

Business Transaction Sense-Making and Debit-Credit Application Skills among Senior High School Learners

Sherly G. Darang^{1*} and Michelle S. Morales^{1,2}

¹Northeastern College

*sherlygdarang@gmail.com, ²michellemorales@northeasterncollege.edu.ph

Date Submitted:
February 20, 2026

Date Accepted:
April 29, 2026

Date Published:
July 18, 2026

DOI:
10.5281/zenodo.21425062

ABSTRACT

This study investigated how business transaction sense-making was associated with debit-credit application skills among senior high school learners. A cross-sectional explanatory-predictive design was used, supported by a process-oriented assessment approach. Participants were selected through proportionate stratified random sampling from eligible senior high school classes. Data were gathered using a validated researcher-developed instrument consisting of a Business Transaction Sense-Making Scale and a Debit-Credit Application Assessment. The measures demonstrated excellent internal consistency, with Cronbach's alpha coefficients of 0.92 and 0.90, respectively. Descriptive statistics, Spearman's rank-order correlation, and bootstrapped quantile regression

were applied. Results showed that learners had a developed level of business transaction sense-making but only a developing level of debit-credit application skills. They performed better in identifying transaction substance and affected accounts than in explaining account changes, assigning the correct debit or credit treatment, and verifying entry accuracy. Business transaction sense-making had a strong positive relationship with debit-credit application skills. Quantile regression further showed that its predictive contribution was greatest among lower-performing learners, although it remained significant across the 25th, 50th, and 75th performance percentiles. The findings indicated that accurate transaction recording depended heavily on learners' ability to interpret the economic meaning of business events before applying procedural rules. Accounting instruction should therefore emphasize guided transaction analysis, account-change reasoning, error detection, and entry verification, with targeted scaffolding for learners who demonstrate weaker application skills.

Keywords: *accounting education; business transaction sense-making; debit-credit application; quantile regression; senior high school learners; transaction analysis*

INTRODUCTION

Accounting provides a structured means of turning everyday business activities into information that owners, managers, investors, and other users can understand. Before a transaction can be recorded, a learner must determine what occurred, identify the accounts involved, and explain how the event changes the financial position of a business. These processes form part of the Fundamentals of Accountancy, Business, and Management curriculum for senior high school learners. The course is intended to develop an appreciation of accounting as the language of business while building an understanding of the concepts and principles needed to analyze business transactions. This curricular expectation places transaction analysis at the center of introductory accounting instruction rather than treating debit and credit rules as isolated procedures (Department of Education, 2019).

For many learners, however, introductory accounting presents an unfamiliar way of describing ordinary business events. Transactions that appear simple in daily life must be translated into account titles, classifications,

monetary effects, and balanced entries. Learners are expected to distinguish the business from its owner, recognize the dual effect of each transaction, and decide whether an account has increased or decreased. Students may view the subject as highly procedural when instruction concentrates heavily on rules, calculations, and correct answers without giving enough attention to the meaning of the events being recorded. Evidence from students taking their first accounting course shows that learners value instruction that connects accounting concepts with practical situations and helps them understand the purpose behind the procedures they are asked to perform (Abbott & Palatnik, 2018).

Business transaction sense-making refers to the learner's effort to construct a reasonable explanation of a financial event before deciding how it should be recorded. It involves examining available details, separating relevant information from unnecessary information, recognizing relationships among accounts, and checking whether a proposed treatment accurately represents the transaction. Sense-making becomes especially important when a problem does not follow the exact wording or format of an example previously discussed in class. Research on accounting students' learning processes has shown that sense-making includes working through uncertainty, testing possible solutions, learning from unsuccessful attempts, and evaluating whether the resulting information is reasonable. These behaviors reflect deeper learning because students do not merely reproduce a procedure but actively develop meaning from the task presented to them (Mesa, 2019).

Debit-credit application skills are closely connected to this interpretive process. A learner who understands the economic substance of a transaction is more likely to identify the proper accounts, classify them correctly, and determine their appropriate debit or credit treatment. By contrast, a learner who depends mainly on memorized rules may produce correct entries for familiar exercises yet struggle when the transaction is expressed differently or contains several connected details. A qualitative investigation of how students determine the double entry of financial transactions identified different levels of understanding, ranging from limited procedural approaches to more developed ways of connecting the transaction, the affected accounts, and the logic of double-entry bookkeeping. The findings suggest that successful application depends on how learners experience and understand the entire transaction, not simply on whether they remember which side of an account is called debit or credit (Culhane & O'Mahony, 2025).

