

Investigating the Effectiveness of Problem-based Learning in Improving Learner Achievement in Accounting at O.R. Tambo Inland District, Eastern Cape



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ABSTRACT

This study investigates the effectiveness of problem-based learning in improving learner achievement in a selected high school in the O.R. Tambo inland district in the Eastern Cape of South Africa. Given the demand for methods of teaching that improve problem-solving and critical thinking skills, problem-based learning emerges as one promising approach. Adopting a mixed approach design, data was collected from 23 learners from pre-tests and post-tests and learner and teacher reflections. Despite a small sample size and the time constraints, this study highlighted an improvement in learner achievement, understanding of accounting concepts, analytical skills and engagement. The social constructivist theoretical framework was adopted. However, challenges in learner experiences suggest a need for further research into the long-term effectiveness of PBL. It was recommended that learners should be made aware of problem-based learning before implementing it. Additionally, learners should be given enough time for the implementation of PBL, as a variety of students had trouble dealing with complex problems. It was also recommended that teachers should be trained on how to implement and adopt PBL into accounting education. The findings of the study will benefit all schools intending to reform accounting education with the end goal of achieving the intended outcomes in accounting.

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INTRODUCTION

Accounting education has an important role to play in preparing learners for future careers in accounting, such as taxation and financial accounting. Moreover, it equips learners with relevant skills such as problem-solving and critical thinking skills, which are considered to be important for active participation in economic and social environments.¹ Despite the importance of accounting education, current research shows that there has been an alarming decline in learner performance, enrolment rate and learner interest in accounting at the high school level, specifically in South Africa.² This concerning trend is particularly evident in the Eastern Cape province, where accounting learners in high schools are struggling with

¹ Bonnie Amelia Dean et al., “Transforming Accounting Curricula to Enhance Integrative Learning,” *Accounting & Finance* 60, no. 3 (September 24, 2020): 2301–38, <https://doi.org/10.1111/acfi.12363>.

² Chris J. Hendriks and Grace Felicia Dunn, “Factors That Influence Learners’ Performance in Grade 12 Accounting: A Case Study in the Northern Cape,” *Koers - Bulletin for Christian Scholarship* 86, no. 1 (June 17, 2021), <https://doi.org/10.19108/KOERS.86.1.2508>.

underperformance, worsened by issues such as lack of resources, inappropriate teaching methods and shortage of teachers.

Problem-based learning has emerged as a promising pedagogical approach that shifts from traditional teaching methods that encourage memorization to a more learner-centred approach that advocates for self-directed learning, problem-solving and critical thinking skills.³ Originating from Medical school in Canada at McMaster University around the 1950s, problem-based learning has been successfully adopted by other fields of study, such as engineering and recently by accounting.⁴ Although PBL is picking up some momentum in accounting, it is done in countries such as the United States of America, Taiwan and Canada.⁵ Problem-based learning is a student-centred approach rooted in constructivist theory that encourages critical thinking, collaboration, and problem-solving skills.⁶ Lastly, problem-based learning consists of facilitators and learners interacting to create a learning process that requires students to solve problems.⁷

Despite the scholarly interest gained by PBL over the years, there remains a limited number of empirical studies on its effectiveness, particularly in high school education, more specifically in South Africa. International studies, such as those of Eburn et al., conducted in Indonesia, have demonstrated the effectiveness of Problem-based learning in improving learning outcomes in accounting.⁸ However, the studies emphasise the importance of implementing PBL over a long period of time. In South Africa, research on problem-based learning still remains in its infancy, with studies focusing on higher education, such as that of Malajti et al.⁹ This highlights a noticeable gap in the literature on the potential effectiveness of PBL to enhance learner achievement, skills and the overall academic performance in high school accounting.

Given the poor performance and decline in enrolment rate in high schools, educators are exploring alternative teaching strategies. As a result of the above context, which stems from the interest of this study, this research investigated the effectiveness of Problem-based learning in improving learner achievement in accounting at a selected school in the O.R. Tambo inland district. Moreover, the study intended to the study seeks to provide clarity on its potential effect on learner achievement. With the objective mentioned above, this study aimed to address the lack of empirical studies and to contribute to the wider body of knowledge on teaching approaches that can foster better learning outcomes, as noted by Istigfarin and Andayani.¹⁰ The aim of the study is to investigate the effectiveness of problem-based learning in improving learner achievement in accounting.

