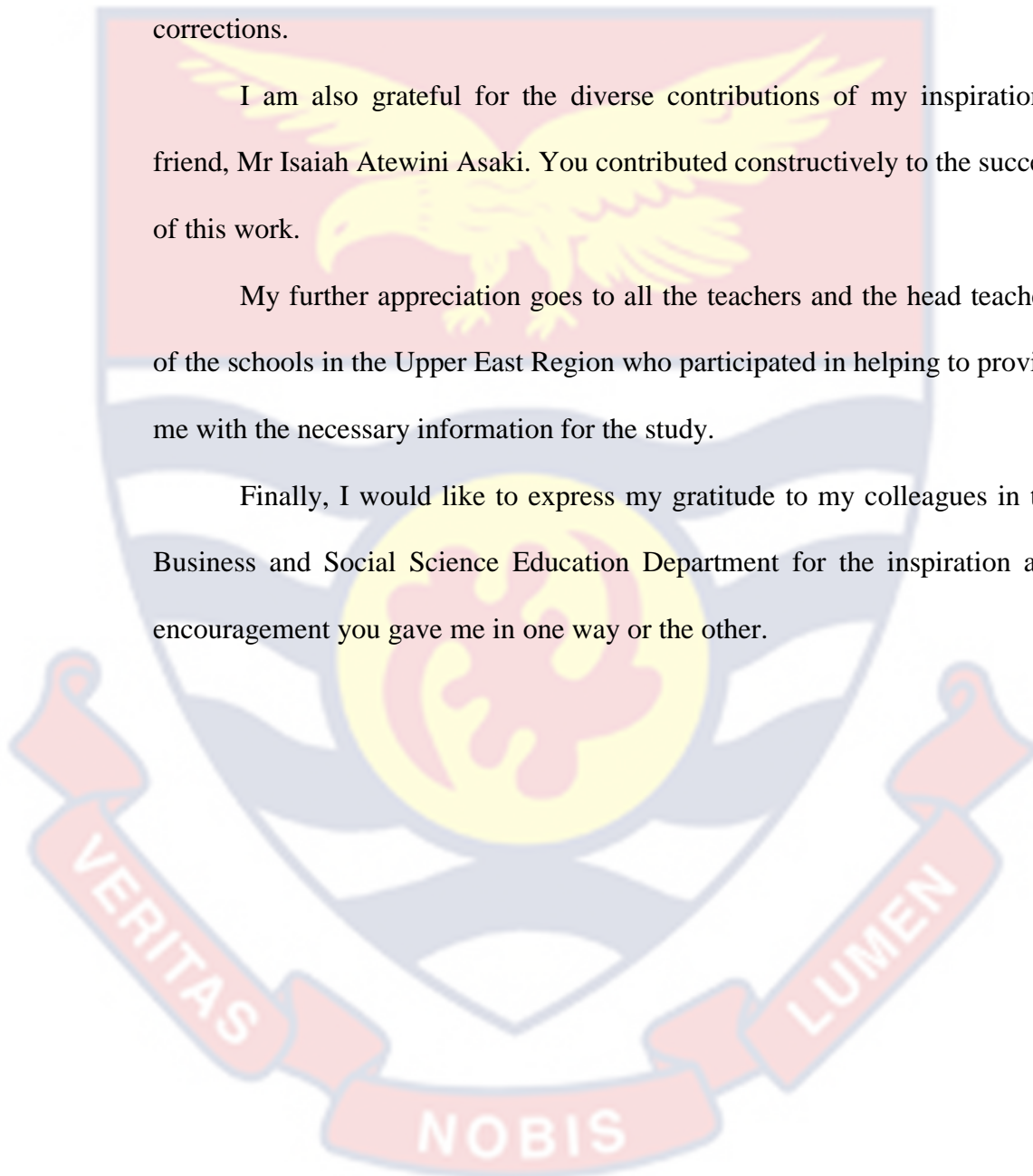
## ACKNOWLEDGEMENTS

My sincere and profound gratitude goes to my industrious supervisor, Professor. Joseph Tufuor Kwarteng of the Department of Business and Social Science Education, University of Cape Coast, Ghana, for his love, advice and corrections.

I am also grateful for the diverse contributions of my inspirational friend, Mr Isaiah Atewini Asaki. You contributed constructively to the success of this work.

My further appreciation goes to all the teachers and the head teachers of the schools in the Upper East Region who participated in helping to provide me with the necessary information for the study.

Finally, I would like to express my gratitude to my colleagues in the Business and Social Science Education Department for the inspiration and encouragement you gave me in one way or the other.



**DEDICATION**

To my family



## TABLE OF CONTENT

	Page
DECLARATION	ii
ABSTRACT	iii
KEY WORDS	iv
ACKNOWLEDGEMENTS	v
DEDICATION	vi
TABLE OF CONTENT	vii
LIST OF TABLES	x
LIST OF FIGURES	xi
<b>CHAPTER ONE: INTRODUCTION</b>	
Background to the Study	1
Statement of the Problem	6
Purpose of the Study	9
Research Hypothesis	10
Significance of the Study	11
Delimitation of the Study	11
Limitations of the Study	12
Organisation of the Study	12
<b>CHAPTER TWO: LITERATURE REVIEW</b>	
Overview	13
Constructivist Theories of Teaching and Learning	13
The Concept and Relevance of Financial Accounting	18
Manufacturing Account	22
Teaching Strategies	24



Problem-Based Learning	26
The Implementation of Problem-Based Learning	30
The Role of Teachers and Students in the PBL classroom	34
Teachers' Role	35
Students' Role	36
Comparing Traditional with Problem-Based Learning	37
Gender Differences in Academic Performance concerning Teaching methods	41
Chapter Summary	43
<b>CHAPTER THREE: RESEARCH METHODS</b>	
Overview	44
Research Design	45
Study Design	46
Study Area	46
Population	48
Sample and Sampling Procedures	48
Data Collection Instrument	49
Validation of the Instrument	50
Reliability of the Instrument	51
Data Collection Procedures	51
Intervention procedure	52
Data Analysis Procedure	53
<b>CHAPTER FOUR: RESULTS AND DISCUSSION</b>	
Hypothesis	60

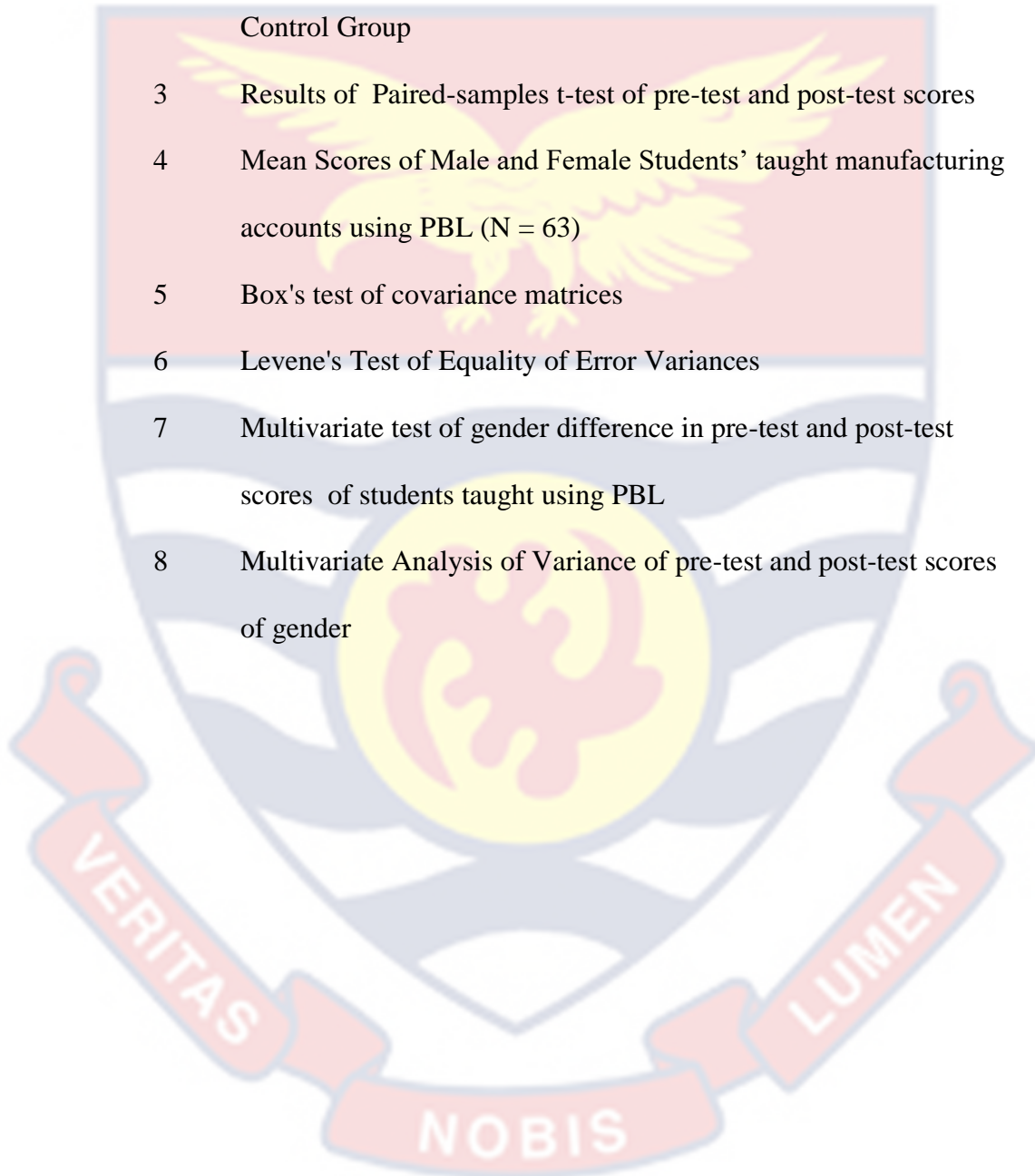
CHAPTER FIVE: SUMMARY, CONCLUSIONS, AND  
RECOMMENDATIONS

Summary	70
Key Findings	71
Conclusion	72
Recommendation	72
Suggestions for further research	73
REFERENCES	75
APPENDICES	94



**LIST OF TABLES**

Table		Page
1	Demographic Characteristics of the Respondents	55
2	Independent t-test Analyses of Post-test scores of Experimental and Control Group	58
3	Results of Paired-samples t-test of pre-test and post-test scores	60
4	Mean Scores of Male and Female Students' taught manufacturing accounts using PBL (N = 63)	64
5	Box's test of covariance matrices	65
6	Levene's Test of Equality of Error Variances	65
7	Multivariate test of gender difference in pre-test and post-test scores of students taught using PBL	66
8	Multivariate Analysis of Variance of pre-test and post-test scores of gender	67



**LIST OF FIGURES**

Figure		Page
1	Learning cycle proposed for PBL adapted from Da Silva, Bispo, Rodriguez & Vasquez (2018).	32
2	Map of Bawku West District	47
3	Normal Q-Q plot of a score of an experimental post-test	57
4	Normal Q-Q plot of scores of control post-test	57



## CHAPTER ONE

### INTRODUCTION

#### Background to the Study

Financial accounting is the act of locating, quantifying, and disseminating economic data so that information users can make wise decisions (Drury, 1992; Osuala, 2004). For Asaolu (2005), it is a subfield of accounting that provides users with financial data from an organization for unbiased evaluation and decision-making. Such benefits of financial accounting could be tapped if students are taught to acquire the concepts of financial accounting.

According to Oduro (2011), the purpose of teaching accounting is to prepare the students to acquire basic account concepts, bookkeeping knowledge and financial information preparation, enabling them to work after Senior High School (SHS) education and for furtherance in their academic discourse. Furthermore, the Ghanaian SHS financial accounting curriculum summarises the aim of teaching financial accounting to the Ghanaian SHS student to include; (a) identifying the use of financial information need and financial reports internally and externally; (b) gaining requisite skills for using accounting as a tool for planning, organizing, controlling and financial decision-making process; (c) applying basic accounting principles in financial statement reporting in modern businesses and using manual, mechanical and computerized system; (d) developing skills for understanding, analysing and interpreting financial statements/ reports for making informed and sound management decisions; and (e) developing attitudes for thoroughness, neatness, orderliness and accuracy in financial record keeping (MOE, 2010).

Accounting knowledge will be required to administer companies with both profit- and nonprofit-oriented goals and businesses (Drury, 2018;1992).

In the financial accounting curriculum, one topic that is central to students accounting knowledge development is manufacturing accounts.

Manufacturing accounts are used to compute and show the cost of manufacturing goods or products for sale (Odo, 2017; Stevens, 1987; Stott, 1982). Bright and Herbert (1990) explained manufacturing accounts as the activity of manufacturing goods and selling them. It has four segments: accounts for factory manufacturing, trading, a profit or loss statement, and a balance sheet. (Ministry of Education [MOE], 2010; Stott, 1982; Wood & Sangster, 2008). The accountant can calculate production costs through manufacturing accounts, which they use in the trading accounts. (Stevens, 1987; Wood & Sangster, 2008). The trading accounts enable the accountant to compute the gross profit for the manufacturing company or entity (Wood & Sangster, 2008).

The gross profit helps the organization to calculate its profit or loss account to determine whether the business is worth operating. Thus, knowledge of these segments of the manufacturing accounts has a bearing on the student's understanding of other topics, such as preparing financial statements, the balance sheet, and accounting books (MOE, 2010) in the Ghanaian SHS financial accounting curriculum. It is therefore, tenable to say that students' correct comprehension of manufacturing accounts will contribute significantly to their academic performance in financial accounting at the SHS and beyond since students' knowledge at the SHS level is related to their performance at the tertiary level (Papageorgiou, 2017; Steenkamp,

Baard and Frick , 2009) For instance, Papageorgiou (2017) in a five year analysis of students profile verse academic performance reported that first-year University students with basic accounting at SHS perform better in accounting. Also, students thorough exposure to the study of manufacturing accounts will instil in them a sound accounting knowledge for efficient business management and non-profit-based organisations (MOE, 2010).

Despite the great relevance of the knowledge of manufacturing accounts, there are challenges associated with the knowledge acquisition process by students in SHS. Several factors may be attributed to student's poor performance in manufacturing accounts and consequently, financial accounting including; ineffective teaching methods, teacher qualification and experience, teachers' attitude towards accounting and speedy coverage of the materials, availability of resources (Kwarteng, 2014; Obidile, Stella, Helene, Akuezuiilo, 2017; Omotayo, 2014; Yeboah-Appiagyei, Osei-Tutu and Darkwa, 2014). According to Yeboah-Appiagyei et al. (2014), teacher choice of approach to lesson delivery impacts the students' performance. Yeboah-Appiagyei et al. (2014) and Omotayo (2014) asserted that financial accounting teachers' professional knowledge and years of experience influence their approach to teaching accounting. Similarly, Kwarteng (2019) stated that the students' academic performance is highly influenced by teachers' professional characteristics, teaching skills and classroom climate.

Teaching financial accounting therefore, requires teachers to adopt better instructional strategies such as participatory approaches to help enhance students' achievements (MOE, 2010) and "avoid rote learning and drill-oriented methods" (MOE, 2010; p. viii) of teaching. Such participatory

teaching strategies include peer tutoring, guided discovery, and problem-based learning (Eze, 2014). The advantages of employing these participatory teaching approaches are that they make the learner involved actively in the lesson and also learn using their ideas to solve problems (Inuwa, Abdullah, & Hassan, 2017). In that regard, Dar and Ezeagba (2014) indicated that, for the government to ensure quality accounting education, it must engage the service of qualified and experience teachers who will introduce practical accounting lessons.

Among the different types of participatory approaches that has been discovered, problem-based learning (PBL) is efficient (Savery, 2006; Stanley & Marsden, 2012) in helping students overcome challenging topics such as manufacturing accounts. Roberts, Nganga, and James (2022) explained problem-based learning as an approach in teaching where students are actively involved and prepared as independent learners and problem solvers. He added that students should be taught the proper skills and strategies that will benefit them all their lives. Savery (2006) believe that the use of PBL (a) increases students' performance in adapting to and participating in change, (b) helps students deal with problems and make reasoned decisions in unfamiliar situations, (c) helps students reason critically and creatively, (d) helps students appreciate the other person point of views; collaborate working well in teams or groups, recognizing one's strengths and weaknesses, and taking the necessary corrective action. In PBL, the function of the teacher is to promote learning and students do self-regulated and directed learning (Barut, Soares, Araujo & Kanet, 2016). Thus, in this study the researcher hypothesis that



using the PBL will improve students' academic performance in financial accounting significantly.

Kwarteng (2019) asserted that the traditional method of teaching accounting, such as 'memorisation', will promote students' inabilities to become life-long learners in the accounting discipline. He added that the accounting teacher's approach to delivering accounting lessons affected the student's thinking ability. In Nigeria, a study conducted by Ishaq (2011) revealed that financial accounting teachers' use of traditional teaching methods resulted in low accounting performance. He encouraged professional bodies and the National Examination Council to organize seminars, workshops and in-house training for accounting teachers on how to use the participatory teaching methods. Again, the traditional process or strategies of teaching does not result in student achievement. The 21<sup>st</sup>-century teachers are encouraged to use student-centred techniques or strategies such as the problem-based learning of lesson delivery (Abdisa & Getinet, 2012; Balim, 2009; Behzadan & Kamat, 2013; Eze, 2014). Accounting teachers should be discouraged from using traditional/conventional teaching strategies such as lecture, memorization, planned repetition, drill and practice, textbook reading, and classic demonstration (Eze, 2014). Similarly, MOE (2010) suggests that accounting teachers should focus on participative teaching strategies instead of rote learning and drill-oriented teaching strategies. In this regard finding a participatory approach to teaching and learning of financial accounting more manufacturing account will be the focus of the study.

Studies have indicated that a student's academic performance in accounting programs may be influenced by their gender (Gammie et al. 2003;

Gracia and Jenkins 2003; Martí-Ballester, 2012). These research findings, however, are inconsistent. According to Kherfi (2008), male students in accounting programs perform better academically than female students; nevertheless, Martí-Ballester (2012), Gammie et al (2003), and Gracia and Jenkins (2003) assert that female students outperform male students in terms of academic achievement. Research also shows that the influence of teaching approaches and gender on academic performance (Huggins & Riggio, 2010). While certain teaching approaches help to bridge gender disparity in academic performance others seem to be promoting gender disparity. For instance, Huggins and Riggio (2010) asserted that traditional teaching approaches, such as lectures and rote memorization, have been shown to be less effective for female students in financial accounting. These approaches tend to emphasize competition and individual achievement, which can be less appealing to female students who may value collaboration and cooperation more highly (Gilliland & Dunn, 2003). Research has also found that traditional teaching approaches can lead to decreased motivation and engagement among female students in financial accounting (Riegle-Crumb & King, 2010). This study content that using participatory teaching approach such as PBL will bridge the gap.

### **Statement of the Problem**

Despite the researches into the accounting curriculum implementation in Ghana, students still do not adequately learn the necessary concepts to succeed in financial accounting (Kwarteng, 2019). Statistical analysis of students' performance in WASSCE shows students only perform a little above average, even though this is inconsistent. For example, in 2013, the average

performance was 53. In 2014, it declined to 47.3, rose to 53.92 in 2015 and declined to 50.64 in 2016 ( Arthur, Sam, Osei & Kattah 2019).

Of more concern is the performance in the concept of manufacturing accounts. Chief examiners have reported that student performance in manufacturing accounts is unsatisfactory. (WAEC, 2013; 2014; 2015; 2016; 2017; 2018). For instance, in 2013, there was a requirement for students to prepare: “Manufacturing, Trading and Profit and Loss Account for the year ended 31<sup>st</sup> December 2009, and Balance sheet as at that date”. However, the chief examiner reported that students demonstrated weaknesses in (i) giving incorrect and incomplete headings, (ii) preparing final accounts without indicating the monetary denomination, (iii) their inability to prepare the Income Surplus Account, and (iv) giving an incorrect classification of items in the Balance sheet. The chief examiner sums it up as “The performance on this question was discouraging” (WAEC, 2013).

Similarly, in 2018, students were required to explain, with examples, the following components of cost in a Manufacturing Account: (i) Direct material cost, (ii) Direct labour cost, and (iii) Factory overhead. In addition, students were asked to describe three types of stocks in a manufacturing concern. The chief examiner however, lamented that the students’ responses to the questions indicated a lack of preparation on the part of candidates (WAEC, 2018).

Empirical studies of Kwarteng (2019) indicates that accounting teachers’ difficulties in teaching some topics in the financial accounting curriculum affect the degree of implementation of the accounting curriculum and that this stems from the fact that there is an inappropriate use of teaching

technique/ strategies and a lack of Accounting teacher' understanding of the instructional subject they teach (Kwarteng, 2013) causes the low-performance level of SHS students in Ghana. In that regard, Arthur, et al. (2019) recommended that a better innovative way of teaching accounting should be adopted to heighten students' interest in accounting.

Empirical studies have established that such innovative teaching strategies that have the potential of proffering solutions to student's poor performance in accounting are PBL (Bergstrom, Pugh, Phillips & Machlev, 2016; Breton, 1999; Dolmans & Schmidt, 1994; Heagy & Lehmann, 2005; Hosal-Akman, & Simga-Mugan 2010; Milne & McConnell, 2001; Sugeng, & Suryani, 2020) Breton (1999) compared the effects of two different teaching methods used concurrently on two comparable classes of accounting theory. The first class used the traditional lecture with assignments and examinations, and the second applied the PBL approach. The study found that, in an accounting education context, PBL methods produce better academic results than traditional lectures. However, this study did not look at students' performance in manufacturing accounts when thought with PBL. Bergstrom et al. (2016) also assessed the impacts of problem-based learning on goal orientation, recognition learning, and transfer accounting for GPA. One hundred ninety-seven participants (113 in the PBL class and 84 in the Lecture method class) distributed in 8 classes- four PBL and four Lecture method classes- found significant differences in the PBL group and the lecture method group. However, their research focused on the tertiary level.

Similarly, Sugeng and Suryani (2020) also looked at how to enhance students' learning performance in financial management using PBL. The study

found PBL a better innovative approach to improving students learning performance than the conventional approach. However, the research did not extent to cover manufacturing accounts. Sugeng and Suryani (2020) concluded that PBL should be used in improving students learning and performance. Similarly, Milne & McConnell (2001) concluded that PBL approaches should be used in bridging the gap between university education and professional life and advised accounting instructors to take such an approach seriously as a means of lessons or instructions.