The specialized language of accounting adds another layer of difficulty. Terms such as asset, liability, equity, revenue, expense, receivable, payable, withdrawal, and normal balance carry precise meanings that may differ from how similar words are used in everyday communication. Learners must understand each concept separately and also recognize how the concepts work together within the accounting equation and the double-entry system. When these connections are weak, students may correctly define an account but fail to determine how it is affected by a particular business event. An examination of accounting knowledge and terminology found that learners often struggle to connect conceptual meaning with practical application because accounting concepts contain dense and interrelated meanings. The development of systematic links among concepts is therefore necessary for learners to use accounting knowledge accurately across different tasks (Bardien & Lubbe, 2025).

The mental demands of double-entry accounting may also affect how learners process transactions. In a single exercise, a student may need to understand the narrative, identify the business event, recall account classifications, determine increases and decreases, apply debit-credit rules, and verify that the entry remains balanced. Presenting all these elements at once can overwhelm learners who have not yet developed stable accounting concepts. A scaffolded approach based on cognitive load theory showed that double-entry accounting can be made more understandable when technical language and procedures are introduced in manageable stages. Simplifying the initial representation of transactions and gradually moving toward formal journal entries can help learners concentrate first on the economic meaning of the event before handling the full recording procedure (Zhou & Lamberton, 2021).

Accounting tasks become more meaningful when learners can follow a transaction beyond the journal entry. A cash sale, purchase of supplies, payment of an obligation, or owner investment does not end after the debit and credit have been written. Each event affects ledger balances, the accounting equation, and the financial statements of the business. Instruction that shows these connections can help learners recognize accounting as an

organized information system rather than a collection of separate rules. Integrated accounting projects have been found useful in helping students understand how transactions move through the accounting cycle and influence financial reports. Such activities also encourage students to combine technical procedures with problem-solving because they must consider how one decision affects later stages of the accounting process (Porter, 2019).

Experiential learning offers another way of strengthening the connection between transaction meaning and accounting application. Tasks based on realistic business activities allow students to examine source documents, classify accounts, prepare entries, correct errors, and reflect on the consequences of their decisions. These activities provide opportunities to apply accounting principles under conditions that resemble actual business practice. A systematic review of experiential learning in accounting education found that practical and experience-based activities can support the development of technical knowledge, professional abilities, reflection, and learner engagement. The value of these activities lies not only in making lessons interesting but also in requiring students to use accounting knowledge while responding to complete and meaningful situations (Gittings et al., 2020).

Technical accuracy remains essential, but accurate recording alone does not fully demonstrate accounting understanding. Learners must be able to explain why particular accounts are affected, justify the direction of the changes, detect inconsistencies, and revise an entry when the recorded effect does not represent the transaction. These abilities require critical judgment alongside knowledge of accounting rules. Accounting education research has continued to call for learning experiences that develop technical competence and critical thinking together. Students need tasks that move beyond routine recall and allow them to interpret information, consider possible treatments, and defend their conclusions using accounting principles. Without these opportunities, learners may complete structured exercises correctly while remaining uncertain when faced with less familiar transaction situations (Wolcott & Sargent, 2021).

Research in accounting education has examined curriculum design, teaching strategies, learning technologies, student characteristics, assessment, and the development of professional competencies. A review of 112 studies published across major accounting education journals illustrates the continuing attention given to improving instruction and learner outcomes. Much of this scholarship, however, has focused on learners enrolled in universities and professional accounting programs. The pattern of available research points to the need for closer examination of accounting learning at the senior high school level, where students are first introduced to formal transaction analysis and debit-credit application. Evidence drawn from this stage may help explain whether learners' ability to make sense of business events is associated with their capacity to produce technically correct accounting entries (Apostolou et al., 2022).

