



The Impact of Learning Style and Learning Strategy Towards Accounting Students' Academic Achievement

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Abstract. Various studies have researched the importance of learning style and strategy to develop student academic achievement. However, most of these studies were not conducting their research during the pandemic era, when most learners attended classes online. Another thing to pay attention to is that most studies in this area do not conduct their research in the context of accounting. This study intended to analyze the impact of learning style and learning strategy on accounting students' academic achievement and provide empirical evidence on this topic using statistical tests. The lack of studies exploring this topic during the pandemic makes this research unique. The research outcomes of this study are intended to contribute to the educational world and those interested in it. The data in this research study are gathered from accounting students at Petra Christian University through a questionnaire. The data were then analyzed using a multiple linear regression test in SPSS software. The results of this statistical test show that kinesthetic learning style and surface approach learning strategy influence accounting students' academic achievement but prove that learning style does not impact accounting students' learning strategy. Regardless of this study's results, it is highly recommended that other researchers replicate this research on different subjects because the researchers felt it is an exciting topic to study. It may also give different results due to factors that affect the study, such as population and sample size, student's major, learning environment, and other factors.

Keywords: Learning Style · Learning Strategy · Academic Achievement · Accounting Student

1 Introduction

The future of accounting lies in the competence of accountants who depend very much on the educational process they have experienced [1]. Many universities have been criticized for producing accounting graduates who cannot think and make independent judgments when dealing with problems [2]. Low-level grades or achievements might cause this during their education, indicating that students do not get the knowledge their teachers convey. Because of that, the researchers of this study will pay more attention to Academic Achievement as the dependent variable.

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One way that students can improve their academic achievement is by utilizing effective learning strategies. Learning strategies are an essential variant of the learning process [3]. Each student selects and actualizes different strategies depending on learning variables, including individual differences, learning methods, learning technology, types of criticism, required level of mastery, measurement methods, and others [4]. From previous theory, we can see that students with the right learning strategy will most likely have a good learning process, leading to high academic achievement. However, the research results by Takase & Yoshida [5] show that not all learning strategies significantly impact student academic achievement. This result has attracted the attention of this study's researchers to discover further the influence of surface approach learning strategy and deep approach learning strategy on Accounting students' academic achievement.

Learning style can be one of the factors influencing an individual's learning strategy [6]. Nja et al. [7] define learning style as a unique way for every individual to absorb, process, understand, and store information that can be affected by environmental, emotional, and cognitive factors apart from their backgrounds. We can see from the previous theory that learning style and strategy are not the same. Truthfully, many studies have researched this area. However, most of these studies are not conducted directly towards accounting and do not have a large quantity [6, 8, 9, 28]. It motivated researchers to explore the impact of learning style on learning strategy.

The previous matter does not also rule out the possibility that the learner's learning style may directly influence a learner's academic achievement, which can be seen from many studies that have found a correlation between learning style on academic achievement. However, each study's results differ in what type of learning style is the most effective for improving academic achievement. For example, research results from [7] found that the audio-visual learning style is the most effective in improving students' academic achievement. Meanwhile, [10] found that the most effective learning style to improve students' academic achievement is the Kinesthetic (K) learning style. From the two research results mentioned above, our research results differ in the most effective learning style and the quantity of learning styles that each student adopts. Therefore, the researchers of this study believe that the results of other learning style studies cannot be implemented due to differences in external factors that influence the subject and the nature or characteristics of the research subject itself. Because of this, researchers have decided to examine the relationship of learning style to academic achievement using accounting students as subjects.

2 Literature Reviews and Hypotheses Formulation

2.1 Learning Style

Each student learns differently from another, where they tend to pick the preferred learning style [11]. Based on the previous theory, learning style define as an individual's method of receiving, understanding, storing, and processing data in the most comfortable way. Therefore, we can also see that learning style is unique because each has various ways to receive information indefinitely [7].

Knowing and recognizing each individual's learning style can benefit several parties where this can help them achieve their goals in the most effective & efficient way and

produce better outputs [8]. One of the parties who benefit from recognizing students' learning styles is none other than the students themselves. Sadeghi et al. [12] explained that if students can identify the most suitable learning style to be applied, then students can have a better learning process.

