

Performance of Grade 9 Learners in PISA-like Financial Literacy Test

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Abstract

The PISA-like Financial Literacy Test was developed to assess how Grade 9 learners apply mathematical knowledge and problem-solving skills to real-life financial contexts. The study employed a descriptive research design with qualitative support. Using the ADDIE model, test items were aligned with the K to 12 Mathematics Curriculum and contextualized the PISA-like Financial Literacy Test using familiar Filipino experiences. Expert validation confirmed the high relevance and appropriateness of the items, where master teachers rated the test “Very Good” in terms of design, layout, and illustrations. Cronbach’s alpha of 0.76 indicates acceptable reliability. Most learners performed below expectations, with 31 of 42 learners below mastery ($M = 17.74$, $SD = 4.26$). It reflects that while learners manage computations, they find it challenging to reason and make decisions in real-life financial contexts. Case analysis further emphasized that effective problem-solving requires both contextual understanding and systematic strategies. The study concludes that the contextualized PISA-like Financial Literacy Test is a valid, reliable, and relevant tool for assessing learners’ financial reasoning. It recommends integrating the test into classroom assessment and conducting future research on learners’ progression and socioeconomic influences.

Keywords: Financial literacy, Contextualization, ADDIE model, PISA-like Test

1. Introduction

Every learner who sits in a mathematics classroom carries with them a future full of financial decisions, such as how to budget a monthly salary, whether to take out a loan, or when to compare prices before buying. The ability to navigate these choices wisely is what researchers call financial literacy, and its absence has real consequences for individuals and societies alike. Despite its importance, financial literacy among young people globally, and especially in the Philippines, remains remarkably low. This study was motivated by that gap and by the absence of assessment tools that speak directly to the financial experiences of Filipino teenage learners.

The Organization for Economic Co-operation and Development (OECD) defines financial literacy as the knowledge, understanding, skills, and attitudes that enable individuals to make effective financial decisions across diverse contexts, ultimately

contributing to personal well-being and broader economic participation (OECD, 2023a). This definition, which anchors the PISA 2022 financial literacy framework, reflects a broader conception than earlier versions by including attitudes alongside cognitive skills while acknowledging that knowing what to do and being motivated to do it are both critical to sound financial behavior (OECD, 2023b).

The PISA financial literacy framework is organized around three interrelated dimensions. The content dimension covers four knowledge areas: money and transactions, planning and managing finances, risk and reward, and the broader financial landscape, including digital services and consumer rights. The process dimension captures how students engage with financial problems, that is, identifying relevant information, analyzing situations, evaluating options, and applying their knowledge. Finally, the context dimension situates these skills across personal, local, societal, and global scenarios (OECD, 2023b). Together, these dimensions ensure that assessments are both cognitively demanding and practically grounded (Kaiser & Lusardi, 2024).

Hence, financial literacy levels among Filipino youth remain deeply concerning. Only roughly one in four Filipinos demonstrates a basic understanding of financial concepts, with most lacking foundational skills in budgeting, saving, and managing debt (Villanueva, 2021). Recognizing this vulnerability, the Department of Education issued DepEd Order No. 22, s. 2021, requiring the integration of financial concepts, including investment, saving, budgeting, and financial planning across all K to 12 learning areas, including Mathematics (Department of Education, 2021). However, policy mandates alone have not resolved the gap. Research continues to show that insufficient exposure to real-world financial contexts leaves learners ill-equipped to evaluate risk or make sound financial choices (Gabay, 2024). A study on Filipino elementary learners found that most achieved only low to moderate financial literacy levels, with none reaching the highest proficiency band, which creates a pattern that persists into secondary schooling (Orbeta et al., 2020).

This challenge is not unique to the Philippines. Across developing nations, young people consistently fail to transfer classroom financial knowledge into real-world decision-making (Lusardi, 2015; Garg & Singh, 2018). The problem is compounded by a shortage of validated, locally contextualized financial literacy assessments at the secondary level. Most existing tools are adapted from Western populations or designed for adults, making them poor proxies for Filipino adolescent competence (Mancone et al., 2024). Evidence suggests that financial literacy programs are most effective when instruction is contextualized within existing subject areas and anchored to learners' lived experiences (Cordero & Pedraja, 2019). In the Philippine context, contextualized mathematics lessons aligned with the K to 12 Curriculum have been shown to improve learners' motivation, problem-solving ability, and achievement (Buan et al., 2021; Manjares & Pasia, 2023). The ADDIE instructional design model has a strong track record as a framework for developing contextually relevant, reliable, and valid educational instruments (Rondillas & Buan, 2019; Hidayat et al., 2023).

