



Cognitive and Psychomotor on University Student Study Outcome in Apparel Basic Pattern Making Using CAD

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Abstract. Education has a final goal which is classified taxonomically as the cognitive, psychomotor and affective domains. This study aims to see how the cognitive and psychomotor domains of students and their relation to student learning outcomes in making fashion patterns using Computer Aided Design (CAD). This study used a cross-sectional design with total sampling data collection techniques. The population of this study were students who were recorded in the fashion pattern development of the Padang State University Fashion Design Education Program as many as 83 respondents. The data analysis technique used was one-way ANOVA using SPSS 21. The results showed that there were differences in student learning outcomes with cognitive and psychomotor students. Further analysis with p value < 0.05 that cognitive and psychomotor aspects have a significant relationship to student learning outcomes in CAD for making basic fashion patterns.

Keywords: Cognitive · Psychomotor · learning outcomes

1 Introduction

The ability gained by learners and resulting behavioral change after receiving learning experience is a study outcome. Study outcome is a crucial indicator in learning process fruitfulness. Perseverance in study leads to how high the achievement level reached. There are several things required by teachers to determine factors affecting learner's success study. Several studies focus on investigating factors from part of students, family, school environment in affecting study outcome success. [2]

University student's competence is measured based on knowledge, skills in study capability. Learners should master the field or subjects suit and interested to them. Education is emphasizing process in intellectual, social, emotional capabilities and physical competence individually. Moreover conversancy, experience and capability enhancement to motivate learners. [3] Education is an important thing used as learners guidance in live. Cognitive, affective and psychomotor students need to be specially designed in its development. The maximal actualization of competence is achievable with comprehensive development on three aspects toward learners, which are academic, creativity and social.

Individual's behavior evolve from not knowing to knowing with attitude adjustment based on experience occurs to each person, be it intellectually, emotionally or psychomotor is a learning process for each person. Learning process in educational world is not just touching ingenuity. Optimal learners' progress is done by giving extra attention toward various potentials of learners or other subject of studies.

Education world in its growth, experts has designed multiple learning methods and many has gained success in those field and methods. Bloom 1965 in "Taxonomy of Educational Objectives, Cognitives, Affective Domain" shared target of education in three aspects which are cognitives, affective and psychomotor. [4] Teaching strategy application based on pedagogy syntaxly and substantively is needed as an aspect in reaching educational success, where teachers' and learners' approach are also an important factor. Individual is expected to be able to fulfill society's demand be it socially, culturally and religiously hence he is able to answer future challenge. [5]

Information cultivation process that span to cognition, problem solving, intelligence, problem forming are cognitive ability. it is a process and fruit of thinking for knowledge in the form of mental activity such as symbolizing, remembering, categorizing, problem solving, fantasizing and creating. Capability and brain acumen development is called cognitive development. Skill and capability in acting are things that shown in psychomotoric learning result. Cognitive realm is used to provide things available in recollection, whereas psychomotor realm is activity in outpour ideas in form of actual communication [6].

Science and technology progress in this era have pushed several changes in many live sectors, including educational sector that keeps on changing following technology advancement in order to reach relevant quality of education with working world and fit development of era. Higher education has an important role in generating competence graduates. Educational world today is focused on preparing university students with competence as well as able to survive industry 4.0 progress and approaching society 5.0. University students of fashion is expected to be able to withstand and overcome today's 4.0 challenge. Close competition, human resource upgrading, adequate internet access plus qualified information and communication technology are current challenges for students of fashion. Students is also hoped to own competence in facing society 5.0 where they able to balance technology progress with economy through problem solving with integrating virtual world and real world. [7, 8]

Students must posses competency, skills and mastery thus able to take on standard the world applied and can face the globally change of garment industry. Competency needed including cognitive aptitude, adaptation, teamwork and emotional control. Cognitive aptitude can be acquired through digital literacy that benefit as competency for student of fashion to be developed in the future. Digital literacy, technology literacy and student literacy are competencies to be possessed by industry 4.0 students. [9]

