

Conference Paper

Study of the Analysis on the Characteristics of Learning Style of the Students of the Vocational Education of Building Construction Study Program, Faculty of Engineering, Jakarta State University

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Abstract

This study aims to: (1) identify student learning styles; (2) obtain data on students' critical thinking skills; and (3) looking at the relationship between the quality of student learning styles and critical thinking skills in the subject areas of study. This research is correlational research. The population of this study is all Vocational Education of Building Construction Study Program students who are enrolled in the even semester, 2017/2018 academic year, taking courses in the field of study. The total population was 106 people. The number of samples that were respondents were 84 people. Of all the participants, as many as 73 (84.8%) people filled out the research questionnaire. The results of the study were nine learning styles, namely: (1) Auditory Language, (2) Visual Language, (3) Numerical Auditory, (4) Numerical Visual, (5) Tactile Kinesthetics, (6) Individual Learning, (7) Group Learning (Social), (8) Expressive Oral, and (9) Expressive Writing; it was concluded that: (1) the majority of students' learning styles were group (social) learning styles, where students preferred group learning compared to individuals, and Tactile Kinesthetic learning style, which means students preferred learning styles that focus on involvement and experience with real learning, (2) students' critical thinking skills are represented by student learning outcomes or cumulative achievement index (GPA) of students who take subject areas, even semester 2017/2018 academic year, which is an average GPA of 3.27. Minimum GPA of 2.80 and maximum GPA of 3.67, and (3) the level of strength of the relationship between learning styles (learning styles 1 to 9) with students' critical thinking skills are weak, or in other words there is no significant relationship between learning styles with student critical thinking skills.

Keywords: students, learning styles, critical thinking

1. Introduction

In the learning process, each student has different critical thinking skills. Where each student has a quicker critique of the subject matter and there is a difficulty. This different

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critical thinking ability has resulted in some of the students feeling themselves unable to solve problems in the learning process. But in reality, the learning process in the classroom is still held with the assumption that each student is the same, in terms of their abilities and learning styles. The lecturers consider all students to have a homogeneous learning style.

Learning style is the way a student processes and retains new information [1]. Learning styles depend on the development of one's personality and are influenced by the environment, emotions, social influences and individual feelings. As a result, in a learning process with certain learning models can be effective for a student but not effective for other students because their learning styles are different. Risnawati and Gufron [2] state that learning styles refer to personalities, beliefs, choices, and behaviors used by individuals to assist in learning according to the conditions that have been conditioned. Rose and Nicholl [3] explained that there was a study in the United States conducted by Professor Ken and Rita Dunn from St. University. John, in Jamaica, New York, and experts in Neuro-Linguistic Programming, such as Richard Bandler, John Grinder, and Michael Grinder identified three different learning and communication styles, namely: a) Visual. Namely learning through seeing things, such as pictures or diagrams, shows, shows or watching videos; b) Auditory. Learning through hearing something, namely by listening to audio tapes, lectures, discussions, debates and verbal instructions (orders); and c) Kinesthetic. Learning through physical activity and direct involvement, namely by moving, touching, and feeling or experiencing yourself. The same opinion was also conveyed by Fleming and Mills in Bobbi De Porter and Mike Hernacki [4] who proposed three learning styles, namely: visual, auditory and kinesthetic.

In addition to the three learning styles above, Babich, Burdine, Albright, and Randal [5] proposed adult learning styles formulated by the Innovative Center for Teaching Experience (CITE) at Murdoch Teachers Center, Wichita, Kansas, USA. CITE is divided into three main areas, namely: (1) language, visual language, (2) numerical auditory, numerical visual and (3) visual auditory. Furthermore, according to Babich, Burdine, Albright, and Randal, (1976) there are 9 (nine) learning styles, and 9 of these learning styles that will be used in this study: (1) auditory language, (2) visual language, (3) numerical language, (4) numerical visuals, (5) tactile kinesthetics, (6) individual learning, (7) group learning, (8) expressive oral, and (9) expansive writing.