Since one of the roles of every teacher, especially the accounting teacher, is to structure students' learning to ensure that specific concepts like manufacturing accounts are meaningfully learnt and internalized, it is imperative for accounting teachers to adopt a strategy that will perhaps make instruction more efficient, effective and meaningful by actively involving students in the learning process, and hence reducing rote memorization. However, the successful implementation of PBL in accounting through 'learning by doing' could catalyse change to bring about better learning outcomes for accounting graduates (Stanley & Marsden, 2012). Against this background, the Problem-based teaching strategy is employed to determine its effect on the academic performance of SHS students in manufacturing accounts.

### **Purpose of the Study**

This study aims to determine the effect of a problem-based learning strategy on students' performance in manufacturing accounts in Senior High School in Ghana. Specifically, the study seeks to

1. assess the variations in the post-test average academic performance scores in Manufacturing Accounting among students in the experimental and control groups
2. examine the impact of PBLs on students' academic performance in Manufacturing Accounting
3. determine whether there is any gender difference in pre- and post-test academic performance mean scores in Manufacturing Accounting among students in the experimental group

### **Research Hypothesis**

The following hypotheses were directed the study:

1.  $H_{01}$ : There is no statistically significant difference in the post-test academic performance mean scores in Manufacturing Accounting among students in the experimental and control groups.  
 $H_1$ : A statistically significant difference exists in the post-test academic performance mean scores in Manufacturing Accounting among students in the experimental and control groups.
2.  $H_{02}$ : There is no statistically significant difference in the impact of PBLs on students' academic performance in Manufacturing Accounting.  
 $H_1$ : There is a statistically significant difference in the impact of PBLs on students' academic performance in Manufacturing Accounting
3.  $H_{03}$ : There is no statistically significant gender difference in pre- and post-test academic performance mean scores in Manufacturing Accounting among students in the experimental group.

H<sub>1</sub>: There is a statistically significant difference in any gender difference in pre- and post-test academic performance mean scores in Manufacturing Accounting among students in the experimental group

### **Significance of the Study**

The findings provided some quantitative evidence on the effectiveness and impact of PBL on manufacturing accounts. Students, educators and other stakeholders would have the basis to appreciate that PBL stimulates students' interest and strengthens students' weaknesses in manufacturing accounts at Senior High Level. Thus, the findings are helpful in the following ways: (a) sustain the attention and interest of students in teaching and learning of manufacturing accounts, (b) erase negative attitude and perception of accounting students towards the learning of manufacturing accounts and other related accounting concepts.

Again, school administrators and business department heads will be able to see the importance of Problem-Based Learning (PBL). This will inform them to organize in-service training for staff on using PBL strategy in financial accounting lessons.

Moreover, the findings will help enlighten teachers who are glued to the conventional methods of teaching manufacturing accounts through seminar organization, workshops and the Ghana Association of Business Education teachers (GABET) annual conferences.

### **Delimitation of the Study**

The study was delimited to using Problem-Based Teaching as a learner-centred approach in teaching manufacturing accounts in SHS. The

researcher further restricted the study to SHS in the Bawku West District of the Upper East Region.

### **Limitations of the Study**

The study may lack internal validity because it was unable to control for uncontrollable factors like age, ability, maturation, experience, and prior learning that could affect how well students understood the ideas in manufacturing accounting. Once more, not every student attended every lesson that was planned, which may have an impact on the study's results. Since just two complete classes out of a large number of classes were employed for the study, the conclusions could only be applied to the senior high schools that were chosen and possibly schools with comparable characteristics.

### **Organisation of the Study**

The thesis is organised into five chapters; Chapter one and four others. Chapter two highlights the review of related literature. The chapter examined theories, facts, and other authors' suggestions about the topic. Chapter three deals with the methodology. The areas of the method are research design, population and sampling procedures, the instrument used for data collection, and data collection procedure, and analysis plan of the data collected. Chapter four consisted of the results and discussion of the findings. The research hypothesis guided the presentation of results and discussion of the findings. Finally, chapter five comprised the summary, conclusion, and recommendation. The decision aligned with research questions, and the suggestions were based on the study's key findings. This chapter ends with suggested areas for future research.



## CHAPTER TWO

### LITERATURE REVIEW

#### Overview

This chapter examines the literature on using problem-based learning to teach SHS manufacturing accounts. The literature is reviewed under a theoretical framework: constructivist theory of teaching and learning accounting, accounting concept, problem-based learning, and comparison of traditional and problem-based learning. The Chapter ends with a summary.

#### Constructivist Theories of Teaching and Learning

Learning theories try to explain the steps that lead to enduring behaviour changes brought on by interactions with the environment. Learning theories attempt to explain the nature of learning, including how it occurs in humans and animals. The business teacher's instruction is significantly influenced by the learning theory they use. Learning theories have two main benefits: first, they give us terminology and a conceptual framework for interpreting the learning examples we see, and second, they point us in the direction of actual problem-solving. Constructivist teaching from t

The constructivist learning theory, is one theoretical framework that helps explain why problem-based learning works (Bada, 2015). It is predicated on the idea that learning happens when students actively contribute to developing meaning and knowledge rather than merely absorbing information (Philips, 1995). The fundamental tenet of constructivism is that learners build knowledge as they build new knowledge on top of prior learning (Bada, 2015).

Kim (2005) outlined three essential distinctions between constructivist teaching and other teachings: (a) learning is an active constructive process rather than the process of acquiring knowledge, (b) teaching is supporting the learners to construct their understanding other than passing the information to the learner (c) is a learning-teaching concept rather than a teaching-learning concept that is placing the learner first, and teaching is second in that way the learner will be at the centre of learning.

Baviskar, Hartle and Whitney (2009) noted the components of constructivism are:

(a) creating new knowledge in connection to the learner's prior knowledge

(b) creating cognitive dissonance, that is, assigning problems and activities that will challenge students. This is because knowledge is built as learners encounter novel problems and revise existing schemas as they work through the challenging problem;

(c) applying knowledge with feedback- encouraging students to evaluate new information and modify existing knowledge.

Therefore, lessons should allow students to compare pre-existing schema to the novel situation. Thus, activities such as presentations, small group or class discussions, and quizzes are helpful;

(d) reflecting on learning- allow students to show you (and themselves) what they have learned. Thus, learners engage in a wide range of group activities that will enable them to combine

different influences into new ways of understanding and participating.

The constructivist approach to peer education places a lot of emphasis on the premise that learning happens when students share what they understand during class discussions and through exchanges of ideas. The following peer-to-peer interaction-based activities encourage cognitive construction: (i) students present their ideas by explaining them to other group members; (ii) they reflect on their experiences and talk about them; (iii) they suggest and test out new ideas; (iv) they discuss changes in their ideas; (v) they negotiate with other students and help them to clarify their ideas; and (vi) they advance ideas by making sense of new ones. The importance of social cognitive interaction, cooperation, and collaboration in the context of peer tutoring is highlighted by constructivist theory. Honebein (1996) outlines the seven educational objectives of constructivist learning settings: students determine how they will learn.

1. Evaluation of alternative solutions.
2. To situate learning in realistic contexts
3. To encourage student-centred learning.
4. learning should be collaborative
5. To promote the use of multiple modes of representation
6. To encourage awareness of the knowledge construction process

The constructivists see the learner as a unique individual with unique needs and backgrounds. (Merrill, 1991). The learner is also seen as a complex individual hence, he should be regarded as an integral part of the learning process.

Different groups of constructivism referred to in the literature as cognitive constructivism (Piaget, 1969), social constructivism (Vygotsky, 1978) and radical constructivism (Von Glasersfeld, 1974) have paid attention to student-centred approaches of teaching. In Cognitive constructivism, students construct knowledge based on their existing cognitive structures. Thus, learning is relative to the learner's cognitive development stage. Cognitive teaching methods seek to help the student assimilate the new information to their existing knowledge and modify their current knowledge's framework to enable them to accommodate the new knowledge (Teaching Guide for GSIs, 2016). Radical constructivism believes that all knowledge is constructed and not perceived through the senses and that the knowledge the individuals create tells us nothing about reality. It only helps us to function in our environment. Thus, radical constructivist understanding is invented, not discovered (Von Glassersfeld, 1974).

Based on the constructivist paradigm, social constructivism maintains that knowledge is created by the person through interpretation and idea synthesis rather than being an external phenomenon that must be acquired by the learner (Kutz & Roskelly 1991). Similarly, Palincsar (1998) added the 'social' component which indicates that learners accept knowledge by constructing the knowledge through Participatory approaches (Adu-Gyamfi, Ampiah & Adjei, 2020; Shen, Wu, Achhpiliya, Bieber, & Hiltz, 2004) that is, interacting with other students to create and solve problems as well as evaluate and settle disputes concerning colleagues' solutions (Shen et al., 2004). Social constructivism is a sociological theory of knowledge centred on how individuals construct and use knowledge in socially mediated contexts

(Fuhrman, 1994; Hutchinson & Huberman, 1994). The fundamental idea of this theory is that knowledge is a human construction. The learner actively participates in the learning process (Vygotsky, 1978). According to Driscoll (2014) and Steffe and Gale (1995), constructivism is based on three assumptions about learning. (a) Learning is a product of interaction with the environment. That is, knowledge is constructed as the learner uses their experiences in the world. What the learner gets to comprehend is a function of the context of learning, the goals of learning, and the activity the learner engages (b) Cognitive dissonance is a result of having two conflicting thoughts at the same time. That is the driving force that makes the mind acquire new thoughts and /or modify the existing beliefs to reduce the conflict. Cognitive dissonance mainly determines the organisation and nature of what is learned (Festinger, 1957) (c) Other individuals in the learning environment may try to test the learner's understanding and make available alternative views against which the learner questions his knowledge viability.

Constructivism supports acquiring cognitive processing strategies, self-regulation and problem-solving through socially constructive learning opportunities (Gredler, 1997; Savery & Duffy, 1995; Steffe & Gale 1995; Von Glaserfeld, 1995). Social constructivism recognizes the importance of the background and culture of the learner thus, it encourages the learners' social interaction with knowledgeable members of the society (Sarkodie, 2013). In this sense, the manufacturing accounts class students interact with the teacher and their peers in the group. This will enable the learner acquire the social meaning of critical symbol systems and learn how to utilize them that is, the necessary information and the procedures involved in manufacturing accounts

problems are well thought out and understood. The constructivists encourage young children to develop their thinking abilities by interacting with other children, adults and the physical world (Sarkodie, 2013).

In the constructivist learning environment, the problem to be solved directs the learning; students learn content and theory to solve the problem (Jonassen, 1999). This is in contrast to the traditional objectivist teaching where the view is presented first. Issues are then used afterwards to practice theory. Jonassen added that depending on students' previous experiences, related cases and scaffolding may be necessary for the support. The teacher must provide knowledge resources, cognitive skills, collaboration tools, and an authentic environment for the tasks.

When teaching complex skills like problem-solving or critical thinking, the perceived advantages of constructivist learning may be especially beneficial (Tam, 2000). According to Tam (2000), constructivist instructional methodologies should take into account the following four fundamental qualities of constructivist learning environments: (a) Knowledge will be exchanged between them, (b) Teachers and students will share authority, (c) The teacher's position is that of a facilitator or guide and (d) Learning groups will be made up of a limited number of diverse students.

### **The Concept and Relevance of Financial Accounting**

Accounting is a system that provides data to various stakeholders to provide information on profit and loss, as well as financial information standing of the company concerning its owner (Patel, 2015). Such information is often valuable for auditing firms, suppliers, purchasers, lenders, and other professionals or financial institutions. (Patel, 2015). Accounting is also

viewed as record keeping, which tracks income and expenses (Abdul-Rahamon & Adejare, 2014). For Oladele (2009), accounting includes keeping track of an organization's revenue and expenses and recording its funds' inflows and outflows.

Accounting covers financial, management, and cost accounting (Bhimani et al., 2015). Whereas Management accounting measures and reports financial information as well as other types of information that are intended primarily to assist managers in fulfilling the goals of the organization, Cost accounting measures and reports financial and non-financial information related to the organization's acquisition or consumption of resources providing information for both management accounting and financial accounting (Bhimani et al., 2015; Drury, 2018). On the other side, financial accounting focuses on outward reporting that is controlled by authoritative rules. Organizations must adhere to specific standards in their financial reporting to third parties (Bhimani et al., 2015).

According to Drury (1992) and Osuala (2004), financial accounting is the act of locating, quantifying, and disseminating economic data so that information users can make wise decisions. Additionally, it is a subfield of accounting that provides users with financial data from an organization for unbiased evaluation and decision-making (Asaolu, 2005). Oyetade (2008) described financial accounting as a process involving recording, classifying, summarising, and communicating what has been learned from the data. Once more, Akintelure and Oguobi (2003) concurred that financial accounting is the process of documenting, classifying, and summarizing financial transactions

or events in terms of money or money's worth and communicating the outcome to management and other users of the financial information.

Okafor (2000) stated that the primary purpose of financial accounting is to lessen the numerous principal-agent issues by assessing and tracking the agent's performance and then informing interested parties of the findings. It is required by law, is created using previous data, and provides information to outside parties (Eze, 2014). Financial accounting is the process of gathering, recording, summarizing, presenting, reporting, and analyzing/interpreting accounts to help the users of financial statements in various decision-making situations, (Omorokpe,2006).

Adams (2002) opined the traditional role of financial accounting is to keep track of business transactions, create operating or income statements (profit and loss accounts or income and expenditure accounts) that are subject to accounting conventions and restrictions, and create a financial position statement (balance sheet) at the end of a given period. Oyetade (2008) observed that contemporary accounting functions go to analyze, assess, and interpret financial statements for decision-making. Similarly, , Obi (2005) suggests the following as the general goals of financial accounting: (1) a better understanding of business activities, familiarity with the documents and forms frequently used in business transactions, and (2) an understanding and appreciation of the values and opportunities for record-keeping, personal needs, vocational preparation, or preparation for further education. To help students correctly analyze company problems, students need to have a solid understanding of assets, liabilities, and proprietorship. Accuracy, orderliness, neatness, and responsibility are crucial financial accounting skills.



Furthermore, Ekwere (2005) asserted that measuring economic events and disseminating the economic results to external decision-makers are the primary goals of financial accounting. As given by Ekwere, the other general purposes of financial accounting are to: (a) provide accurate financial information about an organization; (b) help estimate the earning potential of an enterprise; (c) accurately assess management ability; (d) provide accurate information to both external and internal users for predicting, comparing, and evaluating an organization's earning power; and (e) disclose information that is pertinent to financial statement users.

Financial accounting is significant to the general public, the government, investment analysts, lenders, managers/directors, shareholders, and suppliers, as stated by Agara (2005). He continued by saying that financial accounting aids workers in evaluating the likelihood of maintaining employment and determining pay scales. In the words of Adebisi (2001), financial accounting enables the general public to assess potential investments, social, political, and environmental challenges, and available job opportunities. Per Agara (2005), financial accounting aids the government in making decisions on its value-added tax (VAT) and corporate taxation, government statistics, grants and financial assistance, monopolies, and mergers. As defined by Agara (2005), financial accounting enables investment analysts to identify investment potentials for people and institutions based on previous and projected performance, management quality, and risk vs. reward. He also said that financial accounting enables lenders to evaluate a company's capacity and ability to return capital and service debt. Longe and Kazeem (2006) stated that financial accounting is important because it (i) provides

information for decisions, (ii) provides permanent records for all transactions, (iii) helps determine the profitability of a business concern, (iv) provides records for tax purposes (v) helps in preventing fraudulent activities (vi) provides information on assets and liabilities, as well as income and expenditure, and (iv) helps to determine the profitability of a business concern.

### **Manufacturing Account**

Manufacturing converts raw materials into finished products with labour and other services (MOE, 1991). Manufacturing cost is further divided into three known as the elements of cost: (i) material cost, (ii) labour cost (iii) expenses. MOE (1991) explained that manufacturing is an account prepared to show the cost of the production of products. It gives the total cost of finished goods manufactured for the period, which is put into prime, factory, and production costs.

The manufacturing account calculates and shows the cost of those goods (Wood & Sangster, 2005). Identifying the cost of sales and maximising profit enables a manufacturing organization to ascertain its production price (Oyetade, 2008). The significance of the manufacturing account extends to all facets of the economy, including government, businesses, people, investors, etc. The factory manufacturing account, the trading account, the profit and loss account, and the balance sheet are the divisions that make up the manufacturing account (MOE, 1991; Okafor, 2000). However, MOE (1991) defined trading account as the sum cost of unsold finished goods in stock and production cost transferred from the manufacturing account compared with sales for the period to give the gross profit earned by the manufacturer. The

Okafor explained that the trading account takes care of raw materials used in production, the prime cost of production, and factory overheads (or expenses) to arrive at the cost of production and gross profit on manufacturing and trading.

On the other hand, to determine a net profit or loss, depending on the situation, the profit and loss account accounts for administrative and distribution costs as well as other financial charges. (Okafor, 2000). It is also explained as an account in which the gross profit from the trading account, which is posted on the credit side, is compared with all non-production administration and selling and distribution expenses on the debit side to reveal the net profit for the manufacturing firm (MOE, 1991).

Again, the manufacturing company's financial situation at the end of the accounting period is finally shown on the balance sheet (Okafor, 2000). MOE (1991) noted that the balance sheet for a purely trading concern and a manufacturing concern differ because a trading concern has the stock of finished goods in the asset column. In contrast, the manufacturing concern has the supply of finished goods, including raw materials and work-in-progress, at the assets column. It is important to remember that a balance sheet is a statement that depicts a corporation's financial situation at a specific point in time rather than an account. A balance sheet, as described by Longe and Kazeem (2006), is essentially a statement that summarizes assets and liabilities in an orderly manner so that a corporation's financial situation can be discovered. The writers also said that after creating the trade, profit, and loss accounts, a balance sheet displays the balances still present in the books of accounts. A balance sheet is divided into assets and liabilities (MOE,

2010). Liabilities are the amounts owed by the business as opposed to its support. (Longe & Kazeem, 2006).

### Teaching Strategies

Changing a learner's behaviour is the goal of the art of teaching. The professionals in the industry face various difficulties in their line of work. This is the case since teaching involves dealing with human beings frequently rife with issues. Teaching is seen as an art or a science (Javirs, 2006). Due to the numerous matters professionals face, teachers are always looking for fresh, creative solutions to improve their work. The nature of learning necessitates specific circumstances to achieve a desired outcome. The teaching strategies used during a learning process create the conditions necessary for effective teaching and learning. Teaching methods have been considered the general principles, pedagogy and management strategies used for classroom instruction (Kucharčíková, & Tokarčíková, 2016). The choice of teaching methods depends on what fits the teacher – educational philosophy, classroom demographic, subject area(s) and school mission statement (Kucharčíková, & Tokarčíková, 2016). Teaching methods have been classified as teacher-centred and child-centred.

The traditional teacher-centred pedagogy is an approach in which the teacher becomes the primary responsibility for communicating knowledge to students (Mascolo, 2009). With the teacher-centred method of instruction, the student's participation and contribution is very little in class (Mascolo, 2009). On the other hand, student-centred pedagogy is an idea that students must be active in constructing knowledge that implies a diminishing role for the teacher in the learning process (Mascolo, 2009). The students-centred

pedagogy includes collaborative, experiential, problem-based, and various other pedagogical methods (Mascolo, 2009). In student-centred pedagogy, the teacher only guides or facilitates the teaching, creating an enabling environment for the learners to construct their knowledge (Manaf, Ishak, & Hussin, 2011). Javed, Hussain and Karim (2014) argue that the child-centred approach gives the teacher the privilege to interact actively with students, enabling the students to achieve the set goals of the lesson to meet industry demand and make business education meaningful for them.

Ubulom and Ogwunte (2017) found that the teacher-centred pedagogy was ineffective, while the learner-centred method was the most effective in teaching accounting subjects at senior secondary schools' level. They added that the learner-centred approach should be made a compulsory method for the teaching of accounting subjects at the senior secondary school level, but Alao and Ukpong (2020) found that financial accounting teachers were not using activity-based pedagogical strategies and recommended that economic accounting teachers should use innovative and experiential learning strategies in the teaching and learning of financial accounting.

Boud (2002) asserted that participating in activities where they can learn from their peers and sharing their ideas with others help students learn a lot. According to Kirschner, Sweller, and Clark (2006), effective learning requires guidance in learner-centred instructional practices. According to Sinclair (2005), information technology has given kids a fantastic opportunity to learn nowadays without needing a teacher to convey the available knowledge. Boud (2002) added that students primarily work on finding, gathering, analyzing, evaluating, integrating, and applying the information to

complete assignments or solve problems. Memorization is one classic teaching approach that has come under fire for turning students into passive recipients of teachers' knowledge, leaving them excessively reliant on teachers to meet their educational goals (Aduwa-Ogiegbaen & Uwameiye, 2006).

In this regard, Caruana (2011) noted that if 21<sup>st</sup>-century students can be successful academically and professionally, it will require a basic set up of soft skills that rely on the teachers to use appropriate pedagogy in imparting these soft skills formally or informally. This implies the choice of pedagogy in Financial Accounting is critical to successfully delivering lessons. It is, therefore, important for financial accounting teachers to place much priority on methods of teaching accounting. Any instructional strategy that involves active student participation and provides opportunities for students to formulate their questions, discuss issues, explain their views, and engage in cooperative learning by working in teams on problems and projects should be used because it can increase students' achievement, especially in manufacturing accounts (Aduwa-Ogiegbaen & Uwameiye, 2006). Grow (1991) concluded that good teaching involves identifying the learner's self-directed stage learning and guiding the student to move towards greater self-directed learning. Due to the teacher's pedagogical difficulties, there has been a mismatch between a student needing direction and a non-directive teacher (Grow, 1991).

### **Problem-Based Learning**

Problem-based Learning (PBL) is learning that results from the process of working towards the understanding or resolution of a problem (Barrows & Tamblyn, 1980). It provides a pathway for students to discover

new knowledge and aids them in internalizing their learning consequently leading to greater understanding (Delisle, 1997). It is a learning strategy that makes students become self-directed learners and have the desire to know and learn, generate their own learning needs as learners, develop the ability to select and use the best available resources to satisfy these needs and by so doing, building on their knowledge and skills as they solve a real problem (Delisle, 1997).