LITERATURE REVIEW

Effectiveness of Problem-Based Learning in Student Knowledge

Problem-based learning has been shown to enhance student knowledge acquisition in theoretical and practical accounting subjects.¹¹ According to a study by Ahmed and Kannaiah, student knowledge

³ Nokuphiwa Felicia Hlongwane, "Strategies Used by Accounting Teachers to Teach Accounting Concepts in Grade 10: A Case Study of Accounting Teachers in Pinetown District" (University of KwaZulu-Natal, n.d.).

⁴ Ingrid Snijders et al., "Alumni Loyalty Drivers in Higher Education," *Social Psychology of Education* 22, no. 3 (2019): 607–27.

⁵ S. E. Malajti, L. Khumalo and C. Mtshika, "Skills Developed through Problem-Based Learning Approach and Its Benefits to Auditing Students in Higher Institutions in Developing Countries: A Literature Review" (University of Johannesburg., 2022).

⁶ Luis Fernando Santos-Meneses, Taras Pashchenko, and Aleksandra Mikhailova, "Critical Thinking in the Context of Adult Learning through PBL and E-Learning: A Course Framework," *Thinking Skills and Creativity* 49 (September 2023): 101358, <https://doi.org/10.1016/j.tsc.2023.101358>.

⁷ Eburn. A., Darussamin. A.M., and Safihie S.F.M, "Problem Based Learning: A Fauzi, A. and Respati, D.K., 2021. Development of Students' Critical Thinking Skills through Guided Discovery Learning (GDL) and Problem-Based Learning Models (PBL) in Accountancy Education." *Eurasian Journal of Educational Research* 95(2018): 210–26.

⁸ Eburn. A., Darussamin. A.M., and Safihie S.F.M, "Problem Based Learning: A Fauzi, A. and Respati, D.K., 2021. Development of Students' Critical Thinking Skills through Guided Discovery Learning (GDL) and Problem-Based Learning Models (PBL) in Accountancy Education."

⁹ Malajti, Khumalo and Mtshika "Skills Developed through Problem-Based Learning Approach and Its Benefits to Auditing Students in Higher Institutions in Developing Countries: A Literature Review."

¹⁰ Wilda Auwalina Istigfarin and Endang Sri Andayani, "Is the Implementation of Problem-Based Learning Appropriate? A Literature Review on Accounting Learning," *Dinamika Pendidikan* 18, no. 1 (June 25, 2023): 40–52, <https://doi.org/10.15294/dp.v18i1.42143>.

¹¹ R. Ahmed and D. Kannaiah, "Problem Based Learning In Accounting: Where Are We Now?," *International Business Research*. (Sydney [Preprint].2020).

acquisition supports the idea that PBL is effective in accounting.¹² However, the study did not specify the methods used to measure the retention of knowledge, which affects the reliability of its argument. Martins et.al. explored the effectiveness of PBL in accounting, and the findings of the study demonstrated that students were able to understand how theoretical concepts could be applied to real-world problem solving.¹³ This view is supported by Ahmed and Kannaiah, who state that problem-based learning is effective in enhancing student engagement and assisting them to acquire and retain knowledge for real-life situations.¹⁴ The results of their study prove PBL to be effective in bridging the gap between practice and theory and improving problem-solving skills.

Another study by Pike et. al. concluded that PBL was effective in promoting student learning, which improved their overall understanding of the subject.¹⁵ Additionally, students themselves agreed that PBL motivated them to participate actively in their own learning, and they were able to apply their knowledge from previous accounting courses to a capstone project. Moreover, problem-based learning provides students with intellectually stimulating challenges to help them master the subject material. Despite the study providing valuable insights into how effective problem-based learning is, the data from students can be biased.

Another study by Lai et.al. supported the effectiveness of PBL in accounting, with 71% of students expressing satisfaction with their learning experiences.¹⁶ However, the study was not without limitations, as the experiment and control groups were taught by two different educators, while the grading standards were the same. The conclusion of the study supports the idea that problem-based learning improves student engagement. However, the study could have benefited from one teacher teaching both the experimental and control groups and a more controlled design, which would improve the reliability of the study, as that can affect the results.

Stanley and Marsden found that 95% of students believed that PBL improved their ability to connect knowledge from different accounting courses.¹⁷ While the study provides valuable insights into the effectiveness of PBL in enhancing student interest and engagement, it used a descriptive case study as the research method and a questionnaire as the only form of data collection. The use of different teaching methods across accounting courses can influence the results of the study.