The study sought to examine how learners interpreted business transactions and how well they applied debit and credit principles when recording those transactions. It treated transaction sense-making and debit-credit application as related but distinct areas of learning. A student may understand parts of a transaction but commit errors in formal recording, while another may memorize entry patterns without fully explaining the business event involved. Determining the relationship between these areas may provide teachers with a clearer basis for designing examples, guided exercises, assessment tasks, and learning interventions that strengthen both conceptual understanding and procedural accuracy. The findings may also contribute evidence from Philippine senior high school accounting education, particularly from learners who are still establishing the foundational knowledge required for more advanced study in accountancy, business, entrepreneurship, and financial management.

Literature Review

Business Transaction Analysis and Sense-Making

Business transaction sense-making begins with understanding the substance of an economic event before selecting the accounts and recording an entry. Learners must determine what the business received, what it gave up, which account classifications were affected, and whether each account increased or decreased. This process requires more than recognizing familiar words in a problem because the same transaction may be expressed

through different narratives, documents, or business situations. Blayney et al. (2024) described transaction analysis as a fundamental but demanding area of introductory accounting, particularly because learners must coordinate several decisions while managing the technical language of the subject. Their work emphasized the value of arranging transaction problems from simple to complex and providing immediate corrective feedback as students develop their understanding. These findings indicate that sense-making grows through guided interpretation, repeated reasoning, and opportunities to examine why an answer is correct or incorrect, rather than through repeated journalizing without sufficient explanation.

Debit-Credit Application as a Coordinated Skill

Debit-credit application is not a single act of recalling which side of an account should be used. It consists of several connected abilities, including modeling the transaction, identifying the affected accounts, determining the proper side of each account, calculating the amount, and recognizing the effect on profit or loss. Helm et al. (2022) used cognitive diagnostic models to examine these component skills among learners in introductory accounting classes. Their findings showed that students could demonstrate mastery in some aspects of transaction recording while remaining weak in others, which means that an overall score may conceal particular learning difficulties. A learner may correctly identify an account but fail to determine whether it should be debited or credited, while another may select the proper account side but misunderstand the amount or financial effect. The study supports assessing debit-credit application through distinct but connected indicators so that instruction can respond to the exact stage where a learner's reasoning breaks down.

Prior Accounting Knowledge and Learner Confidence

Exposure to accounting lessons does not automatically guarantee confidence or dependable performance in a new accounting task. Choo et al. (2026) compared the self-efficacy of 272 students enrolled in an introductory accounting course and found no significant difference between those who had studied accounting in secondary school and those who had not. The authors explained that previous knowledge may provide limited support when the earlier curriculum and the present course have few meaningful similarities. This finding is important for senior high school accounting research because it questions the assumption that lesson exposure alone represents mastery. Learners may have encountered the accounting equation, account classifications, and debit-credit rules but may still struggle to apply them when transactions are presented in less familiar forms. Consequently, actual sense-making and application skills should be measured directly instead of being inferred from previous coursework, classroom attendance, or completion of accounting subjects.

Active Learning for Transaction and Debit-Credit Mastery

Learning activities that require students to make decisions can strengthen accounting understanding by moving them beyond passive listening and mechanical copying. Park et al. (2019) found that active participation in accounting board-game activities was associated with more favorable perceptions of accounting and stronger learning effects. The findings suggest that participation matters because students must discuss choices, test their understanding, and respond to the consequences of their answers. Digital learning tools can serve a similar purpose when their design remains closely tied to accounting concepts. HajiMoradkhani et al. (2023) developed an instructional game covering financial statement elements, the accounting equation, transaction analysis, and debit-credit rules. Their study illustrated how game-based tasks could organize fundamental concepts into interactive exercises while allowing learners to apply knowledge within structured situations. Taken together, these studies support classroom activities that require learners to interpret transactions, justify account selections, apply debit-credit rules, and receive feedback while their reasoning is still open to correction.

METHODS

Research Design

The study followed a cross-sectional explanatory-predictive design anchored in a process-oriented assessment approach. This design was selected because it allowed the researcher to examine how learners' ability to interpret the meaning and financial effects of business transactions was associated with their skill in applying debit and credit principles. Rather than limiting the inquiry to a general description of the two variables, the design treated business transaction sense-making as an explanatory factor that could account for differences in debit-credit application skills. Data were gathered at one point in the school year without manipulating classroom conditions, instructional methods, or learner placement. The design was appropriate because the study aimed to determine patterns of association and predictive differences under the learners' existing accounting learning conditions.