Manaf et al. (2011) explained that PBL is an instructional approach that does not only involve confronting students with problems from practice. These problems provide the stimulus for learning but makes use of problems to help one focus on learning, preparing students to think critically and analytically, and helping them develop problem-solving skills whilst searching for and gaining the appropriate knowledge. On their part, Duch, Groh, and Allen (2001) described the PBL as one that gives students the ability to think critically, analyze and solve complex, real-world problems, identify, assess, and use suitable learning resources; to collaborate, display strong communication skills, and use content knowledge and intellectual skills to become lifelong learners. For Belland, Ertmer and Simons (2006), PBL is a framework in which students learn content by working in collaborative groups to solve real-world, realistic problems and thus, pushing students to extend their existing knowledge to develop a solution (Wirkala & Kuhn, 2011). To De Graaff and Kolmos (2003), PBL is a student-centred learning approach, taking place in small groups with the teacher as a facilitator. For Schmidt and Loyens (2007), PBL is a structured educational approach consisting of large and small group discussions. In another sense, PBL is considered an advance

methodology promoting student-centered, activity-based learning that benefits both the teacher and the student (Dockter, 2012). In sum, PBL is a learning approach with the core principle that the starting point for learning should be a problem, query or puzzle that the learner wishes to solve (Blayney, 2003).

Minle and McConnell (2001) concluded from the review of the development of problem-based learning that , is advantageous than conventional teaching pedagogy . Although, Minle and McConnell(2001), did not conduct a practical class based teaching using PBL, but their extensive review revealed that PBL assists in the formation of memories through the activities of building upon prior knowledge through discussion with other students. Further, it makes learning cooperative and is a better way of engaging students to actively participate and concentrate on whatever is being discussed in class (Onyon, 2012). Additionally, problem-based learning (PBL) is effective with all students, making its techniques perfect for heterogeneous classrooms where students with various abilities can collaborate to come up with a solution. (Desisle, 1997).

Within the educational setting, Schmidt and Loyens (2007) stated that PBL had aided students to actively create their understandings of a subject based on their past knowledge and freshly learned material. In addition, students also learn how to work in groups and with others, which helps them understand challenges or issues (Schmidt & Loyens, 2007).

Stanley and Marsden (2012) indicated that PBL brings on to student's development of high skills in questioning, teamwork, and problem-solving. They added that proper implementation of the PBL approach to the teaching



of account could catalyze more outstanding learning outcomes in account students. Milne and McConnell (2001) concluded in their research that accounting graduates lack general knowledge, and lifelong and self-directed learning skills and therefore need improvement in their communication, problem-solving and interpersonal skills. A critical skill expected from students to master is self-directed learning skills (Hammond & Collins, 1991).

On the impact of problem based learning, Chileya, and Shumba (2020) in studying the impact of problem based learning on the academic performance of students in chemistry, found that students in the PBL impacted positively on the students achievement in learning although their study was in science. They found that between the control group and experimental groups post test scores, there was statistical significant difference. Further, comparing the pre-test and post test scores of the experimental groups also revealed there was a statistical significant difference. However, their study did fail to indicate the extend of the impact and also whether PBL was gender sensitive. This study focused on extending the PBL to accounting education in finding out PBL is gender responsive well as the extend of impact of PBL in accounting education. Similarly, Ferreira and Trudel (2012), found that students' problem solving skills and sense of community in the classroom were all positively impacted. Ferreira and Trudel (2012) only focused on measuring students' attitude towards science learning using observations and questionnaires. This research hypothesized that PBL is also relevant in accounting education and thus, sought to contribute to literature by taking into consideration the established attitudes of students in PBL (Ferreira & Trudel, 2012) to find out its impact on students' performance. In a related study,

Winarti and Waluya (2019) found a significant positive impact of PBL learning on students' performance. Winarti and Waluya (2019) studies used university mathematics students. This research content that PBL will have a positive impact on high schools more so accounting students. Again, Winarti and Waluya (2019) studies with a sample size of 33 students, used a pre-test post test design without any control group. In this research a control group would be added to help better assess the whether any changes is not by change but due to PBL.

### **The Implementation of Problem-Based Learning**

1. Decide what your students should learn and be able to accomplish after finishing the learning project. These are known as the learning outcomes.
2. Locate a current issue pertinent to the students; frequently, the issues are ones that the students may experience in their own lives or future careers. (Massa, 2008)
3. To ensure that learning is successful, review the important group work guidelines.
4. Exercise group practices include listening, including others, and evaluating peers' work.
5. Depending on the problem, explore various roles for students to play to complete the work that needs to be done and view the issue from different angles (for example, for a problem involving pollution, various roles could be a mayor, business owner, parent, child, nearby city government officials, etc.).

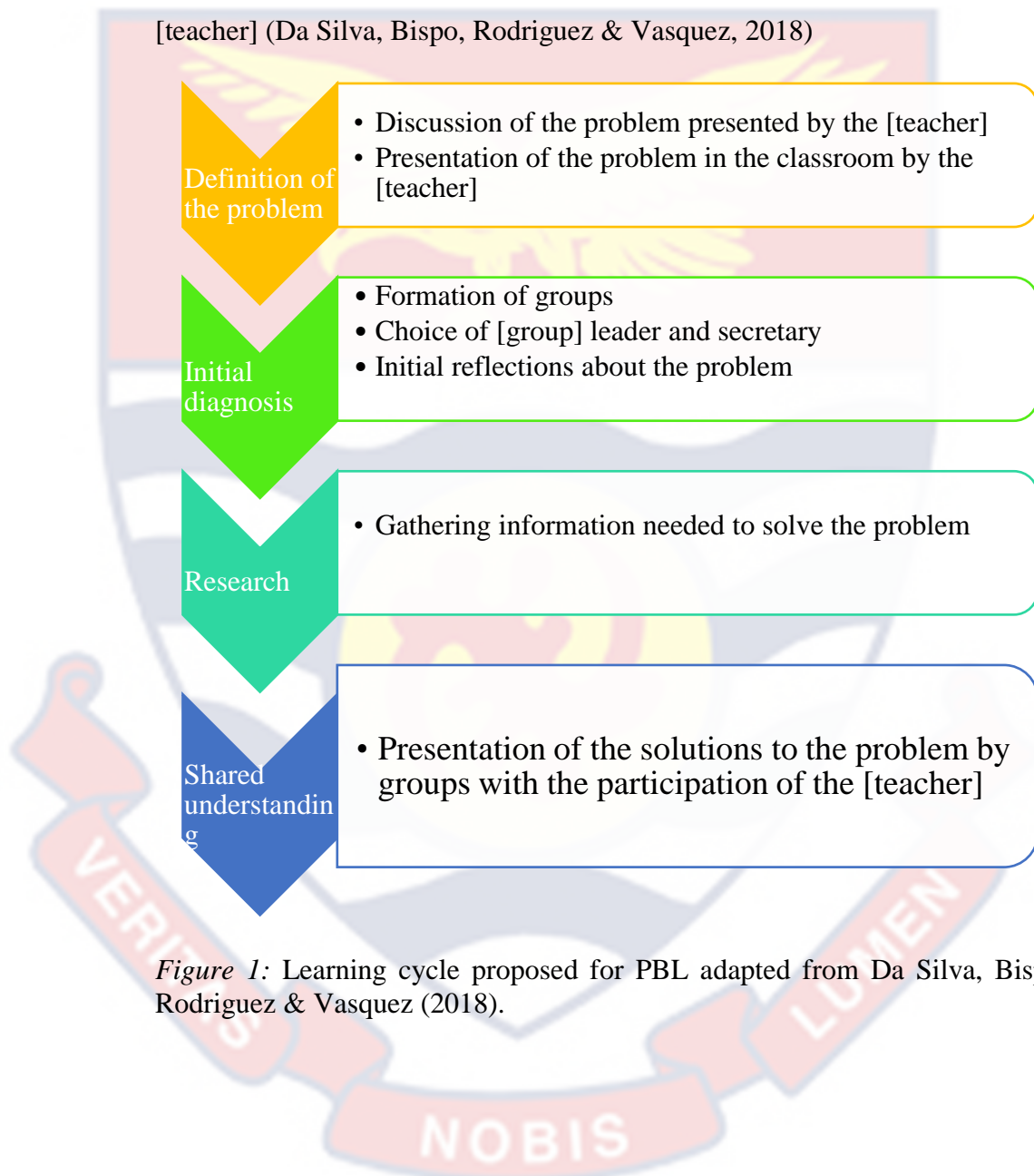
6. Identify the project's evaluation and assessment procedures. Most likely, the mark for the task will consider both the self- and peer-assessments.
7. Separate the curriculum into different units. Determine the categories of issues that your students will address. Your goals will be these.
8. Identify the precise issues that are most likely to have several solutions and consider student interest.
9. Set up the proper resources for students to use, and where necessary, use other teaching staff to assist students (such as media professionals who may introduce students to internet resources).
10. Establish the proper grading criteria (such as a rubric) and presenting styles to communicate learning (such as an individual paper, group PowerPoint, an online blog, etc.).
11. Decide how to include group participation (such, how much, potential peer review, etc.) (Kurt, 2020)

Da Silva, Bispo, Rodriguez, and Vasquez (2018) noted that implementing the problem-based learning involves four stages: definition of the problem, initial diagnosis, research and shared understanding. As shown in Figure 1, the Phase 1 definition of the problem encompasses the teacher presenting and discussing the problem with the students. The problem should be objective, specific and contextual.

Phase 2: The initial diagnosis takes place in the classroom and involves selecting the student groups who will offer the initial reflections after the management presents the issue.

Phase 3: research. This occurs outside of the classroom and entails gathering information to support the groups in problem-solving.

Phase 4: shared understanding occurs during the second PBL class meeting when the solutions to the problem are presented, with the participation of the [teacher] (Da Silva, Bispo, Rodriguez & Vasquez, 2018)



*Figure 1:* Learning cycle proposed for PBL adapted from Da Silva, Bispo, Rodriguez & Vasquez (2018).

Remy (2020) also noted that in implementing [PBL], four phases are involved: Exposure through comprehension, experience through modeling, implementation through debate and problem-solving, and extension of thinking through accuracy checking. The researcher explained further that during phase one (Exposure through Understanding), the teacher introduces the lesson through an exploratory activity involving a real-world problem (Remy, 2020). Such action could include multiple representations of the concepts for students to discuss; in phase two (Experience through Modeling) students generate and select ideas by testing various techniques to solve the problem, and the teacher acts as a facilitator and a participant by modelling the task students are to complete and setting clear task-specific expectations that would guide students' discussions and thinking (Remy, 2020); in phase three (Execution through Discussion and Solving) students collaborate to find solutions to the problem, and in phase four (Extension of Thinking through Checking for Accuracy) Students present their findings to the rest of the class. The results are either validated or adjusted (Remy, 2020).

However, Hadi and Izzah (2018) indicated five phases in the PBL model. In phase one, the teacher prepares students for the task to be assigned. Phase two, the teacher is required to develop collaborative skills among students and help them investigate problems together; in phase three, the teacher allows students develop the method of investigation and this is dependent on the nature of the problem, in phase four; the study is followed by writing reports or making artifacts, and in phase five; the teacher helps students to analysis and evaluate their thinking processes and investigation skills used.

For Schmidt and Loyens (2007):

1. Problem-based learning begins with the [teacher] carefully presenting a series of constructed problems or issues to small groups of students. Such problems or issues relate to things students possess limited prior knowledge.
2. In solving the problem, there is the need to discuss prior knowledge and ask questions about the specific problems or issues.
3. After the class discussion, the students individually research or reflect on the newly acquired information and seek out areas requiring further exploration
4. After a pre-determined amount of time (as outlined by the educator), students will meet in the same small groups that were composed before the class discussion.
5. In the first meeting, groups will spend between one and three hours further discussing the problems or issues from class in addition to presenting any new information collected during individual research.
6. Following the first meeting, students will independently reflect on the group discussion, specifically comparing thoughts regarding the problems or issues in question.
7. The groups will meet a second time to analyze individual and group thoughts and discussions critically and will attempt to synthesize the information to conclude the given problem or issue

### **The Role of Teachers and Students in the PBL classroom**

When PBL is used, the teacher's role shifts from the more conventional model, which follows a linear, sequential pattern and calls for

the teacher to present pertinent material, explain what needs to be done, and give students the specifics and information they need to apply their knowledge to a given problem. The goal of PBL is for students to solve the given situation; the instructor serves as a facilitator. The problem is developed at the beginning of learning instead of being presented last in the traditional paradigm. The tasks range from somewhat brief to a whole semester, and group work is scheduled throughout daily lectures. (Kurt, 2020).

### **Teachers' role**

A teacher is a crucial actor in learning. This is so because they are responsible for employing the finest instructional technique to accomplish the goals and objectives that have been established. Manufacturing accounting must be taught and learned effectively for the instructor to implement a relevant and effective teaching style to maximize students' academic success. Kurt (2020) outlined the following as the role of the teacher in the PBL classroom:

1. Determine a problem that aligns with the topic and your students. The challenge of the assignment should be such that the students are unlikely to be able to complete it on their own. It must also provide new knowledge and abilities. Explain the issue in a narrative style that includes all necessary background information while being concise. As they tackle the problem, let the children learn more information.
2. To improve the groups, put students in groups with a balanced variety and skill levels—aid students in completing their tasks. One strategy is assigning different responsibilities to the students in the group process after evaluating their strengths and shortcomings.

3. Assist the students in better organizing the problem-solving process's many steps and developing a deeper comprehension of the subject matter.

In the PBL classroom, the teacher must commit to the curriculum and the process of PBL in order to give the students the opportunities to be successful (Sindelar, 2010). The teacher is not to present worksheets to the students and stays at their desk while the students work silently or create a chaos classroom where the students are unfocused and unsure of how to complete a given task (Sindelar, 2010). Clark, Clough and Berg (2000) opined that for effective teaching in the [PBL] classroom, the teacher is vital in structuring the classroom to ensure it is interactive and thus a path way for students to engage and heighten their content knowledge.

#### **Students' role**

1. Compile a list of the knowledge that exists regarding the issue. What information regarding the issue do your other students have? Do they have any prior knowledge of the problem? Talk about the team members' projected contributions. What are their advantages and disadvantages? Follow the guidelines for brainstorming when coming up with potential solutions, including accepting all responses without passing judgment. Construct the problem statement in your own words and consider the team's knowledge and experience as previously discussed, as well as what else needs to be known to solve the problem. Proceed through the following steps: Get agreement from the team members regarding the problem statement. Put the problem statement in written form. Solicit feedback from the teacher. Be open to changing



the written notice based on any new learning that is found or feedback provided.

2. Come up with a list of potential answers. Include pertinent ideas, speculations, and causes, as well as any possible solutions. Then, rank the solutions and choose the one your group that is most likely to think will result in the success of the meeting.
3. Create a schedule that includes specific actions. Include the knowledge and activities required to address the problems identified. Set the various steps' priorities. Think about how the measures will affect the potential fixes. Check to see if everyone agrees on the timeline; if not, consider how to reach a consensus.
4. Create a list of further information your team needs to have to tackle the issue. Think about the knowledge the instructor can impart. What materials—such as books, primary and secondary sources, and the Internet—are available to assist. Assign research projects to team members. Decide on deadlines.
5. Arrange and compose the team's report on the problem-solving strategy (draft/final). Include any necessary supporting documentation. Observe the professors' guidelines on the report's format and expectations.

### **Comparing Traditional with Problem-Based Learning**

Traditional teaching refers to an instructional strategy in which the learning environment is teacher-driven and tends to limit student engagement. A typical view of this strategy would consist of students in their seats, passively taking notes as the teacher stands before the class. Problem-based learning offers a different strategy to combat the lack of student engagement

and enhance student learning by giving the students the power over their education. In comparing the traditional and problem-based learning teaching methods. Sindelar (2010) noted that in the conventional techniques (lecture), the curriculum is prescriptive; it is from the perspective of the teacher/expert, linear and rotational, from part to whole organization, teaching as transmitting, learning as receiving, and the classroom environment is structured whereas the PBL curriculum is experienced. It is from the perspective of the student/learner, coherent and relevant, from whole to part organization, teaching is facilitating, learning is constructing, and the classroom environment is flexible (Sindelar, 2010)

Manaf et al. (2011) compared PBL and non-PBL pedagogy of teaching and found that students in the PBL class out-performed the students in a non-PBL class. The study also found that the PBL enhances student's presentation, teamwork, leadership and IT skills but felt that PBL was a challenging way of learning and required more effort, contributions and participation from students (Manaf et al., 2011). Similarly, Siaw (2000), in investigating whether there was a significant difference between the benefits gained from PBL across two disciplines, Accounting and Statistics and whether PBL was a preferable method to the traditional way of instruction or otherwise, found a significance level of 0.05 that PBL course for statistics was significantly lower than that for Accounting as students appeared to have gained more benefits in Accounting PBL tutorials than in Statistics PBL tutorials. Their study also found that teaching accounting using PBL was successful than using PBL in the statistics course (Siaw, 2000). This means that PBL gains can vary across disciplines. Also, Newble and Clarke (1986),

in a study on students learning on traditional and PBL in medical schools, found a difference between students at a conventional school and an innovative problem-based school. They found that the students in the problem-based school seem to have an approach to studying that closely approximates the aims of most medical schools contrasting the traditional approach adopted by students at the conventional school, which was far from the ideal.

When studying the effects of Problem-Based Learning on Recognition Learning and Transfer Accounting for GPA and Goal Orientation, Bergstrom, Pugh, Phillips and Machlev (2016) found that adjusting for GPA, Students in the PBL condition outperformed those in the lecture/discussion condition on a transfer measure ( $p = .001$ , partial  $\eta^2 = .271$ ) while performing equally on a recognition learning test ( $p = .530$ ). Similarly, Sugeng and Suryani (2020) Problem-based learning outperforms the traditional method by improving both students' self-regulated learning and their higher-order thinking skills. Still, it falls short in maintaining students' lower-order thinking skills, according to research on the effectiveness of learning performance of passive learners in a Financial Management class. Manaf et al. (2011) also revealed that student's response to an open-ended question is evident that PBL is an acceptable way of learning to account.

Barut, Soares, Procopio de Aroajo and Kanet (2017) on PBL in accounting: An empirical study stated that the statistical results found through factor analysis show students acquire problem-solving skills, improve their communication skills and become more self-confident. Hadi and Izzah (2018), in examining PBL in teaching English to students of primary school teacher

education, concluded that the use of PBL can increase the student's ability to master the English language. Onyon (2012), on PBL, a review of the educational psychological theory, affirm that PBL, by its nature, provides mixed rather than block example and has been shown to improve diagnostic accuracy, encourage autonomous motivation through practice and foster self-directed learning. Stanley and Marsden (2012), collecting both quantitative and qualitative data on whether accounting education needs PBL, found that PBL was effective for students especially in developing the skills of questioning, teamwork and problem-solving. Similarly, Milne and McConnell (2001), in investigating PBL: a pedagogy for using case material in accounting education, revealed that PBL is effective in developing self-directed learning behaviours in students and increasing their motivation and clinical reasoning skills. Javed, et al. (2014), in investigating a shift from teacher centred to experiential teaching method: a case study, the documentary analysis concluded that only a minor part (12%) of the teaching methodology employed in accounting courses was experiential and experiential components were seen only in class projects and assignments that included field work and simulations. Again, they added that the teachers wanted students to learn skills that would help them enter the corporate world and indicated the significance of experiential learning, such as PBL, to achieve their aim.

In this regard, Jaafar (2018) opined that accounting instructors should provide learners with requisite soft skills such as time management, communication skill and problem-solving. This is because PBL students not only show a higher understanding but also demonstrate greater independence

in their learning method compared with the traditional lecture-type students (Vernon & Blake, 1993). Comparing PBL with the conventional techniques, Onyon (2012) indicated that PBL has many advantages of improving the integration of basic and clinical skills, improving communication, team working skills and self-directed learning skills.

### **Gender differences in academic performance concerning teaching**

#### **methods**

Gender academic performance of students can be looked at as the knowledge and skills males and females get in school subjects (Good, 1959; Sam, 2015). It may also be looked at as the extent to which a learner benefits from instructions in a particular learning area (Crow & Crow 1969), that is, performance is the degree to which skill and knowledge has been imparted to them. Sinha (1970) noted that those students whose academic performance is superior in the form of a high percentage of marks are considered successful candidates. On the other hand, those students who failed in the previous examination and obtained low divisions are considered individuals who have fallen on their achievements.

Regarding gender differences and teaching methods, the literature shows some mixed findings. Whereas some found females to be performing better than males (Wally-Dima & Mbekomize, 2013), others found males to be performing better than females with specific teaching methods (Boateng, 2015; Sam, 2015; Bouillon & Doran, 1992), yet others found no significant difference in the performance of both gender with specific teaching methods to be reasonably exact (Khwaileh & Zaza, 2011; Hanks & Shivaswamy, 1985). For instance, Wally-Dima and Mbekomize (2013), in their study on

the causes of gender differences in accounting performance, reveal that female students work harder than their male counterparts and perform better than male students. They argued that women score better than men because they attend more lectures and tutorials, ask professors for advice on their coursework, and participate more in class discussions than men do.

However, Boateng (2015), using a descriptive survey with 370 financial accounting students and 13 teachers, found that gender influenced the academic performance of students in mathematics and financial accounting, with males outperforming females. Similarly, using a survey design with 133 accounting students and 137 accounting teachers, Sam (2015) found that there was a gender difference in students' performance in financial accounting. Male accounting students outperform more significantly than their colleagues. Bouillon and Doran (2010) researched whether female accounting students were high achievers in accounting, and their findings indicated that males perform better than female students in accounting. In their study, male students significantly outperformed the female students in accounting. Hanks and Shivaswamy (1985) researched the gender gap in academic performance in accounting and revealed that females perform quite the same as their male counterparts in accounting.