Huitt, in Iriani [6] states that critical thinking is an important tool for achieving success in the 21st century. Arend [7] also states that critical thinking can be owned by a student if the student is consistently trained both through direct discussion and facilitated by an instructor. Learning styles are thought to influence critical thinking. According to Richard

W. Paul and Linda Elder [8] "Critical thinking is that mode of thinking - about any subject, content or problem - in which the thinker improves the quality of his or her thinking by skillfully taking change of the structures inherent in thinking and imposing intellectual standards upon them. Meanwhile, Edward M. Glaser [9] defines "critical thinking as: (1) an attitude of being disposed to consider in a thoughtful way and problems that come within the range of one's experience; (2) knowledge of the methods of logical inquiry and reasoning; and (3) some skills in applying those methods. "Critical thinking calls for a persistent effort to examine any belief or evidence that supports it and the further conclusions to which it tends." Robert H. Ennis [10] states that, "Critical thinking it is reasonable, the reflective thinking is deciding what to believe or do. "Therefore, he defines critical thinking as a skillful and active interpretation and evaluation of observation and communication, information and argumentation. While Santrock [11] states that critical thinking (critical thinking) is to understand the meaning of the problem more deeply, maintain that the mind remains open to all different approaches and views, and think reflective and not only accept statements and carry out procedures without significant understanding and evaluation. According to Trilling and Fadel [12], critical thinking is interpreted as the ability of students to use various reasons such as inductive or deductive for various situations; use system thinking; make decisions and resolve problems.

Based on the definitions of critical thinking it can be concluded that critical thinking is thinking that occurs in the cognitive system by comparing some of the knowledge that already exists in the mind that aims to solve a problem by deciding which knowledge is more appropriate to solve the problem. Critical thinking includes analyzing and interpreting data in scientific inquiry activities. The Secretary's Commission on Achieving Necessary Skills in 1990 states that competencies in critical thinking, decision-making, problem solving, and reasoning are important in work performance. In addition, according to Johnson [13] critical thinking is an essential ability that must be possessed by students in solving problems.

2. Research Methods

This study will use a quantitative approach, a survey method with correlational techniques. This study will examine or analyze the dependent variable of students' critical thinking abilities, and the independent variable of student learning styles. The population in this study were all Vocational Education of Building Construction Study Program students enrolled in the even semester, 2017/2018 academic year, taking

courses in subjects that require higher-order thinking or subjects with many counting material. Total population of 106 people. The number of samples is 84 people. The research instruments were in the form of questionnaires or questionnaires, and had been distributed to 84 respondents. Respondents who returned and filled out the research questionnaire were 73 people or 84.8%. Research instruments use the CITE Learning Styles Inventory. Scores on CITE fall into one of three categories: Major, Minor, and Ignored.

TABLE 1: Learning Style Category.

| Category Learning Style | Score | Description |
|-------------------------|-------|--|
| Major | 33–40 | Students prefer this learning style and feel comfortable using it. |
| Minor | 20–32 | Students use this learning style, but usually as a second choice or together with other learning style |
| Ignoring | 5–20 | Students prefer not to use this learning style. |

Learning styles consist of 9 learning styles, namely: (1) auditory language, (2) visual language, (3) numerical language, (4) numerical visual, (5) tactile kinesthetics, (6) individual learning, (7) group learning, (8) expressive oral, and (9) expansive writing. To measure the learning style, use the CITE Learning Styles Inventory with a Likert scale. Consists of four answer options, namely (1) strongly disagree, (2) disagree, (3) agree, and (4) strongly agree. Scores for each statement (1) = 1, (2) = 2, (3) = 3, and (4) = 4. All positive statements. Critical thinking skills are measured based on the acquisition of learning outcomes in the subject areas of study, namely: (1) Building Material Science, (2) Concrete Technology, (3) Mechanical Mechanics 2, (4) Steel Structure 2, (5) Concrete Structure 2, (6) Engineering Economics, (7) Measuring 1 Theory and Practice, (8) Theory and Practice of Measuring 2 Sciences, (9) Structural Analysis Programs, (10) Construction Management Applications, and (11) Land Mechanics Practice. Data on the critical thinking skills of students of the Vocational Education of Building Construction Study Program students were taken from the learning outcomes or cumulative grade point average (GPA) of students taking courses in the even semester of the academic year 2017/2018. The results of the tabulation of data on 73 student respondents, obtained information on the average GPA of 3.27. Minimum GPA of 2.80 and maximum GPA of 3.67.

Data collection techniques in this study, in this study there are two: (1) dependent variable (Y) critical thinking skills of students, secondary data is used, namely the average achievement index subjects obtained by respondents (students), and (2) independent variables (X), namely student learning styles, data obtained questionnaires or questionnaires. Data collection on student learning styles through the dissemination of research instruments in the form of questionnaires or questionnaires, containing 45

items of statements filled out by respondents. The points of the statement were adopted from the CITE Inventory and adjusted to the characteristics of students of the Vocational Education of Building Construction Study Program.