Problem-based learning is also active in combination with instructional approaches.¹⁸ For example, a study by Jibrin et.al., focused on the effects of cooperative and problem-based learning on secondary students interested in financial accounting in Nigeria.¹⁹ The study employed a quasi-experimental research design with a population of 217 students from different schools. The success of the study illustrated a positive effect on student interest in financial accounting. The researchers further stated that the adoption of problem-based learning would aid in improving the financial accounting skills of secondary school students. However, the study collected data from three different schools, all of which were taught by different teachers and adopted different teaching approaches. The use of these three different approaches across schools can introduce variability, which can impact the results of the study.

The current study benefited from having all three schools adopt a combination of PBL and cooperative and conventional teaching methods, and having students grouped as experimental and control groups would provide clearer insights. The researcher believes that the effect of cooperative and PBL on learner interest could be more reliable, as the effect of the study on learner interest cannot be easily measured in a school that uses conventional teaching methods. For example, Adamu and Jibrin criticized

¹² R. Ahmed and D. Kannaiah, "Problem Based Learning In Accounting: Where Are We Now?," *International Business Research*. (Sydney [Preprint]. , 2020).

¹³ D. B., Martins, M. B. Espejo, and F. Frezatti, "Problem-Based Learning in Management Accounting Teaching: Report of a Brazilian Experience," *Journal of Education and Research in Accounting* 9 (2015): 417–38.

¹⁴ Ahmed and Kannaiah, "Problem Based Learning In Accounting: Where Are We Now?"

¹⁵ J. C. Pike et al., "Role-Playing and Problem-Based Learning: The Use of Cross-Functional Student Teams in Business Application Development," *Information Systems Education Journal* 15 (2017): 75–83.

¹⁶ C S Hsu, S H Yen, and W H Lai, "The Effectiveness of Problem Based Learning in the Accounting Course," *Asian Journal of Finance & Accounting* 151 (2016).

¹⁷ Trevor Stanley and Stephen Marsden, "Accountancy Capstone: Enhancing Integration and Professional Identity," *Journal of Accounting Education* 31, no. 4 (2013): 363–82.

¹⁸ Mary Martin, "Promoting the Effectiveness of Problem-Based Learning," 2019, <https://api.semanticscholar.org/CorpusID:200067009>.

¹⁹ H. Jibrin et al., "Effects of Cooperative and Problem-Based Learning Methods on Secondary School Students Interest in Financial Accounting in Akoko-Edo, Edo State, Nigeria," *AAU Journal of Business Educators*, 4, no. 1 (2024): 414–22.

the conventional teaching strategy at the high school level as most teacher-centered approaches are utilized, which, as such, negates the interest and learner achievement of students.²⁰ Anyhow, this study aligns with the calls for reform in accounting education by adopting student-centered approaches such as PBL. The study would benefit from empirical data comparing conventional teaching strategies and student-centered teaching strategies.

Benefits of Problem-Based Learning in Accounting Education

Lim et.al. observed several benefits of problem-based learning, including enhanced problem-solving skills and critical thinking skills.²¹ The researchers further reported that students became highly motivated and interested in learning accounting. According to the study, the concern of accounting students lacking self-directed learning was addressed as students became more self-directed and were more responsible in their own learning. Lastly, the study provides valuable insight, stating that problem-based learning may pose challenges to students who rely mostly on teachers. The findings of the study align with the argument that PBL fosters important skills and improves student engagement. However, the study was not without limitations, as problem-based learning became challenging for some students to try. This suggests a need for support to assist students in the adoption of PBL. Overall, the adoption of PBL led to improved student achievement in accounting.

Research evidence shows that with the adoption of problem-based learning accounting, students developed common skills such as problem-solving skills, teamwork, critical thinking, and self-directed learning.²² Lai et al. reported that students in PBL greatly outperformed students in non-PBL in a second-year accounting final exam.²³ Similar results were found by Manaf et.al., where PBL students were superior to those in the control group.²⁴ The study provided evidence from financial accounting and concluded that PBL improved students' soft skills and leadership abilities. The study employed a questionnaire as a form of collecting data, and they concluded results on 267 students who attended the PBL and non-PBL methods out of 148 students. The limitation of their study is that they used a small sample and relied only on a questionnaire to draw conclusions, which limits the strength of the findings. The study could have been aided by using a larger sample of the population and additional data collection methods to conclude on the effectiveness of PBL.