On the other hand, Azih and Nwosu (2011) investigated the effects of instructional scaffolding on the achievement of male and female students in financial accounting, revealing that the instructional scaffolding method was superior to the conventional way of teaching accounting and that gender has no significant difference in students' achievement in accounting. On their part,

Deepak, Al-Umran, Al-Sheikh & Al-Rubaish (2011) found out that female medical students outperform male students in overall test assessment.

### Chapter Summary

The literature review supports an active and interactive learning process in the theoretical framework. Constructivist theory of learning emphasizes that learners learn by constructing and building new knowledge on their prior learning (Bada, 2015). Constructivists entreat the teacher to facilitate and guide students to discover principles for themselves and construct knowledge by solving identified problems through working in teams (Manaf et al., 2014; Stanley & Marsden, 2012; Onyon, 2012).

Empirical studies reveal that the choice of appropriate teaching strategies is necessary to enhance students' understanding. The traditional teaching method only makes the student a passive learner (Sindelar, 2010). Literature supports that PBL is one such teaching method that can be used to teach topics such as manufacturing accounts to better understand students in manufacturing accounting and, consequently, the performance of students in financial accounting in senior high schools. This is because it provides an effective and engaging learning environment. PBL enables students to apply what is learned to a different situation, their own lives, and other course projects (Kurt, 2020). PBL has its foundation in the constructivist learning theory

## CHAPTER THREE

### RESEARCH METHODS

#### Overview

This chapter describes the research methods used to investigate the effects of problem-based teaching on student's academic performance in financial accounting in senior high schools. The areas of the research methods are research design and procedures employed in obtaining data from the students. It also talks about the population and sample selection procedures, the data collection instruments, data collection procedures, and data processing and -analysis.

#### Philosophical Foundation

This study was grounded in the philosophical framework of positivist, which value objectivism and proving or disproving hypotheses. takes the position that there is a single version of what is real, regardless of the researcher's perspective; the only way to find this truth and 'credible' data is to measure or observe the world with as little intervention from the researcher and other factors, as possible (Leavy, 2023; Ryan, 2018). Objectivism follows the deductive reasoning, where the analyst finds a theory, makes predictions based on the theory, and then, uses observation or experiment to test it (Bryman, 2008). So, positivists normally select scientific method to produce knowledge (Rahi, 2017). Therefore, given that the present study is quantitative in nature, theory confined, involves the testing of hypotheses, deductive in reasoning, objective, and predictive in nature (Leavy, 2023); the positivist philosophical paradigm was deemed appropriate and, therefore, adopted by the researcher.



The research adopted a quantitative research approach. It is an approach for testing objective theories by examining the relationship among variables or a comparison among groups. These variables, in turn, can be measured, typically on instruments, so that numerical data can be analyzed using statistical procedures (Creswell & Creswell, 2023). Generally, surveys, questionnaires, personality tests and standardised research instruments are used in the quantitative research approach (Creswell & Creswell, 2023).

### **Research Design**

The quasi-experimental design was used as the researcher used intact classes which were not randomized (Cohen, Manion & Morrison, 2007). Quasi-experimental design is an empirical study used to estimate the causal impact of an intervention. This kind of design includes at least an experimental (treatment) group and a control group. It is the best type of design often available for field studies when causal inference is desired. This was selected because it minimizes the threats to external validity, the idea of having any manipulation the researcher chooses. Specifically, a pre-test – post-test non-equivalent design was used. The experimental group was exposed to teaching manufacturing accounts using the PBL approach, and the control group was also exposed to the same concept using the conventional teaching method (lecture).

The pre-test, post-test with the control group gives the actual potential effects of problem-based learning since the treatment group receives the intervention. However, the control group gets the business-as-usual conditions, meaning they only receive interventions that they would have gotten if they had not participated in the study (Sarkodie, 2015). By having

both groups that received the intervention and another group that did not, the researcher can compare the potential impact of the intervention, which the first method cannot achieve.

In this research, the pretest-posttest with a control group approach was used. The participants were put into two groups: one group (experimental) who were taught manufacturing accounts using problem-based learning, and the second group (control group) was also led the same concept using the conventional teaching method (lecture). All participants were pre-tested in manufacturing accounts. Post-test was conducted on all the groups after the intervention.

#### Study design

Experiment	pre-test	treatment	post-test
-----			
Control	pre-test		post-test

#### Study area

The study area was Bawku West district. The selection of the district was based largely on proximity, convenience, familiarity and accessibility to the researcher. The researcher, having taught in the district for some years, is familiar with many of the schools and as such has easy access to the needed information that made data collection effective. It was also because of difficulty in getting permission from head teachers and district directors of education to enable the researcher conduct the study in their schools or districts respectively. The Bawku West District is one of the 15 districts of the Upper East Region of Ghana. It was removed from the old Bawku District under the new local government system in 1988. It lies roughly between

latitudes  $10^{\circ} 30'N$  and  $11^{\circ} 10'N$ , and between longitudes  $0^{\circ} 20'E$  and  $0^{\circ} 35'E$  (UNDP, 2011) The District shares boundaries with Burkina Faso in the North, Binduri district to the East, Nabdam District to the West and East Mamprusi Municipality in the North East Region to the South. The district covers an area of approximately  $1,070 \text{ km}^2$ , constituting about 12 per cent of the total land area of the Upper East Region. There are 82 Kindergarten and primary schools, 54 JHS and four senior high schools.

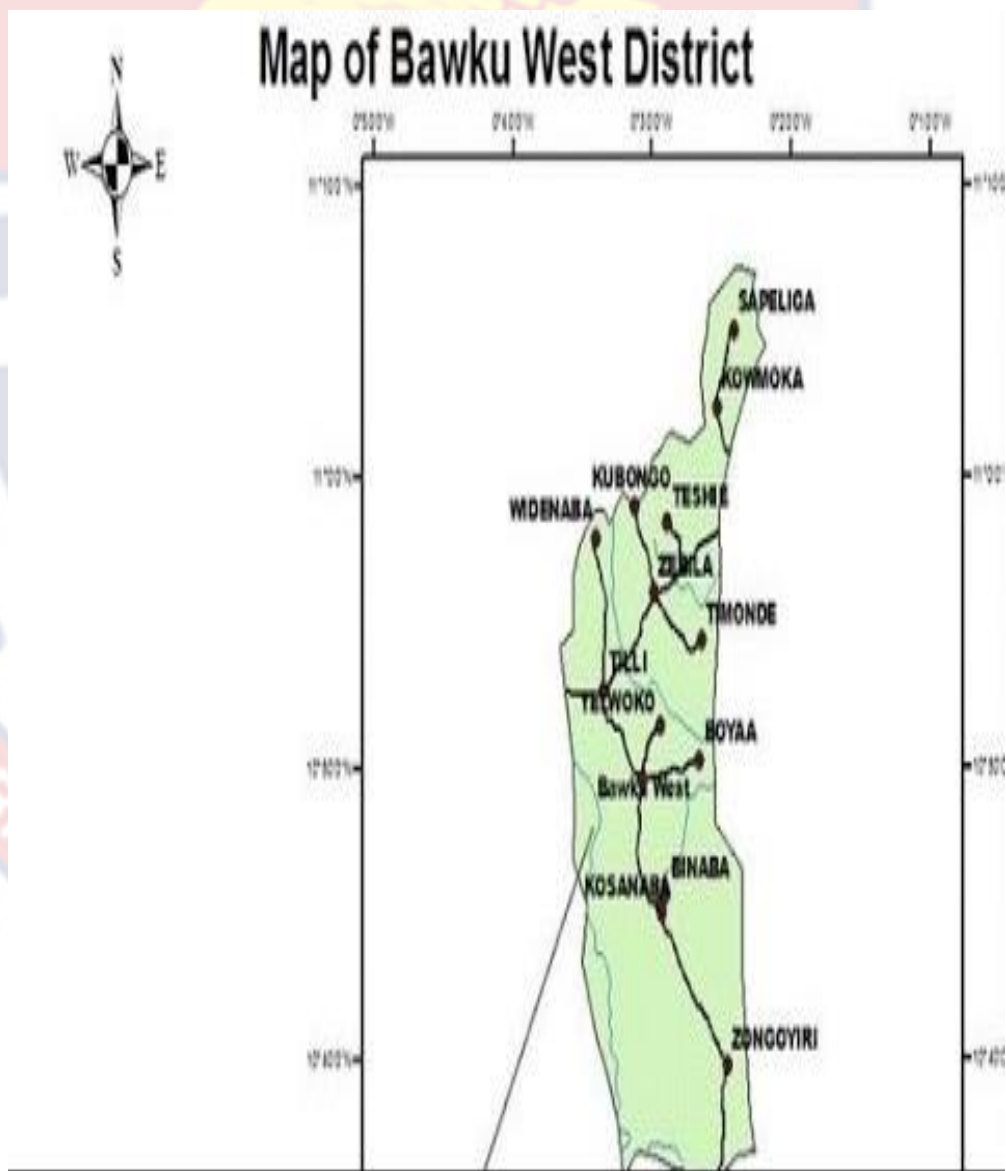


Figure 2: Map of Bawku West District  
Source: googleimages.com

## Population

The target population was all business students in the SHS in the Upper East region of Ghana since the concept of manufacturing accounts is peculiar to students offering business programmes. However, the accessible population was SHS 3 business students in the area as it was the case that they would have a continuous stay in School while the SHS 1 and SHS 2 students were to alternate their stay in school based on the academic calendar. During the 2022 academic year, there were 37 SHS where the business programme was studied in the region. These 37 SHS were distributed across the 15 administrative districts – four municipals and 11 districts. There were 273 students, comprising 128 SHS3 and 145 SHS2 students.

## Sample and Sampling Procedures

A multistage sampling procedure was used to obtain four intact classes – two schools in the control group and two schools in the experimental group – as the sample for the study. For the selection of the district, purposive sampling was used. The schools within each district were assessed on the distance of the schools to one another to remove knowledge dissemination and contamination effects and the willingness of the school heads and teachers to cooperate in the study. By these criteria, the Bawku West district was selected. There were four SHSs in Bawku West District consisting of 2 public and two private schools in the 2022 academic year. Only the two public schools offered business programmes.

In stage two of the selection process, all two schools offering business programmes were selected for the study. In these two schools, six business classes existed in each school, divided into two at each level -SHS 1, SHS 2

and SHS3. However, since the accessible population was SHS 3, only the two SHS

3 business classes in each school were considered. One of the schools had 37 in one class and 33 in the second class, while the other had 29 in the first class and 34 in the second class.

In the third stage of the sampling process, simple random sampling was used to assign the schools into control and experimental groups. Thus, one of the schools was designated as Problem-Based Learning group (PBLG) this school had two classes -class one (n=29), class two (n= 34) and was taught using problem-based learning while another school was designated as Traditional Method Group (TMG) also had two classes - classes one n=37, classes two (n= 39) and was taught using the traditional method. In all, a total of 139 students comprising 63 students in the experimental group and 76 in the control group, were used for the study.

#### **Data Collection Instrument**

Standardised test items were selected from the West African Examination Council financial accounting papers to construct. Manufacturing Accounts Performance Test (MAPT) (Appendix A) which was used for data collection. It consisted of parts A and B. There were three items on biodata of students and 40 multiple-choice questions in Part A. Students had to create manufacturing, trade, profit and loss, and balance sheets from supplied questions in Part B. In constructing the test items, a table of specifications was used. From the table of specifications, 20 (50%) items were on manufacturing accounts concepts, 6 (15%) items were on trading, 4 (10%) profit and loss accounts, and 10 (25%) items were on balance sheet preparation. In Part B, a

single test item that required students to apply knowledge on all four thematic areas was used.

Pre-test and post-test were administered to all the students in both the experimental group and the control group before and after the intervention, respectively. The post-test items in the MAPT were re-arranged to remove bias. The time gap was four weeks between the pre-test and the post-test.

Section A, which was multiple choice items, was awarded a single mark for each correct option selected while section B was scored using a marking scheme. The marking scheme was developed in line with the West Africa Examination Council's marking scheme. The total mark for the multiple choice was 40, while the essay was 60 marks. Thus, the maximum effect a student could score was 100 or a most minor impact of 0.

### **Validation of the Instrument**

Problem-based learning lesson plans were subjected to face validation by three experts from the Department of Business in Kusanaba SHS and Zebilla Senior High /Technical School. Each validator asked to offer general comments or ideas for refining the instruments to match the goals of the study, as well as to rewrite, eliminate, or add items as was deemed appropriate. Before creating the final versions of the instruments for use in the study, changes were made based on their errors and suggestions. It was also done to ensure the content and construct validity of the test items.

To validate the Manufacturing Accounts Achievement Test (MAPT), the test items were compared with similar ones constructed by WAEC for the WASSCE. After that, three experienced financial accounting teachers, WAEC examiners, were consulted to review the items. The items on MAPT were then

shown to an accounting educator and researcher from the University of Cape Coast to critique and make suggestions. The expert suggestions were used in improving the quality of the instrument.

### **Reliability of the Instrument**

The reliability of the instrument was tested . The device was trial tested on twenty (20) Financial Accounting students at Bawku Senior High School. These students selected for the testing had similar characteristics as those in the population. The chosen school is located in a geographical enclave which shares a common cultural and educational background with the second school to be considered because the two schools have the exact geographical origin. After the pilot test, the item complex indices were calculated, and things that were less difficult or extremely difficult were deleted. Kuder Richardson Formula 21 (KR21) was used to approximate the MAPT instrument's internal consistency following administration and grading. Ezeh (2003) states that KR21 is typically used with exams that contain dichotomous results; as the MAPT have this type of scoring, KR21 was used. The Cronbach alpha value was .750, and thus the instrument was deemed reliable.

### **Data Collection Procedures**

The researcher sought permission and approval from the school's headmaster and the head of Business departments to undertake the study using an introductory letter obtained from the Department of Business and social science education. To ensure confidentiality, students were asked not to indicate their names on the test script. Students were also told they were free to exit if they were not interested in the study. The Manufacturing Accounts

Performance Test (MAPT) was administered to all the groups after permission was granted to the researcher. A pre-test was then conducted in the control and the experimental groups. Then, for the following four weeks, the experimental and control groups were introduced to the concepts of manufacturing accounts using both problem-based learning and the conventional, traditional methods. After the treatment, a post-test was given, monitored, and graded by the teachers who had taught the groups using the scoring guidelines created by the researcher. To see if there was a noticeable difference in the group's performance, the scores of the experimental and control groups were recorded and compared for the pre-test and post-test. The post-test was administered in the fifth week.

#### **Intervention procedure**

1. The problem, constructed by the researcher to achieve the curriculum and learning objectives, was presented to students. The students were introduced with worksheets. For each worksheet given to the students, other relevant documents, such as the background of the problems and sources of documents (invoices, bills, receipts and vouchers) of the business transactions, were attached to the worksheet to assist the students in solving the problems.
2. Students were put into groups of five or six to carry out an initial analysis of the problem, with guidance in the process but with no content-knowledge instruction from the teacher. Each PBL and non-PBL session consisted of two hours each.



3. Work consisted of defining the problem, discussing, brainstorming, creating need-to-know lists, deciding what to research and how to proceed. Students were given record sheets to guide their research, and this offered the teacher an understanding of their progress at the end of each lesson.
4. Research time was given for gathering information, evaluating it, and discussion among group members.
5. Groups then report their findings and communicate their information as required by the problem, with conclusions or recommendations to the teacher and their peers.

In organizing the PBL class, we followed the same syllabus as used in the traditional class. However, to achieve the course's learning outcomes, several problems were created in the entry documents in worksheets. The coverage of the topics, the number of weeks allocated, and the learning outcomes for each entry document are as shown in Table 1. Detailed lesson plans are provided in Appendix B and Appendix C for the experimental group and control group, respectively.

#### **Data Analysis Procedure**

Responses from the MAPT were scored and organised using the Statistical Package for Social Science (SPSS), specifically IBM SPSS version 23, into mean and standard deviations. This analysed data was, therefore, used to help answer Hypothesis 1, which sought to assess the differences in the post-test academic performance mean scores in Manufacturing Accounting among students in the experimental and control groups. The means and standard deviations of each group PBL group and LM post-test scores were

each compared to help find out if there was any effect. Again, an independent sample t-test was also used to find out if there was any significant difference in both interventions. After that, both groups are compared to help appreciate the effect of the PBL and LM.

Hypothesis 2 sought to examine the impact of PBTS on students' academic performance in Manufacturing Accounting. A paired sample t-test was used to analyse the scores of the pre- and post-test scores of an experimental group to provide information to help answer it. Inferences were drawn from the statistical analysis results to answer the research questions and to test the hypotheses.

Hypothesis 3 was used to determine whether there is any gender difference in pre- and post-test academic performance mean scores in Manufacturing Accounting among students in the experimental group. Data obtained were analysed using One-Way Multivariate analysis of variance (MANOVA).

The details of the data analysis are presented in the next chapter (chapter four)

## CHAPTER FOUR

### RESULTS AND DISCUSSIONS

The purpose of this study is to investigate the effects of the use of problem-based learning in teaching manufacturing accounts at the senior high level. The analysis is done in line with the research objectives and questions.

#### Demographic characteristics of the respondents

There were 63 students in the experimental group, comprising 26 males representing 41.27% and 37 females representing 58.73%, with an average mean age of 18 for males and 17 for females. The maximum period for the PBLG was 21 years, and the minimum age was 15 years. In the TMG, 76 students comprising 46 females representing 60.5% and 30 males representing 39.5%, with an average age of males being 18 years and females being 17 and half years. The maximum period in the TMG was 20, and the minimum age was 17. It could be said that in this study, the students in both groups were about the same age and possibly could be of almost the same maturational level. Table 1 below provides information about the demographic characteristics of the respondents. On the part of the response rate, all students both in the PBLG class and TMG class participated in the exams as such a 100% response rate was recorded.

**Table 1: Demographic Characteristics of the Respondents**

	Frequency	Percentage	Average age
PBLG			
Male	26	41.27	18
Female	37	58.73	17
Total	63		
TMG			
Male	30	39.47	18
Female	46	60.53	17.5
Total	76		

Source: Field survey (2023)

**Hypothesis,  $H_{01}$ :** There is no statistically significant difference in the post-test academic performance mean scores in Manufacturing Accounting among students in the experimental and control groups.

This research hypothesis sought to determine if there was any significant difference between the post-test scores of students taught using the PBL and those prepared using the traditional/conventional approach. To ascertain which statistical tool was the most appropriate to use in testing the hypothesis, the data was subjected to a normality test. To test for the normality, Skewness, kurtosis were first examined. Assessment of the skewness (0.169) and kurtosis (-0.999) for the experimental group and skewness (0.683) and kurtosis (0.168) for the control group were found to be within the acceptable range ( $\pm 1$ ) (Awoniyi & Fletcher, 2017) as well as the actual mean (55.61) and trimmed mean (55.50) for the experimental group, and the actual mean (29.35) and trimmed mean (28.75) for the control group were almost the same for each group pair. These suggested a nearly normal distribution. To further ascertain the normality, the Kolmogorov-Smirnov test was conducted. The value was non-significant for the control group (sig. =0.200,  $\rho > 0.05$ ) indicating normal distribution. However, the Kolmogorov-Smirnov value for the experimental group was significant (sig. =0.023,  $\rho > 0.05$ ), suggesting a violation of the normality test. Thus, there was a need to physically inspect the plots for normality by using the standard actions (Pallant, 2007). Figures 3 and 4 below show the standard Q-Q plots of scores of the experimental and control groups, respectively.

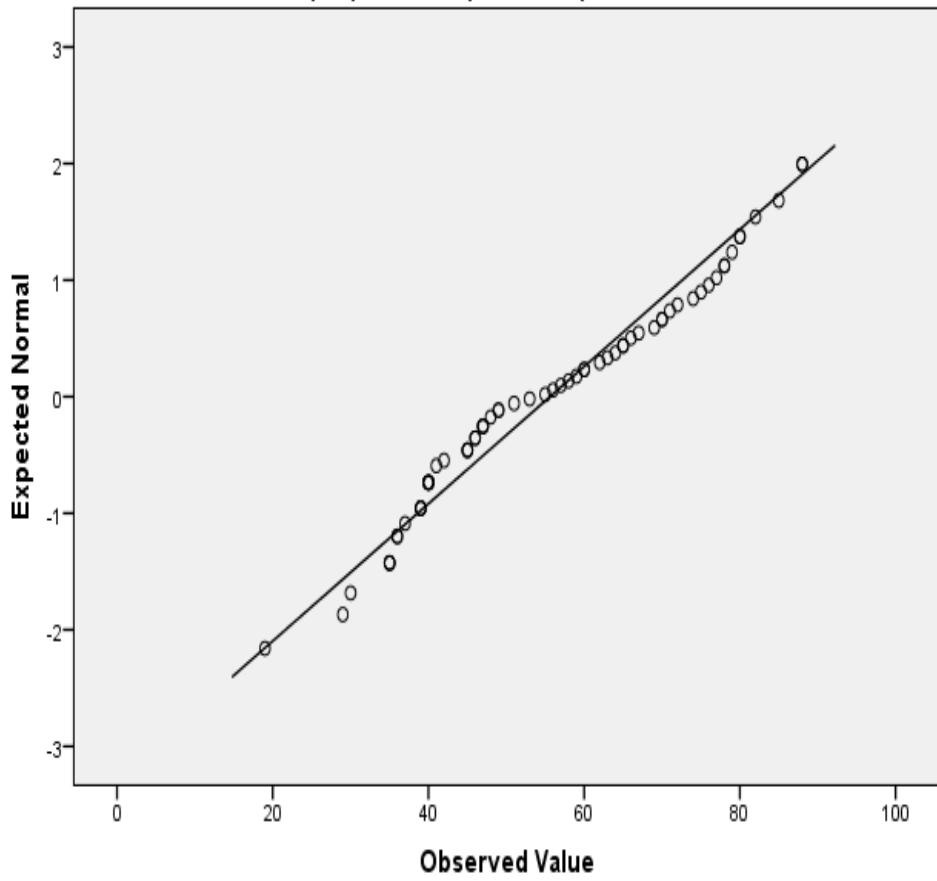


Figure 3: Normal Q-Q plot of a score of an experimental post-test

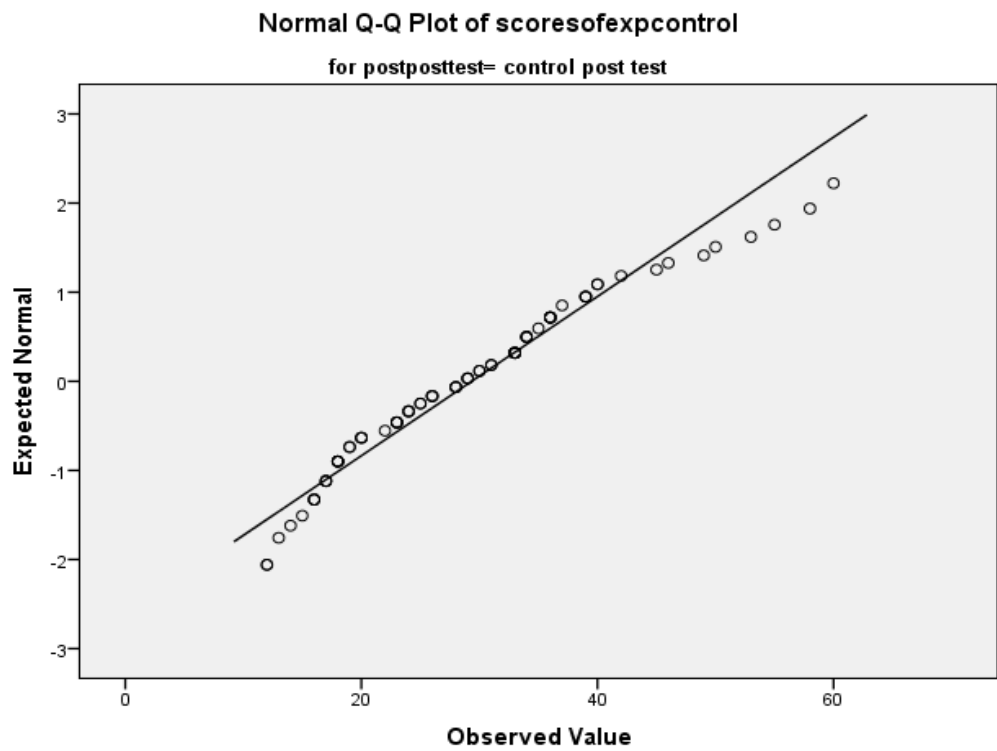


Figure 4: Normal Q-Q plot of scores of control post-test

Inspection of Figures 3 and 4 shows a reasonable straight line suggesting a normal distribution of scores in both the experimental and control groups.