CAD technology is one of the needed basic competency in apparel pattern making for students. Computer Aided Design (CAD) is a computer technology that is used in design making process and documentation, one of the industry benefited in using CAD is industry of garment. More than 10,000 set CAD systems, be domestically and abroad are used by garment companies, higher education and university related to garment. The acceptance of CAD usage in industry of garments are better in developed countries such

as United Kingdom, France, People Republic of China, Italia, and Japan. Influence of CAD is fastly spreading across other developing countries hence opening new prospect in growth of garment industry in those countries. [10, 11]

Computer Aided Design (CAD) usage in designing and product development is an important skill for future generation of apparel professional. Thriving progress of CAD system indirectly help apparel makers in making pattern. Apparel making using CAD is more productive compared to manual work, even in the simplest model. CAD is a digital technology where in its design function application and production provides efficiency, effectiveness, and precision, color choosing and the most important it has data storage for pattern plan to be used later. It benefited designer n making pattern using CAD because it responds to order quickly and in various size of apparel. Another benefit is it reduce production cost by reducing fabric usage substantially. [10, 12]

Students of fashion is expected to be able to use technical skill, advance creativity in developing new clothes for women, men and children. Apparel producing done by students of fashion by taking inspiration from current trend and consumer needs. [13] Students will sketch ideas and decide on fabric, color, and pattern in making clothes. They are hoped to owned knowledge, skill and qualified competency thus able to take on changes in garment industry globally according to world standard. Because of that, this article emphasizes on the importance of cognitive and psychomotor in process of defining study outcome in fashion design program of study.

2 Methods

This research is a qualitative research with cross sectional design. It aims to discover the corelation in study outcome of students of fashion in drawing apparel pattern using CAD with cognitive and psychomotor aspects. Secondary data is used in this research. Population of the research is 83 students in Family Welfare Science Study of Universitas Negeri Padang Tourism and Hospitality Faculty (IKK FPP UNP), sample is at total sampling. Reseach instrument used is quizionaire with 5 likert scale and data gathered by distribution quizionaire via lecturers.

Cognitive and psychomotor aspects is collected in interview with students utilizing likert scale quizionaire. Assessment for cognitive and psychomotor is done by mean value scoring.

Gathered date then followed by researcher to analyze, where is done using SPSS 21 with One-way Anova. Reduced data would be interpreted thus generate conclusion of the research.

3 Result

Table 1 shows cognitive study outcome with mean value in good category is at 84.26 with deviation standard of 4.051. Students with cognitive score in good category possess average score of 74.29 with deviation score 3.266. Whereas student with cognitive score in less category possess average score of 55 with deviation 9.165. Study outcome from psychomotor aspect, students with cognitive score in good category possess average score 84.48 with deviation standard 3.931. Different with students with psychomotor

Table 1. Cognitive and Psychomotor Category on Students

No	Value of Mean	Interpretation
1	1 - 2,33	Less
2	2,34 - 3,66	Moderate
3	3,67 – 5	Good

Table 2. Correlation in Cognitive and Psychomotor Realm toward Students Study Outcome in Making Basic Apparel Pattern Using CAD

Variable	Mean	SD	95% CI	P-value
Cognitive				
Good	84,26	4,05	83,07–85,4	0,0005
Moderate	74,29	13,266	473,48–75,09	
Less	55	9,165	46,52–63,48	
Psychomotor				
Good	84,48	3,931	83,31–85,65	0,0005
Moderate	74,48	3,128	73,52–75,05	
Less	55	9,165	46,52–63,48	

with moderate category possess average score 74.48 with deviation score 3.128. Students in less category with average score 55 with deviation standard 9.165 (Table 2).

Result of statistic test obtained value $p = 0.0005$ where $\alpha 5\%$, thus it concluded that there is difference in students’ study outcome seen on students’ average score among three categories in cognitive aptitude. Further analysis proved that cognitive and psychomotor realms have a significant correlation toward students’ study outcome in using CAD for apparel basic pattern making.