Some studies have found PBL to be beneficial in accounting as students developed communication skills, teamwork, and problem-solving skills.²⁵ Ahmed and Kannaiah further reported additional skills that students developed, such as presentation skills and communication skills. Other benefits of adopting PBL in accounting include increased student satisfaction and enhanced knowledge acquisition and retention.²⁶

While the reviewed literature demonstrates valuable insights on the effects of Problem-based learning in accounting and its benefits, there is a huge gap in education research focusing on high school contexts in South Africa. This gap in the literature arises from a lack of comparative studies, studies understanding the socio-economic and cultural factors influencing the pedagogical shift to PBL, and teacher development and training to implement PBL effectively. Lastly, there is a lack of longitudinal studies that focus on the effectiveness of PBL on learner achievement and academic performance in South

²⁰ Adamu Ibrahim and Jibril Alhaji Haruna, "Effects Of Flipped And Conventional Teaching Approaches On Performance And Retention Ability Of Students In Advance Financial Accounting In Abubakar Tafawa Balewa University Bauchi, Nigeria," 2017, <https://api.semanticscholar.org/CorpusID:73626129>.

²¹ H. Lim, et al., "PBL in Accounting: Loyens, S.M., Wijnia, L., Van Der Sluijs-Duker, I. and Rikers, R.M., 2020. Problem-Based Learning," in *Oxford Research Encyclopedia of Education*, 2020.

²² Lim, et al., "PBL in Accounting: Loyens, S.M., Wijnia, L., Van Der Sluijs-Duker, I. and Rikers, R.M., 2020. Problem-Based Learning"; Malajti, Khumalo and Mtshika "Skills Developed through Problem-Based Learning Approach and Its Benefits to Auditing Students in Higher Institutions in Developing Countries: A Literature Review."

²³ L.C. Tan, Z.C. Lin, and S.Y. Lai, "Developing a Mobile Problem-Based Learning System: A Preliminary Study.," *International Journal of Scientific Knowledge* 5, no. 4 (2014): 1–13.

²⁴ N. A. A. Manaf, Z. H. Ishak, and W. N. Wan, "Application of Problem Based Learning ((PBL) in a Course on Financial Accounting Principles," *Malaysian Journal of Learning and Instruction* 8 (2011): 21–47.

²⁵ Malajti, Khumalo, and Mtshika, "Skills Developed through Problem-Based Learning Approach and Its Benefits to Auditing Students in Higher Institutions in Developing Countries: A Literature Review."

²⁶ Ahmed and Kannaiah, "Problem Based Learning In Accounting: Where Are We Now?"

Africa. Further research is needed to investigate how problem-based learning can be adapted for high school accounting education and the challenges of implementing PBL in the school context.

THEORETICAL FRAMEWORK

The Social Constructivism Theoretical Framework was chosen as a guiding theory for this research. As per Santos-Meneses et. al. and Marra et.al., Problem-based learning is a pedagogical approach that is underpinned by the constructivist assumption of learning.²⁷ Social constructivism emphasises that the learner's construction of knowledge is the product of social interaction, interpretation, and understanding.²⁸ Problem-based learning is like any other learning approach, such as inquiry learning, which originated from a constructivist approach to teaching and learning, where students are actively engaged in their learning.²⁹ Additionally, Barut et al. fondly expressed that social interaction through groups results in constructive learning, as group work is considered a major aspect of problem-based learning.³⁰ The social Constructivist Theoretical framework is suitable for this PBL, which requires learners to be placed in a collaborative group and engage in socialisation when constructing knowledge, which is often a key component of PBL.

METHODOLOGY

This study adopted a mixed methods design for data collection and analysis, allowing for the attainment of extensive data and the drawing of strong conclusions.³¹ To achieve the research objectives, three sets of data were collected and analysed: the first set consisted of pre-test and post-test marks, the second set involved an open-ended questionnaire, and lastly, interviews were administered. Initially, a lengthy study to observe the effectiveness of Problem-Based Learning on final controlled test results over time was planned, but due to time constraints, the study was shortened. The study investigated the effectiveness of PBL on learner achievement in accounting by selecting one accounting class of 23 students, with 13 males, all of whom were taught using traditional teaching methods for over a month before the PBL approach was implemented for two weeks.