Despite these developments, there is still no published study that has created and validated a PISA-like financial literacy test specifically designed for Grade 9 learners. This study aims to address this gap by using the ADDIE model to develop, validate, and implement a PISA-like Financial Literacy Test for Grade 9 learners. With this, the study provides a locally relevant assessment tool aligned with international standards that can support classroom assessment and guide curriculum development in the Philippine education system.

2. Research Questions

This study aims to examine the performance of the grade 9 learners in PISA-like Financial Literacy tests. Moreover, to reach this general objective, this study aims to:

1. Identify and contextualize PISA-like tests about Financial Literacy.
2. Investigate the performance of the Grade 9 learners in the financial literacy test in PISA.
3. Analyze the process of solving the financial literacy tests.

3. Methodology

3.1 Research Design

This study utilized a descriptive research design with qualitative support. The quantitative strand examined learners' scores and overall performance patterns through descriptive statistics, while the qualitative strand employed case analysis to explore the reasoning strategies individual learners used when solving the PISA-like items. Furthermore, these complementary approaches offered a richer understanding of both what learners achieved and how they approached financial problem-solving.

3.2 Participants and Setting

The participants were 42 Grade 9 students enrolled in one of the larger public secondary schools in the City Central District of Iligan City, Philippines. Grade 9 learners were selected as respondents, as their age group closely aligns with PISA's target demographic of 15-year-olds, making them suitable for assessing financial literacy using a PISA-like test. The school serves a wide cross-section of socioeconomic backgrounds, which adds ecological validity to the study.

3.3 Instrument Development: The ADDIE Model

The development of the test followed the ADDIE model, which begins with the analysis of relevant PISA items, alignment with the K-12 Mathematics curriculum, and contextualization to the Philippine setting scenarios. This test measures your ability to understand and apply financial concepts in real-life situations. The PISA-like test covered the learning competencies in the most essential learning competencies with the topics of measurement, linear equations and inequalities, and real numbers. The test was ten (10) items with five (5) different situations composed of multiple-choice and constructed-response questions. The test underwent reliability and pilot testing to ensure the validity of the PISA-like test results. Also, a scoring guide was developed to ensure consistency and objectivity in evaluating the learners' responses, particularly for constructed-response questions. The scoring guide included specific criteria for awarding full, partial, or no credit based on the accuracy and reasoning.

Data analysis using descriptive statistics and qualitative methods to provide a comprehensive understanding of the learner's performance in financial literacy. Mean and standard deviation to summarize overall achievement score variability, while Cronbach's Alpha and the Content Validity Index ensured reliability and validity of the test. Thematic analysis was used to explore learners' reasoning and problem-solving strategies guided by coding for both learners and expert validators.

4. Results and Discussion.

4.1 Identify and Contextualize PISA-like tests about Financial Literacy

Analysis Phase. The analysis phase involved selecting relevant PISA 2018 and 2022 financial literacy items, removing duplicates, and mapping each situation to the K–12 Mathematics Curriculum to ensure alignment, contextual relevance, and suitability for developing refined PISA-like test questions.

Design and Development Phase. This phase focuses on creating context-rich, culturally appropriate to the Philippine setting and Grade 9 learners, which reflect the real-life experiences of the learners and assess both conceptual understanding and practical application of financial skills.

Implementation Phase. This phase involves revising the items of the PISA-like Financial Literacy Test based on the comments and suggestions from the panel of evaluators following the pilot testing and validation process. The test was administered within 45 minutes, with an additional 15 minutes allocated for reading instructions and clarifications, and 30 minutes for completing a perception questionnaire on learners' experiences and attitudes toward financial literacy.

Evaluation Phase. The results of the pilot testing with forty (40) learners indicated that they performed well on basic calculations, such as currency conversion, but faced difficulties with budget allocation and analyzing digital transactions. Expert validation confirmed the high relevance and appropriateness of the test items, with master teachers rating the test as “Very Good” in terms of design, layout, and illustrations. A Cronbach's alpha of 0.76 demonstrated acceptable reliability.

4.2 Investigate the Performance of the Grade 9 Learners in the Financial Literacy Test in PISA

The performance of Grade 9 learners was classified into five descriptive ratings: Outstanding, Very Satisfactory, Satisfactory, Fairly Satisfactory, and Did Not Meet Expectations based on DepEd Order No. 8, s. 2015. These ratings serve as indicators of learners' mastery of the learning competencies, where they reflect from advanced understanding and consistent achievement of learning standards to insufficient mastery.