Again, to test for homogeneity of variance, Levene's test for equality of variance was used. The test was not significant ( $F(20.429)$ , sig. =0.08,  $\rho > 0.05$ ), an indication that equal variances were assumed (Pallant, 2007). Having established these, an independent t-test was conducted to ascertain if there was any statistical difference. The results of the t test is in Table 2 below.

**Table 2:** Independent t-test Analyses of Post-test scores of Experimental and Control Group

	N	mean	Std	t	df	P
Experimental post-test	63	56.19	16.470	11.06	105.65	0.01
Control post-test	76	29.21	11.178			

Source: Field survey (2023)

\*Significant at  $p < 0.05$

Table 2 reveals that there was a statistically significant difference between the post-test scores of the experimental group ( $M= 56.19$ ,  $Std = 16.470$ ) and control group ( $M= 29.21$ ,  $Std., 11.178$ ;  $t(105.65)= 11.06$ ,  $\rho = 0.01$ , which is  $\rho < 0.05$ ). The Eta squared was calculated using the information from Table one to ascertain the magnitude of the differences between the conceptual difficulties of the experience and non-experience. The relation for the eta squared.

$\frac{t^2}{t^2(N_1+N_2-2)}$ , from Table 2, where  $t= 11.06$ ,  $N_1=63$ ,  $N_2= 76$

$$\frac{11.06^2}{11.06^2 + (63+76-2)}$$

58

$$= 0.472$$

According to Cohen (1988), an Eta squared value of .010 should be considered as having a small effect, 0.06 should be a moderate effect, and 0.14 have enormous impact. Thus, based on the Eta squared value, the magnitude of the difference between the post-test scores of the experimental group and the post-test scores of the control group was significant (Eta squared = 0.472) and, therefore, supports the statistically significant difference that existed between the experimental group and the control group.

The findings that there was an improvement in the academic performance of students taught problem-based learning resonates with the results of (Newble & Clarke, 1986; Manaf et al., 2011; Siaw, 2000), who also found that the problem-based learning group had significant gains (Siaw, 2000). These findings could be that the problem-based learning is a participatory learning approach (Adu-Gyamfi et al., 2020) which leans itself to a constructivist approach (Bada, 2015; Baviskar et al., 2009; Honebein, 1996; Kim, 2005) which considers the learner as an integral part of the learning process (Merrill, 2013). Thus, learners with different skills and background knowledge collaborate in the task and discussion of the task at hand (Duffy & Jonassen, 2013) and consequently build their learning from their social environment (Vygotsky, 1978). The learners will draw from their everyday experiences (Philips, 1995) of buying and selling goods or products to comprehend the concept of manufacturing accounts. The improvement could also be because, in problem-based learning, students interact with colleagues to create and solve problems, evaluate them and settle disputes concerning their colleagues' solutions (Shen et al., 2004).

Again, the finding of a significant improvement in the PBL method also confirms earlier findings of (Manaf et al., 2011; Milne & Mcconnel, 2001; Sugeng & Suryani, 2020) that comparing both ways, PBL outperformed the lecture method. With these significant gains in problem-based learning, it stands to reason that accounting education also needs problem-based learning (Stanley & Marsden, 2012).

**Hypothesis, H<sub>02</sub>:** There is no statistically significant difference in the impact of PBTS on students' academic performance in Manufacturing Accounting.

This research hypothesis sought to determine the impact of the Problem-based learning on academic performance. To answer this question, a paired-sample t-test was conducted to evaluate the effect of the PBL intervention on students' scores on the MAPT. The results of which are presented in Table 3.

**Table 3: Results of Paired-samples t-test of pre-test and post-test scores**

	N	Mean	Std	T	df	P
Pre-test	63	19.21	6.15			
Post-test	63	56.19	16.47	24.82	62	0.01*

Source: Field survey (2023)

\*Significant at  $p < 0.05$

The results from Table 3 show that there was a statistically significant increase in the post test scores of the students in the experimental group taught using PBL from post-test scores (M = 56.19, Std. = 16.47) to pre-test scores (M = 19.21, Std. = 6.15),  $t(62) = 24.82$ ,  $p = 0.01 < 0.05$ . To determine the impact of the intervention, the eta square was evaluated. Using the relation;



$\frac{t^2}{t^2 + (N-1)}$ , from Table 3, where  $t = 24.82$ ,  $N = 63$

$$\frac{24.82^2}{24.82^2 + (63-1)}$$
$$= 0.908$$

From Cohen's (1988) analysis of Eta squared values, an Eta squared value of .010 should be considered as having a small effect, 0.06 should have a moderate effect, and 0.14 have significant impact. In this study, the Eta squared value was 0.908, indicating a significant difference between the scores of the pre-test and post-test of the experimental group. This implies that the PBL approach impacted the students' academic performance on manufacturing accounts.

The findings that PBL has an impact on students' performance in manufacturing accounts resonates with earlier studies that PBL had a positive impact on the students' performance (Chileya, & Shumba, 2020; Ferreira, & Trudel, 2012; Winarti, & Waluya, 2019). It might be because of Manaf et al.'s (2011) assessment that PBL allows for critical thinking among students and also makes them problem solvers. Thus, as the students search for knowledge, they develop a deeper understanding of the concepts under the teachers as a facilitator (Kurt, 2020). The findings resonate with Siaw (2000), who found a significant improvement in students who were taught using PBL across two disciplines. Student's performance in the manufacturing accounts depends on their conception of the underlying concepts in manufacturing accounts. As such, if the student is given the role of an active participant organised in a student-centred learning environment (Wirkala & Kuhn, 2010), there is a great tendency of a significant improvement in their performance. It is that in the

problem based learning classroom, the students learn from their peers and share their idea and this makes the student learn a lot (Boud, 2002) and consequently could give the student the great performance. It is however, worth pointing out that PBL learning requires resources for achieving this maximum impact (Kurt, 2020). This is because these resources become the cultural tools (Vygotsky, 1978) the students need to construct the knowledge (they need with the teacher as the facilitator (Kurtz & Roskelly, 1991; Palinesar, 1998).

The higher impact of PBL could also be that students must first work on getting the content and theory right to now propel them to solve the problem (Jonassen, 1999)

**Hypothesis, H<sub>03</sub>:** There is no statistically significant difference in gender difference in pre- and post-test academic performance mean scores in Manufacturing Accounting among students in the experimental group.

This research question sought to find out if there was a statistically significant difference in gender between the pre-test scores and post-test scores of students in taught manufacturing accounts using problem-based learning. To do this, multivariate analysis of variance (MANOVA) was used. Preliminary checks were conducted to ensure no violations of the assumptions of normality, linearity, homogeneity of variance, and outliers.

First, normality and the presence of multivariate outliers were determined using the Mahalanobis distance (Pallant, 2007). Tabachnick and Fidell (2019) explained Mahalanobis distance as the distance of a case from the centroid of the remaining instances in which the centroid is the point created at the intersection of the means of all the variables and It reveals issues that are

dissimilar to the other issues and are therefore regarded as outliers. The Mahalanobis distance of the issues is compared with the crucial  $X^2$  value of the number of degrees of freedom of the independent variables to identify whether examples are multivariate outliers (Tabachnick & Fidell, 2019). An outlier is when the Mahalanobis distance value exceeds the crucial  $X^2$ .

According to Tabachnick and Fidell (2019), a study with two independent variables has a critical  $X^2$  value of 13.82. Thus, with the two independent variables in this study, examining the data case by case, the maximum Mahalanobis distance was 8.707. Therefore, the data was considered not to have outliers. When the Cook's length (a measure of the influence of outliers on the model) was also examined, the maximum value was 0.139. For Tabachnick and Fidell (2019), if the Cook's distance is greater than 1, then there is suspicion of the presence of outliers, which will potentially affect the results. Since Cook's distance was less than 1, there was no problem with outliers' influence on the result.

The mean scores of both males and females in their pre-test and post-test were also inspected to see if there was any difference. The results of which are presented in Table 4.

**Table 4: Mean Scores of Male and Female Students' taught manufacturing accounts using PBL (N = 63)**

	GENDER	Mean	Std.	N
PRE-TEST	MALE	20.3615	6.57924	26
	FEMALE	18.4000	5.78312	37
	Total	19.2095	6.14989	63
POST-TEST	MALE	59.4615	17.92480	26
	FEMALE	53.8919	15.19463	37
	Total	56.1905	16.46977	63

Source: Field survey (2023)

From Table 4, The mean score in the pre-test for males (M 20.36, std = 6.58) was a little higher than that of the females (M 18.40, std. = 5.78). Their lower standard deviation values also implied the scores were closely spread around their mean values. On the post-test scores, the mean scores of males (M= 59.46, std. = 17.92) were also slightly higher than the mean scores of females (M = 53.89, std. = 15.19), which is about 6-point difference. However, comparing the pre-test with the post-test of both males and females, there was much increase. Males saw a mean increase in pre-test score from (M= 20.36, std = 6.58) to post-test score of (M= 59.46, std. = 17.92) and females saw a rise in pre-test score from (M= 18.40, std. = 5.78) to post-test score (M = 53.89, std. = 15.19).

In further assessment of the data for suitability of conducting MANOVA, homogeneity of variance was looked at, the results of which are presented in Table 5 below

**Table 5: Box's test of covariance matrices**

Box's M	F	df1	df2	Sig.
2.767	0.89	3	202534.88	.446

Source: Field survey (2023)

Sig. at  $P < 0.05$

Pallant (2007) noted that a significant Box's M value violates the assumption of homogeneity of variance. From Table 5, the Box's M sig. weight was not significant ( $P > 0.05$ ), implying no violation of homogeneity of variance. Examination of Levene's test of equality of variance presented in Table 6 suggested the assumption of equal variance since both were not significant ( $p > 0.05$ ).

**Table 6: Levene's Test of Equality of Error Variances**

	F	df1	df2	P
Pre-test experimental	0.126	1	61	.724**
Post-test experimental	3.146	1	61	.081**

Source: Field survey (2023)

\*\*significant at  $p > 0.05$

Having checked these assumptions, a one-way between-groups multivariate analysis of variance was performed to investigate how gender differed in their pre-test and post-test scores taught manufacturing accounts using problem-based learning. Two independent variables were used: Pre-test scores and Post-test scores, and the dependent variable was gender.

The results, as shown in Table 7, show there was no statistically significant difference between the gender in the pre-test and post-test scores group of  $F((2, 61) = 0.971, p = .410 > 0.05)$

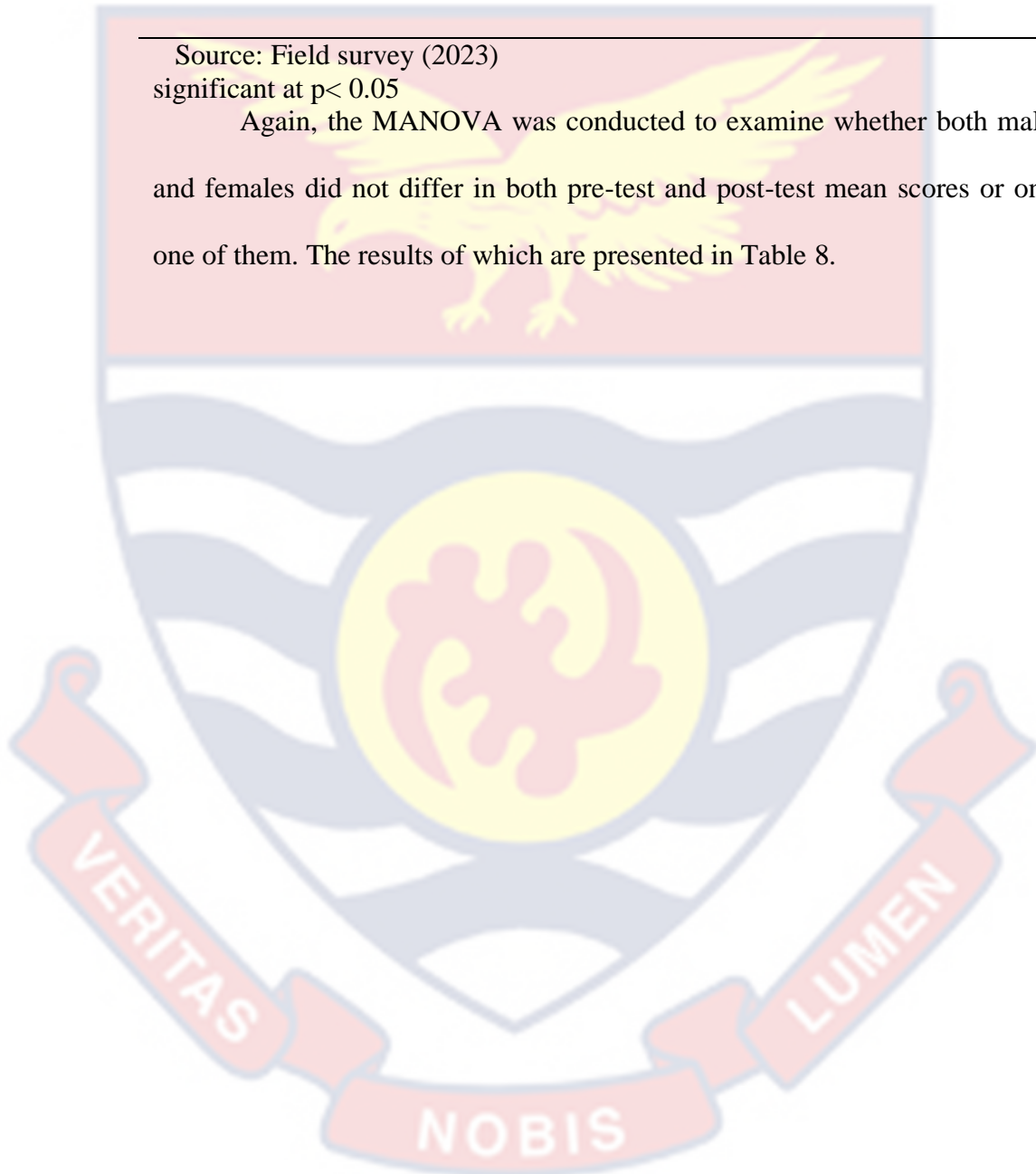
**Table 7: Multivariate test of gender difference in pre-test and post-test scores of students taught using PBL**

Effect		Value	F	Hypothesis df	Error df	p
Gender	Wilks'	.971	.904	2.000	60.000	.410

Lambda

Source: Field survey (2023)  
significant at  $p < 0.05$

Again, the MANOVA was conducted to examine whether both males and females did not differ in both pre-test and post-test mean scores or only one of them. The results of which are presented in Table 8.



**Table 8: Multivariate Analysis of Variance of pre-test and post-test scores of gender**

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	PRE-TEST	58.753 <sup>a</sup>	1	58.753	1.568	.215	.025
	POST-TEST	473.685 <sup>b</sup>	1	473.685	1.768	.189	.028
Intercept	PRE-TEST	22942.278	1	22942.278	612.152	.001	.909
	POST-TEST	196202.193	1	196202.193	732.276	.001	.923
GENDERSCHOOL	PRE-TEST	58.753	1	58.753	1.568	.215	.025
B	POST-TEST	473.685	1	473.685	1.768	.189	.028
Error	PRE-TEST	2286.162	61	37.478			
	POST-TEST	16344.029	61	267.935			
Total	PRE-TEST	25592.280	63				
	POST-TEST	215732.000	63				
Corrected Total	PRE-TEST	2344.914	62				
	POST-TEST	16817.714	62				

Source: Field survey (2023)

\*\*significant at  $p < 0.05$

From Table 8, it can be seen that there is no statistically significant difference in the performance of gender in their pre-test scores ( $F(1, 62) = 1.568, p = 0.215$ ) and post-test scores ( $F(1, 62) = 1.768, p = 0.189$ ).

The findings that there is no statistically significant difference in gender and academic performance in Manufacturing accounts taught using PBL confirms earlier findings of Hanks & Shivaswamy (1985), Khwaileh & Zaza (2011), and Okafor & Egbon (2011). The results of Hanks and Shivaswamy (1985), who researched the gender gap in academic performance in accounting, found that females perform pretty much the same as their male counterparts in accounting. The findings, however, contrast that of (Boateng, 2015; Bouillon & Doran, 2010; Nwosu & Azih, 2010; Sam, 2015), who found males to be performing better than females with specific teaching methods and those who found females to be performing better than males (Wally-Dima & Mbekomize, 2013). It could be that unlike Wally-Dima and Mbekomize (2013), who noted that females are hard workers, attend more classes and tutorials, seek guidance on their studies from lecturers and participate more in class discussions than their male counterparts, males in this study might probably have shown similar behavior. Sam (2015) noted that males tend to outperform females perhaps because of existing stereotypes such as cultural differences and biological differences, among others; however, we will need to integrate gender neutrality as part of taught ethics in teaching manufacturing accounts to help increase female academic performance in setting where females are culturally undermined by males (Okafor & Egbon, 2011). In this way, we will be able to get both males and females to perform relatively equally. It could also be said that the no statistical difference in gender performance is because



PBL aligns itself to constructivism. Like Merrill (2013) noted the constructivism address unique individual needs and backgrounds. The PBL used could have addressed the unique needs and backgrounds of both male and females who took part in this study.



## CHAPTER FIVE

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter summarizes the study to provide appropriate conclusions for the study. Based on the findings, conclusions and recommendations are made. The chapter ends with a section on suggestions for further research.

#### Summary

The problem that necessitated the study was the continuous report on the poor performance of students by the Chief examiner of WAEC on manufacturing accounts topics of the financial accounting paper of SHS. The teacher's methodology plays a vital role in students' conception of challenging topics such as manufacturing accounts. However, PBL as a teaching approach in teaching manufacturing accounts was not much explored. This study therefore, investigated the effect of problem-based learning on students' performance in manufacturing accounts.

The study was conducted in the Bawku West district of the Upper East Region of Ghana using the quasi-experimental design. One hundred and thirty-nine business students consisting of 63 students in the experimental group and 76 students in the control group. The groups were made to take both pre-test and post-test after an intervention was given to the experimental group whereasthe control group was taught using the lecture method. The research was guided by three research hypotheses including  $H_{01}$ : There is no statistically significant difference in the post-test academic performance mean scores in Manufacturing Accounting among students in the experimental and control groups,  $H_{02}$ : There is no statistically significant difference in the impact of PBLS on students' academic performance in Manufacturing

Accounting and  $H_{03}$ : there is no statistically significant difference in any gender difference in pre- and post-test academic performance mean scores in Manufacturing Accounting among students in the experimental group. Data was collected using MAPT1 and MAPT2 (as pre-test and Post-test respectively). Data were analysed using inferential statistical tools, including independent t-test, paired sample t-test and multivariate analysis (MANOVA) to explore the three research hypotheses.

### Key findings

The findings from the study showed that:

- a. A statistically significant difference exists in the post-test academic performance mean scores in Manufacturing Accounting among students in the experimental and control groups. This is because the post-test scores of the experimental group ( $M = 56.19$ ,  $Std = 16.470$ ) and control group ( $M = 29.21$ ,  $Std., 11.178$ ;  $t(105.65) = 11.06$ ,  $\rho = 0.00$ , which is  $\rho < 0.05$ ) was significant. The difference, however, was large as the calculated Eta squared value was 0.472, about 47.2%.
- b. The PBL significantly impacted the students' performance in the manufacturing accounts concepts when taught the PBL approach. This is because the experimental group taught using PBL from pre-test scores ( $M = 19.21$ ,  $Std. = 6.15$ ),  $t(62) = 24.82$ ,  $p = 0.00 < 0.05$ ) to post-test scores ( $M = 56.19$ ,  $Std. = 16.47$ ). The impact size was 0.908, representing a 90.8 percent improvement.
- c. There was no statistically significant difference in gender difference in pre- and post-test academic performance mean scores in Manufacturing Accounting among students in the experimental group

## Conclusion

The findings that statistical difference existed between the experimental and the control groups in favour of the experimental group in this study implied that the PBL approach is more effective in helping students learn manufacturing accounts and by extension financial accounting at the SHS level. Consequently, PBL has the ability to improve student's performance in Manufacturing accounts leading to a higher performance in financial accounting at the SHS level.