A stratified purposive sampling strategy was employed, resulting in a sample size of 11 participants, including one educator from a selected school in the O.R. Tambo inland district, Eastern Cape Province. The educator and learners were interviewed, and a questionnaire was administered to the learners. The research design followed an explanatory sequential approach, where students were taught using the same method for more than a month, and the Term 3 results were used to assess the effectiveness of PBL. Data was gathered using pre- and post-tests, questionnaires, and interviews, and analysed through both quantitative and qualitative methods. Descriptive statistics were used for quantitative data analysis, while thematic and narrative analysis were employed for qualitative data, with the researcher identifying patterns and themes from transcribed interviews. The researcher used tables and spreadsheets to organise the data, providing a comprehensive overview of PBL's effectiveness in enhancing learner achievement in accounting.

Ethical Considerations

The Eastern Cape Department of Education and the school principal for each school granted permission before the transmission of this study. The researcher explained why it is essential that associates participate in this study in their capacity as experts. As soon as possible, the researcher sent a letter requesting permission to conduct the research to the school's principal, teachers, and learners. Every participant was given an informed consent form before they participated in this study; in the cases of

²⁷ Santos-Meneses, Pashchenko, and Mikhailova, "Critical Thinking in the Context of Adult Learning through PBL and E-Learning: A Course Framework"; R. Marra et al., "Why Problem-Based Learning Works: Theoretical Foundations.," *Journals on Excellence in College Teaching*. 25, no. 3&4 (2014): 221–38.

²⁸ L. Vygotsky, *Thought and Language*, ed. Eugenia Hanfmann and Gertrude Vakar (Cambridge, MA: MIT Press, 1962).

²⁹ Cassandra M Bergstrom et al., "Effects of Problem-Based Learning on Recognition Learning and Transfer Accounting for GPA and Goal Orientation," *The Journal of Experimental Education* 84, no. 4 (2016): 764–86.

³⁰ Mehmet Barut et al., "Problem-Based Learning in Accountancy: An Empirical Study," *IOSR Journal of Research & Method in Education* 6, no. 6 (2016): 50–58.

³¹ Yujia Gao, "An Evaluation of the Application of Mixed Research Methods in Educational Research," *International Journal of New Developments in Education* 4, no. 6 (2022): 89–93.

learners below the age of 18, parents were requested to sign the consent form on their behalf. The principal of each school granted permission to carry out this study. The participants were assured that the data collected would be used for academic purposes only. The data was only accessible to the researcher and the supervisor. Interviewees were anonymous. Names of participants were not revealed in this study. Principles of the Ethical Code of Conduct were highly prioritised.

The researcher emphasised to all participants that they have the right to withdraw from the study at any point, particularly if they feel uncomfortable or distressed during their involvement. This assurance of freedom to withdraw is a crucial ethical consideration in qualitative research, as it helps to foster an environment of trust and respect between the researcher and participants.

PRESENTATION OF FINDINGS AND DISCUSSION

This section discusses the findings of the analysis carried out in this study. The discussion begins by describing the descriptive statistics of the data considered in this study, followed by qualitative data analysed through thematic analysis.

Table 1 : Descriptive statistics

| | Min | Q1 | Median | Q3 | MAX | Mean |
|-------------------|-----|----|--------|----|-----|------|
| Pre-test 1 score | 9 | 15 | 19 | 26 | 37 | 20 |
| Pre-test 2 scorer | 9 | 17 | 21 | 28 | 33 | 23 |
| Post-test scores | 7 | 22 | 33 | 50 | 68 | 33 |

Based on Table 1, the average marks for the Final post-controlled test (33%) demonstrate that students scored better in the post test as compared to pretests 1 and 2. The minimum and maximum scores for all three tests also indicate that students’ performance post-test was better than pre-tests.

Table 1 indicates an improvement in learner achievement and academic performance after the intervention of problem-based learning. The mean score in post-test (33) is greater than pre-test scores (pre-test 1: 20; pre-test 2: 23). Furthermore, the quartiles (Q1, Q3) suggest that not only did average students perform better, but a larger number of the class performed exceptionally well. Table 1 indicates a great shift in test scores, implying a better application and understanding of accounting concepts.

