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# Preferences of Learning Styles among Non-Accounting Students in Accounting Subject

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**Abstract:** Learning style is a crucial component in encouraging quality teaching and promoting effective learning. Every student possesses distinct learning objectives, prior knowledge, cognitive ability, and cognitive style. Therefore, it is essential to understand students' learning style preferences for high-quality and effective teaching and learning methods. This paper aims to examine the variation of learning styles among non-accounting students from one of the higher learning institutions in Melaka, Malaysia. Data were gathered from self-administered questionnaires given to students enrolled in diploma courses during financial accounting class sessions. The survey received a response from a total of 398 students. This study discovered that most students use an unimodal learning style in their studies, regardless of whether the subject is theoretical or calculative. However, the distribution of learning style modalities is significantly different between male and female respondents. Overall, the visual learning style was discovered as the most dominant among male and female students in learning accounting subjects through seeing or observing visual materials. Hence, it is vital to understand how students' learning style affects their acquisition of knowledge, which could provide useful insights into designing teaching strategies concerning the profiles of the students and enhancing the teaching-learning process.

**Keywords:** *Learning Preferences, Learning Styles, Non-accounting students, VARK model, VARK Learning Styles.*

## 1. Introduction

Students' interaction with information reflects their preferred learning styles. Each student is unique in their learning objectives, past knowledge, thinking abilities, and cognitive style (Graf et al., 2009). Hence, learning styles are closely related to how teachers and students interact in a teaching-learning process as well as how they both learn and teach (Viloria et al., 2018). Consequently, recognizing students' learning styles is pivotal for fostering high-quality teaching. Understanding these styles can facilitate the creation of environments conducive to effective learning, given the significant correlation between learning styles and students' academic performance (Rezaeinejad et al., 2015). In relation to accounting, the basic accounting course is now a mandatory subject for nearly all diploma courses at Universiti Teknologi MARA (UiTM), providing students with essential knowledge in accounting. As the field of accounting is one of the most competitive disciplines, hence students should prioritize entrepreneurship over traditional employment, especially given the current high unemployment rate in Malaysia. Nonetheless, numerous students lacking an accounting background encounter challenges in excelling in accounting subjects. They often perceive these subjects as irrelevant to their field and struggle with comprehension due to their technical complexity (Muda et al., 2013).

Conversely, students with prior knowledge of accounting tend to perform better and have a higher chance of success in introductory accounting courses, as noted by Mohd Pauzi et al. (2021). The difficulties in grasping accounting concepts stem from various factors. These include the subject's heavy reliance on mathematics, emphasis on rote learning, and insufficient integration of case studies (Ay, 2012). Additionally, there exists a disparity between theoretical teachings and practical applications, coupled with issues such as irrelevant textbooks, examination formats, and language proficiency barriers, all contributing to students' negative perceptions toward accounting courses and subsequently affecting their academic achievements (Tailab, 2013). Although accounting is perceived as challenging, non-accounting students must learn accounting, as the knowledge and skills are essential for lifelong learning (Jones & Fields, 2001). Fostering student interest in accounting is crucial for nurturing the skills essential for success in both accounting and non-accounting professions (Geiger & Ogilby, 2000). However, generating such interest may require educational reforms that emphasize not just memorization but also the ability to synthesize and apply information from diverse sources.

Educators have a plethora of instructional and assessment methods at their disposal. Therefore, it becomes imperative to tailor these approaches considering factors like students' gender and pre-existing levels of interest to enhance both academic engagement and performance (Lee & Boo, 2022). Students with appropriate study skills, teaching, and learning approaches will better understand subjects in any discipline. According to Alvis-Arrieta et al. (2023), students who favor a reflective learning style are more likely to witness enhancements in their academic performance compared to those inclined towards an active learning style. The quality of undergraduate education is crucial. Utilizing the most suitable teaching method for each subject is essential for enhancing students' competence and qualities. By employing diverse teaching methodologies, lecturers can facilitate better comprehension among students, provided they align their delivery approach with the student's preferred learning styles (Boyd et al., 2000). Thus, this paper aims to discover and better understand the learning styles among non-accounting students in one of the higher learning institutions in Melaka, Malaysia, to improve the quality of teaching and learning experiences to support effective learning. Additionally, this study examines the dominant learning styles of students, providing useful insights into designing teaching strategies tailored to students' profiles and ultimately enhancing the teaching-learning process. This research article is structured as follows: the subsequent section explores pertinent literature, followed by an elucidation of the methodology utilized in this study. The findings and ensuing discussion section offer a comprehensive analysis of the results. Finally, the paper concludes by delineating its limitations and suggesting avenues for future research.