2.1.1 Fleming-Mills VARK Model

Fleming & Mills developed The VARK *Learning Style* model in 1992 [13]. The VARK model classifies students according to their sensory modalities, explaining how they choose to receive information presented to them [13, 14]. Students who do not know their *learning style* and wish to learn more about this matter can access the VARK website to answer the VARK Questionnaire.

The VARK model can be classified into four types: 1) Visual (V). Visual type students study effectively through their observation [7]. This learner studies most effectively using media such as presentations, guide videos on Youtube, and others; 2) Auditory (A). Auditory-type students are the type of students who prefer to learn by listening to information [15]. Generally, those who use this learning style study most effectively through discussion and listening to voice recordings; 3) Reading/Writing (R). If an individual is most easily receptive to information through writing or tables, they can be classified as reading / writing students [16]. This type of student generally likes to revise materials and use books or summaries as a favourite tool for collecting data and sharing information [17]; 4) Kinesthetic (K). Pei-Xin [8] and Albeta [18] define a kinesthetic learner as an individual who learns with much movement or learns by direct experimenting.

In addition to being highly rated by its users, the VARK model also has a positive influence that is easy to see, especially for those involved in education. The study [19] perceived one of these positive influences, which found that identifying a student's learning style will assist learners or lecturers in determining effective and systematic ways of learning. With that, the researcher believes that the VARK model plays a part in the advancement of this study and becomes the main reason this study used the VARK model.

2.2 Learning Strategy

Pei-Xin [8] defined a learning strategy as an external skill students use to enhance their learning process, often consciously. Each student has several ways or strategies to solve problems, but they will choose one or several to solve specific problems [8]. From the previous theory, we can see three things. First, one strategy cannot be used to master all subjects. Second, learning strategy does not only have one type but many types. Third, the selection of student learning strategies can be influenced by the lecturing subject. Because of this, the learning strategy of accounting students becomes interesting in this study, where the researchers feel that the student's learning strategy has a strong relationship with the student's educational process.

2.2.1 Student Approaches to Learning (SAL) Theories

The Student Approaches to Learning (SAL) Theories were used to develop this research topic. This theory was first proposed by Marton and Saljo in 1976 [20] in their qualitative

analysis research which defined the differences in students' learning strategies through written texts. From this theory, they have divided learning strategy into two terms called deep approach and surface approach.

In addition, many other researchers have classified learning strategies into various types with different quantities than that of SAL theory. One is the research [21], which adopts Duff's theory [22], where learning approaches are separated into the deep, surface, and strategic or achieving approaches. However, many researchers support the SAL theory and still choose to break down learning strategy into only two types: the deep approach and the surface approach. According to [23], the strategic or achieving approach cannot be combined in the same category as the deep and surface approach. They stated that students' strategies for learning are mainly separated into deep and surface approaches, while the strategic approach is known to be a part of the deep approach. In addition, Biggs [24] also states that the deep approach and surface approach focuses on how a student copes with a task, while the strategic approach focuses on how they organize their learning process. Hence, the strategic approach is different from the surface and deep approach. For the same reason as the previous researchers, this study chose to focus on only two types following what has been proposed by the SAL Theory: the deep approach and the surface approach.

2.2.1.1 Surface Approach

The surface approach is a strategy that tends to be used by students who have the intention to use minimal effort to achieve their goals [25]. Students who use this strategy usually tend only to memorize the material they receive, intending to swiftly complete the task they were given while having minimal or no intention to understand the logic underlying their knowledge [15].

2.2.1.2 Deep Approach

Students with a deep approach strategy generally desire to understand what they have learned. These characteristics differentiate deep approach users and those who utilize the surface approach strategy. They tend to feel enthusiastic about learning new material/science [25]. In general, to understand something, students who use a deep approach strategy tend to think critically and form their understanding of the material that has been studied [26]. In addition, it is also known that students with this strategy usually tend to provide more satisfactory learning outcomes than those who use the surface approach strategy [15].