Research Locale

The investigation was conducted at Rang-ayan National High School in Rang-ayan, City of Ilagan, Isabela. The school offered senior high school learning experiences that included business and accounting competencies involving the analysis and recording of financial transactions. The locale was selected because it provided direct access to learners who had encountered lessons on account classification, the accounting equation, transaction analysis, and debit-credit rules. Data collection was carried out within the regular school setting so that the learners responded to the measures under conditions familiar to them. The conduct of the study did not alter the class schedule, grading system, or prescribed learning activities of the school.

Participants and Sampling Technique

The participants consisted of senior high school learners who were taking or had completed a subject that included fundamental accounting concepts and business transaction recording. Eligibility required prior classroom exposure to the accounting equation, account classifications, and the debit-credit system. Learners who participated in the pilot testing were excluded from the main data collection. Proportionate stratified random sampling was applied, with eligible class sections serving as the sampling strata. The number of participants selected from each stratum was based on its proportion within the eligible learner population. Individual participants were then selected through a computer-generated random procedure. This technique reduced the likelihood that a single class section would be overrepresented and gave eligible learners a comparable chance of inclusion.

Research Instrument

Data were collected through a researcher-developed instrument composed of the Business Transaction Sense-Making Scale and the Debit-Credit Application Assessment. The first measure contained situational statements that examined how learners identified the substance of a transaction, recognized relevant financial information, determined the accounts affected, explained changes in account balances, and checked whether a proposed accounting treatment was reasonable. Responses were recorded through a four-point scale ranging from limited evidence of sense-making to highly developed evidence of sense-making. The second measure presented short business transaction scenarios that required learners to identify the affected accounts, determine whether each account increased or decreased, assign the correct debit or credit treatment, and verify the equality of the entry. A structured scoring guide was used to assign credit according to the accuracy and completeness of each response.

The initial instrument was examined by specialists in accounting education, educational measurement, business education, and research methodology. They evaluated the clarity, curricular alignment, developmental suitability, and representativeness of the items. Revisions were made when statements contained unnecessary technical language, overlapping ideas, unclear transaction conditions, or more than one possible interpretation. Content validation produced an average scale-level content validity index of 0.95, indicating strong agreement

among the validators regarding the relevance of the items. The revised instrument was then pilot-tested with a separate group of senior high school learners from a comparable school who were not included in the main study. The pilot responses were reviewed for unclear wording, skipped items, extreme difficulty, and inconsistent interpretation. Cronbach's alpha was 0.91 for the Business Transaction Sense-Making Scale and 0.89 for the Debit-Credit Application Assessment. The combined instrument obtained an alpha coefficient of 0.93, which indicated high internal consistency. Items that weakened reliability or created confusion during the pilot administration were revised before the final instrument was used.

Data Gathering

Permission to conduct the study was secured from the appropriate school authorities before the participants were approached. After approval was obtained, the researcher coordinated with the senior high school teachers to identify eligible classes and arrange an administration schedule that caused minimal disruption to instruction. Because the participants included learners below the age of legal adulthood, written parental or guardian consent and learner assent were obtained before participation. The researcher explained the purpose of the study, the voluntary nature of participation, the expected completion procedure, and the measures used to protect confidentiality.

The instrument was administered personally by the researcher during the approved schedule. Standard instructions were read to all groups to maintain consistency. Learners answered the transaction sense-making scale before completing the debit-credit application tasks. They were instructed to work independently and were not permitted to consult notes, textbooks, mobile devices, or classmates while answering. Completed instruments were checked only for missing responses and were not altered after submission. Each questionnaire was assigned a code instead of a learner's name. The debit-credit responses were scored using the approved scoring guide, and the recorded scores were verified a second time before the dataset was prepared for analysis.

Data Analysis

Descriptive measures were first computed to summarize the two variables. The median and interquartile range were used as the principal measures of central tendency and dispersion because the sense-making responses were ordinal and the skill scores could contain uneven distributions. Means and standard deviations were also reported to support comparison across indicators. Item-level results were examined to identify the aspects of transaction interpretation and debit-credit application in which learners showed stronger or weaker performance. Internal consistency coefficients were recalculated using the main-study data to confirm the stability of the instrument.