## 2. Literature Review

**Learning Styles or Preferences:** Learning preferences refer to the general approaches individuals adopt when engaging with a particular subject. As asserted by Sadeghi et al. (2012), these preferences significantly influence both the learning journey and the unique ways individuals engage with material based on their preferred styles. A learning preference can also be described as a predisposition towards a particular learning strategy. While many students have a preferred style, some may adapt their approach depending on the task at hand (Poon Teng Fatt, 2000). Various typologies have been devised to categorize learners, facilitating the provision of appropriate materials and enhancing their overall learning experience (Peter et al., 2010). Education recognizes four primary learning styles: visual, auditory, reading/writing, and kinaesthetic. Visual learners excel in interpreting visual aids like charts and diagrams. Auditory learners thrive on lectures and discussions. Kinaesthetic learners prefer hands-on experiences while reading/writing learners process information best through written text (source: https://bau.edu/blog/types-of-learning-styles/).

Surveys of first-year undergraduate language students at Chiang Rai Rajabhat University, Thailand, using the VARK questionnaire, revealed that most learners (64.0%) have multimodal preferences, with kinaesthetic being the most popular (Payaprom & Payaprom, 2020). In contrast, a study by Boland et al. (2011) comparing learning styles across student groups in Australia, Belgium, and Japan found that Australian and Belgian students tended to favor individualistic and hands-on learning, while Japanese students preferred observational learning. Thus, educators should accommodate students' preferred styles to facilitate more effective learning (Poon Teng Fatt, 2000). Moreover, research in Indonesia by Asgafi et al. (2023) found a link between students' learning preferences and their mathematical communication skills, highlighting the importance of well-designed learning processes. Similarly, a study by Mardi et al. (2024) in an Indonesian Vocational High School demonstrated that using innovative teaching materials like Accounting UNO Cards increased student motivation and participation in learning accounting. This emphasizes the significance of dynamic teaching methods in fostering an engaging learning environment.

**Learning Styles Versus Gender:** Students exhibit varied learning preferences, which may differ based on gender. Considering a student's favored learning style is crucial in planning classroom instruction. An important educational disparity between genders concerns the subjects they opt to study (Severiens & Dam, 1997). Philbin et al. (1995) conducted research emphasizing distinctions in learning styles between men and women. Men often associate their preferred learning style with traditional education, whereas women may not share this correlation. Conversely, an analysis using Kolb's instrument suggested that men lean more toward abstract conceptualization in learning (Severiens & Dam, 1997). In Science, Technology, Engineering, and Mathematics Education (known as STEM), Kulturel-Konak et al. (2011) noted that women frequently favor hands-on learning experiences, make intuitive judgments, are more people-oriented, and are comfortable with

ambiguity. In contrast, men typically adopt an analytical approach, engaging in logical thinking and enjoying working with symbols and structures.

Additionally, a study by Slater et al. (2007) among first-year medical students, utilizing VARK (Visual, Auditory, Reading/Writing, Kinaesthetic) learning preference questionnaires, revealed that both male and female students prefer various modes of information presentation, with no significant differences between genders in the quantity and types of modalities used. Although not statistically significant, female students exhibited greater diversity than males, encompassing a wider range of sensory modality combinations in their preference profiles. Conversely, a survey of first-year undergraduate students at Chiang Rai Rajabhat University, Thailand, found no link between gender and students' learning style preferences (Payaprom & Payaprom, 2020). Thus, gender, alongside other factors such as cultural influences, exhibits some correlation with students' learning styles. Lecturers or instructors should adapt their course assessments and teaching methods to accommodate the various styles of learning among students (Corbin, 2017). Meanwhile, in a study among senior high school students in Ghana, Amoah (2024) discovered significant differences in mathematical performance between male and female students. Meanwhile, Laoli et al. (2023) presented substantial evidence suggesting that gender differences contribute to enhancing college students' English proficiency through inquiry-based learning.