2.3 Academic Achievement

Academic achievement indicates a learner's capacity to obtain academic or educational goals [27]. Academic achievement can be evaluated from the grades obtained by a student in a particular subject [7]. Because of this, in general, students in a university often put in a lot of energy and time to get good grades. Many students have done this to offer a higher bargaining power than other students in the future when they start their careers where each student will become a potential competitor between one another.

2.4 The Relationship Between Learning Style and Learning Strategy

Pei-Xin's research [8] found that every student has various ways to solve a problem, but they will often choose only one of these ways to solve a particular problem. The theory does not rule out the possibility that students will use strategies according to their comfort level, which means that there is a possibility that the learning strategy chosen by accounting students will be according to each individual's learning style. Several initial kinds of research found a relationship between learning style and learning strategy [6, 8, 9, 28], although the majority of these studies do not use accounting students as their research subjects. However, some researchers have not found a connection between learning style and strategy. One study that found this result stated that the lack of population and sample might cause it [28]. This inconclusive result has attracted the researchers of this study to explore this matter further for accounting students.

H1: There is an influence from learning style towards accounting student's learning strategy.

2.5 The Relationship Between Learning Strategy and Academic Achievement

Learning strategy is closely related to the grades of particular subjects and academic achievement in general [21]. The deep approach is often affiliated with superior learning outcomes. In contrast, the surface approach is closely related to unsatisfactory learning outcomes [5]. Although, during online learning, students could utilize easy internet access to achieve high academic achievement through the surface approach [29–31].

Several studies have found that learning strategy has an impact on academic achievement [4, 23, 25]. However, several research results also conclude that learning strategy does not impact academic achievement [5, 32]. Inconclusive results of previous research have attracted the attention of this study's researchers to deeply explore the impact of learning strategies, especially the deep and surface approach toward accounting students' academic achievement.

H2: There is an influence from learning strategy towards accounting student's academic achievement.

2.6 The Relationship Between Learning Style and Academic Achievement

Previous research has investigated students' learning styles and academic achievement. For example, Kruck et al. [33] found that academic achievement is influenced by learning style. Although this is true, it should also be considered that the impact of learning style on academic achievement may differ from one study to another. For example, Albata et al. [18] found that visual and kinesthetic learning styles have lower performance than aural learning styles. In comparison, Zain et al. [10] concluded that students who obtained high academic scores were those who used kinesthetic learning styles based on their research on students in Selangor. The results differences are most likely due to differences in external factors that affect student learning styles, such as geographic location, learning environment, characteristics of the research subject itself, and many other factors. Another thing to consider is that several studies have found that student

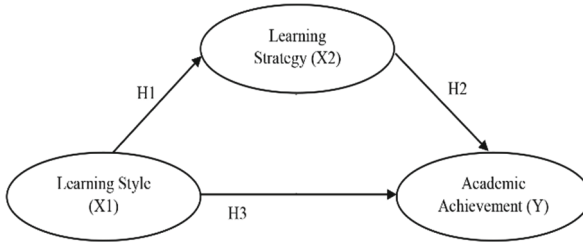


Fig. 1. Research' Variables and Hypotheses Model

learning styles have a minimal impact [9] or may even have no impact on their academic performance [15, 34].

The results of previous studies are inconclusive and cannot be directly applied to this research because of the different external factors that affect the learning styles of students who become the subject of this study. The previous statement has motivated the researchers of this study to further investigate the impact of learning style on academic achievement, especially among accounting students.

H3: There is an influence from learning style towards accounting student's academic achievement (Fig. 1).

3 Method

3.1 Research Participants

795 Petra Christian University Accounting Students, who were still active as students in the 2021/2022 academic year according to data on the Higher Education Database website [35], were selected as the population of this study. The population is divided into three programs: Business Accounting, Tax Accounting, and *International Business Accounting*. This study used a simple random sampling technique which determined 278 students as the research sample based on the sample size formula by Saunders, Lewis, & Thornhill [36] with a 5% Margin of Error and 95% Confidence Interval.