Again, findings from this study show the PBL approach significantly impacts students' understanding of manufacturing accounts. The results of the study have provided empirical evidence that PBL if well implemented can have a positive impact on learners' academic performance, as it fosters the development of creative thinking abilities, problem-solving skills and activating the learner's interest to learning manufacturing accounts concepts. These findings have contributed to the literature that PBL is not only helpful in medical studies/fields and the sciences but valuable for accounting education. Again, the results of the study have contributed to helping clarify whether PBL is needed in accounting education.

Moreover, among gender, the PBL approach did impact almost equally in them. It could then be concluded that PBL is a gender responsive strategy that can be utilized in accounting education. This is because PBL takes into consideration gender differences and individual differences as it impacts practically the same way on both male and female performance.

## Recommendation

Based on the findings of the study, it is recommended that

1. Teachers in the Bawku West district could be encouraged to use problem based learning approach to teaching manufacturing accounts because of its effectiveness as well as its impact on students' performance. It can develop students' communicative and collaborative working skills and their skills in accessing and utilising information.
2. At the in-service level, seminars and workshops should be organized by Stakeholders of Education, such as Ghana Education Service, GABET, GNAT, CCT, etc., to educate practising teachers on how to implement PBL in schools at all levels of the district and beyond
3. Male and female students do not perform differently when using the PBL. It is therefore recommended that Business departments in the Bawku West District and other Senior High Schools with similar characteristics, consider the participatory learning approaches, such as the PBL approach, which allows students to interact and share ideas so as to improve their performance in manufacturing accounts

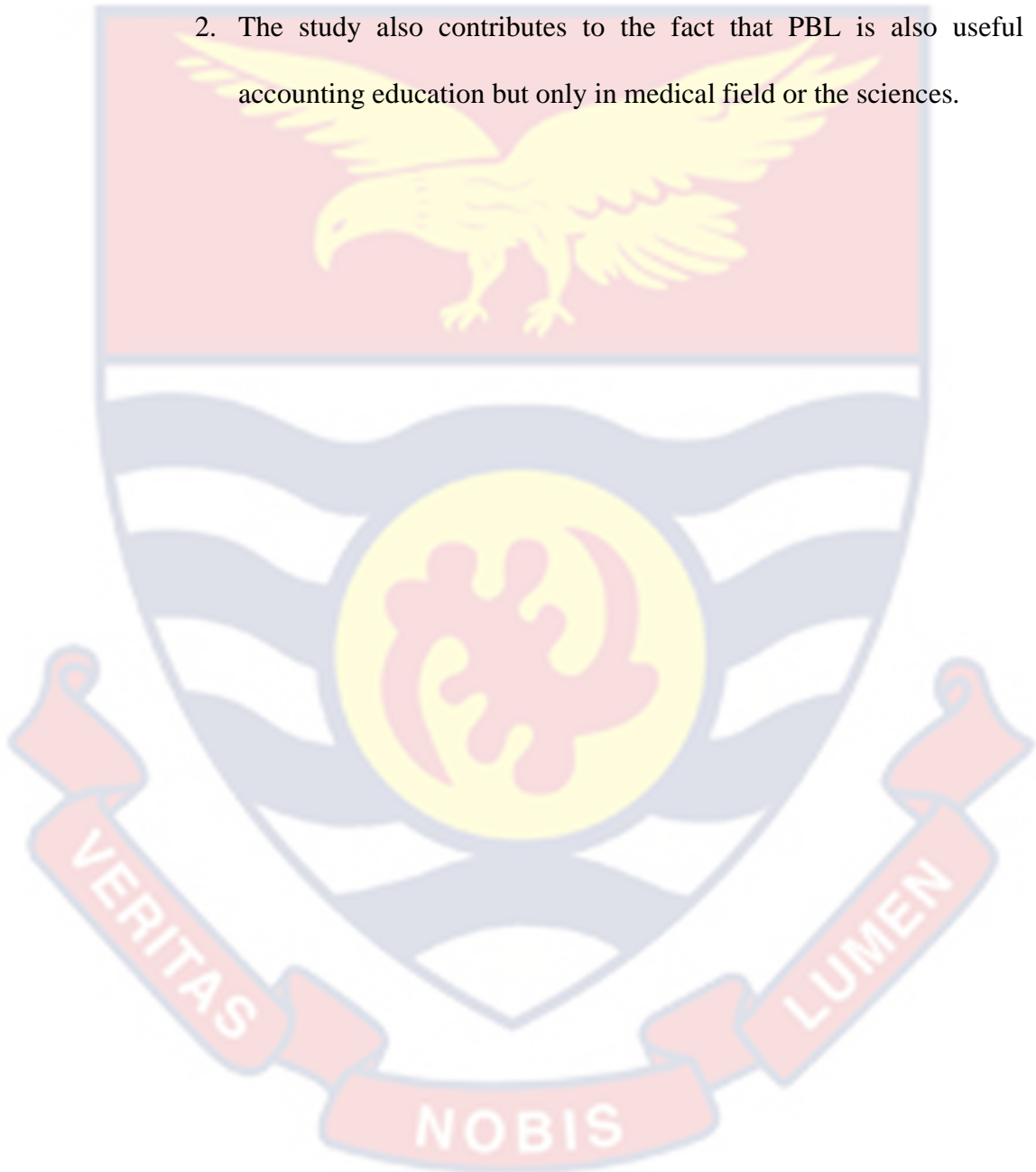
### **Suggestions for further Research**

It is suggested that the study be conducted with a larger representative sample in Senior High schools in Ghana to assess the effectiveness of the PBL in teaching and learning business studies and accounting in particular.

Teachers play an essential role in the development of their students; they determine what method to adopt in teaching a particular concept. Hence, researchers could consider assessing business teachers' preparedness in using PBL in teaching accounting at the high school level.

**Original contribution of the study**

1. The study has contributed to the ongoing advocacy of gender responsive strategies in education that PBL has the capability of bridging gender difference in learning financial accounting.
2. The study also contributes to the fact that PBL is also useful in accounting education but only in medical field or the sciences.



## REFERENCES

- Abdisa, G., & Getinet, T. (2012). The effect of guided discovery on students' Physics achievement. *Journal of Physics Education*, 4(6), 530-537.
- Abdul-Rahamon, O. A., & Adejare, A. T. (2014). The Analysis of the Impact of accounting records keeping on the performance of small scale enterprises. *International Journal of Academic Research in Business and Social Sciences*, 4(1), 1-17. doi: 10.6007/IJARBSS/v4-i1/506
- Adams, R.A. (2002). *Public sector accounting and finance (3rd ed.)*. Lagos: Corporate Publishers Ventures
- Adebiyi, K. (2001). *Accounting and information technology: A handbook for accountants and IT users*. Ibadan: Polygraphics Ventures Ltd.
- Adu-Gyamfi, K., Ampiah, J. G., & Agyei, D. D. (2020). Participatory Teaching and Learning Approach: A Framework for Teaching Redox Reactions at High School Level. *International Journal of Education and Practice*, 8(1), 106-120.
- Aduwa-Ogiegbaen, S. E., & Uwameiye, R. (2006). Internet usage among university lecturers in southern Nigeria. *International Journal of Information and Communication Technology Education (IJICTE)*, 2(1), 28-36.
- Agara, I. G. (2005). *Management accounting: Effective management tool*. Lagos: ETI-KIND and Company (Nig.) Ltd.
- Agboh, C. I. (2017). Effects of computer-assisted instructional techniques on students' achievement in financial accounting in college of education in south-east Nigeria. *Research Journal of Finance and Accounting*, 6(20), 234-236

- Akintelure, S.L. & Oguobi, J. I. (2003). *Comprehensive financial accounting* (New Ed.). Lagos: A Johnson Publishers Ltd.
- Alao, O. E., & Ukpong, M. J. (2020). Instructional resources and effective pedagogy of financial accounting in secondary schools, Lagos, Nigeria. *International Business Education Journal*, 13, 94-108.
- Arthur, E. K., Sam, T., Osei, G. A., & Kattah, G. (2019). Comparative analysis of male and female students' academic performance in financial accounting: a survey in the Cape Coast metropolis. *International Journal of social science and humanities research*, 7(1), 150-164.
- Asaolu, A. (2005). *Financial accounting for schools and colleges*. Abuja: Spectrum Books Ltd.
- Awoniyi, F. C. & Fletcher, J. A. (2017). The influence of mathematics anxiety on performance among senior high school students in the Cape Coast metropolis. *Journal of science and mathematics education*, 6(2). 125-163.
- Azih, N., & Nwosu, B. O. (2011). Effects of instructional scaffolding on the achievement of male and female students in financial accounting in secondary schools in abakaliki urban of Ebonyi state, Nigeria. *Current Research Journal of Social Sciences*, 3(2), 66-70.
- Bada, S. O. (2015). Constructivism Learning Theory: A Paradigm for Teaching and Learning. *Journal of Research & Method in Education*, 5(6). 66-70. DOI 10.9790/7388-05616670.



- Balim, A. G. (2009). The effects of discovery learning on student's success and inquiry learning skills. *European Journal of education and research*. 35, 1-20
- Ballester, C. P. M. (2012). Analysis of the Factors that Influence the Academic Performance of Financial Accounting Students using Binary Choice Models. *Review of Business Management*, 14(45), 379–399. <https://doi.org/10.7819/rbgn.v14i45.1080>
- Barrows, H.S., & Tamblyn, R.H. (1980). *Problem-Based Learning: An Approach to Medical Education*. New York: Springer Publishing Company.
- Barut, M., Soares, M. A., De Araujo, A. P., & Kanet, J.J. (2016). Problem-based learning in accountancy: An empirical study. *International Journal of research and methods in education*. 6(6). 50-58. Doi:109790/7388-0606015058
- Baviskar, S. N., Hartle, R. T., & Whitney, T. (2009). Essential criteria to characterize constructivist teaching: Derived from a literature review and applied to five constructivist-teaching method articles. *International Journal of Science Education*, 31(4), 541-550.
- Behzadan, H. A. & Kamat, R. V. (2013). They are enabling discovery-based learning in construction using telepresent augmented reality. *Automation in construction*. 33, 3-10
- Belland, B. R., Ertmer, P. A., & Simon, K. D. (2006). Perceptions of the value of problem-based learning among students with special needs and their teachers. *The Interdisciplinary Journal of Problem-Based Learning*, 1(2), 1-18.

Bergstrom, C. M., Pugh, K. J., Phillips, M. M., & Machlev, M. (2016). Effects of problem-based learning on recognition learning and transfer accounting for GPA and goal orientation. *The Journal of Experimental Education*, 84(4),764-786. <https://doi.org/10.1080/00220973.2015.1083521>

Bhimani, A., Horngren, C. T., Datar, S. M. & Rajan, M. V. (2015). *Management and Cost accounting*. (6<sup>th</sup> ed.). Prentice-Hall Inc., Upper Saddle River, New Jersey, USA

Blayney, N. (2003). Problem-based learning: a new approach in medical education. *In Practice*, 25(2), 101–106. doi:10.1136/inpract.25.2.101

Boateng, O. C. (2015). *The influence of mathematics ability on students' academic performance in financial accounting*. Unpublished thesis. University of Cape Coast, Ghana.

Boud, D. (2002). *Introduction: Making a move to peer learning. Peer learning in higher education*. London: Kogan Page Ltd.

Bouillon, M. L., & Doran, B. M. (1992). The relative performance of female and male students in accounting principles classes. *Journal of Education for Business*, 67(4), 224-228.

Breton, G. (1999). Some empirical evidence on the superiority of the problem-based learning (PBL) method. *Accounting Education*, 8(1), 1-12.

Bright, G., & Herbert, M. (1990). Manufacturing Accounts. In *Mastering Accounting* (pp. 166-179). Palgrave, London.

Bryman, A. (2008). *Social research methods* (3rd ed.). London, UK: Oxford University Press.

Caruana, S. (2011). Accreditation of Soft Skills in Higher Education using ICT. *Soft Skill Accreditation*.

Cassandra M. Bergstrom, K. J., Pugh, M. Phillips & Moshe Machlev (2016). Effects of problem-based learning on recognition learning and transfer accounting for GPA and goal orientation, *The Journal of Experimental Education*, 84(4), 764-786, DOI: 10.1080/00220973. 2015.1083521

Chavez, A. D., Gámiz-Sánchez, V.M., & Vargas, C. A. (2020). Problem-based learning: Effects on academic performance and perceptions of engineering students in computer sciences. *Journal of Technology and Science Education*, 10(2), 306-328. <https://doi.org/10.3926/jotse.969>

Chileya, M. E. & Shumba, O. (2020). The Impact of Problem Based Learning on Learners Academic performance in Chromatography and Science Learning Activation *International Journal of Research and Innovation in Social Science*. 4(9).778-

Clark, R., Clough, M., & Berg, C. (2000). Modifying cookbook labs: A different way of teaching a standard laboratory engages students and promotes understanding. *The Science Teacher*, 67(7), 40-43

Cohen, L., Manion, L. & Morrison, K. (2007). *Research Methods in Education*. (6<sup>th</sup> ed.). New York.

Collins, R., & Hammond, M. (1991). How to share control with workshop participants. *Medical Teacher*, 13(1), 13-19.

Creswell J.W. & Creswell, J.D. (2023). *Research design: qualitative, quantitative, and mixed methods approaches* (6<sup>th</sup> ed.). SAGE Publications, Inc

Crow, L. D., & Crow, A. (1969). *Adolescent development and adjustment*.  
New York:McGraw–Hill Book Company.

Da Silva, A. B., Bispo, A. C. K. A. Rodriguez, D. G. & Vasquez, F. I. F.  
(2018). Problem-based learning A proposal for structuring PBL and  
its implications for learning among students in an undergraduate  
management degree program. *Revista de Gestao*, 25(2) 160-177. DOI  
10.1108/REGE-03-2018-030

Dar, B. & Ezeagba, C. E. (2014). The problems in the teaching and learning of  
accounting as a vocational subject in Nigeria secondary schools. *An  
International Journal of Science and Technology*, 3 (2), 208-226,  
<http://dx.doi.org/10.4314/stech.v3i2.13>.

De Graaf, E., & Kolmos, A. (2003). Characteristics of problem-based  
learning. *International journal of engineering education*, 19(5), 657-  
662.

Deepak, K. K., Al-Umran, K. U., Al-Sheikh, M. H. & Al-Rubaish, A. (2011).  
The influence of gender on undergraduate performance in multiple-  
choice testing in clinical disciplines at the University of Dammam,  
Saudi Arabia. *Al Ameen Journal of Medical Science*, 4(2), 123-130.

Delisle, R. (1997). *How to use problem-based learning in the classroom*.  
Ascd.

Dockter, D. L. (2012). Problem-based learning in accounting. *American  
Journal of Business Education*, 5(5), 547-554.

Dolmans, D. H. J. M. & Schhimdt, H. G. (1994). What drives the student in  
problem-based learning? *Medical education*, 28, 372-380.

Driscoll, M. P. (2014). *Psychology of Learning for Instruction*. Needham, MA: Allyn and Bacon

Drury, C. M. (1992). *Management and cost accounting*. (3<sup>rd</sup> ed.). Chapman and Hall Ltd.

Drury, C. M. (2018). *Management and cost accounting*. Springer.

Duch, B. J., Groh, S. E., & Allen, D. E. (2001). *The power of problem-based learning: A practical "how to" for teaching undergraduate courses in any discipline*. Sterling, VA: Stylus

Duffys, T. M., & Jonassen, D. H. (2013). Constructivism: New implications for instructional technology. In *Constructivism and the technology of instruction* (pp. 1-16). Routledge.

Ekwere, A.B. (2005). *Contemporary accounting*. Abuja: AFLON Ltd.

Enwere, J.O; Ezenwafor, J.I & Eze T.I. (2020). Relative effectiveness of just-in-time teaching and peer instructional strategies on students' retention in financial accounting in colleges of education. *International Journal of Scientific & Technology Research*. 9(4),

Eze, M. I. (2014). *Comparison of peer tutoring and memorization strategies and students' achievement in manufacturers' final accounts in colleges of Education in Anambra State, Nigeria*. Master's Thesis. Retrieved from <https://materials.projecttopics.org/22410-comparison-of-peer-tutoring-and-memorization-strategies-on-students-achievement-in-manufacturers-final-accounts-in-colleges-of-education-in-anambra-state-nigeria>

Ezeh, D.N. (2003). Validity and reliability of tests in Nworgu, B.G.(ed). *Educational measurement and evaluation: Theory and practice (rev. ed)*. Nsukka: University Trust Publishers.

Ferreira, M. M., & Trudel, A. R. (2012). The impact of problem-based learning (PBL) on student attitudes toward science, problem-solving skills, and sense of community in the classroom. *The Journal of Classroom Interaction*, 47(1), 23–30. <http://www.jstor.org/stable/43858871>

Festinger, L. (1957). *A Theory of Cognitive Dissonance.*, Stanford, CA: Stanford University Press.

Francis, M. P. (2014). Climate change and implication for senior secondary school financial accounting curriculum development. *Journal of education and practice*, 5(26), 153-157

Fuhrman, S. (1994). Uniting producers and consumers: Challenges in creating and utilizing educational research and development. In T. M. Tomlinson & A. C. Tuijnman (Eds.), *Educational research and reform: An international perspective* (pp. 133–147). Washington, DC: U.S. Department of Education

Gammie, E., Paver, B., Gammie, B. & Duncan, F. (2003). Gender differences in accounting education: an undergraduate exploration. *Accounting Education: An International Journal*, 12(2), 177-196.

Gilliland, S. E., & Dunn, J. (2003). The impact of teacher-student relationships on student achievement. *Journal of Educational Research*, 96(3), 139-146

Good, C. V. (1959). *Dictionary of education* (2<sup>nd</sup> ed.). New Delhi: McGraw Hill

Gredler E. M. (1997). *Learning and instruction. Theory into practice*. New Jersey: Merrill

Grow, G. O. (1991). Teaching learners to be self-directed. *Adult education quarterly*, 41(3), 125-149.

Hadi, M. S., & Izzah, L. (2018). Problem Based Learning (PBL) in teaching English for students of primary school teacher education department. *English Language in Focus*, 1(1), 45-54.

Hanks, G. F. & Shivaswamy, M. (1985). Academic Performance in Accounting: Is There a Gender Gap? *The Journal of Business Education*, 60(4), 154-156. <http://dx.doi.org/10.1080/00219444.1985.10534962>.

Heagy, C. D., & Lehmann, C. M. (2005). Is PBL an improved delivery method for the accounting curriculum? In *Advances in accounting education: Teaching and curriculum innovations* (pp. 221-251). Emerald Group Publishing Limited.

Honebein, P.C. (1996). Seven goals for the design of constructivist learning environments. In *Constructivist Learning Environments: Case Studies in Instructional Design*. Brent G. Wilson (Ed.). Englewood Cliffs: Educational Technology Publications: 11-24.

Hosal-Akman, N., & Simga-Mugan, C. (2010). An assessment of the effects of teaching methods on academic performance of students in accounting courses. *Innovations in education and teaching international*, 47(3), 251-260.

- Huggins, A. W., & Riggio, R. E. (2010). The impact of teaching style on student learning outcomes in financial accounting. *Journal of Education for Business*, 85(4), 233-240.
- Hutchinson, J. R., & Huberman, M. (1994). Knowledge dissemination and use in science and mathematics education: A literature review. *Journal of Science Education and Technology*, 3(1), 27-47. <https://doi.org/10.1007/BF01575814>
- Inuwa, U., Abdullah, Z. & Hassan, H. (2017). Assessing the Effect of Cooperative Learning on Financial Accounting Achievement among Secondary School Students. *International Journal of Instruction*, 10(2), 31-46. <https://doi.org/10.12973/iji.2017.1033a>
- Ishaq, A. M. (2011). The challenges of teaching financial accounting in Nigeria secondary school: a case study of Gombe State. *SSRN electronic journal*. DOI:10.2139/ssrn.1854322
- Jaafar, S. B. (2018). *Are Soft Skills Required for Accounting Students in Future Careers?*. Available at SSRN 3167595. <http://dx.doi.org/10.2139/ssrn.3167595>
- Javirs, P. (2006). *The theory of practice of teaching*. (2<sup>nd</sup> ed.), New York.
- Jonassen, D. H. (1999). Constructing learning environments on the web: Engaging students in meaningful learning. *EdTech 99: Educational Technology Conference and Exhibition 1999: Thinking Schools, Learning Nation*.
- Kherfi, S. (2008). Economic Education in the Middle East: Are the Determinants of Success in Introductory Economics Any Different? *Journal of Economic Education*, 39(1), 22-40.



- Khwaileh, F. M., & Zaza, H. I. (2011). Gender differences in academic performance among undergraduates at the University of Jordan: Are they real or stereotyping? *College Student Journal*, 45(3), 633- 648.
- Kim, J. S. (2005). The effects of a constructivist teaching approach student academic performance, self-concept, and learning strategies. *Asia Pacific Education Review*, 6(1). 7-19. and *Teaching*, 10(1). 34-43.
- Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist*, 41(2), 75-86.
- Kucharčíková, A., & Tokarčíková, E. (2016). Use of participatory methods in teaching at the university. *The Online Journal of Science and technology*, 6(1), 82-90.
- Kutz, E., & Roskelly, H. (1991). *An unquiet pedagogy: Transforming practice in the English classroom*. Boynton/Cook : Heinemann
- Kwarteng, J. K. (2014). Use of instructional resources in senior high school accounting lessons: The tale of teachers and learners. *International Journal of Scientific and Research Publications*, 4(10), 563-567.
- Kwarteng, J.T. (2013). The degree of fidelity of the 2007 Education Reform implementation, *Journal of Arts and Humanities*, 1(4), 149-154.
- Kwarteng, J.T. (2019). Degree of senior high school accounting curriculum implementation in Ghana: relevant and problematic topics, *Malaysian online journal of educational sciences* 7(3), 1-11.