Spearman's rank-order correlation was applied to determine the direction and strength of the monotonic relationship between business transaction sense-making and debit-credit application skills. This procedure was selected because it did not require the assumption that the two scores were normally distributed or measured at a strict interval level. The analysis reported the correlation coefficient, probability value, and confidence interval rather than relying only on statistical significance.

Bootstrapped quantile regression served as the primary explanatory treatment. It estimated whether business transaction sense-making predicted debit-credit application skills at the lower-performing, middle-performing, and higher-performing portions of the skill distribution. Models were estimated at the 25th, 50th, and 75th percentiles. This procedure provided more detailed evidence than ordinary least squares regression because it did not assume that the influence of sense-making was identical for all learners. It allowed the study to determine whether transaction interpretation was more strongly associated with debit-credit performance among learners who struggled, those who performed near the middle, or those who already demonstrated stronger application skills. Bootstrap confidence intervals based on 5,000 resamples were used to produce estimates that were less sensitive to non-normality and isolated extreme scores. Statistical decisions were made at the 0.05 level of significance, while coefficient size, confidence intervals, and patterns across the three quantiles were considered when interpreting the practical meaning of the findings.

Ethical Consideration

The study observed the principles of voluntary participation, informed consent, assent, confidentiality, fairness, and protection from harm. Learners and their parents or guardians received sufficient information about the purpose and procedures of the study before deciding whether to participate. They were informed that participation or nonparticipation would not affect grades, class standing, access to school services, or relationships with teachers and school personnel. Participants could decline to answer any item or withdraw before submitting the instrument without penalty.

No names, student identification numbers, contact details, or other direct personal identifiers were written on the research instrument. Coded data were stored in a password-protected file accessible only to the researcher. Printed materials were kept in a secured location and were not shown to individuals who were not directly involved in the study. Findings were presented in aggregated form so that individual learners and class sections could not be identified. The information collected was used solely for the stated research purposes and was handled in accordance with applicable school research procedures and Philippine data privacy requirements.

RESULTS AND DISCUSSION

Table 1. Internal Consistency of the Research Measures Based on the Main Study Data

Research Measure	Number of Indicators	Cronbach's Alpha	Reliability Interpretation
Business Transaction Sense-Making Scale	5	0.92	Excellent
Debit-Credit Application Assessment	4	0.90	Excellent
Combined research instrument	9	0.94	Excellent

Note. Coefficients of 0.90 or higher were interpreted as evidence of excellent internal consistency.

Table 1 showed that the Business Transaction Sense-Making Scale obtained a Cronbach's alpha coefficient of 0.92, while the Debit-Credit Application Assessment obtained a coefficient of 0.90. The reliability coefficient for the combined instrument was 0.94. These results indicated that the indicators within each measure consistently represented the intended construct. The coefficients also supported the use of the composite scores in the descriptive, correlational, and quantile regression analyses.

Table 2. Business Transaction Sense-Making among Senior High School Learners

Sense-Making Indicator	Mean	Standard Deviation	Median	Interquartile Range	Interpretation
Identifying the substance of the transaction	3.18	0.49	3.25	0.50	Developed
Recognizing relevant financial information	3.07	0.52	3.00	0.75	Developed
Determining the accounts affected	2.91	0.55	3.00	0.75	Developed
Explaining changes in account balances	2.72	0.58	2.75	0.75	Developed
Checking the reasonableness of the accounting treatment	2.68	0.61	2.75	1.00	Developed
Overall business transaction sense-making	2.91	0.43	2.94	0.58	Developed

Note. The interpretation followed these ranges: 3.26 to 4.00, Highly Developed; 2.51 to 3.25, Developed; 1.76 to 2.50, Emerging; and 1.00 to 1.75, Limited.

Table 2 indicated that the learners had a developed level of business transaction sense-making, with an overall mean of 2.91 and a standard deviation of 0.43. The median of 2.94 supported the mean-based interpretation and showed that the center of the score distribution remained within the developed range. The relatively narrow

interquartile range of 0.58 suggested that the middle half of the learners produced generally similar overall sense-making scores.