4 Discussion

This research divided cognitive and psychomotor of students in three categories which are good, moderate, and less. Cognitive and psychomotor have an important role in teaching process. Cognitive realm illustrated students knowledge in pattern making using CAD, whereas in psychomotor showed students’ skill also how the implementation of teaching activity in class. Students of fashion should be unsatisfied with only remembering and comprehending theory, definition but how in applying the-still-abstract theory. Application of gained knowledge could be used as benchmark of students comprehension. Knowledge understood with comprehension indirectly makes students possess a strong implementation.

Study outcome is a reflection of students competency individually. It refers to Taxonomy Bloom that it is reachable in three aspects which is cognitive, psychomotor, and

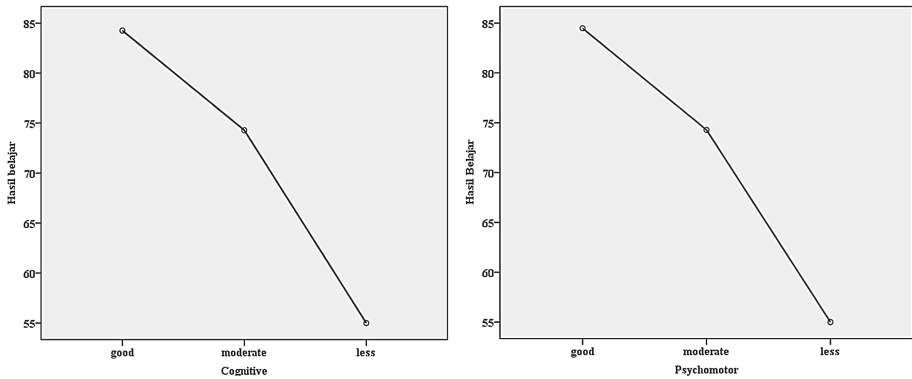


Fig. 1. Means Plot Cognitive and Psychomotor

ffective. Thus it can be concluded that experience gained including cognitive, psychomotor and affective aptitude is study outcome. [14] It is better to interpret anything expected, showed and hope to achieve by students when they finish lecturing activity. It can be defined as a mix of teaching strategy, procedure and criteria in assessment. [15]

Research analysis done to students of fashion with cognitive in good category, shows that they have initial understanding in implementation of apparel basic pattern making using Computer Aided Design (CAD), although improvement is needed. They can help other students to the better. Compared to students in moderate and less categories shows their cognitive is yet to be optimal even perhaps have none initial knowledge in doing the task.

Students' psychomotor in this research is divided into three categories of the same. Students' psychomotor skill in good category shows that they, in apparel basic pattern making, are skillful, ready and capable be in tool mastery, material, and in practice. Further analysis done in investigating cognitive and psychomotor of students toward study outcome shows $p < 0.05$. This explains that there is difference in students' average value between cognitive and psychomotor of students of fashion.

Based on analysis done, it can be seen that students who own cognitive and psychomotor in good category has better study outcome compared to students in moderate and less category. This is, as (Fig. 1) seen that higher average score is on students with good cognitive and psychomotor skills.

Reciprocal to Anderson L.W that stated competency (skills) should focus on several aspects.

such as skill (psychomotor), knowledge (cognitive) and attitude (affective). Combination of three realm usually called CPA (Cognitive, Psychomotor, affective). Practice done in class in making clothes for students of fashion is an important habit in teaching process implementation. [3] Research done by Sonmez in 2017 also explains that cognitive study outcome correlates with psychomotor capability of students, besides that, students with high study outcome are also possess good cognitive aspect. [16]

Cognitive and psychomotor have important role during teaching and learning on students. Students' study outcome in making apparel basic patter making are influenced by their cognitive and psychomotor during teaching process. Because of that, cognitive

and psychomotor aspects should be regarded, because they are linked with study outcome in apparel basic pattern making using CAD.

5 Conclusion

Cognitive dimension refers to concept comprehension by students of fashion meanwhile psychomotor refers to students of fashion's skill, also how they apply concept and theory obtained. Study outcome can be improved by raising cognitive and psychomotor aptitude of students. Cognitive and psychomotor dimension balance on students shows the need to develop integrated learning result on students of fashion.

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