Data analysis using descriptive analysis, correlation and regression. Before testing the hypothesis, analysis requirements were tested which included the normality test of the data with the Lilliefors test while the significance and linearity tests used the regression equation. Statistical Hypothesis: $H_0: p = 0$, there is no relationship between learning style and critical thinking skills, and $H_1: p > 0$, there is a relationship between learning style and critical thinking skills

3. Results and Discussion

Based on the results of the study (see Table 2), it shows that the social learning style of the group gets the highest score (score equals 32.22), which means that the majority of students of the Vocational Education of Building Construction Study Program prefer group learning compared to individually. Furthermore, the learning style that is more preferred by respondents is the tactile kinesthetic learning style (score equal to 31.89) which means that students of the Vocational Education of Building Construction Study Program prefer learning styles that focus on involvement and experience with the actual learning. For example practice courses or psychomotor related subjects. This is in accordance with the opinion of De Potter & Hernacki (1999) which says that people with this learning style more easily grasp lessons when they move, feel, or take action. The next learning style chosen by students is a numerical visual learning style (score equal to 31.37) which means that respondents prefer numbers on the board, in books, or on paper when working on tasks related to the count. Meanwhile, the learning style that the students did not like was oral expressiveness (score equal to 24.93), where students did not like things related to the ability to speak directly.

Based on Tables 1 and 2 shows that in general respondents (students of the Vocational Education of Building Construction Study Program) are in the minor group which means that students use this style, but usually as a second choice or along with other learning styles. More detailed analysis, obtained data and information, that not all categories of minor learning styles, but there are major, although not dominant.

The results of correlation data processing, obtained the significance of the relationship between the variables of the quality of learning styles with students' critical thinking abilities, as follows: (1) Relationship to Learning Style 1 with Critical Thinking Ability, Sig (2-tailed) Value 0.661 > 0.05, meaning that there is significant relationship

TABLE 2: Characteristics of Student Learning Styles.

| No. | Learning Style | Score |
|-----|---------------------|-------|
| 1 | Visual Language | 29.92 |
| 2 | Auditory Numerical | 27.26 |
| 3 | Social Group | 32.22 |
| 4 | Visual Numerical | 31.37 |
| 5 | Tactile Kinesthetic | 31.89 |
| 6 | Oral Expression | 24.93 |
| 7 | Auditory Languages | 27.42 |
| 8 | Individual Social | 28.33 |
| 9 | Writing Expressions | 29.92 |

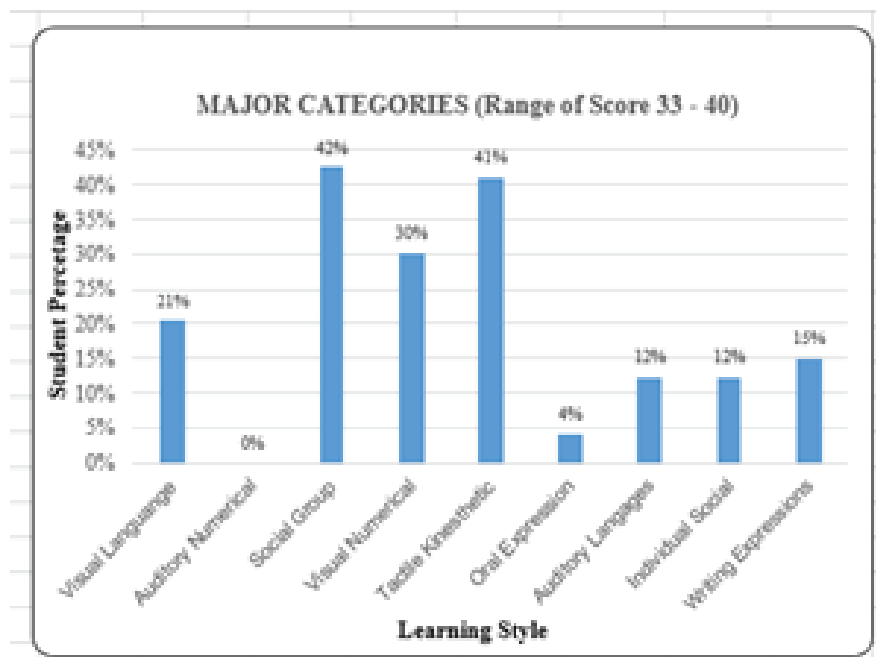


Figure 1: Major Categories of Student Learning Styles.