**VARK Learning Style Model:** The VARK model assists students in recognizing their preferred learning style, which is determined by how individuals perceive and process information (Duff, 2000). Othman and Amiruddin (2010) view the VARK learning style as a distinctive approach to acquiring knowledge, abilities, and attitudes. Initially devised by Neil Fleming in 1987 and subsequently updated in 2006, the VARK model categorizes students' senses into four main types: visual, auditory, reading/writing, and kinaesthetic. Each student possesses a unique learning style, and comprehending these styles is pivotal in assessing the efficacy of the educational process (Ismail, 2010). Thomas et al. (2002) assert that learning style is crucial for enhancing comprehension and performance in any subject. Therefore, the VARK learning style has the potential to create an engaging classroom environment for learners and stimulate their senses during learning activities (Othman & Amiruddin, 2010). According to Fleming and Baume (2006), students inclined toward the visual mode prefer learning through visual representations such as diagrams, charts, graphs, and pictures. Those favoring the aural mode learn best through auditory means, such as lectures and discussions. In contrast, students with a reading or writing preference excel in comprehending and interpreting printed information, such as textbooks and notes. Conversely, the kinaesthetic mode caters to students who prefer learning through physical experiences, such as hands-on activities, experiments, and role-playing.

Furthermore, Fleming (1995) found in a study that the most frequently utilized mode in the learning process is the speech mode or aural mode in the VARK model. Moreover, the study by Khongpit et al. (2018) which looked at the VARK learning styles of 145 computer course students at Sripatum University-Chonburi Campus and Burapha University revealed that students selected visual and kinaesthetic learning at the same percentage (27%), and aural and reading/writing at the same percentage (23%). Additionally, kinaesthetic (69.2%) and auditory (55.9%) learning modes were the most favored among unimodal learning preferences, according to a study done with medical students by Shakeri et al. (2022). Research by Iyer and Sethuraman (2024) found that the majority of students favored the kinaesthetic approach. According to the findings of Nguyen et al. (2024), students who took theory-oriented courses favored visual learning. Students, however, favored the kinaesthetic approach in practice-oriented courses. As a result, course types have a big impact on how students choose their learning styles. Therefore, it is crucial to identify students' learning styles to ensure the effectiveness and acceptance of the teaching and learning process. In the growing digital world, teaching and learning processes have shifted online, and students need to be creative in selecting their learning styles to prevent boredom during the learning process, as success in e-learning depends on the student's learning style (Byrne, 2002).

**Different Sensory Modalities (Unimodal & Bimodal):** Learning style denotes an individual's preferred method of acquiring knowledge and processing information, encompassing cognitive, affective, and psychological factors that govern how individuals interact with and respond to the learning environment (Duff, 2000). The learning styles of students are dynamic and subject to change. Certain students have a preference for one or more of the four modes—quadrimodal, trimodal, bimodal, or unimodal the VARK learning style. A moderately favorable link between students' academic performance and their bimodal learning style was

discovered by Javed et al. (2023), indicating that learning style had to be taken into account throughout both the instructional and evaluation phases. As a result, knowing the preferred learning styles of their students can assist lecturers or teachers in modifying their delivery style to enhance student engagement improve students' understanding, and prevent boredom. According to numerous studies, students prefer to use a variety of styles, depending on the context and subject matter being learned. Students' preferences for multimodal (bimodal) learning styles ranged from 13.2% (Saudi Arabia) to 87% (Iran) in global research (Shakeri et al., 2022). Chakravarty et al. (2022) found that 68.2% of students chose multimodal learning techniques, with 28.2% of students preferred quadrimodal learning, 28.2% preferred bimodal learning, and 11.7% favored trimodal learning. Additionally, the study revealed that 31.7% of participants exhibited single learning preferences, with 20% favoring kinaesthetic learning, 7.05% preferring visual learning, and 4.7% leaning towards auditory learning. Moreover, Mon et al. (2014) discovered that 61 students (62.2%) preferred multimodal learning, while the remaining 37 students (37.8%) preferred unimodal learning. Conversely, in a study conducted by Jailani et al. (2023), the majority of pharmacy students were identified as unimodal learners, with the most prevalent learning style being kinaesthetic, whereas reading and writing were the least preferred options.

