

Perception regarding learning computer based test during Covid-19 pandemic Persepsi tentang pembelajaran computer based test selama pandemi Covid-19

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ABSTRACT

Background: Education is one of the largest and most complex social sectors that have been negatively affected by Covid-19, which has led to subsequent changes in modes of learning and teaching in many universities around the world by introducing e-learning platforms. This online learning method has also been carried out by Hasanuddin University through the SIKOLA.

Objective: To determine students' perceptions regarding the computer-based test (CBT) through the SIKOLA learning platform during COVID-19 pandemic. **Method:** This analytic observational study was design as cross-sectional, using students of Hasanuddin University Faculty of Dentistry as population, which were divided by gender and educational stages. Respondents filled out online questionnaires consisting of 6 variables, namely pedagogy, validity, reliability, affective factors, efficiency, and safety. Data collected were in a form of Likert scale and then analyzed with t-test using SPSS. **Result:** There was a significant difference in perception between preclinical and clinical students on the pedagogical and efficiency variables ($p < 0.005$). Based on the educational stage, significant differences were only seen in the pedagogical and efficiency aspects.

Conclusion: Student perceptions related to CBT exams through SIKOLA learning have good perceptions, seen from the majority of respondents who agree on the pedagogical aspects, validity, reliability, affective factors, efficiency and safety.

Keywords: CBT, e-learning, platform, pandemic, perception

ABSTRAK

Latar belakang: Pendidikan adalah salah satu sektor sosial terbesar dan paling kompleks yang terkena dampak negatif dari Covid-19, yang telah menyebabkan perubahan selanjutnya dalam mode pembelajaran pada banyak universitas di seluruh dunia dengan memperkenalkan platform *e-learning*. Metode pembelajaran *online* ini juga telah dilakukan oleh Universitas Hasanuddin melalui SIKOLA.

Tujuan: Mengetahui persepsi siswa tentang *computer-based test* (CBT) melalui platform pembelajaran SIKOLA selama pandemi Covid-19. **Metode:** Penelitian observasi analitik dengan desain *cross-sectional*, menggunakan populasi mahasiswa Fakultas Kedokteran Gigi Unhas, yang dibagi berdasarkan jenis kelamin dan jenjang pendidikan. Responden mengisi kuesioner *online* yang terdiri atas 6 variabel, yaitu pedagogi, validitas, reliabilitas, faktor afektif, efisiensi, dan keamanan. Data yang terkumpul berupa skala likert kemudian dianalisis dengan uji-t menggunakan SPSS. **Hasil:** Terdapat perbedaan persepsi yang signifikan antara mahasiswa praklinik dan klinik pada variabel pedagogik dan efisiensi ($p < 0,005$). Berdasarkan jenjang pendidikan, perbedaan yang signifikan hanya terlihat pada aspek pedagogik dan efisiensi. **Simpulan:** Persepsi siswa terkait CBT melalui pembelajaran SIKOLA adalah baik, terlihat dari mayoritas responden menyatakan setuju pada aspek pedagogik, validitas, reliabilitas, faktor afektif, efisiensi dan keamanan.

Kata kunci: *computer-based test*, *e-learning*, platform, pandemi, persepsi

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INTRODUCTION

Along with the increasing use and advancement of internet, humanity has witnessed the transformation of various fields including education. Implementation of e-learning triggers development of blended learning, which is a mixture of e-learning and involves creation of an electronic learning platform that accompanies teaching and learning assessment process. Utilization and management of virtual learning is very complex, this type of platform is starting to be used especially in universities in managing distance learning.¹ As part of the e-learning trend, computer-based test (CBT) are becoming more common in educational assessment domain as changes made in assessment methodologies

reflect practical changes in pedagogy.²

Most countries affected by Covid-19 outbreak have implemented strict restrictive measures.³ This situation raised a very complex issue in the study of health sciences and health related fields, which requires a minimum practical training component.⁴ Covid-19 outbreak resulted in a digital revolution in the higher education system through online lectures, teleconferencing, digital open-books, online exams, and virtual environmental interactions.⁵