between learning style 1 with critical thinking ability, (2) Relationship between Learning Style 2 and Critical Thinking Ability, Sig (2-tailed) Value $0.277 > 0.05$, meaning that there is no significant relationship between learning style 2 and thinking ability critical, (3) Relationship between Learning Style 3 and Critical Thinking Ability, Sig (2-tailed) Value $0.467 > 0.05$, meaning that there is no significant relationship between learning styles 3 and critical thinking skills, (4) Learning Style Relations 4 Critical Thinking Ability, Sig (2-tailed) Value $0.345 > 0.05$ means that there is no significant relationship between learning styles 4 with critical thinking skills, (5) Relationship between Learning Styles 5 and Kemamp Critical Thinking, Sig (2-tailed) value $0.181 > 0.05$, it means that there is no significant relationship between learning styles 5 with critical thinking skills, (6) Relationship between Learning Style 6 and Critical Thinking Ability, Sig Value

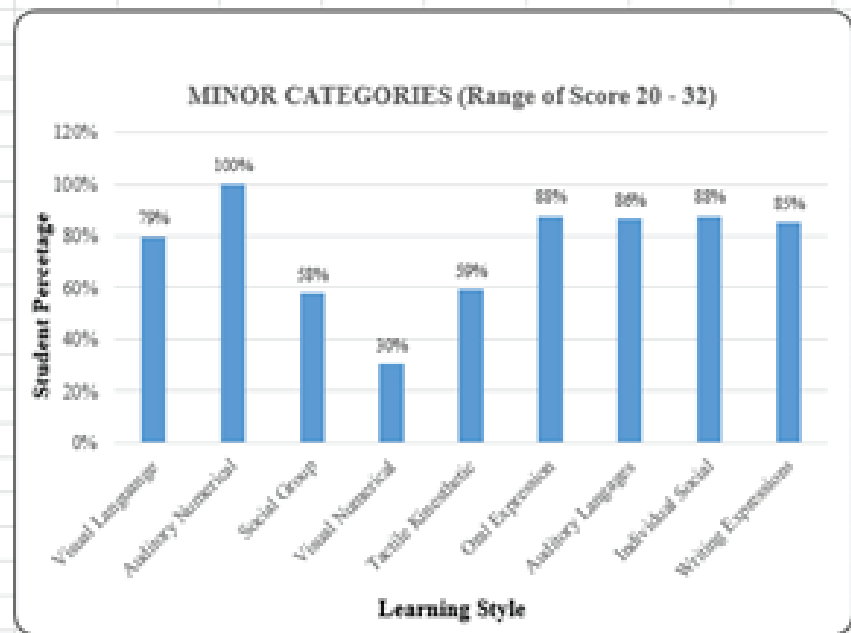


Figure 2: Minor Categories of Student Learning Styles.

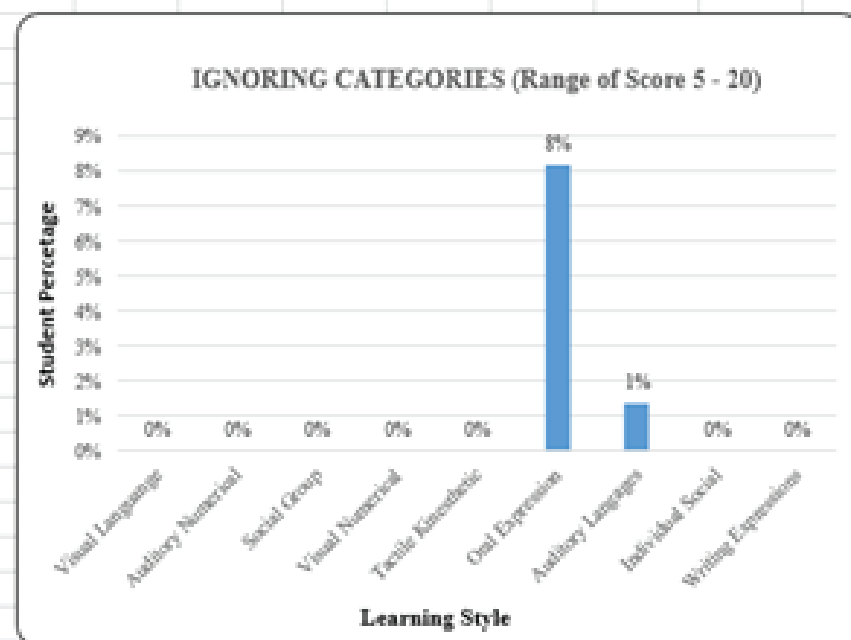


Figure 3: Ignoring Categories of Student Learning Styles.