The highest mean was recorded in identifying the substance of a transaction at 3.18. This finding suggested that the learners could generally recognize what had occurred in a business event, such as an owner investment, cash purchase, credit sale, payment of an obligation, or receipt of income. Recognizing relevant financial information followed with a mean of 3.07. The learners therefore appeared more capable of understanding explicit transaction details than of working through the accounting consequences of those details.

Determining the accounts affected obtained a lower mean of 2.91. Although the result remained within the developed category, it showed that some learners experienced difficulty translating an understandable business event into appropriate account titles. This difficulty became more evident in explaining changes in account balances, which obtained a mean of 2.72. Learners could identify that a transaction occurred but were less consistent in explaining whether an asset, liability, equity, revenue, or expense increased or decreased.

Checking the reasonableness of an accounting treatment received the lowest mean of 2.68 and the widest interquartile range of 1.00. The result indicated substantial variation in the learners' ability to review an accounting decision after producing it. Some learners appeared to accept their first answer without verifying whether the entry reflected the transaction, preserved the accounting equation, or produced a logical effect on the accounts. The identified weakness was therefore not limited to recalling rules. It involved monitoring and evaluating the result of the accounting process.

Table 3. *Debit-Credit Application Skills among Senior High School Learners*

Skill Component	Mean Percentage Score	Standard Deviation	Median	Interquartile Range	Skill Level
Identifying the affected accounts	82.17	10.62	83.33	16.67	Proficient
Determining account increases and decreases	76.83	12.44	77.78	16.67	Developing
Applying the correct debit-credit treatment	69.44	14.73	70.00	20.00	Beginning
Verifying the equality and accuracy of the entry	71.58	15.21	72.22	22.22	Developing
Overall debit-credit application skills	74.96	10.38	75.00	13.89	Developing

Note. Skill levels were interpreted as follows: 90.00 to 100.00, Advanced; 80.00 to 89.99, Proficient; 70.00 to 79.99, Developing; and below 70.00, Beginning.

As presented in Table 3, the learners obtained an overall mean percentage score of 74.96 in debit-credit application, which was interpreted as developing. The median score of 75.00 closely approximated the mean, indicating that the overall result was not produced merely by a small number of extremely high or low scores. Nevertheless, the standard deviation of 10.38 revealed meaningful differences in the learners' ability to complete debit-credit tasks.

Identifying the affected accounts emerged as the strongest skill, with a mean percentage score of 82.17. This was the only component classified as proficient. The result indicated that many learners could determine which accounts belonged in an entry when the transaction details were stated clearly. Their ability declined when they were required to determine how those accounts changed. The mean score of 76.83 for identifying increases and decreases showed that account selection did not always lead to an accurate understanding of account movement.

The weakest component was applying the correct debit-credit treatment, which obtained a mean percentage score of 69.44 and was classified as beginning. This result revealed a clear instructional problem. Learners sometimes selected the correct accounts but placed them on the wrong side of the entry. The finding

suggested confusion about normal balances, account classifications, and the relationship between an account's increase or decrease and its debit or credit treatment.

Verifying the equality and accuracy of an entry obtained a mean score of 71.58. The wide interquartile range of 22.22 showed that performance in this component varied considerably. Some learners checked whether total debits equaled total credits, while others submitted entries containing unequal amounts, missing accounts, or technically balanced entries that did not accurately represent the transaction. The result reinforced the weakness identified in the sense-making measure concerning the reasonableness of an accounting treatment.

Table 4. Spearman Rank-Order Correlation Between the Research Variables

Variables	Spearman's Rho	95% Bootstrap Confidence Interval	Probability Value	Decision	Interpretation
Business transaction sense-making and debit-credit application skills	0.638	0.523 to 0.730	< 0.001	Reject the null hypothesis	Strong positive relationship

Note. The confidence interval was generated through 5,000 bootstrap resamples. Statistical significance was evaluated at the 0.05 level.

Table 4 showed a strong positive relationship between business transaction sense-making and debit-credit application skills, with a Spearman correlation coefficient of 0.638. The probability value was below 0.001, while the bootstrap confidence interval ranged from 0.523 to 0.730. Since the confidence interval did not include zero, the relationship was statistically supported. The null hypothesis stating that there was no significant relationship between the two variables was therefore rejected.

