# The Influence of Learning Styles (Visual, Auditory, Kinesthetic) on Learning Productivity of SONIC Students in the Kampus Merdeka Curriculum at Universitas Kristen Maranatha

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**ABSTRACT**

Learning styles are the unique ways individuals comprehend, process, and retain information. Each person exhibits a distinct learning style, such as visual, auditory, and kinesthetic. Effective learning styles can impact student learning productivity in higher education by reflecting the outcome of an efficient and effective learning process. This study investigates the relationship between learning styles and student learning productivity in the Students' Innovation and Incubation (SONIC) program at Universitas Kristen Maranatha. By comprehending this correlation, it is anticipated that more effective learning strategies can be developed to enhance student learning productivity. The research method uses a quantitative approach; the sample is 60 students from the SONIC program. The analysis demonstrates that all questionnaire items are both valid and reliable. A simple linear regression analysis identifies a positive relationship between learning styles and student learning productivity, as indicated by the regression equation $Y = 9.550 + 0.561X$. This research implies the importance of understanding students' learning styles to improve learning effectiveness in higher education. It contributes to comprehending the connection between learning styles and student learning productivity. The outcomes of this study can serve as a foundation for devising more effective learning strategies in higher education, particularly within the SONIC program at Universitas Kristen Maranatha. By understanding students' learning styles, educational institutions can enhance students' learning productivity and facilitate their attainment of optimal learning outcomes.

*Keywords: Learning Style, Learning Productivity, Education, Human Resource Management, Merdeka Belajar Kampus Merdeka (MBKM)*

## 1. INTRODUCTION

Education is the fundamental pillar driving a nation's progress and future success. The evolving landscape significantly impacts development endeavors, particularly in the education sector, aimed at nurturing high-quality human resources in both academic and non-academic realms. One pivotal approach to cultivating such human resources is through innovative teaching and learning methods, exemplified by the inception of the Merdeka Belajar Kampus Merdeka (MBKM) initiative in 2020, initiated by the Indonesian Ministry of Education, Culture, Research, and Technology. This program offers avenues for transforming learning approaches and students' learning styles. Implementing engaging learning strategies fosters active student involvement in the learning process and ensures a comprehensive understanding of the material (Widayanti, 2013).

In this context, students can be defined as individuals pursuing studies at the university level, both public and private, or at other institutions at the same level as universities (Siswoyo, Sulistyono, & Dardiri, 2007). Higher education places a growing emphasis on students' need to possess effective and productive learning capabilities. Each individual has unique capacities and characteristics that set them apart, including various aspects of learning styles (Ghufron & Risnawita, 2014).

The way individuals acquire new knowledge and information through practice, habituation, and experience is known as learning style. According to French, Cosgriff, & Brown (2007), learning style is how individuals perceive and process information in a learning situation. Learning style is an important factor that can influence students' learning

productivity. Although each individual has a different combination of learning styles, most individuals tend to have one dominant learning style over others (Herawati & Junaedi, 2023).

DePorter & Hernacki (2004) categorized learning styles as visual, auditory, and kinesthetic. Each student has a different learning style in which to process information (Prayitno, 2009). Individuals can improve their learning effectiveness by understanding their learning styles and using appropriate learning strategies (Coffield, Ecclestone, Moseley, & Hall, 2004). Monotonous teaching methods with no effort to create a conducive and pleasant learning environment by teachers can make students uncomfortable and impede optimal learning outcomes (Sardiman, 2005).

With the development of technology and the increasing variety of learning approaches, it is crucial to continuously investigate the correlation between learning styles and student learning productivity. Wirausaha Merdeka program, a part of the Merdeka Belajar Kampus Merdeka (MBKM) Curriculum, provides an opportunity for students to gain knowledge in the field of entrepreneurship for one semester at selected implementing universities, such as Universitas Kristen Maranatha. This case study examines Students' Innovation & Incubation (SONIC) participants, a collaboration between Bahasabisnis.id, Universitas Kristen Maranatha, and the Institution of Innovation and Entrepreneurship Development (LPIK) under the Wirausaha Merdeka program in the form of business incubation. The SONIC class integrates three primary learning styles: visual, auditory, and kinesthetic, emphasizing a practical learning approach. It employs interactive discussions, simulations, and practical activities to deepen students' understanding and applicability of the subject matter. This study aims to investigate the impact of learning styles on student learning productivity. Understanding this relationship will offer valuable insights for enhancing student learning productivity.