(2-tailed)) $0.203 > 0.05$, meaning that there is no significant relationship between learning styles 6 with critical thinking skills, (7) Relationship between Learning Styles 7 and Critical Thinking Ability, Sig (2-tailed) Value $0.913 > 0.05$, meaning that there is no significant relationship between learning styles 7 with critical thinking skills, (8) Relationship between Learning Style 8 and Critical Thinking Ability, Sig (2-tailed) Value $0.472 > 0.05$, meaning that there is no significant relationship between learning styles

8 and thinking ability critical, and (9) Relationship of Learning Style 9 with Critical Thinking Ability, Sig (2-tailed) Value $0.809 > 0.05$, meaning that there is no significant relationship between learning styles 9 and critical thinking skills. The level of strength of the relationship between learning styles (learning styles 1 to 9) with critical thinking skills is very weak. The types of relationship between learning styles 1, 2, 4, 5, 8, and 9 with critical thinking skills are in the same direction, while learning styles 3, 6, and 7 are not in the same direction.

Data on the critical thinking skills of students of the Vocational Education of Building Construction Study Program were taken from the learning outcomes or cumulative grade point average (GPA) of students taking courses in the even semester of the academic year 2017/2018. The results of the tabulation of data on 73 student respondents, obtained information on the average GPA of 3.27. Minimum GPA of 2.80 and maximum GPA of 3.67.

TABLE 3: Frequency Distribution of Student GPA.

| No. | GPA Interval | Amount | % |
|-----|---------------|-----------|--------------|
| 1 | < 3.00 | 9 | 12.3 |
| 2 | 3.100–3.223 | 23 | 31.5 |
| 3 | 3.224–3.446 | 27 | 37.0 |
| 4 | > 3.446 | 14 | 19.2 |
| | Amount | 73 | 100.0 |

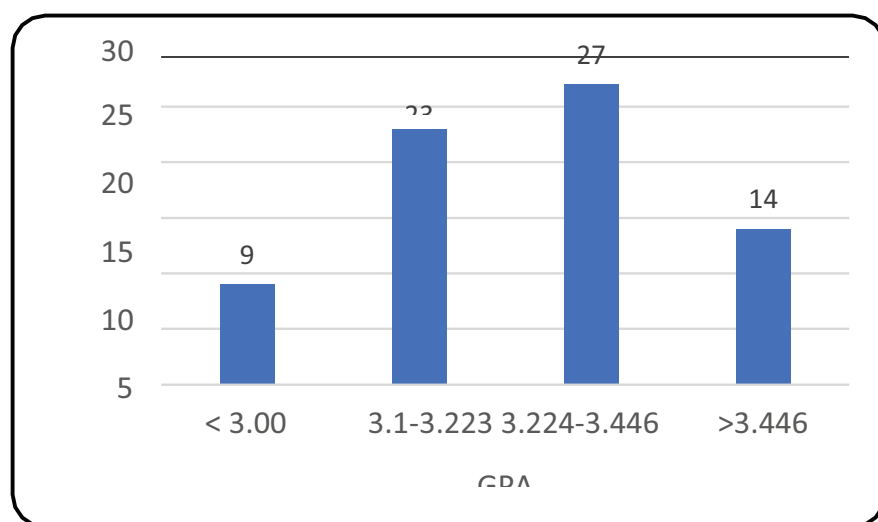


Figure 4: GPA Student Subject Course.

4. Conclusion

Based on the results of the study, it can be concluded as follows: (1) The learning style of the majority of students in the Vocational Education Building Construction Study Program is a group (social) learning style, where students prefer group learning compared to individuals, and Tactile Kinesthetic learning styles, which means students prefer learning styles that emphasize real involvement and experience the learning. (2) Critical thinking ability of students in Building Construction Vocational Education Program is represented by the learning outcomes or cumulative achievement index (GPA) of students who take subject areas (i.e. subjects: Building Materials Science, Concrete Technology, Mechanical Mechanics 2, Steel Structure 2, Structure Concrete 2, Engineering Economics, Measuring 1 Theory and Practice, Measuring 2 Theory and Practice, Structural Analysis Program, Construction Management Application, and Soil Mechanics Practice) even semester 2017/2018 academic year, which is an average GPA of 3.27. Minimum GPA of 2.80 and maximum GPA of 3.67. (3) The level of strength of the relationship between learning styles (learning styles 1 to 9) with students' critical thinking skills is very weak. The types of relationship between learning styles 1, 2, 4, 5, 8, and 9 with critical thinking skills are in the same direction, while learning styles 3, 6, and 7 are not in the same direction, and (4) characteristics of student learning styles with one another are different, it is suggested that the lecturer should adjust the learning model and method that varies, according to the nature of student learning styles.

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