This has led to alternative modes of learning and teaching in many universities around the world by introducing e-learning platforms to allow students continued access to lectures and assessments.⁶ Including Ha-

sanuddin University, who introduced the learning management system (SIKOLA), which is a learning platform used during the pandemic. This Covid-19 pandemic period is unpredictable and is filled with certainty in regard to how long this pandemic is going to last, therefore, e-learning has begun to be applied to almost all educational institutions,⁷ including Hasanuddin University, Makassar. The problem of standardized exams when the testing center is closed is negatively affected by the loss of direct contact especially that some areas do not have a well-developed e-learning platform.⁸ This provided the appropriate background for researchers investigate students' perceptions regarding CBT through the SIKOLA learning platform for Hasanuddin University students during Covid-19 pandemic, which is expected to be used as evaluation material in the future.

METHODS

Study design and sampling

This study was conducted at Faculty of Dentistry, Hasanuddin University in June 2021. This study employed an analytic observational approach with a cross sectional study design and the sampling technique was convenience sampling. The population were students of the Hasanuddin University Faculty of Dentistry. To determine the number of respondents, formula of Slovin was used with a margin of error of 5%. Slovin formula was used due to the large number of respondents and the limited time of the study. This formula helped writer to get a few respondents but can represent the entire population (Fig.1).

$$n = \frac{N}{1 + N \times e^2}$$

Figure 1 Formula of Slovin

Data collection was carried out during June 2021 using a research instrument in the form of an online questionnaire adapted from Turkish Online Journal of Distance Education, written by Dr. Shraim. Respondents were contacted through WhatsApp communication media and following a brief explanation, respondents then filled out the questionnaires in the form of Google forms.

The questionnaire consisted of numerous statements regarding their opinions about the implementation of the CBT through SIKOLA learning platform, and were grouped into 6 categories: pedagogy, validity, reliability, affective factors, efficiency, and safety which then consisted of 3 question items in each category. Items were assessed using a Likert scale adjusted five points, with 1 is strongly agree (SA), 2 is agree (A), 3 is neutral (N), 4 is disagree (D), 5 is strongly disagree (SD). This rating was based on a five-point adapted Likert scale, where a mean score of 3 can be seen as neutral, a mean score above 3 can be seen as positive and

an average rating below 3 considered negative. There were 317 students who returned and completely filled in the questioner thus subsequently became research subjects. The data collected was tabulated and processed using MS Excel and SPSS. Data were analyzed with descriptive statistic analysis and t-test with a significance value of $p < 0.005$, then presented in the form of tables and descriptions.

RESULTS

Table 1 Subjects distribution based on characteristics

Characteristics		n	%
Students' educational stages	Clinical	156	49,2
	Pre-clinical	161	50,8
Total		317	100
Gender	Male	43	13,6
	Female	274	86,4
Total		317	100

From the number of registered respondents and active as preclinical and clinical students, 317 respondents were record.

Table 1 showed the distribution of research subjects based on sociodemographic profiles. In the students' educational stage category most respondents were clinical students counting up to 161 students (49.2%). Based on the gender category, subjects were predominantly female, counting up to 274 students (86.4%).

Table 2 shows the distribution of respondents' answers. All answers to 18 statements in 6 variables have a mean value above 3, which means that respondents have a positive perception.

Table 3 showed the differences in students' perceptions regarding taking CBT through SIKOLA learning platform based on gender and educational stage. In all variables, for gender characteristics, the female group comprised of 274 students showed a total average of 65.34, whilst for the male group comprised of 43 students with a total average of 63.16. For educational stage, the preclinical group comprised of 161 students with a total average of 66.21, whilst the clinical group comprised of 156 students with a total average of 63.84. For gender characteristics, for all variables, there were no significant differences in students' perceptions between the female and male groups. For educational aspect, preclinical group showed an average of 11.11 while the clinical group showed an average of 10.41 with a p-value of $0.001 < 0.005$ which means that there is a significant difference in students' perceptions between the preclinical and clinical groups for the pedagogy. For efficiency, preclinical group showed an average value of 11.99, whilst the clinical group showed an average of 11.33 with a p-value of $0.001 < 0.005$ which means there is a significant difference in students' perceptions between the preclinical and clinical groups for