3.2 Variable Measurement

Variables were measured with instruments adapted from previous studies. The VARK Questionnaire version 8.01, developed by Neil Flemming [37], is used to measure the *learning style* variable in this study. This particular questionnaire was also used in the research of Peyman et al. [38]. The *Learning Strategy* Questionnaire used in this study was adopted from Aharony [39], which divides *Learning Strategy* into *Surface Approach* into the first 7 question items and a *Deep Approach* on the last 8 question items. Meanwhile, the questionnaire to measure students' Academic Achievement was adopted from Garg et al. [27].

3.3 Data Collection and Analysis Procedures

Firstly, each variable's questionnaire was translated into Bahasa and then compiled in a Google Form, which was later divided into four parts before it was distributed. The first part of the questionnaire is the respondent's demographic data. The second part contains 16 multiple-choice questions where each choice of the answer symbolizes Visual, Audio, Read/Write, or Kinesthetic Learning Style. The third part of the questionnaire contains fifteen Learning Strategy questions where the first seven questions are used to measure the surface approach, while the following eight items were used to measure the deep approach. Lastly, the fourth part of the questionnaire contains seven questions to measure Academic Achievement. Five-Likert Scale was used to measure both learning strategy and academic achievement questionnaires. This scale has a score of one as the lowest and five as the highest. A score of one denotes that the respondents strongly disagree, while a score of five denotes that the respondents strongly agree.

Then, the questionnaire was distributed through group chat or personal chat on LINE and WhatsApp social media. Initially, the questionnaire was given out to only 20 students to be later asked for feedback regarding the clarity of the questionnaire. The collected data were tested for validity and reliability using SPSS version 25. Later, it was found that each item of the Learning Strategy and Academic Achievement questionnaire is valid for measuring these variables with Pearson Correlation (2-tailed) significance value below 0.005. The questionnaires were also reliable because they have a Cronbach's Alpha value > 0.7 , precisely 0.878 and 0.770 for each. Meanwhile, based on the official VARK version 8 website, the validity of the Learning Style variable questionnaire item has been tested in the research of Leite, Svinicki, and Shi [40] using four multitrait-multimethod confirmatory factor analysis methods with Cronbach's Alpha values for each following item from the visual, aural, read/write, and kinesthetic subscale: 0.85, 0.82, 0.84, and 0.77. The previous test result proves that the VARK questionnaire is valid and reliable for research. Hypotheses were tested by Linear Regression using SPSS. The coefficient R test is used to test how able the independent or predictor variable is in describing the dependent or predictive variable.

4 Results and Discussion

4.1 Results

4.1.1 Statistics Data

Based on Table 1, the previously distributed questionnaires received 278 respondents. The majority of whom were students of the Business Accounting study program with as many as 129 people (46.40%), with the percentage of female respondents (76.26%) more than the male (23.74%). The majority of students involved in this study are batch 2020 (32.38%) and students who went through their educational process through whole online learning (89.57%) in the last July-December 2021 period. Most of these students attend their classes using cell phones & laptops (68.71%).

Table 1. Respondents' Demography

Item	Choices	Frequency	Percentage
Major	Business Accounting	129	46.40%
	Tax Accounting	123	44.24%
	International Business Accounting	26	9.35%
Batch	2017	4	1.44%
	2018	60	21.58%
	2019	56	20.14%
	2020	90	32.38%
	2021	68	24.46%
Age	<18	2	0.7%
	18–21	242	87.1%
	>21	34	12.2%
Gender	Male	66	23.74%
	Female	212	76.26%
Learning Methods	Hybrid	29	10.43%
	Online	249	89.57%
Gadgets used when online classes	Handphone & Laptop	191	68.71%
	Laptop	44	15.83%
	Handphone, Laptop & Tablet	35	12.59%
	Others	8	2.87%
GPA	<2.51	4	1.44%
	2.51–2.75	12	4.32%
	2.76–3.00	21	7.55%
	3.01–3.25	58	20.86%
	3.26–3.50	85	30.58%
	>3.50	98	35.25%
Time spent for study per week (outside of lecture hours)	<5 h	85	30.58%
	6–10 h	119	42.81%
	11–15 h	51	18.35%
	16–20 h	11	3.96%
	>20 h	12	4.32%