## 2. LITERATURE REVIEW AND HYPOTHESIS

Learning styles are the diverse approaches individuals use to comprehend and process information. Citing Mufidah (2017), in the book by Richard Bandler, John Grinder, and Michael Grinder on Neuro-Linguistic Programming (NLP), it is suggested that there is strong evidence that humans generally have dominant learning styles: visual, auditory, and kinesthetic. Felder (1988) states that individuals with visual learning styles tend to be more effective at understanding information through images or visualization. This learning style can be applied in teaching by using various approaches, such as using different graphic forms to convey information/lesson materials in films, slides, illustrations, sketches, or series of picture cards to explain information sequentially. The term "auditory" originates from "audio," which pertains to hearing. Auditory learning involves listening, with its characteristics emphasizing hearing as the main method for absorbing information or knowledge (Nihayah, 2011). An auditory learning style consists of a preference for learning through listening, often involving activities such as lectures or discussions (DePorter & Hernacki, 2010). Kinesthetic learning entails learning through physical actions or direct experiences (Riding & Rayner, 1998). Individuals with a kinesthetic learning style are usually more effective in understanding and remembering information when involved in physical activities, such as practical experiments, simulations, or role-playing games. Understanding these learning styles is important in the educational context, as it enables educators and learners to customize more effective learning methods to individual preferences.

Student learning productivity is a critical measure in evaluating the effectiveness of the learning process. It encompasses students' ability to achieve learning objectives, overcome barriers, and produce high-quality learning outcomes (Marzano, 2007). Learning productivity is a crucial aspect of educational outcomes, reflecting the effectiveness and efficiency of the learning process. It also demonstrates how students can understand, process, and apply the subject matter they receive. Kuh (2009) states that student learning productivity can be assessed based on their level of engagement, ability to solve problems, and achievement of learning goals. Learning productivity is effective when students can achieve optimal learning outcomes by efficiently using their time, energy, and other resources. Also, learning productivity includes understanding, remembering, and applying learned information in academic and practical contexts.

The study by Kirschner, Sweller, & Clark (2006) indicates that the concept of learning styles lacks strong support from scientific evidence. Furthermore, the effectiveness of teaching methods based on learning styles in enhancing learning productivity remains debatable.

$H_0$: There is no influence between learning styles (visual, auditory, and kinesthetic) and the learning productivity of SONIC students at Maranatha Christian University.

Kolb (1981) found that learning styles and experiences among college students influence how they process information and learn. This research suggests that accommodating different learning styles can significantly impact student learning productivity, emphasizing the importance of personalized educational approaches.

H₁: There is an influence between learning styles (visual, auditory, and kinesthetic) and the learning productivity of SONIC students at Maranatha Christian University.

## 3. RESEARCH METHOD

This research uses a quantitative approach to collect numerically measurable data and statistical analysis to test hypotheses about the relationship between variables. The sample used purposive sampling, with the sample criteria being students currently participating in the Students' Innovation & Incubation (SONIC) program second batch at Universitas Kristen Maranatha and all students who participated in SONIC the first batch last semester. Data collection for this research was conducted using a Google Form questionnaire containing 100 ordinal scale questions. The independent variable (X) in this study is learning style, while the dependent variable (Y) is learning productivity. A simple linear regression analysis technique was employed to test the hypothesis about the influence of learning style on the learning productivity of SONIC students.

## 4. RESULTS AND DISCUSSION

In this study, a total of 60 SONIC students participated, including 13 students (22%) from the first batch and 47 (78%) from the second batch, with 28 (47%) males and 32 (53%) females. There were 11 (18%) students from the Accounting program, 48 (80%) from the Management program, and 1 (2%) from the Informatics Systems program. The dominant learning styles of each SONIC student are listed in Figure 1:
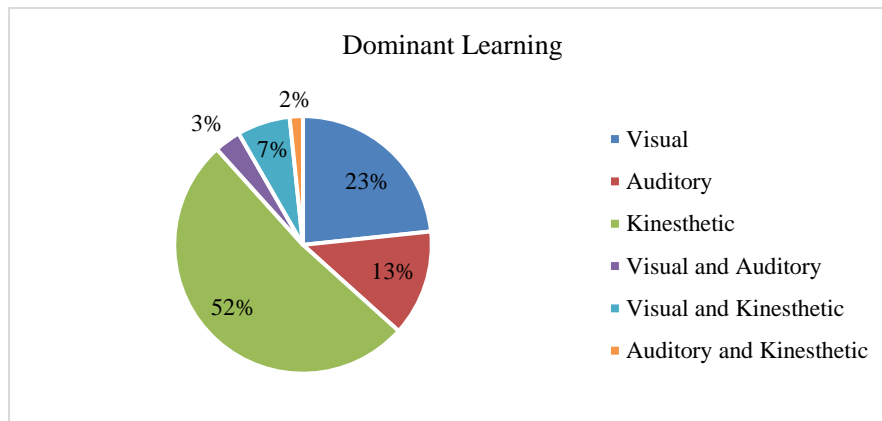