Table 2. Subjects' answers distributions

Statement	SA%	D%	N%	A%	SA%	Mean	SD
Pedagogy							
1) SIKOLA helps students to get better understanding regarding school related subjects	0.3	11	39.7	39.1	9.8	3.47	0.82
2) Utilizing latest technology available in SIKOLA enables students to take a new approach on online learning	0.0	3.2	31.9	53.9	11.0	3.72	0.69
3) SIKOLA facilitates a more adaptive learning approach compared to conventional approach	0.0	7.3	41.3	38.5	12.9	3.57	0.80
Validity							
1) SIKOLA is suitable for all subjects	0.3	21.1	30.3	35.3	12.9	3.39	0.97
2) SIKOLA is suitable to test students' level of knowledge	0.0	7.6	36.9	46.1	9.5	3.57	0.76
3) SIKOLA facilitates a more authentic assessment compared to conventional method using multimedia integration, simulation, etc.	0.0	6.3	41.6	42.0	10.1	3.5	0.75
Reliability							
1) Marking tests using SIKOLA is automatically more accurate than paper-based	0.3	5.0	21.1	54.6	18.9	3.86	0.78
2) Exams using SIKOLA is more fair than paper best test	1.3	9.8	37.9	39.1	12.0	3.51	0.87
3) Technologies used in SIKOLA are reliable	0.9	5.0	34.1	47.3	12.6	3.65	0.79
Affective							
1) SIKOLA lessens stress and anxiety in exams	0.9	8.8	45.1	35.0	10.1	3.44	0.82
2) Utilization of SIKOLA enables students to be more focused and concentrate on exam questions	0.6	5.4	39.4	44.8	9.8	3.57	0.76
3) Students feel more comfortable using SIKOLA as means of learning compared to conventional learning	1.6	15.1	42.0	33.8	7.6	3.31	0.87
Efficiency							
1) SIKOLA is more efficient in time, effort, and financial expenses	0.0	0.9	23.3	54.6	21.1	3.95	0.69
2) Making multiple choice exam questions archive through SIKOLA; can be reused again; ease in storing and marking of exam results	0.0	1.3	19.9	61.8	17.0	3.95	0.64
3) SIKOLA is more easily accessible compared to conventional	0.3	2.2	33.1	49.2	15.1	3.76	0.73
Security							
1) Exam materials and results through SIKOLA is safer than conventional method	0.0	5.4	42.3	40.7	11.7	3.58	0.76
2) Technology used in SIKOLA is effective enough in handling cheating and plagiarism	1.9	8.8	39.1	42.6	7.6	3.45	0.83
3) Using random questions from exam questions archive means the probability of cheating whilst using SIKOLA is slimmer than that of conventional learning	0.6	3.2	35.6	48.3	12.3	3.68	0.75

Table 3 Differences in students' perceptions regarding CBT through SIKOLA learning platform based on gender and education stage

Variable	Gender		P value	Education Stage		P Value
	Male	Female		Pre-clinical	Clinical	
	n (mean)	n (mean)		n (mean)	n (mean)	
Pedagogy	43 (10.61)	274 (10.78)	0.663	161 (11.11)	156 (10.41)	0.001*
Validity	43 (10.06)	274 (10.59)	0.113	161 (10.81)	156 (10.23)	0.011
Reliability	43 (10.67)	274 (11.08)	0.200	161 (11.11)	156 (10.94)	0.427
Effectivity	43 (9.86)	274 (10.40)	0.119	161 (10.26)	156 (10.26)	0.589
Efficiency	43 (11.62)	274 (11.67)	0.862	161 (11.99)	156 (11.33)	0.001*
Security	43 (10.27)	274 (10.79)	0.110	161 (11.33)	156 (10.78)	0.540
Total	43 (63.16)	274 (65.34)	0.136	161 (66.21)	156 (63.84)	0.018

*t-test

the efficiency variable.