- Leavy, P. (2023). *Research design: quantitative, qualitative, mixed methods, arts-based, and community-based participatory research approaches*. (2<sup>nd</sup> ed.). New York. The Guilford Press
- Longe, O.A. & Kazeem, R.A. (2006). *Essential financial accounting*. Lagos: Tonad Pub. Ltd.
- Manaf, N. A. A., Ishak, Z., & Wan Hussin, W. N. (2011). Application of Problem Based Learning (PBL) in a Course on Financial Accounting Principles. *Malaysian Journal of Learning & Instruction*. 8, 21-47.
- Martí Ballester, C. P. (2012). Analysis of the Factors that Influence the Academic Performance of Financial Accounting Students using Binary Choice Models. *Revista Brasileira de Gestão de Negócios*, 14(45), 379-399
- Mascolo, M. F. (2009). Beyond student-centered and teacher-centered pedagogy: Teaching and learning as guided participation. *Pedagogy and the human sciences*, 1(1), 3-27.
- Massa, N. M. (2008). Problem-Based Learning (PBL): A real using Problem-Based Learning. *Journal of University Teaching & Learning Practice*, 17(1), <https://ro.uow.edu.au/jutlp/vol17/iss1/5>
- Merrill, M. D. (2013). Constructivism and instructional design. In *Constructivism and the technology of instruction*. Routledge.
- Milne, M. J., & McConnell, P. J. (2001). Problem-based learning: a pedagogy for using case material in accounting education. *Accounting Education*, 10(1), 61-82.
- Ministry of Education [MOE] (2010). *Teaching syllabus for financial accounting for senior high school 1-3*. CRDD. Accra.

Ministry of Education, (1991). *Accounting for senior secondary schools*,  
Accra. Allied Publishers Limited.

Mohammed, I. A. (2018). The Challenges of Teaching Financial Accounting  
In Nigerian Secondary Schools: A Case Study of Gombe State, *SSRN  
Electronic Journal*, <https://www.researchgate.net/publication/228307957>.

Newble, D. J., & Clarke, R. M. (1986). The approaches to learning of students  
in a traditional and an innovative problem-based medical school.  
*Medical Education*, 20, 267-273.

Obi, C.A. (2005). *Methodology in business education*. Enugu: Oktek  
(Publishers) Nig. Ltd.

Obidile, I. & Stella, C. & Helene, U. & Akuezuilo, J. (2017). Perceived  
factors influencing academic performance of students in accounting in  
secondary schools in Anambra State. *Journal of Humanities and  
Social Science*. 22. 96-99. 10.9790/0837-2202039699.

Odo, J. O. (2017). *Manufacturing accounts*.

Oduro, E. (2011). *Financial accounting for senior high schools and tertiary  
institutions in West Africa*. (3<sup>rd</sup> ed.). Terror publications. Accra.

Okafor, C. A. & Egbon, O. (2011). Academic Performance of Male versus  
Female Accounting Undergraduate Students: Evidence from Nigeria.  
*Higher Education Studies*, 1(1), 9-19. doi:10.5539/her.v

Okafor, R.G. (2000). *Element of financial accounting (3rd ed.)*. Enugu:  
Precision Printers and Publishers

Oladele, O.K. (2009). Computer-based accounting systems: In the private  
sector. *ICAN Students' Journal*, 2(13) 7-12.

- Omorokpe, R.O. (2006). *Financial accounting practice in business and not-for-profit organizations*. Lagos: Mareh Publishers.
- Omotayo, B. K. (2014). Teachers characteristics and students' performance level in senior secondary school Financial Accounting. *Journal of Empirical Studies*, 1(2). 48-53.
- Onyon, C. (2012). Problem-based learning: a review of the educational and psychological theory. *The clinical teacher*, 9(1), 22-26.
- Osuala, E.C. (2004). *Principles and methods of business and computer education*. Enugu: Cheston Agency Ltd.
- Oyetade, B. (2008). Accounting procedures: implications for non-compliance and the way forward. *ICAN Students' Journal*, 4(12). P. 5 – 58.
- Palincsar, A. S. (1998). Social constructivist perspectives on teaching and learning. *Annual review of psychology*, 49(1), 345-375.
- Pallant, J. (2007). *SPSS Survival Manual: A Step-by-Step Guide to Data Analysis using SPSS for Windows*. (3<sup>rd</sup> ed.). England: McGraw Hill Open University Press
- Papageorgiou, E. (2017). Accounting students profile verse academic performance: A five-year analysis. Johannesburg.
- Patel, F. (2015). Effects of accounting information system on Organizational Profitability. *International Journal of Research and Analytical Reviews*, 2(1), 72-76.
- Phillips, D.C. (1995). The good, the bad, and the ugly: The many faces of constructivism. *Educational Researcher*, 24 (7), 5-12.
- Piper, M. (2010). *Accounting Made Simple: Accounting Explained in 100 Pages or Less*. P. 11. Simple Subjects, LLC Chicago, Illinois

- Remy, E. (2020). *Impact of Pro-Based Learning on Student Performance In Elementary Mathematics*. Published doctoral thesis. Retrieved from [https://scholar.stjohns.edu/theses\\_dissertations](https://scholar.stjohns.edu/theses_dissertations)
- Riegle-Crumb, C., & King, B. (2010). Teacher bias and self-efficacy: A study of student-teacher interactions in high school mathematics classes. *Journal of Educational Psychology*, 102(2), 347-356
- Roberts, A., Nganga, L., & James, J. (2022). Classroom examples: Problem-based learning in secondary education. *Open Access Library Journal*, 9(6), 1-16.
- Ryan, G. (2018). Introduction to positivism, interpretivism and critical theory. *Nurse researcher*, 25(4), 41-49.
- Sam, L. (2015). *Gender differences in academic performance of financial accounting students in selected senior high schools in the central region of Ghana* (Doctoral dissertation, university of cape coast).
- Savery, J. R. (2006). Overview of Problem-based Learning: Definitions and Distinctions. *Interdisciplinary Journal of Problem-Based Learning*, 1(1), <https://doi.org/10.7771/1541-5015.1002>
- Savery, J. R., & Duffy, T. M. (1995). Problem based learning: An instructional model and its constructivist framework. *Educational technology*, 35(5), 31-38.
- Shen, J., Wu, D., Achhpiliya, V., Bieber, M. & Hiltz, R. (2004). *Participatory learning approach: An overview (ver. 1.0)*. A Technical Report Submitted to New Jersey Institute of Technology, New Jersey.

Siaw, I.S.C. (2000). PBL experience in business programs: Do disciplines matter? *The 2nd Asia Pacific Conference on PBL*, Temasek Polytechnic, Singapore.

Sindelar, T. M. (2010). *The effectiveness of problem-based learning in the high school science classroom*. Published Master's thesis.

Sinha, D. (1970). *Academic achievers and non-achievers: An analysis of some factors associated with success and failure in university education*. Allahabad: United Publishers

Stanley, T. & Marsden, S. (2012) Problem-based learning: Does accounting education need it? *Journal of Accounting Education*, 30, <http://dx.doi.org/10.1016/j.jaccedu.2012.08.005>267–289

Stanley, T. & Marsden, S. (2012). Problem-based learning: Does accounting education need it? *Journal of accounting education*. 30, 267–289. <http://dx.doi.org/10.1016/j.jaccedu.2012.08.005>

Steenkamp, L. P., Baard, R. S. & Frick, B. L. (2009). Factors influencing success in first-year accounting at a South African University: A comparison between lecturers' assumptions and students' perceptions. *South African Journal of Accounting Research*, 23(1), 113-140.

Steffe, L. P., & Gale, J. E. (1995). *Constructivism in education*., Hillside, NJ: Laurence Erlbaum.

Steven, P. (1987). *Manufacturing Accounts*. In: *Work Out Accounting GCSE*. Macmillan Work Out Series. Palgrave, London. [https://doi.org/10.1007/978-1-349-09460-8\\_19](https://doi.org/10.1007/978-1-349-09460-8_19)

Stott, J.R. (1982). *Manufacturing Accounts and Production Costs*. In: *Mastering Principles of Accounts*. Macmillan Master Series. Palgrave, London. [https://doi.org/10.1007/978-1-349-16707-4\\_22](https://doi.org/10.1007/978-1-349-16707-4_22).

Sugeng, B. & Suryani, A. W. (2020). Enhancing the learning performance of passive learners in a Financial Management class using Problem-Based Learning. *Journal of University Teaching & Learning Practice*, 17(1), <https://ro.uow.edu.au/jutlp/vol17/iss1/5>

Tabachnick, B. G. & Fidell, L. S. (2019). *Using multivariate statistics*. (7<sup>th</sup> ed.). Pearson Education, Inc. Boston: Pearson.

Tam, M. (2000). Constructivism, Instructional Design, and Technology: Implications for Transforming Distance Learning. *Educational Technology and Society*, 3(2).

Teaching Guide for GSIs (2016). *Learning theory and research* (2016). Retrieved on 6<sup>th</sup> September 2021 from <http://gsi.berkeley.edu/media/Learning.pdf>

UNDP (2011). *Bawku West Human Development Report 2011: Resource Endowment, Investment Opportunities and the Attainment of MDGs*. Ghana. Retrieved from UNDP\_GH\_INCGRO\_DHDR2011\_Bawku-West-District.pdf

Vernon, D. T., & Blake, R. L. (1993). Does problem-based learning work? A meta-analysis of evaluative research. *Academic medicine*, 68(7), 550-63.

von Glaserfeld E: A (1995). *A constructivist approach to teaching*. *Constructivism in education*. Edited by: Steffe LP, Gale JE., Hillside, NJ: Lawrence Erlbaum Associates, 3-15.

Vygotsky, L (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Wally-Dima, L., & Mbekomize, C. J. (2013). Causes of Gender Differences in Accounting Performance: Students' Perspective. *International Education Studies*, 6(10), 13-26.

West African Examination Council. [WAEC]. (2013). *West African senior secondary certificate examination. Financial accounting 2&1*. Accra: WAEC.

West African Examination Council. [WAEC]. (2014). *West African senior secondary certificate examination. Financial accounting 2&1*. Accra: WAEC.

West African Examination Council. [WAEC]. (2015). *West African senior secondary certificate examination. Financial accounting 2&1*. Accra: WAEC.

West African Examination Council. [WAEC]. (2017). *West African senior secondary certificate examination. Financial accounting 2&1*. Accra: WAEC.

West African Examination Council. [WAEC]. (2018). *West African senior secondary certificate examination. Financial accounting 2&1*. Accra: WAEC

Weygandt, J. J., Kimmel, P. D. & Kieso, E. D. (2015). *Accounting principles*. 12<sup>th</sup> (ed.). 4. John Wiley & Sons, Inc



Winarti, E. R., & Waluya, S. B. (2019). The impact of problem-based learning using performance assessment on student's mathematical problem-solving ability. In *Journal of Physics: Conference Series*. 1321(3), 1-4. doi:10.1088/1742-6596/1321/3/032090

Wirkala, C., & Kuhn, D. (2011). Problem-based learning in k-12 education: is it effective and how does it achieve its effects? *American Educational Research Journal*, 48(5), 1157–1186.

Wood, F., & Sangster, A. (2008). *Business Accounting* (11<sup>th</sup> Ed.). Pearson Education Limited. The U.K.

World antidote to the standards and testing regime. *The New England Journal of Higher Education*, 19-20.

Yeboah-Appiagyeyi, K., Osei-Tutu, J., & Darkwa, B. F. (2014). Effect of professional qualification of financial accounting teachers on academic performance of financial accounting students in Tamale Metropolis of Ghana. *International Journal of research in social sciences*, 4(8), 83-91.

## APPENDICES

## APPENDIX A

## MANUFACTURING ACCOUNTS ACHIEVEMENT TEST (MAPT)

## PART A:

Select by ticking [  ] the option applicable to you

1. Gender: Male [  ] Female [  ]
2. Age: 11-15 [  ] 16- 20 [  ] 21 and above [  ]
3. Level : SHS 1 [  ] SHS 2 [  ] SHS 3 [  ]

**Choose the correct answer from the options provided below**

4. Manufacturing account is prepared by \_\_\_\_\_
  - (a) non-trading organizations
  - (b) non-governmental organizations
  - (c) shareholders
  - (d) manufacturing organizations
5. Manufacturing account has \_\_\_\_\_ accounts.
  - (a) one
  - (b) two
  - (c) three
  - (d) four
6. Manufacturing account ascertains cost of \_\_\_\_\_
  - (a) Goods produced
  - (b) finished Stock
  - (c) raw materials
  - (d) Goods brought in
7. Gross profit is ascertained from \_\_\_\_\_
  - (a) manufacturing account
  - (b) trading account
  - (c) profit and loss account
  - (d) balance sheet.
8. Prime cost represents \_\_\_\_\_
  - (a) the direct cost of production
  - (b) , the indirect cost of production
  - (c) , the overhead cost
  - (d) , and the total cost of production.
9. Manufacturing profit represents \_\_\_\_\_
  - (a) the profits made by the factory staff on Stock sold by them.
  - (b) The portion of the total gross profit attributable to the production of goods.

- (c) The profit-sharing bonus paid to manufacturing staff.
- (d) The excess of sales value over the cost of goods produced.

Use the following information to determine answers to questions 7 and 8:

Prime cost GH¢250,000; production overheads GH¢80,000; opening work-in-progress GH¢20,000; and closing work-in-progress GH¢30,000.

10. The cost of Stock produced is \_\_\_\_\_
  - (a) GH¢340,000
  - (b) GH¢380,000
  - (c) GH¢330,000
  - (d) GH¢320,000
11. Assuming that Saidat Affordable Factory has a policy of transferring Stock manufactured to Trading Account at a mark-up of cost plus 10%, the value of finished Stock moved will be \_\_\_\_\_
  - (a) GH¢352,000
  - (b) GH¢330,000
  - (c) GH¢374,000
  - (d) GH¢363,000
12. Which of the following is not a production overhead expense?
  - (a) Insurance of factory building
  - (b) Depreciation of factory equipment
  - (c) Royalty payable
  - (d) Foreman's salary
13. Net profit is ascertained from \_\_\_\_\_
  - (a) trading account
  - (b) profit and loss account
  - (c) manufacturing account
  - (d) balance sheet
14. An example of the cost of production which tends to remain fixed within a relevant range of output is \_\_\_\_\_
  - (a) work-in-progress
  - (b) direct labour costs
  - (c) direct expenses
  - (d) Stock of Stock
15. Opening work-in-progress minus closing work-in-progress equals \_\_\_\_\_
  - (a) labour cost
  - (b) production cost
  - (c) cost of raw materials
  - (d) Cost of finished Stock
16. Prime cost plus factory overheads equals \_\_\_\_\_
  - (a) labour cost
  - (b) production cost
  - (c) cost of raw materials
  - (d) Cost of finished Stock

17. Administrative and distribution expenses are set off against \_\_\_\_
- (a) net profit
  - (b) net loss
  - (c) gross profit on trading
  - (d) gross profit on manufacturing
18. Which of the following is a direct expense?
- (a) Carriage outwards
  - (b) Royalties
  - (c) Office salaries
  - (d) Depreciation
19. The financial position of a firm is shown by a \_\_\_\_\_
- (a) balance sheet
  - (b) trading account
  - (c) profit and loss account
  - (d) manufacturing account
20. Assets and liabilities are the components of a \_\_\_\_\_
- (a) manufacturing account
  - (b) trading account
  - (c) profit and loss account
  - (d) balance sheet
21. Assets minus capital equals \_\_\_\_\_
- (a) current liabilities
  - (b) liabilities
  - (c) bad debts
  - (d) accruals
22. Current assets minus current liabilities equal \_\_\_\_\_
- (a) invested capital
  - (b) borrowed capital
  - (c) stagnant capital
  - (d) working capital
23. Prepaid expenses are reported as \_\_\_\_\_
- (a) current assets
  - (b) fixed assets
  - (c) current liabilities
  - (d) short-term liabilities
24. Manufacturing account is prepared by \_\_\_\_\_
- (e) non-trading organizations
  - (f) non-governmental organizations
  - (g) shareholders
  - (h) manufacturing organizations
25. Manufacturing account has \_\_\_\_\_ accounts.
- (e) one

- (f) two  
(g) three  
(h) four
26. Manufacturing account ascertains cost of \_\_\_\_\_  
(e) Goods produced  
(f) finished Stock  
(g) raw materials  
(h) Goods brought in
27. Gross profit is ascertained from \_\_\_\_\_  
(e) manufacturing account  
(f) trading account  
(g) profit and loss account  
(h) balance sheet.
28. Prime cost represents \_\_\_\_\_  
(e) the direct cost of production  
(f) , the indirect cost of production  
(g) , the overhead cost  
(h) , and the total cost of production.
29. Manufacturing profit represents \_\_\_\_\_  
(e) the profits made by the factory staff on Stock sold by them.  
(f) The portion of the total gross profit attributable to the production of goods.  
(g) The profit-sharing bonus paid to manufacturing staff.  
(h) The excess of sales value over the cost of goods produced.

Use the following information to determine answers to questions 7 and 8:

Prime cost GH¢250,000; production overheads GH¢80,000; opening work-in-progress GH¢20,000; and closing work-in-progress GH¢30,000.

30. The cost of Stock produced is \_\_\_\_\_  
(c) GH¢340,000 (c) GH¢330,000  
(d) GH¢380,000 (d) GH¢320,000
31. Assuming that Saidat Affordable Factory has a policy of transferring Stock manufactured to Trading Account at a mark-up of cost plus 10%, the value of finished Stock moved will be \_\_\_\_\_  
(c) GH¢352,000 (c) GH¢374,000  
(d) GH¢330,000 (d) GH¢363,000
32. Which of the following is not a production overhead expense?  
(e) Insurance of factory building  
(f) Depreciation of factory equipment  
(g) Royalty payable  
(h) Foreman's salary
33. Net profit is ascertained from \_\_\_\_\_  
(e) trading account

- (f) profit and loss account  
(g) manufacturing account  
(h) balance sheet
34. An example of the cost of production which tends to remain fixed within a relevant range of output is \_\_\_\_\_  
(e) work-in-progress  
(f) direct labour costs  
(g) direct expenses  
(h) Stock of Stock
35. Opening work-in-progress minus closing work-in-progress equals \_\_\_\_\_  
(e) labour cost  
(f) production cost  
(g) cost of raw materials  
(h) Cost of finished Stock
36. Prime cost plus factory overheads equals \_\_\_\_\_  
(e) labour cost  
(f) production cost  
(g) cost of raw materials  
(h) Cost of finished Stock
37. Administrative and distribution expenses are set off against\_\_\_\_  
(e) net profit  
(f) net loss  
(g) gross profit on trading  
(h) gross profit on manufacturing
38. Which of the following is a direct expense?  
(e) Carriage outwards  
(f) Royalties  
(g) Office salaries  
(h) Depreciation
39. The financial position of a firm is shown by a \_\_\_\_\_  
(e) balance sheet  
(f) trading account  
(g) profit and loss account  
(h) manufacturing account
40. Assets and liabilities are the components of a \_\_\_\_\_  
(e) manufacturing account  
(f) trading account  
(g) profit and loss account  
(h) balance sheet
41. Assets minus capital equals \_\_\_\_\_  
(e) current liabilities  
(f) liabilities  
(g) bad debts  
(h) accruals

42. Current assets minus current liabilities equal \_\_\_\_\_
- (e) invested capital
  - (f) borrowed capital
  - (g) stagnant capital
  - (h) working capital
43. Prepaid expenses are reported as \_\_\_\_\_
- (e) current assets
  - (f) fixed assets
  - (g) current liabilities
  - (h) short-term liabilities



**PART B**

The following trial balance was extracted from the books of Saidat Affordable Factory as at 31/12/12:

	GH¢	GH¢
The stock of raw materials 1/1/12		8,400
The stock of finished Stock 1/1/12	15,560	
Work-in-progress 1/1/12		5,400
Direct labour GH¢72,000		
Indirect labour <u>GH¢58,000</u>		130,000
Royalties		2,800
Carriage inwards	1,400	
Purchase of raw materials	148,000	
Production machine (cost GH¢112,000)	92,000	
Accounting machine (cost GH¢8,000)	4,800	
General factory expenses	12,400	
Lighting and heating	3,000	
Factory power		5,480
Administrative salaries	17,600	
Salespeople salaries	12,000	
Commission on sales	4,600	
Rent and Rates		4,800
Insurance		1,680
General Administrative expenses	5,360	
Bank Charges	920	
Discounts allowed	1,920	
Carriage outwards	2,360	
Sales 400,000		
Debtors and Creditors	56,920	50,000
Bank	22,720	
Cash	600	
Drawings		8,000
Capital as at 1/1/12		<u>          </u>
<u>118,720</u>	<u>568,720</u>	<u>568,720</u>

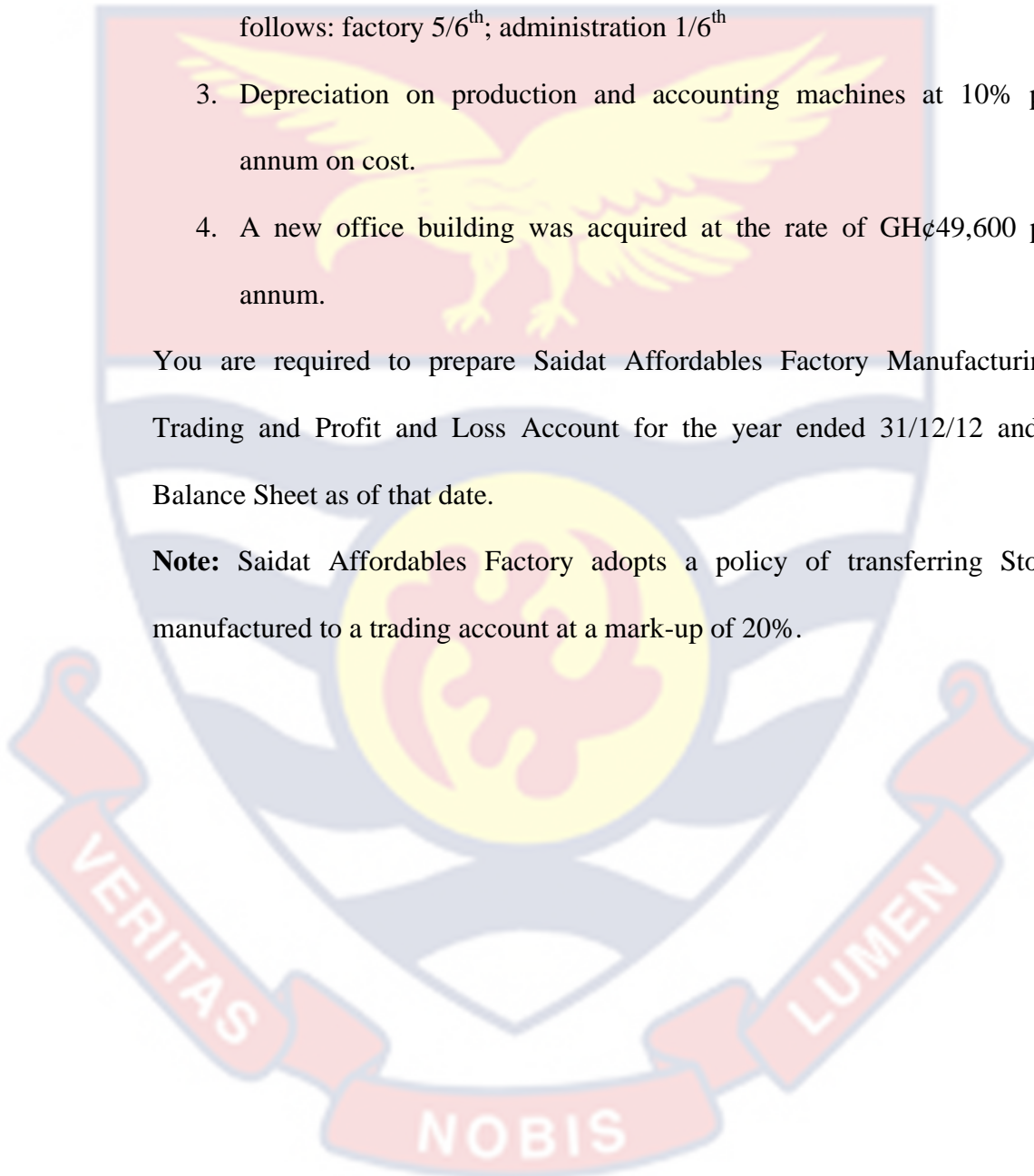


Additional information on 31/12/12:

1. Stock of raw materials was GH¢9,600, Stock of finished goods was GH¢16,000 and work-in-progress was GH¢6,000.
2. Lighting, heating, rent, rates and insurance are to be apportioned as follows: factory  $\frac{5}{6}$ <sup>th</sup>; administration  $\frac{1}{6}$ <sup>th</sup>
3. Depreciation on production and accounting machines at 10% per annum on cost.
4. A new office building was acquired at the rate of GH¢49,600 per annum.