## 3. Methodology

Questionnaires were distributed to non-accounting students in one of the higher learning institutions in Melaka, Malaysia. The study aims to determine students' preferred learning styles, whether unimodal or bimodal, for the financial accounting subject. A total of 398 students returned the questionnaires. The questionnaires were based on the VARK Learning Styles Questionnaire: excerpted from Enid (2005). It consists of three learning styles: visual, auditory, and kinaesthetic. The questionnaires were distributed to students during financial accounting class sessions. Students took approximately ten minutes to answer the questions. The questionnaire consisted of two sections: Section A contained demographic questions, and Section B contained thirty (30) questions regarding learning style preferences. Ten (10) items for each style, where respondents were required to select 'YES' or 'NO' to the statements provided in the questionnaire. The "YES" answer was then totalled up for the three categories. The highest score indicates the student's learning style. If a high score is more than one area, students are using additional modalities. The learning style and the modalities are presented in the table below:

| Modalities | Learning styles |
|---|---|
| Unimodal | Visual |
| | Kinaesthetic |
| | Auditory |
| Bimodal | Visual + Kinaesthetic |
| | Visual + Auditory |
| | Auditory + Kinaesthetic |

Descriptive statistics were used to determine the learning styles that students preferred, whether they were unimodal or bimodal. Subsequently, the data were analyzed using DataTab software to perform Chi-Square tests and establish any potential connection between gender and unimodal or bimodal learning preferences.

## 4. Findings and Discussion

### Results of Learning Style Modal

**Figure 1: Percentages of Students Who Preferred Unimodal and Multimodal Learning Styles Based on Gender**

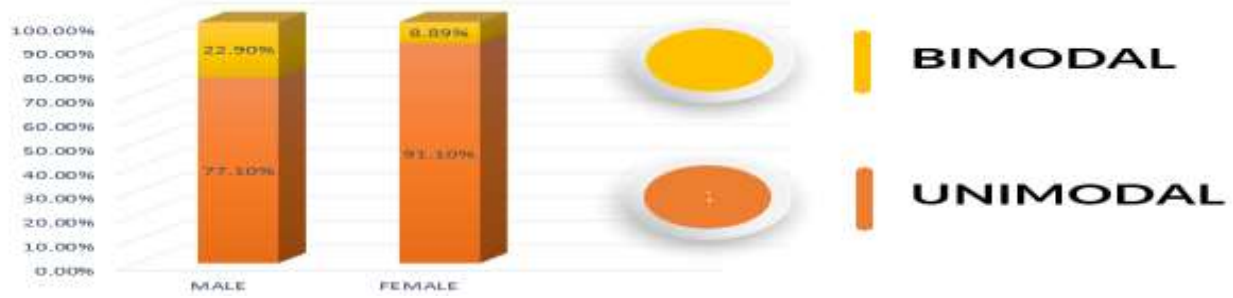



Figure 1 depicts the composition of non-accounting students' learning styles when studying the accounting subject, categorized as either unimodal or bimodal, based on gender (male or female). The majority of male students (77.1% of the overall population) exhibit unimodal learning styles, with only 22.9% demonstrating multimodal learning styles. Conversely, 91.1% of female students exhibit unimodal learning styles, with only 8.89% displaying bimodal learning styles. Students with unimodal learning styles employ tend to rely on one specific approach, such as visual, auditory, or kinaesthetic. In contrast, bimodal learning styles involve the combination of two types of learning styles, such as visual and auditory, visual and kinaesthetic, or auditory and kinaesthetic. The findings suggest that most students tend to have an unimodal learning style, whether they are studying theoretical or computational subjects.

**Table 1: Distribution of Respondents Based on Learning Style Modal Across Different Genders Based on the Total Population**

| Learning Style Modal | Gender | | | | | |
|---|---|---|---|---|---|---|
| | Female | | Male | | Total | |
| | N | % | n | % | n | % |
| Unimodal | 164 | 41.21% | 168 | 42.21% | 332 | 83.42% |
| Bimodal | 16 | 4.02% | 50 | 12.56% | 66 | 16.58% |
| Total | 180 | 45.23% | 218 | 54.77% | 398 | 100% |

The distribution of learning style modalities is further examined in more detail. Table 1 displays the distribution of respondents based on learning style modality across different genders. The total number of respondents involved was 398, consisting of 218 males (54.77%) and 180 females (45.23%). Among the total population, 332 students (83.42%) represent those with unimodal learning styles, while 66 students (16.58%) represent those with bimodal learning styles. The data underwent further scrutiny through a Chi-Square Test, specifically between gender and learning style modality. This analysis aimed to ascertain whether there exists a noteworthy disparity between male and female genders concerning their respective learning style modalities, be it unimodal or bimodal. Table 2 delineates the outcomes of the Chi-Square Test between gender and learning style modality. The results reveal a chi-square value $\chi^2(1) = 14.06$, $p < .001$, with Cramér's V = 0.19. The p-value of < .001 obtained falls below the predetermined significance level of 5%, thus establishing the statistical significance of the Chi-Square test and leading to the null hypothesis's rejection. Additionally, Cramér's V coefficient of 0.19 signifies a weak correlation between gender and learning style modality. This indicates that while the two variables exhibit a statistically significant relationship, the effect size remains relatively modest.