**Figure 1.** Dominant Learning Styles of SONIC Students

The kinesthetic learning style has the highest frequency, with 31 students (52%), followed by the visual learning style with 14 students (14%), and the auditory learning style with 8 students (13%). An interesting finding in this study is the presence of three categories with two dominant learning styles: visual and kinesthetic, comprising 4 students (7%); visual and auditory, consisting of 2 students (3%); and auditory and kinesthetic, totaling 1 student (2%). In the SONIC class, four curriculum design cycles are arranged: (1) Finding, which includes market analysis, problem-solving approach, and business mindset; (2) Prototyping, discussing prototype design, product development, and marketing product; (3) Validating, comprising market validation, prototype evaluation, and test and retest strategy; and (4) Biz Fundamental, covering comprehensive business aspects of finance, operations, and marketing, with (5) Nurturing involving business growth aspects such as personal consultation, networking, business evaluation, and investment readiness. The curriculum in the SONIC program emphasizes practical application, including activities like group work, presentations, icebreakers, simulations, product testing, and investor pitching. With 52% of the students' dominant kinesthetic learning style, this approach is expected to enhance the absorption of information in a stimulating learning environment.

Before hypothesis analysis, a validity test was executed to assess the measurement adequacy of the questionnaire items. Sugiyono (2011) emphasizes the importance of using valid and reliable instruments to ensure the validity and reliability of research findings. The aim was to ensure that the questions were valid and measured the intended variables effectively. The validity test involved calculating the Pearson Product Moment correlation coefficient ($r$) for each question item, correlating it with the total score of each item. The critical $r_{value}$ for validity was determined based on the sample size (N), and the validity was assessed using a significance level of 5% (0.05). Out of the 60 respondents who completed the questionnaire, the calculated $r_{value}$ was 0.254. This result indicates that all items had an $r_{value} > critical\ r_{value}$, proving their validity for the study.

Then, a reliability test was conducted to assess the extent to which the questionnaire used in the study could be relied upon to measure the same variables consistently by examining each variable's Cronbach's Alpha values. A variable is reliable if it obtains a Cronbach's Alpha value > 0.60 (Ursachi, Horodnic, & Zait, 2015). Based on the results of the reliability test for learning style (X) of 0.977 and productivity learning (Y) of 0.973, it can be inferred that each item of the questionnaire successfully obtained a Cronbach's Alpha value > 0.6, indicating that the questionnaire used in the study was reliable. The analysis was complemented with a normality test using the One-Sample Kolmogorov-Smirnov test to ensure the data followed a normal distribution. The results of the normality test based on the Kolmogorov-Smirnov test in table 1:

**Table 1**. Normality Test Results (One-Sample Kolmogorov-Smirnov Test)

|  |  | Unstandardized Residual |
|---|---|---|
| N |  | 60 |
| Normal Parameters [a,b] | Mean | .0000000 |
|  | Std. Deviation | 2.33681663 |
| Most Extreme Differences | Absolute | .078 |
|  | Positive | .056 |
|  | Negative | -.078 |
| Test Statistic |  | .078 |
| Asymp. Sig. (2-tailed) |  | .200c,d |

Table 1 shows the results of the normality test, it was determined that all variables had a significance value > 0.05 (0.200 > 0.05), indicating a normal distribution for all data used in this study. The Glejser test examines whether there is a discernible pattern in the variance heterogeneity of residuals between observations in the regression model by regressing the independent variables against the absolute residuals. (Gujarati, 2004) as illustrated in the table:

**Table 2**. Heteroscedasticity Test Results

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 2.436 | 1.010 | | 2.412 | .019 |
| | Learning Style | -.031 | .050 | -.080 | -.608 | .546 |

If the significance value > 0,05, then the data has no heteroskedasticity. Table 2 showed a significance value of learning style 0,546 > 0.05, indicating no heteroskedasticity in the model. This research performed hypothesis testing on the correlation between the independent variable (X) and the dependent variable (Y) using simple linear analysis. Simple regression relies on the functional or causal connection between a single independent variable and a single dependent variable (Sugiyono, 2011). The results are in table 3:

**Table 3**. Simple Linear Regression Analysis

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 9.550 | 1.655 | | 5.770 | .000 |
| | Learning Style | .561 | .083 | .666 | 6.792 | .000 |

The equation derived from the output is Y = 9.550 + 0.561X**.** The regression model results prove that the positive constant value is 9.550. This result indicates that the learning style variable (X) influences learning productivity (Y). This finding supports Honey & Mumford's (2000) study on understanding learning styles, which can help improve student learning productivity by providing a more suitable approach according to individual learning preferences. The learning style variable (X) demonstrates a positive coefficient of 0.561, signifying that a unit increase in the learning style variable (X) results in a 0.561 increase in learning productivity (Y). This finding supports the influence of learning style on student learning productivity, leading to rejecting the null hypothesis $H_0$ and accepting the alternative hypothesis $H_1$.

The coefficient of determination, often referred to as R-squared, evaluates how well variables within a study can predict outcomes. A higher R-squared value indicates a stronger ability to predict, with values ranging from 0 to 1. A value close to 1 indicates that the independent variable provides nearly all the necessary information for predicting the dependent variable. Conversely, a lower R-squared value suggests that the independent variables have limited explanation for the dependent variable. (Ghozali, 2016). In the context of this study, the coefficient of determination measures how much contribution is given by learning styles (X) to learning productivity (Y), with the output obtained:

**Table 4**. Determination Coefficient ($R_2$) Results

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .666a | .443 | .433 | 2.35688 |

Based on the analysis, an R-squared value of 0.443 or 44.3% was obtained. This value indicates that learning styles (X) collectively contribute to or influence student learning productivity (Y) by 44.3%. Meanwhile, the remaining percentage, 100% - 44.3% = 55.7%, represents the influence of other unexamined variables. These findings demonstrate that although learning styles play a significant role in influencing productivity, other factors beyond learning style variables also contribute to student learning productivity.

## 5. CONCLUSIONS

The study's data analysis yielded several key findings. Firstly, it underscored the diverse learning styles among students, including visual, auditory, and kinesthetic. Understanding these variations can assist educators in preparing more inclusive and effective teaching approaches. Secondly, the research revealed that the majority of Students' Innovation & Incubation (SONIC) participants in the Merdeka Belajar Kampus Merdeka (MBKM) curriculum of both batches predominantly exhibited kinesthetic learning styles for 52% of the total with 31 students. Furthermore, 7 students were identified as having dual dominant learning styles, with 4 students (7%) leaning towards visual and kinesthetic, 2 students (3%) visual and auditory, and 1 student (2%) showing preferences for auditory and kinesthetic styles.

The analysis affirmed the validity and reliability of all questionnaire items, with Pearson Product Moment correlation coefficients for validity and Cronbach's Alpha for reliability exceeding 0.6. The data exhibited a normal distribution; no heteroskedasticity was observed in the regression model. Simple linear regression analysis demonstrated a positive correlation between learning styles and student learning productivity, represented by the regression equation Y = 9,550 + 0,561X. The coefficient of determination indicated that learning style (X) contributed 44.3% to learning productivity (Y), while other unexplored variables influenced the remaining 55.7%.

Through the findings of this study, new insights are provided into the importance of understanding students' learning styles, particularly in enhancing student productivity. With this understanding, SONIC can more effectively create a learning environment that aligns with students' learning preferences.



**Figure 2.** Compilation of SONIC at Universitas Kristen Maranatha

Figure 2 presents a compilation of the SONIC classes of the first and second batches at Universitas Kristen Maranatha. This study sets the stage for several developments. It highlights the importance of recognizing and accommodating diverse learning styles among students, paving the way for more personalized and effective teaching strategies. Educators will use these insights to enhance their instructional methods and create a more inclusive learning environment.

The SONIC program adopts various innovative strategies to support diverse learning styles and boost learning outcomes, such as (1) Utilizing an array of visual tools, including films, slides, illustrations, and sequential picture cards, to present information visually engaging and structured. (2) Integrates interactive discussions and group activities to cater to auditory learners, enabling them to participate in discussions and verbal exchanges to deepen their understanding. (3) For kinesthetic learners, the program emphasizes hands-on learning experiences such as simulation

and experiential learning activities, fostering better comprehension and retention of information. Additionally, the program incorporates regular breaks to allow for brief periods of rest, which have been shown to enhance learning productivity. The SONIC program aims to establish an engaging and inclusive learning atmosphere by employing these customized strategies, catering to various learning styles, and maximizing educational achievements.

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