Table 2 : Students’ perceptions about the Effectiveness of Problem-Based Learning in improving learner achievement in Accounting.

| Statements | Total ^a | Mean | S.D ^b |
|---|--------------------|------|------------------|
| 1. PBL effect on the Understanding of accounting Concepts | 46 | 4.6 | 0.51 |
| 2. Effectiveness of PBL on Retention of Knowledge | 38 | 3.8 | 1.0 |
| 3. PBL on Motivation and Engagement | 40 | 4 | 0.47 |
| 4. Critical, analytical and problem-solving skills | 42 | 4.2 | 0.42 |
| 5. Overall academic performance | 48 | 4.8 | 0.42 |
| 6. Compared to the traditional teaching method | 41 | 4.1 | 0.87 |

Note (a): Using 5 points of the Likert Scale (5= Strongly agree, 4= Agree, 3= Neutral, 2= Disagree, 1= Strongly Disagree), the total scores are the sum of the responses gathered from 10 students.

(b): denotes the standard deviation

The findings in Table 2 align with the improvement in test scores, showing learners' perceptions of the effectiveness of problem-based learning. The mean of 4.6 (SD- 0.51) for the effect of PBL on learner understanding of concepts complements the score in Table 1. According to the collected data, students perceived PBL to be effective in developing analytical, problem and critical skills, as shown with a low standard deviation (0.42), expressing consistency in learner responses. Despite the impact of PBL as perceived by students, the higher standard deviation (0.87) suggests that some students prefer the conventional method of teaching.

QUALITATIVE DATA:

For research purposes and participant confidentiality, participants were coded as follows:

Learners are coded as: **Accounting Learner (AL)**

The educator is coded as follows: **Accounting Educator (AE)**

Content analysis was applied to the students' and teachers' responses to identify key phrases in their answers to each question.

Data Interpretation (Educator)

Learner Mastery of Concepts Compared to Conventional Methods

As PBL encourages students to apply their knowledge to real-world problems, the educator noted that learners developed a deeper understanding of accounting concepts through PBL compared to conventional teaching methods.

AE: "I've observed that students, through the adoption of PBL, master accounting concepts more effectively. Unlike their tendency of memorizing numbers and answers, they apply what they learnt to real-world problems, which I believe leads to this better knowledge retention and understanding"

Skills Developed Through PBL

The response from the educator suggests that PBL has contributed to the development of critical thinking, analytical skills, and problem-solving abilities in learners. These skills are particularly important in accounting, where learners must apply rules and principles to various financial scenarios.

AE: "PBL has undoubtedly equipped students with essential skills, as I noticed that their analytical skills in analysing transactions have improved and their ability to solve problems. They now approach problems with caution and often apply different ways to reach answers."

Engagement and Participation

The educator noted increased engagement and participation in class. PBL's collaborative structure encourages all students, even those who are typically passive, to contribute and stay motivated.

AE: "From what I see, this problem-based Learning improved classroom interaction and participation. Students are more aroused and are interested in taking part in discussions, and the group work keeps them on their toes. Even students who are shy now become involved."

Change in Assessment Outcomes

There was noticeable improvement in assessment outcomes, even though some still faced difficulties with theoretical concepts, which overall affected their outcome.

AE: "Yes, I did see an improvement in assessment outcomes during this period as compared to other terms. They performed better than I expected."

Long-Term Benefits

According to the educator, most learners who showed signs of improved self-confidence are no longer afraid of one another, and they can work independently. This will not benefit them; only skills are likely to benefit them in both academic and professional settings.

AE: "The long-term benefit I see is that their self-confidence level in dealing with difficult questions will increase. I think they will stop relying on the teacher too much, and they seem more prepared to learn. "

Data Interpretation (Learners):

Understanding and Retention

- AL 1: "PBL was helpful because we had to do things ourselves and not rely on the teacher. I remember most of what I learnt when I apply it to real problems, unlike when I just memorize notes for tests."
- AL 2: "It took me some time to grasp and get used to it, but I now think I understand accounting better. The way we used to be taught didn't make me think as much as this one does."
- AL 4: "It has helped me to relate what I learned to real-life accounting scenarios. Before this, I would just forget everything after the test."
- AL 7: "I can truly say I understand accounting much better than before. It is not easy, but I got to remember most of what I learnt."
- AL 8: "I like problem-based learning because it demonstrates how we should do accounting and how it actually is. It is harder than just reading and memorizing, but I remember things better now."
- AL 9: "For me, it is effective given that we do not perform well in accounting because we have to apply what we learn in accounting, and that it makes the concepts stay with me."
- AL 3: "I struggled at first because I was not used to learning that way. I thought it was too difficult, but after a few problems, it became clear, and it then became easy to remember most of the subject matter"
- AL 5: "I think problem-based learning is confusing, as I normally do not know where to start but, it helped me understand better"
- AL 6: "For me, the conventional approach was much easier because I prefer straightforward instructions. Problem-Based Learning makes me think more, even though I do not retain information as much as I want."
- AL 10: "I still want the way we usually learn accounting, but PBL opened my eyes to understanding accounting"