To summarise, the findings from the Chi-Square Test suggest a noteworthy variance in the distribution of learning style modalities among male and female respondents.

**Table 2: Chi-Square Test between Gender and Learning Style Modal**

| **$Chi^2$** | **14.06** |
|---|---|
| df | 1 |
| p | <.001 |
| Cramér's V | 0.19 |

**Results of Learning Style Preferences**

**Figure 2: Percentages of Students' Learning Styles According to Their Respective Genders**

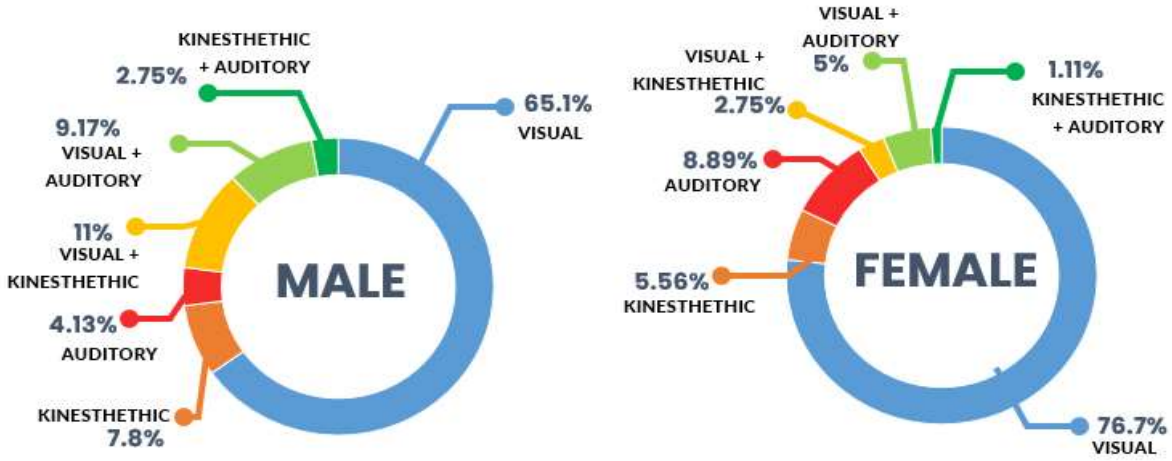



Figure 2 illustrates the breakdown of learning style preferences among male and female students, respectively. Most male and female students tend to have an unimodal visual learning style, comprising 65.1% of males and 76.7% of females. This suggests that students are utilizing a visual learning approach when studying accounting subjects, relying on visual materials for comprehension. In our context, educators have provided students with a resource called an 'accounting map'. This map encapsulates the entire process, beginning with comprehensive dummy transactions, double entries, journals, ledgers (t-accounts), trial balances, financial statements, year-end adjustments such as depreciation, accruals, bad debts, allowance for doubtful debts, and culminating in financial statement analysis using financial ratios. We hypothesize that students adopt a visual learning style as they heavily rely on this accounting map as their primary study material for accounting subjects.

The second most popular learning style preference among males is represented by bimodal (visual and kinaesthetic), accounting for 11% of the total male population. This finding suggests that some male students prefer learning using the visual style but also find it beneficial to combine it with the kinaesthetic method. Moreover, it indicates that these students may benefit from additional tutorials and hands-on practice to enhance their understanding of the accounting subject. Bimodal study strategies (visual and auditory) rank as the third most popular among male students, representing 9.17% of the total male population. Some of these students extensively utilize the accounting map while engaging in class discussions with lecturers, as they prefer detailed explanations from their instructors. They rely on lecture content to achieve a comprehensive understanding of the accounting subject. Overall, in learning accounting subjects, the visual learning style appears to be the most dominant among male students. Conversely, bimodal (kinaesthetic and auditory) learning styles are the least popular among male students, accounting for only 2.75% of the entire male population.

