Advances in Social Science, Education and Humanities Research, volume 650
4th International Conference on Educational Development and Quality Assurance (ICED-QA 2021)

Analysis of Learning Outcomes Achievement in Advanced Blocks of Undergraduates Students at the Medical Faculty of Universitas Andalas

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ABSTRACT

Background: Problem-Based Learning (PBL) is a learning method that is very useful for developing competency and improving critical thinking and self-directed learning. The study aims to assess the correlation of learning outcomes between the Special Sensory Disorder block with Physiology System block in the PBL method. Material and Methods: The study is retrospective. Data were taken from the learning outcomes of the Special Sensory Disorder block and Physiology System block of the 2018 students' batch, including tutorials and Computer-Based Tests (CBT) results. The data were analyzed using the Mann Whitney and Spearman tests. Results: The average scores of student tutorials in block 3.4 are higher than the tutorial scores in block 1.2 ($p = 0.00$). In contrast, the average CBT scores were higher in block 1.2 compared to block 3.4. The study found a positive correlation between CBT scores of block 3.4 and block 1.2 ($R = 0.510$, $p < 0.001$). However, the tutorial score correlation between the two blocks is less convincing. Conclusion: The cognitive test found a positive correlation between the learning outcome of the Physiology System and the Special Sensory System blocks. The tutorial score is a learning process assessment that cannot be avoided by the personal standard perception of the tutor.

***Keywords*:** *Assessment Score, Competency Learning Process, Problem-Based Learning, Tutorials.*

1. INTRODUCTION

The PBL method is a learning method that is very useful for developing competency and improving critical thinking and self-directed learning. The method is significant in shaping and developing a personality that leads to lifelong learning [1,2]. The method uses the *student-centered, problem-based, integrated, community-based, elective, early exposure to the clinical situation, systematic* approach (SPICES). Therefore, the PBL method is considered an appropriate learning method for students at the general basic education level and basic medical education. This method is applied to our students from the 1st to seventh semesters. The problem-based learning method strategy aims to achieve the expected competencies. The expected result is that students take responsibility and take their initiative in the learning process [2,3].

The learning objective on the Special Sensory Disorder block is that the students can obtain competence related to Special Sensory Disorders (ear, nose, throat (ENT), ophthalmology, and dermatology). The learning objectives are Special Sensory Disorder (block 3.4) in the 6th semester linked with other blocks before, such as Physiology Systems (block1.2) in 1st seme, where students obtain competence related to the normal physiology system of special sensory. If the students understood the Physiology System well, they would better understand the special sensory system disorder [4,5,6]. The study aims to assess the correlation of learning outcomes between the Special Sensory Disorder block with Physiology System block in the PBL method.

2. MATERIAL AND METHODS

The study is a retrospective. Data were taken from the learning outcome of the Special Sensory Disorder block and Physiology System block of the 2018 students batch. These include tutorials and computer-based tests (CBT) results. As for the analysis, we used Mann-Whitney and Spearman tests.

3. RESULTS

The two blocks are made up of 246 students of the 2018 batch whose tutorials and CBT results were analyzed, as shown in Table 1. The average scores of students tutorials in block 3.4 are higher than those in block 1.2 (p=0.00). On the other hand, average CBT scores were higher in block 1.2 compared to block 3.4 (Table 1).

Table 1. Tutorials and CBT means of student assessments result

Test results	means	±SD	Min – Max
Tutorial Block 1.2	84.05	6.87	48.75 - 100
Tutorial Block 3.4	86.77	6.11	27.50 - 100
CBT Block 1.2	74.80	9.06	38.00 – 91.00
CBT Block 3.4	57.85	10.81	6.00 – 82.00

The study found that the CBT score test of 240 students in block 3.4 decreased compared with block 1.2, and only six students showed a score increase. The tutorial results of 157 students showed increasing scores, and 83 of the students showed decreased scores, as shown in table 2.

Table 2. Difference between Tutorial and CBT scores

Variables	N (%)
The difference score of CBT (block 3.4 vs. block 1.2)	
Minus	240 (97.56)
Plus	6 (2.44)
Mean	-16.95
Standard deviation	9.91
The difference score of the tutorial (block 3.4 vs. block 1.2)	
Minus	83 (33.74)
Plus	157 (63.82)
constant	6 (2.44)
Mean	2.71
Standard deviation	8.65

Table 3. Tutorial and CBT score correlation test

Block 3.4 and 1.2.	Sig.	R
CBT test	< 0.001*	0.510
Tutorials	0.165	0.089

The study found a good correlation between CBT score block 3.4 with block 1.2 ($R = 0.510$, $p < 0.001$). The tutorial score correlation is very weak, which means that the tutorial value of block 3.4.

4. DISCUSSION

Block 1.2 consists of a physiological system of special sensory in the first semester. Students get educational material on the anatomy and physiology of special sense organs, namely the eyes, skin and genitals, and ENT. In the sixth semester, the students take the Special Sensory Disorder block, which consists of a pathological condition of special sensory. Students who take this block should have an essential physiology competency of the sensory system to understand the pathophysiology of the sensory disorder. The Special Sense Disorder block consists of five modules (two Ophthalmology, two Dermatology, two Venereology, and one ENT).

The results of this study show that the CBT test at Block 1.2 is higher than block 3,4. It is likely caused by block 3.4 being more complicated and advanced than block 1.2. Students who do not have strong understandings of block 1.2 will have difficulties catching up with the block 3.4 objectives. Furthermore, there is no correlation between the students' tutorial scores in block 1.2 and block 3.4. Students who get high scores in tutorial block 1.2 do not always get high scores in block 3.4, which also applies to those with low tutorial scores. The tutorial is a discussion in small groups of students (consisting of ten students per group). A tutor facilitates the discussion. Tutors who facilitate the discussion will change when a new block is introduced. However, the groups are made up of the same students for the three blocks (1 semester). The difference scores can be affected by tutor perception of student achievement even though the administration provides the assessment form. Such differences can

cause differences in assessment standards. The assessment by the tutor is formative because it is intended to assess the learning process. However, at the end of the tutorial meeting, the tutor/lecturer must provide a numerical value for students and take a 30% portion of the total score. The tutorial scores obtained by the students affect their final scores of the block.

Computer-based test CBT scores showed a significant correlation between block 1.2 and block 3.4. This correlation means that students who obtain high scores in block 1.2 also obtain high scores in block 3.4. The same is the case for students who obtain low scores in the two blocks. The CBT is an exam that examines cognitive and affective aspects. The distribution of questions was designed in such a way that each student had a different order of questions from other students sitting on the left, right, front, or behind him/her. It is found that students who could understand well the anatomy and physiology of special sense organ systems in block 1.2 would easily understand disorders of these special senses (block 3.4).

5. CONCLUSION

This study found a good correlation between the learning outcome of the Physiology System block and Special Sensory System block based on a computer test. On the other hand, a tutorial score is a learning process assessment that cannot be avoided by the personal standard perception of the tutor, making the tutor score not appropriate as a tool to assess the competency. However, it is helpful for student-directed learning assessment and provides feedbacks for developing their professional behaviors.

AUTHOR'S CONTRIBUTIONS

Hendriati conceives and designs the study and writes the first draft of the paper.
Dian Pertiwi conceives and designs the study and collects the data.
Zurayya Fadila analyses and interprets the data.
Aisyah Elliyanti contributes to the writing of the paper.

ACKNOWLEDGMENTS

This study is supported by the Lembaga Pengembangan Pendidikan dan Penjaminan Mutu (LP3M) of Universitas Andalas through Contract No. 055/UN.16.18/LP3M/PTK/2021.

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