The above responses seem to suggest that learners agree that problem-based learning improved their understanding of accounting concepts. The responses indicate that PBL was effective in knowledge retention as compared to the traditional approach. However, some respondents suggested that some learners may need extra support in adopting and pedagogically shifting to Problem-Based Learning.

Motivation and Engagement in Learning Accounting

In this probing secondary question, learners reported that PBL enhanced their motivation, engagement and participation in the classroom. The responses further revealed that problem-based learning fostered a sense of involvement in the classroom. These benefits align with the research objective of exploring the advantages of PBL in accounting education.

- AL 1: "PBL makes learning more fun. I feel more motivated because the problems are interesting and relevant to what we might do in the real world."
- AL 2: "I am now more engaged because we work in groups and share ideas. It is not as boring as listening to a teacher."
- AL 4: "I feel more involved in the class now because we get to discuss and solve problems together. It's more interactive."
- AL 5: "PBL keeps me interested because the problems challenge my thoughts. I don't feel like I'm just sitting in class waiting for the teacher to give answers."
- AL 7: "I'm more engaged now. I like the teamwork and solving problems that are related to real accounting situations."
- AL 8: "PBL makes me more motivated because I feel like I'm learning something useful for my future career."
- AL 9: "I'm more motivated because the problems are like real-life scenarios, and we're solving them ourselves."
- AL 3: "I enjoy working on the problems, but sometimes it's hard to stay motivated if the problem is too difficult or confusing."
- AL 6: "It's harder for me to stay motivated because I prefer straightforward lessons, but I still participate more than before because we're working on something real."

AL 10: "I feel more motivated during group discussions, but if the problem is too complex, I sometimes lose interest."

Development of Analytical, Critical, and Problem-Solving Skills

AL 1: "I would say yes because I now know how to break down challenging problems and think of different ways in which I can solve them before asking for help."

AL 2: "Yes, of course. I usually do what I am instructed to do by the teacher, but now I am able to find things on my own and be able to solve problems"

AL 3: "Problem-based learning has encouraged me not to quit easily as I used to do; it indeed has developed my problem-solving skills."

AL 4: "My ability to solve problems has really improved. Now, I can think of different approaches to solve a problem."

AL 5: "Yes, I now believe that I can solve complex problems because of not thinking of one way to solve a problem, as it can be approached from different angles."

AL 7: "Yes, I have learnt how to analyse transactions with understanding and not be confused."

AL 8: "I really think PBL has seriously better my analysing skills. I can approach things in a variety of ways and work on solving problems individually."

AL 9: "I feel more prepared for learning, and I believe my critical thinking has increased and shown me a way of approaching problems."

AL 10: "I think my problem-solving skills have improved because PBL forces me to think critically instead of waiting for answers."

AL 6: "I am still having issues a bit, but I've learned how to approach problems and think about what's the best possible way to solve them."

It can be seen from the responses that through problem-based learning, learners were able to achieve and develop a set of crucial skills in accounting, more especially analytical skills. The responses further suggest that learner noticed a change in their ability to solve problems and think critically. Lastly, the responses show that learners acknowledge the experience of PBL as they were able to apply theoretical concepts in practice.

Impact on Overall Academic Performance

AL 1: "Yes, my performance has improved, especially in tests. PBL assisted me in understanding accounting better than before."

AL 3: "My academic performance has greatly improved, especially when solving real-world problems. I feel more confident now towards accounting."

AL 4: "Yes, there is an improvement in my grades, especially in tests where I have to apply knowledge."

AL 7: "My grades have improved in accounting, especially in tasks that require problem-solving. I feel like I understand the subject more deeply."

AL 8: "It impacted my performance positively. I perform better in tasks where I have to analyse and solve problems."

AL 9: "Yes, it has improved my performance, particularly in the practical components of the course."

AL 2: "It assisted me to do better in group work, but I still need to work on my performance in tests."

AL 5: "PBL assisted me in areas where there is a need to apply knowledge, but I still find it difficult to deal with some problems."