You are required to prepare Saidat Affordables Factory Manufacturing, Trading and Profit and Loss Account for the year ended 31/12/12 and a Balance Sheet as of that date.

**Note:** Saidat Affordables Factory adopts a policy of transferring Stock manufactured to a trading account at a mark-up of 20%.



**Topics, Duration and Learning Outcomes of the Entry Documents**

Entry Documents	Unit	Duration/WEEKS	Learning Outcomes
Worksheet 1	1. The primary purpose of a manufacturing concern	1	1. Identify the nature and purpose of manufacturing concerns.
Worksheet 2		1	
Worksheet 3	2. Cost classification	1	2. Identify the three types of inventory used in manufacturing concerns. 1. State and explain elements of cost. 2. State the components of each cost element.
Worksheet 4	3. Computation of prime cost and production cost	2	2. Determine the prime cost of manufacturing. 3. Identify factory overheads. 4. Adjust opening work in progress and closing work in progress. 5. Calculate the production cost of a manufacturing firm.
	4. Preparation of final account for a manufacturing concern		
			1. Prepare the final account of manufacturing concerns.

**PROBLEM-BASED LEARNING LESSON PLANS ON  
MANUFACTURING ACCOUNTS (EXPERIMENTAL GROUP)**

**Problem-based learning Lesson Plan I**

School: ZEBILLA SHTS

programme: Business

Topic: Manufacturing Accounts

Class: SHS 3

Semester: first

Lesson Duration: 2hrs

Date:

**Lesson Objectives:** By the end of this class, the students should be able to:

- (a) State the meaning, components, and justifications for preparing manufacturing accounts
- (b). Explain the terms used in manufacturing accounts
- (c) Calculate the price of the raw materials used in manufacturing, the primary production cost, the factory overhead, and the overall production cost.

**RPK:** The students are familiar with the objectives of trading, profit or loss account manufacturing companies.

**Instructional Materials:** Financial Accounting Textbook by Eric Oduro, Financial accounting syllabus SHS, a whiteboard, erasable markers and a note of lesson to guide the teacher.

**Instructional Strategy/Techniques:** Problem-based learning and discussion groups.

**Instructional procedure/Presentation**

<b>Step</b>	<b>Lesson content</b>	<b>Teacher's Activity</b>	<b>Students' Activity</b>
I	Meaning, segments and reasons for preparing manufacturing accounts.	The teacher introduces himself to the students and tells them the meaning and the essence of manufacturing accounts. He explains more by mentioning the segments of manufacturing accounts, such as the manufacturing, trading and profit and loss accounts. After outlining the lesson's goals, he breaks the class into smaller groups. The groups are then given additional instructions on what to do when representatives from each group have been appointed. The instructor explains the rationale of creating manufacturing accounts.	The students discuss the meaning, segments and reasons for preparing manufacturing accounts. In their groups, the students ask questions among themselves on the lesson taught and other students are allowed to proffer answers to the questions.
II	Terminologies used in manufacturing accounts.	The teacher writes the terms on the whiteboard for students to discuss among themselves. Cost of raw materials, primary production costs, administrative costs within the factory, and overall production costs. The teacher briefly defines each.	Each group discusses the meaning and terminologies used in manufacturing accounts to the best of their knowledge and asks questions among themselves for clarity.

III	An illustration reflecting the terminologies is given to the students.	The teacher reviews the steps to arrive at each terminology before seeing the students work in groups to discuss and discover new concepts.	Students work cooperatively in learning what has been illustrated by the teacher.
IV	Evaluation	The teacher uses the following criteria to evaluate the students: (a) Explain what manufacturing accounts mean. (a) List the categories and justifications for creating manufacturing accounts. (c) Describe the terminologies used in manufacturing accounts. (d) Describe the steps taken to arrive at each of the terminologies.	The students answer the questions and ask for explanations where necessary.
V	Summary and Assignment	The teacher summarises the lesson and comments how successfully the students worked together to accomplish the lesson's goals in groups. He then asks the students to learn more about manufacturing accounting to establish gross profit on manufacturing, cost of completed goods produced, and gross trading profit for the following class.	The assignment is noted down by the learners so that learners can study in groups and be ready for the subsequent lesson.

**Problem-Based Learning Lesson Plan 2**

School: ZEBILLA SHTS  
programme: Business  
Topic: Manufacturing Accounts  
Class: SHS 3  
Semester: first  
Lesson Duration: 2hrs  
Date:

**Lesson Objectives:** By the end of the lesson, students should be able to:

- (a) Use a prepared manufacturing and trading account to identify gross profit on manufacturing, cost of completed goods produced, and gross trading profit.
- (b) Create a trade and manufacturing account.

The pupils can already calculate the cost of the raw materials utilized, the prime cost of production, factory overhead, and the overall cost of production.

The instructional materials include a textbook on financial accounting, a whiteboard, erasable markers, and a lesson plan.

**Instructional strategies/techniques:** Discussion groups and problem-based learning.

**Set Induction:** The teacher asks the students to estimate the cost of raw materials utilized and the prime cost of production based on an example to refresh their memories of the previous session.

**Instructional Procedure/Presentation**

<b>Step</b>	<b>Lesson content</b>	<b>Teacher's activity</b>	<b>Students' activity</b>
I	Definitions of the terms "cost of finished goods produced," "gross manufacturing profit," and "gross trading profit."	The teacher describes the lesson's goals and defines the terms "cost of goods produced," "gross profit on manufacturing," and "gross profit on trading."	Each group actively participates in the lecture by explaining to any group members who do not comprehend the teacher's explanation.
II	Preparation of manufacturing and trading accounts.	The teacher prepares a manufacturing and trading account on the whiteboard to show gross manufacturing profit, cost of producing completed goods, and gross trading profit. He goes into more detail about how those items were obtained.	The groups discuss among themselves to comprehend and identify the items concerning the procedures involved.
III	More illustrations are given and worked.	As the students work together in groups to complete their studies, the teacher provides more examples and goes around to direct them.	The students study cooperatively to master what has been taught.
IV	Evaluation	The teacher asks the following questions to the groups to assess the lesson: From the provided example, identify the cost of finished goods produced, the manufacturing gross profit, and the trade gross profit	Students observe and answer the questions orally and in writing.
V	Summary and Assignment	The teacher presents a class summary and assigns the students to write out a manufacturing and trading account to be turned in at the subsequent lesson. The teacher also instructs the pupils to review the manufacturing balance sheet and profit and loss account in preparation for the upcoming lecture.	The students take down the assignment to work inter-dependently in groups by offering academic assistance to group members where necessary.

**Problem-based learning Lesson Plan 3**

School: ZEBILLA SHTS  
Programme: Business  
Topic: Manufacturing Accounts

Class: SHS 3

Semester: first

Lesson Duration: 2hrs

Date:

**Lesson Objectives:** By the end of this lesson, the students should be able to:

- (a) Create a manufacturing profit and loss account to determine a net profit or loss.
- (b) Explain what a balance sheet means.
- (c) List the elements that make up a balance sheet.

**Entry Behaviour:** The students can prepare manufacturing and trade accounts already.

**Instructional Materials:** A whiteboard, erasable markers, a financial accounting textbook, and a lecture note are also required.

**Instructional Strategy/Techniques:** Problem-based learning and discussion groups.

**Set Induction:** The teacher helps the students to recall the previous lesson by asking them a question(s) on manufacturing and trading accounts.



**Instructional Procedure/Presentation:**

Step	Lesson content	Teacher's activity	Students' activity
I	Submission of Assignment	The teacher requests the final assignments on preparing a manufacturing and trading account. Based on the completed projects, the teacher evaluates the pupils' level of knowledge and makes appropriate comments.	The groups submit their assignments to the teacher through their group representatives.
II	Manufacturing profit and loss account.	The teacher explains the procedures for preparing a manufacturing profit and loss account.	Students reciprocate by asking and answering questions among themselves. Difficult questions are referred to the teacher.
III	Illustration on the preparation of manufacturing profit and loss account.	The teacher gives an illustration showing the procedures involved in preparing a manufacturing profit and loss account to arrive at the net profit or loss, as the case may be.	Students discuss and assist one another in explaining and working on the illustration, asking and answering questions where necessary.
IV	Balance sheet	The teacher tells the students the balance sheet's meaning and components, including assets and liabilities.	The students observe and discuss the meaning and components among themselves for in-depth understanding.
V	Components of a balance	The teacher further explains the meaning of assets as what	The students discuss

	sheet.	belongs to a business (in this case, a manufacturing firm), e.g. factory/office building, plant/machinery for production, furniture/ fittings, debtors, cash in hand, cash at bank, etc. At the same time, liabilities represent what the business owes to outsiders, e.g. creditors, loan/overdrafts, etc.	the components among themselves, asking and answering questions among themselves. Difficult questions and explanations are referred to the teacher.
VI	Preparation of a balance sheet.	The teacher demonstrates the steps needed in preparing a balance sheet by clearly displaying the assets and liability sides in a balance sheet style.	The students collaborate to produce a balance sheet using the instructions provided in the illustration.
VII	Evaluation	The teacher assesses the lesson by posing the following inquiries about the material covered: (a) Explain what a balance sheet means. (b) What constitutes a balance sheet's components?	The students respond to the questions as best they can and ask the member groups for more help.
VIII	Summary and Assignment	Following a class summary, the teacher assigns students to prepare a manufacturing profit and loss account and a balance sheet for submission.	The students collaborate in groups to prepare a balance sheet and a manufacturing profit and loss statement, asking and answering questions and providing clarifications as needed.

**Problem-based learning Lesson Plan 4**

School: ZEBILLA SHTS  
Programme: Business  
Topic: Manufacturing Accounts  
Class: SHS 3  
Semester: first  
Lesson Duration: 2hrs  
Date:

**Lesson Objectives:** At the end of this lesson, the students should be able to:

- (a) Prepare a Manufacturing, Trading and Profit and Loss Accounts.
- (b) Prepare a Balance Sheet.

**Entry Behaviour:** The students are already familiar with the procedures for preparing manufacturing, trading, profit and loss accounts, and a balance sheet.

**Instructional Materials:** A financial accounting textbook, a whiteboard, erasable markers and a note of lesson.

**Instructional Strategy/Techniques:** Problem-based learning and discussion groups.

**Set Induction:** The teacher asks the students to highlight the procedures for preparing manufacturing, trading and profit and loss accounts.

**Instructional Procedure/Presentation.**

<b>Step</b>	<b>Lesson content</b>	<b>Teacher's activity</b>	<b>Students' activity</b>
I	Comprehensive illustrations of manufacturing accounts	The teacher gives complete descriptions of preparing manufacturing, trading, profit and loss statements, and a balance sheet. Proctors (student-teachers) are appointed by the professional teacher from among the groups to offer group members intensive explanations on the topic to enable them to gain mastery of the subject.	With the help of the proctors, the students work interdependently harder to learn and gain mastery of the topic taught.
II	Illustrations continue	The teacher observes the proctors as they offer individualized assistance to each group member to ensure that the lesson objectives are attained.	Any group member who is not clear asks the proctors questions for clarity purposes. Difficult questions are referred to the teacher.
III	Evaluation	The proctors evaluate their respective group members based on the following: (a) Prepare a manufacturing, trading and profit and loss accounts and (b) A balance sheet from a given question. This is to ascertain the extent of mastery of the topic by the members, then report back to the professional teacher. Based on the report, the experienced teacher confirms whether the group members have gained mastery of the topic by reassessing the students on the lesson objectives.	The students work in groups to answer the questions as asked by the proctors.
IV	Summary and Revision	The professional teacher summarizes the lesson and asks the proctors to revise the study with the group members further. After the revision, the experienced teacher fixes a date for a test.	The group members continue to proffer solutions to as many questions as possible on the lesson to the group members.
V	Test	The professional teacher dissolves the groups, mixes up the students and tests them on the topic taught.	The students individually offer written answers to the questions given to them on the test and submit them to the professional teacher for marking.

**MEMORIZATION LESSON PLANS ON MANUFACTURING****ACCOUNTS (CONTROL GROUP)****Memorization Lesson Plan 1**

School: Kusnaba SHS

Programme: Business

Topic: Manufacturing Accounts

Class: SHS 3

Semester: first

Lesson Duration: 2hrs

Date:

**Lesson Objectives:** At the end of this lesson, the students should be able to:

- (a) State the meaning, segments and reasons for preparing manufacturing accounts.
- (b) Explain the terminologies used in manufacturing accounts.
- (c) Compute the cost of raw materials used in production, the prime cost of production, factory overhead expenses and the total cost of production.

**Entry Behaviour:** The students are familiar with the objectives of manufacturing companies.

**Instructional Materials:** Financial Accounting Textbook by Eric Oduro, financial syllabus for SHS, whiteboard, erasable markers and a note of lesson to guide the teacher.

**Instructional Strategy/Techniques:** Memorization and explanation.

**Set Induction:** The teacher asks the students about the objectives of manufacturing companies.

**Instructional Procedure/Presentation**

Step	Lesson content	Teacher's activity	Students' activity
I	Meaning, segments and reason for preparing manufacturing account.	As part of the course introduction, the teacher explains the meaning, components, and justifications for creating manufacturing accounts.	While the teacher speaks, the students are taking notes.
II	Terminologies used in manufacturing accounts	The terms used in manufacturing accounts are listed on the whiteboard for pupils to replicate. The instructor delivers a brief explanation.	Students hear lectures and take notes.
III	Illustration	The teacher describes the steps taken to arrive at the stated terminology using an example.	When required, students take notes and ask questions.
IV	Evaluation	The following inquiries help the teacher assess the lesson: (a) Explain the purpose, categories, and justifications for preparing manufacturing accounting. (b) Explain the terms used in manufacturing accounts.	The students respond to the teacher's queries exactly.
V	Summary and Assignment.	Using the lesson goals as a guide, the teacher summarizes the lesson. He assigns a homework task for the children to complete at home.	As they copy the assignment out of the board, students pay attention.

**Memorization Lesson Plan 2**

School: Kusanaba SHS

Programme: Business

Topic: Manufacturing Accounts

Class: SHS 3

Semester: first

Lesson Duration: 2hrs

Date:

**Lesson Objectives:** By the end of this lesson, students should be able to:

- (a) identify gross profit on manufacturing, cost of finished goods produced and gross trading profit from a prepared manufacturing and trading account.
- (b) Prepare a manufacturing and trade account.

**Entry Behaviour:** The students already can work to arrive at the cost of raw materials used, prime cost, factory overhead, and total cost of production.

**Instructional Materials:** Financial accounting textbook, a whiteboard, erasable markers and a lesson note.

**Instructional Strategy/Techniques:** Memorization, explanation and drill/practice.

**Set Induction:** The teacher refreshes the students' memory on the previous lesson by asking them to calculate the cost of raw materials used and the the prime cost of production from a given an example.

**Instructional Procedure/Presentation**

<b>Step</b>	<b>Lesson content</b>	<b>Teacher's activity</b>	<b>Students' activity</b>
I	Definitions of the terms "cost of goods produced," "gross manufacturing profit," and "gross trading profit."	The teacher introduces the lesson's objectives and defines the terms "cost of goods produced," "gross profit on manufacturing," and "gross profit on trading."	The teacher discusses the definitions of cost of goods produced, gross profit on manufacturing, and gross profit on trade as the students pay attention.
II	Preparation of manufacturing and trading accounts.	In order to illustrate his points, the teacher prepares a manufacturing and trading account.	The students copy from the whiteboard.
III	More illustrations are given and worked.	The teacher works illustrations to enable students to understand the lesson more.	The students copy the worked illustrations and ask questions where necessary.
IV	Evaluation	The teacher evaluates the lesson based on the lesson objectives.	The students answer questions as asked by the teacher.
V	Summary and Assignment	The teacher summarises the lesson and assigns homework for the students to complete and turn in at the subsequent address.	The students hear the summary and then duplicate the supplied homework.



**Memorization Lesson Plan 3**

School: Kusanaba SHS  
Programme: Business  
Topic: Manufacturing Accounts

Class: SHS 3

Semester: first

Lesson Duration: 2hrs

Date:

**Lesson Objectives:** At the end of this lesson, the students should be able to:

- (a) Prepare a manufacturing profit and loss account to arrive at a net profit/loss.
- (b) State the meaning of a balance sheet.
- (c) State the components of a balance sheet.

**Entry Behaviour:** The students already can prepare manufacturing and trading accounts.

**Instructional Materials:** A financial accounting textbook, a whiteboard, erasable markers and a note of lesson.

**Instructional Strategy/Techniques:** Memorization, explanation and drill/practice.

**Set Induction:** The teacher helps the students to recall the previous lesson by asking them a question(s) on manufacturing and trading accounts.

**Instructional Procedure/Presentation**

<b>Step</b>	<b>Lesson content</b>	<b>Teacher's activity</b>	<b>Students' activity</b>
I	Submission of Assignment	The teacher requests for the submission of the assignment given in the previous lesson.	The students submit the assignment through their course representatives.
II	Manufacturing profit and loss account.	The teacher introduces the lesson for the day, manufacturing profit and loss accounts and explains the procedures involved in its preparation.	The students listen and take down notes.
III	An illustration of manufacturing profit and loss account.	The teacher uses an illustration to prepare a manufacturing profit and loss account to arrive at a net profit/loss.	The students copy and ask questions where necessary.
IV	Balance sheet	The teacher states the meaning of a balance sheet.	The students listen and take down notes.
V	Components of a balance sheet	The teacher mentions the components of a balance sheet and explains thus: the features of a balance sheet include assets and liabilities. Assets represent what belongs to the business, e.g. factory/office building, plant and machinery, debtors, cash, etc. Liabilities represent a company's indebtedness to outsiders, e.g., creditors, loan/overdraft, etc.	The students listen and copy notes, asking questions where necessary.
VI	Preparation of a balance sheet	The teacher states the procedures involved in preparing a balance sheet showing the assets and liabilities clearly.	The students listen and copy notes.
VII	Evaluation	The teacher evaluates the lesson based on the lesson objectives.	The students answer questions as asked by the teacher.
VIII	Summary and Assignment	The teacher summaries the lesson and gives the students an assignment to prepare a manufacturing profit and loss account and a balance sheet for submission.	The students copy the assignments and take them home.

**Memorization Lesson Plan 4**

School: Kusanaba SHS  
Programme: Business  
Topic: Manufacturing Accounts

Class: SHS 3

Semester: first

Lesson Duration: 2hrs

Date:

**Lesson Objectives:** At the end of this lesson, the students should be able to:

- (a) Prepare a Manufacturing, Trading and Profit and Loss Accounts.
- (b) Prepare a Balance Sheet.

**Entry Behaviour:** The students are already familiar with the procedures for preparing manufacturing, trading, profit and loss accounts, and a balance sheet.

**Instructional Materials:** A financial accounting textbook, a whiteboard, erasable markers and a note of lesson.

**Instructional Strategy/Techniques:** Memorization, explanation and drill/practice.

**Set Induction:** The teacher asks the students to highlight the procedures for preparing manufacturing, trading and profit and loss accounts.

**Instructional Procedure/Presentation**

Step	Lesson content	Teacher's activity	Students' activity
I	Comprehensive illustrations on manufacturing accounts.	The teacher comprehensively illustrates preparing manufacturing, trading, profit and loss accounts, and a balance sheet. He offers explanations where necessary.	The students listen and copy the illustrations for practice at home.
II	Evaluation	The teacher evaluates the lesson based on the lesson objectives.	The students answer the questions asked by the teacher.
III	Summary and Revision	The teacher summarizes the lesson by going through all that had been taught.	The students listen, copy notes and ask questions where necessary.
IV	Test	The teacher tests the students on the topic taught.	The students offer written answers to the test and submit them to the teacher for marking.