Table 1. Performance of Grade 9 Learners in PISA-like Financial Literacy Tests

Descriptive Rating	Grading Scale	N	Mean	%
Outstanding	90 – 100	4	28.5	95
Very Satisfactory	85 – 89	0	0	0
Satisfactory	80 – 84	3	24.67	82
Fairly Satisfactory	75 – 79	4	23	77
Did Not Meet Expectations	Below 75	31	14.61	49
Total		42	17.74	59

Table 1 shows that most of the learners fell under “Did Not Meet Expectations,” indicating low mastery of financial literacy skills. Only a small number of learners achieved “Outstanding” and “Satisfactory” performance levels, while none reached “Very Satisfactory”. The overall class mean of ($M=17.74$, $SD=4.26$) or 59% reveals that the Grade 9 learners performed below in financial literacy. The performance aligns with the OECD (2018) findings that many learners perform basic calculations but struggle to apply reasoning in decision-making situations.

The PISA-like financial literacy tests were carefully designed to reflect real-life financial contexts that are relevant and meaningful to Grade 9 learners. These tests aimed to assess not only the learners' knowledge of financial concepts but also their ability to apply these

concepts in practical situations that require critical thinking and decision-making. The development of the test was guided by the PISA financial literacy framework, ensuring alignment with the core competencies such as budgeting, saving, spending, and evaluating financial choices.

Table 2. Learner's Performance in PISA-Like Financial Literacy Test per Item

Item	Situation	Mean	Total Score per item	Interpretation
1	Pizza	2.28	5	Learners struggled with value comparison; reasoning was often incomplete.
2	Exchange Rate (Converting Peso to Dollar)	3.98	5	Learners showed a strong mastery of currency conversion from the Philippine Peso to US Dollars.
	Exchange Rate (Converting Dollar to Peso)	3.63	5	Learners performed well with reverse conversion, showing strong applied skills.
	Exchange Rate (Comparing the amount)	3.00	5	Learners understood the concept but struggled to compare amounts with reasoning and justification.
3	Bicycle (Maximum and minimum)	0.65	1	Learners showed strong computational skills in comparing costs to get the minimum and maximum values using multiple price options.
3	Bicycle (Budget allocation)	0.13	1	Most learners were unable to distribute a fixed budget across multiple parts of the bicycle with accuracy and feasibility; hence, planning skills are lacking.
4	GCash (Transfer fee)	0.68	1	Learners evaluate the ability to extract and sum relevant fee data from a digital transaction log.
	GCash (New Balance)	0.18	1	Learners were unable to identify the information needed to compute the new balance after deposits and deductions.
5	Phone Plans (Comparing the Best Plan)	2.15	5	Learners found it hard to analyze prepaid plan advantages; they showed minimal reasoning. Comparing which is the best plan is difficult for them to identify.
6	Phone Plans (Cost-Effective Plan)	0.55	1	Learners mastered selecting the most cost-effective plan based on the usage data.

However, they struggled with higher-order tasks, such as budget planning, analyzing digital transactions, and comparing values across options. This shows that while basic calculation skills are strong, learners need more support in reasoning, decision-making, and applying mathematics to real-world financial contexts.

4.3 Analyze the Process of Solving the Financial Literacy Tests

The analysis of the process of solving the financial literacy test in PISA focuses on how learners understand the financial context, including the reasoning and strategies they use that affect their performance. There are two cases presented: Case 1 represents the highest-performing learner, and Case 2 is the lowest-performing learner. These two cases were selected to compare how the problem-solving processes affect the performance of the learners in the PISA-Like Financial Literacy Test. This case analysis focuses on the Pizzas as shown in Figure 1 below.

Pizza serves two round pizzas of the same thickness but in different sizes. The smaller pizza, Solo Size, has a diameter of 30 cm and costs Php 300. The larger pizza, Barkada Size, has a diameter of 40 cm and costs Php 400.