The findings for female students revealed that, in addition to the most popular learning style, which was unimodal-visual (76.7%), the second and third most popular learning styles among female students were unimodal-auditory (8.89%) and unimodal-kinaesthetic (5.56%), respectively. Female students predominantly preferred unimodal styles and did not combine different types of learning styles. These results suggest that female students are inclined to fully utilize the accounting map materials provided in the classroom. Those with an unimodal auditory learning style tend to possess strong listening skills, enabling them to discern subtle differences in tone or pitch during lectures. However, they may encounter challenges with written communication or visual aids (such as the accounting map in this research context), as they may find it difficult to process information presented in these formats. Unfortunately, this group represented only a small fraction of the overall female student population. A small subset of female students also prefers unimodal kinaesthetic learning, indicating difficulty with learning through reading, visualization, or attending lectures, as these methods do not provide the physical stimulation they require for successful learning. Overall, female students tend to favor unimodal learning styles such as visual, auditory, or kinaesthetic, rather than bimodal learning styles.

**Table 3: Distribution of Respondents Based on Learning Style Preferences Across Different Genders Based on Total Population**

| | | GENDER | | | | | |
|---|---|---|---|---|---|---|---|
| | | FEMALE | | MALE | | Total | |
| | | n | % | n | % | n | % |
| **LEARNING STYLE** | **AUDITORY** | **16** | **4.02%** | **9** | **2.26%** | **25** | **6.28%** |
| | AUDITORY+KINESTHETIC | 2 | 0.5% | 6 | 1.51% | 8 | 2.01% |
| | KINESTHETIC | 10 | 2.51% | 17 | 4.27% | 27 | 6.78% |
| | VISUAL | 138 | 34.67% | 142 | 35.68% | 280 | 70.35% |
| | VISUAL+AUDITORY | 9 | 2.26% | 20 | 5.03% | 29 | 7.29% |
| | VISUAL+KINESTHETIC | 5 | 1.26% | 24 | 6.03% | 29 | 7.29% |
| | Total | 180 | 45.23% | 218 | 54.77% | 398 | 100% |

**Table 4: Chi-Square Test between Gender and Learning Style Preferences**

| **$Chi^2$** | **19** |
|---|---|
| df | 5 |
| p | .002 |
| Cramér's V | 0.22 |

The analysis is further scrutinized by comparing the details between the two groups, males and females, across different learning styles. Table 2 displays the results of this analysis. For both males and females, the most

preferred learning style when studying accounting is unimodal-visual, representing 70.35% (280 students) of the total population. Conversely, the least preferred learning style is bimodal-auditory and kinaesthetic, accounting for only 2.01% (8 students) of the total sample population. Subsequent to the Chi-Square Test, an analysis was conducted to assess whether a significant difference exists between male and female groups across various learning style types. The outcomes of this analysis are presented in Tables 3 and 4. The results unveil a statistically significant distinction between Gender and Learning Style, with $\chi^2(5) = 19$, $p = .002$, and Cramér's V = 0.22. The p-value of .002 falls below the predetermined significance level of 5%, thereby indicating a substantial finding that warrants the null hypothesis's rejection.

## 5. Conclusion

In conclusion, this study aimed to describe the variation of learning styles among undergraduate non-accounting students. Previous research suggested that adopting various learning styles could assist both male and female students in improving their accounting performance. Overall, students tended to prefer unimodal learning styles over bimodal ones. Additionally, there were statistically significant differences in students' learning styles based on gender. Both male and female students predominantly favored the unimodal visual learning style, while kinaesthetic and auditory styles were less preferred. Notably, this study did not encompass reading and writing learning styles, which are typically considered fundamental educational skills. This omission may stem from the lack of emphasis placed on enhancing students' reading and writing abilities in many schools and universities, making these skills less prioritized. Many students find reading challenging, which in turn affects their proficiency in writing.

To improve student performance, it is imperative to consider additional contributing factors beyond learning styles. Consequently, this study has several limitations. Firstly, the research sample consisted solely of non-accounting students from two faculties, potentially limiting its representativeness of all non-accounting students. To address this limitation in future research, it is recommended to employ a larger and more diverse sample, encompassing students from various faculties and institutions. This approach would augment the generalisability of the findings. Additionally, the data collection for this study was conducted exclusively during face-to-face class sessions. Given the ongoing evolution of teaching and learning methods, including a transition to online platforms, it would be valuable to compare data from both environments. Such a comparison could shed light on whether the learning platform influences students' learning styles and academic performance differently.

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