The positive coefficient indicated that learners who demonstrated stronger transaction sense-making generally obtained higher debit-credit application scores. Learners who could identify the substance of a transaction, select relevant information, determine the affected accounts, explain account changes, and check the reasonableness of their decisions were more likely to produce accurate debit-credit entries. Conversely, learners who struggled to construct meaning from transaction narratives tended to commit more errors in account selection, increase-decrease analysis, debit-credit placement, and entry verification.

The correlation was strong but not perfect. Business transaction sense-making was therefore an important factor in debit-credit performance, but it did not account for every difference in skill. Other factors, such as procedural fluency, practice frequency, retention of normal balance rules, mathematical accuracy, language comprehension, and quality of classroom feedback, may also have contributed to learner performance. Because the study used a cross-sectional design, the relationship did not by itself establish a direct causal effect.

Table 5. Bootstrapped Quantile Regression of Business Transaction Sense-Making on Debit-Credit Application Skills

Performance Quantile	Regression Coefficient	Bootstrap Standard Error	95% Bootstrap Confidence Interval	Probability Value	Pseudo R ²	Decision
25th percentile, lower-performing learners	13.48	2.66	8.29 to 18.71	< 0.001	0.28	Significant
50th percentile, middle-performing learners	10.92	2.09	6.81 to 15.06	< 0.001	0.32	Significant
75th percentile, higher-performing learners	7.36	2.84	1.78 to 12.92	0.010	0.15	Significant

Note. Debit-credit application was expressed as a percentage score. Each coefficient represented the expected percentage-point difference in debit-credit application associated with a one-point difference in business transaction sense-making. Confidence intervals were based on 5,000 bootstrap resamples.

Table 5 indicated that business transaction sense-making significantly predicted debit-credit application skills at the 25th, 50th, and 75th percentiles of the performance distribution. All confidence intervals remained above zero, confirming that the positive association was present among lower-performing, middle-performing,

and higher-performing learners. The results provided more detailed information than a single mean-based regression estimate because the magnitude of the association differed across the three performance levels.

At the 25th percentile, a one-point difference in business transaction sense-making corresponded to an estimated 13.48 percentage-point difference in debit-credit application. This was the largest coefficient among the three quantiles. The result showed that transaction sense-making was particularly important among learners who belonged to the lower-performing part of the skill distribution. Weak interpretation of business events appeared to place these learners at a greater disadvantage when they attempted to identify account effects and construct debit-credit entries.

At the median, a one-point difference in sense-making was associated with a 10.92 percentage-point difference in debit-credit performance. The model obtained its highest pseudo R^2 value at this level, accounting for approximately 32 percent of the variation around the median performance point. This result suggested that sense-making had a substantial role among learners whose debit-credit skills were near the center of the distribution.

The coefficient remained significant at the 75th percentile but declined to 7.36. Sense-making continued to matter among higher-performing learners, although its contribution was smaller. These learners may already have possessed more stable procedural knowledge, allowing them to compensate for occasional weaknesses in transaction interpretation. For lower-performing learners, however, difficulty making sense of the transaction appeared to create a more serious obstacle to correct debit-credit application.

CONCLUSION

Senior high school learners generally demonstrated a developed level of business transaction sense-making but only a developing level of debit-credit application skills, with the most evident difficulties appearing in explaining changes in account balances, applying the correct debit-credit treatment, and checking the accuracy and reasonableness of entries. Business transaction sense-making was significantly and positively associated with debit-credit application skills, and its predictive influence was strongest among learners in the lower-performing group. These findings indicated that learners were more likely to record transactions correctly when they first understood the substance of the business event, identified the accounts involved, and traced how each account changed. It is therefore recommended that accounting instruction follow a step-by-step reasoning sequence that begins with transaction interpretation before proceeding to account classification, increase-decrease analysis, debit-credit assignment, and entry verification. Teachers should use guided questioning, error-analysis exercises, realistic business scenarios, collaborative problem-solving, and short diagnostic tasks to identify the specific stage where learners experience difficulty. Additional support should be provided to lower-performing learners through scaffolded activities, immediate feedback, and repeated practice using varied transaction formats. Assessment practices should also give credit to the reasoning process and not rely solely on the correctness of the final journal entry. Future studies may examine the effectiveness of a targeted instructional intervention based on transaction sense-making and may include learners from other schools to determine whether the observed pattern remains consistent across different senior high school settings.

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