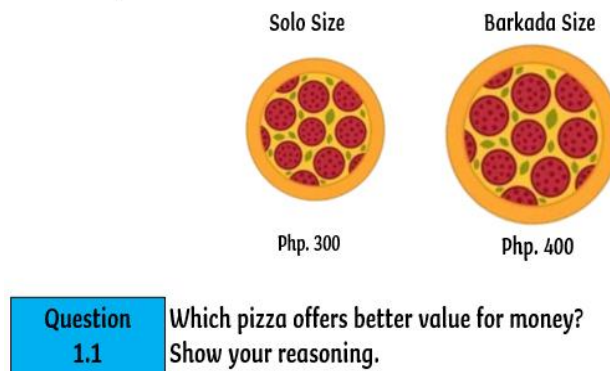


Figure 1. Situation 1 – Pizzas

Case 1: Learner with the Highest Score

The highest-performing learners achieved an outstanding rating, demonstrating a strong understanding of financial literacy concepts such as cost-benefit analysis, currency conversion, budget allocation, digital financial literacy, comparison, and cost-effective planning. They were able to identify relevant information and disregard unnecessary data, showing clear comprehension of real-life financial contexts in every situation.

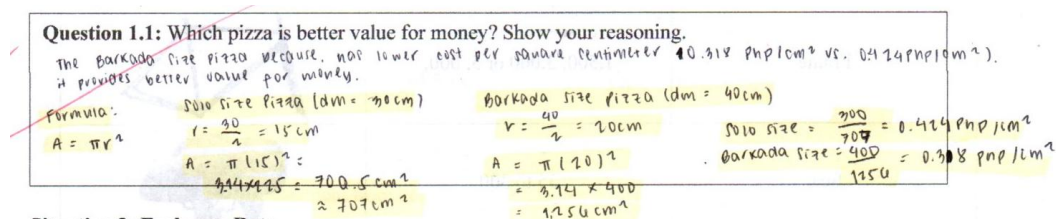


Figure 2. Learners' Sample Output with the Highest Score

The learner accurately determined the better value for money by calculating pizza areas and cost per square centimeter, using a systematic strategy that included analyzing the problem, applying correct formulas, and verifying results through logical reasoning, with minor computational errors that did not affect overall accuracy, demonstrating sound, well-justified responses and a strong understanding of financial concepts and practical decision-making.

Case 2: Learner with the Lowest Score

The lowest-performing learner demonstrated a limited understanding of financial literacy, frequently misinterpreting the presented situations and struggling to distinguish

between relevant and irrelevant information. The learner tended to focus mainly on numbers without considering their financial meaning or connection to real-life contexts.

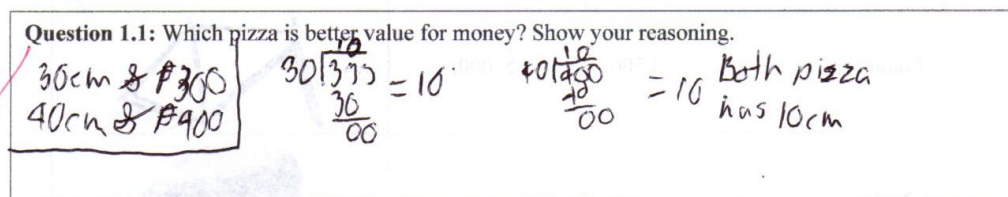


Figure 3. Learner's Sample Output with the Lowest Score

The learner demonstrated a limited understanding of financial concepts, applying incorrect strategies such as using diameter instead of area to compare pizza values, relying on trial-and-error methods, and making frequent computational and conceptual errors in tasks like currency conversion and digital transactions, with responses often incomplete, unjustified, or inconsistent, reflecting uncertainty and a lack of confidence in handling real-life financial situations.

Comparing the two cases, Case 1 demonstrated strong mathematical reasoning and correct application of proportionality by evaluating pizza value based on area, while Case 2 showed a conceptual gap, relying on diameter alone and procedural thinking, highlighting that performance in financial literacy depends not only on computational skills but also on understanding context, applying logical strategies, and making informed financial decisions, as reflected in the PISA framework.

5. Conclusion

The contextualized PISA-like Financial Literacy Test, developed using the ADDIE model and aligned with the K–12 Mathematics Curriculum, is a valid, reliable, and relevant tool for assessing Grade 9 learners' financial literacy, revealing that most students ($M = 17.74$, $SD = 4.26$) struggled with applying logical reasoning and decision-making in real-life contexts; case analysis showed that success depends not only on computation but also on understanding context, using systematic strategies, and making informed financial choices, highlighting the need to strengthen learners' problem-solving and higher-order thinking skills, while affirming that contextualized, problem-based learning enhances engagement, comprehension, and practical application of financial concepts.

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