AL 6: "I have not noticed a big change in my performance, but I feel like I understand accounting better now."

AL 10: "I quite well in other tasks and group work, but I still need to work and improve in tests."

According to the above responses, learners showed an increase in learner achievement, resulting in an improvement in their performance, especially in assessments. This suggests a positive impact on academic performance, which contributes to the research objective of investigating the effectiveness of problem-based learning.

DISCUSSION

The findings of this study evident a significant improvement in learner understanding and retention of knowledge. The improvement in average scores from 20 in pre-test 1 to 33 in post-test contributes to the assertion that problem-based learning improves learner understanding and application of accounting concepts. These finding aligns with those of Ahmed and Kannaiah, stating that Problem-based learning has been shown to enhance student knowledge acquisition in theoretical and practical accounting subjects.³² The researchers further demonstrate that problem-based learning is effective in enhancing student engagement and assisting them in acquiring and retaining knowledge for real-life situations. Furthermore, the study highlighted the development of crucial skills such as analytical skills, problem-solving solving and critical thinking, together with improved engagement and motivation. The results of the questionnaire highlighted that learner perceived problem-based learning as effective towards improving their understanding of accounting concepts and increasing engagement. The high mean scores for understanding (4.6) and motivation (4.0) add to the idea that PBL make the learning process more engaging.

Similar findings by Lim et al. observed several benefits of problem-based learning, including enhanced problem-solving skills and critical thinking skills. The researchers further reported that students became highly motivated and interested in learning accounting.³³ These findings align with the existing literature that emphasize problem-based learning is effective in improving the overall understanding of the subject matter. This sentiment is also shared by Pike et al., who concluded that PBL was effective in promoting student learning, which improved their overall understanding of the subject.³⁴ The participants indicated that their interest in accounting increased, resulting in learner participation and engagement. Therefore, it shows that traditional methods focus on the teacher rather than the learner. This contributes to the criticism made by Adamu and Jibrin, stating that the conventional teaching method at the high school level, as most teacher-centered approaches are utilized, which, as such, negates the interest and learner achievement of students.³⁵ The data shows that teachers should be mindful of learners and center learners in the process of learning and teaching in order to produce well-equipped learners, as shown in the Curriculum Assessment Policy Statement.

RECOMMENDATIONS

Educators wishing to adopt and apply problem-based learning of scholars interested in the adoption of PBL in accounting education at the high school level should note the following:

1. Fully explain and ensure learners understand PBL before implementing it to ensure learner readiness.
2. Ensure enough time is available for the implementation of PBL, as a variety of students experienced difficulty in dealing with complex problems.
3. Use real-world and relatable problems while starting from easy to complex
4. Teachers should be trained on how to implement and adopt PBL into accounting education

Despite the dedication behind the research design and data analysis, the study experienced a few limitations that may have affected the generalizability of findings. The learners were taught by two teachers before the implementation of problem-based learning. Lastly, the study did not have adequate time due to different priorities of the school and being behind on the syllabus according to the Annual Teaching Plan (ATP). Although the study suggests PBL was effective in improving learner achievement and the overall academic achievement, there may be other aspects that warrant further research.

CONCLUSION

The purpose of this research was to investigate the impact of problem-based learning on improving learner achievement of accounting learners in a selected school in the O.R. Tambo inland district. The key

³² Ahmed and Kannaiah, "Problem Based Learning In Accounting: Where Are We Now?"

³³ Lim, et al., "PBL in Accounting: Loyens, S.M., Wijnia, L., Van Der Sluijs-Duker, I. and Rikers, R.M., 2020. Problem-Based Learning."

³⁴ Pike et al., "Role-Playing and Problem-Based Learning: The Use of Cross-Functional Student Teams in Business Application Development."

³⁵ Ibrahim and Haruna, "Effects Of Flipped And Conventional Teaching Approaches On Performance And Retention Ability Of Students In Advance Financial Accounting In Abubakar Tafawa Balewa University Bauchi, Nigeria."

findings that emerged from data indicated an improvement in learner achievement, participation and engagement, critical, problem-solving and analytical skills and leading to better overall performance. The study recommended that learners should fully understand PBL before implementing it to ensure learner readiness, and enough time is provided for the implementation of PBL while using real-world problems. Teachers should be trained on how to implement this pedagogical approach to learning, and the training should emphasize mostly on learner support and measures to address the challenges faced by learners in implementing this approach.

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