DISCUSSION

In the context of online exams, six main dimensions: 1) affective factors, 2) validity, 3) practical, 4) reliability, 5) safety, and 6) learning and teaching can be used to investigate students' perception. This platform model follows the latest pedagogical concepts, which may predict the development of educational technology

in the future as a contemporary pedagogical approach with three principles, namely using software, mobile, and dynamic. In line with research conducted most students feel happy and comfortable in taking electronic exams. Online learning including online exams is not only an automated assessment tool, but it is also an integral part of the learning process itself. Therefore, effective feedback should focus on helping students to gain a clear understanding of concepts and strengthen

their knowledge.⁹⁻¹⁵

Automatic assessments are more accurate, fair and unbiased in assessments than paper-based assessments. This is also consistent transparent assessment and immediate scoring gave students more confidence in their results and felt more comfortable. Another observed advantage of online exams is the fact that students can get results and feedback immediately after the exam making it more efficient and proving that scoring is also easier. This is due to the fact that online exams can be taken from anywhere and anytime, this is also known as distance education.¹⁶⁻¹⁹

Transition to online assessment means not only a change in the assessment platform, but also a series of changes in the assessment style. Online assessment is associated with anxiety whether the test has been submitted, or if answers have been changed due to technical errors. Students felt that the use of online assessments takes longer than traditional assessments. Students feel stressed about online assessments due to fears that their answers will not be submitted, they will not be able to type fast enough, difficulty in focusing on content while typing, inability to explain their answers, partial grade restrictions and that their answers may change drastically automatically due to some errors in the system.^{12,14,20}

Online exam system have some specific settings in the form of a monitoring system to protect data from unauthorized access by systematically tracking and recording activities such as login, logout, exam access, question navigation, and response. The content of each exam is securely locked in a database on an accessible server. The students do not agree that online exams are competent in dealing with cheating and plagiarism. This is because the current technologies, such as smartphones, wireless networks, and bluetooth devices, are available to everyone. One of the most important aspects of administering exams online is preventing students' access to external help (humans) or resources (teaching materials, internet) that are not permitted during the exam. The basic measure of protection could be in a form of combination between a locked browser with footage by a physical camera.^{19,21,22}

Table 3 showed the differences in students' perceptions regarding taking CBT through SIKOLA learning

platform based on gender and educational stage. Based on gender, there was no significant difference. This is in line with research conducted by Clariana and Wallace that gender is not associated with differences in performance between pen and paper and computer-based exams.^{23,24} Investigate students' perceptions of online exams did not reflect differences in perceptions between men and women.^{25,26} This can be attributed to the fact that all students come from the same university, are subjected to the same procedures, and receive the same treatment, regardless of their gender, which makes them have the same point of view on online exams.¹⁸ Investigated moral attitudes towards cheating and they found that female participants had significantly more negative attitudes toward cheating.^{27,28}

Based on educational stage, there were significant differences related to students' perceptions of taking CBT through SIKOLA learning platform in the pedagogical and efficiency aspects. This is in line with research conducted by Khalil et al who assessed individual learning experiences using online modules, and found that the use of online learning was more productive in the context of certain medical disciplines, such as for basic medical science or preclinical subjects. That is why more preclinical students prefer online learning, compared to clinical students.²⁹ Study concluding that preclinical students prefer direct lectures when given a choice.³⁰ This supports the difference in perceptions of CBT on SIKOLA learning platform between preclinical and clinical education levels. Investigate attitudes towards online examinations based on a number of variables, one of which is education level shows that there was no difference between students' attitudes towards online assessments.²⁶

It was concluded that student perceptions related to CBT exams through SIKOLA learning have good perceptions seen from the majority of respondents who agree on the pedagogical aspects, validity, reliability, affective factors, efficiency and safety.

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