Table 2. Linear Regression Test Results

Model	Sig.	T-test	Remarks	Results
Hypothesis 1: Learning Style to Learning Strategy	0.314	-1.008	No-Significant	H1 Rejected
Hypothesis 2: Learning Strategy to Academic Achievement	0.000	13.873	Significant	H2 Accepted
Hypothesis 3: Learning Style to Academic Achievement	0.048	-1.983	Significant	H3 Accepted

4.1.2 Testing Hypothesis

Hypothesis testing was performed primarily at an $\alpha = 0.05$ significance level (Awong et al., 2017).

In Table 2, it can be seen on our sample test that the first hypothesis model or Learning Style relationship to Learning Strategy has a significance level > 0.05 and the t-score $< t$ table 1.65. So, it can be concluded that there is no relationship and H1 is rejected. It also shows that Learning Strategy has a relationship with Academic Achievement with a significance value of 0.000 and a t-score of 13.873. Learning Style in the test results of our sample also affected Academic Achievement with a t-score of -1.983 and a significant value of 0.048, then H3 is accepted. The results of the R coefficient test on our sample show that learning style can explain 0.4% of learning strategy, the learning strategy was able to explain 41.1% of academic achievement, and the learning style was able to explain 1.4% of academic achievement.

4.2 Discussions

This study found that learning style does not influence learning strategy, so H1 is rejected. One factor that may cause this result is because the deep and surface approaches discuss the students' depth of learning, while the learning style is a student's preference for how they receive information [11]. From the previous theory, we can see that these two variables are different and unrelated. This result is consistent with [28], who did not find any influence of learning style on learning strategy but can only identify learning style and learning strategy owned by a person.

This study also showed that surface and deep approach learning strategies positively affect academic achievement, so H2 is accepted. Among the two types of learning strategy, the surface approach (41.1%) had a greater influence than the deep approach (39.2%) on academic achievement. This contradicts with various journals that stated a deep approach will better improve academic achievement [1, 5, 23, 25, 28]. One of many factors that can cause the results of this research is the learning environment where most respondents were pursuing online learning. During online learning, students can easily access the internet and their gadgets which allows them to utilize a surface approach while maintaining high grades [29–31]. It can be one of the reasons why the academic achievement of surface and deep approach users does not have much difference. The

results are also consistent with prior studies [5, 6, 23, 25], which have found that academic achievement is affected by learning strategies.

This research also showed that kinesthetic learning style (K) negatively affects Academic Achievement, meaning H3 is accepted. One factor that can cause this result is that the accounting department's courses do not require much body movement. It contradicts how those with kinesthetic intelligence receive the best information, namely with body movements or practical activities [8, 18].

5 Conclusion

This study can show that the Kinesthetic (K) learning style negatively influences accounting students' Academic Achievement, which proves that the higher the kinesthetic intelligence of an accounting student, the more difficult it is for them to achieve good academic achievement. This study also shows that learning strategy positively influences accounting students' academic achievement, proving that making the right learning strategy choices can improve accounting students' academic achievement. However, this study could not prove that learning style influences accounting students' learning strategy; this means that any learning style an accounting student possesses does not influence an accounting student's choice of learning strategy.

Regardless of those results, researchers highly recommend replicating this research topic in other departments or universities. It caused the research results can be influenced by many external factors such as the number of samples and population, the field of education pursued by students, the learning environment and various other things. The previous statement means that the results of this research are not absolute and do not rule out the possibility that the resulting impact between one variable and another can be different if applied to different research subjects. Another reason to replicate this research is that only a few studies investigate the influence of learning style and strategy on academic performance during the era of *online learning* in Indonesia, which means that this topic is a new and unique matter to study. The researchers of this study also believed that an in-depth investigation regarding this topic could potentially be of great use to the world of education.

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Author's Contribution. Martin developed the theoretical formalism, Stefani performed the analytic calculations, and Miss Sany supervised the research. All authors contributed to the final manuscript.

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