Research Article

University students' perception towards online learning in biology

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ABSTRACT

Every day, the number of patients suffering from covid-19 continues to increase in the world. Learning at home is a decisive step in breaking the chain of Coronavirus spread, and changing traditional learning to entirely online can affect the quality of learning and students' achievement. It requires great effort in designing learning by lecturers. Therefore, a study is needed to investigate the students' perception of online learning to find out how the learning process went through by students during the covid-19 pandemic. This research uses a mixed-method approach. The first phase collects quantitative data using questioner with four dimensions: 1) the ability to learn independently through online learning, 2) student interaction with teaching materials, 3) interaction between students, and 4) interaction with lecturers. Based on data analyzed, students perceive that learning independently through online learning is not high, and scores obtained about 3.3 (average). The other three dimensions get a score that is in the low category. The second phase is collecting qualitative data using open-ended questions. Based on the analysis, the majority problem online learning is bad networking, and the positive impact students got in online learning is flexibility and time management in learning.

INTRODUCTION

Covid-19 pandemic cases have a considerable impact on the world. Every day, the number of patients suffering from Covid-19 continues to increase. This case has a significant impact not only on health but also has a substantial effect on education. Most governments worldwide are temporarily discontinuing the learning process conducted in schools and campuses to prevent the spread of the Covid-19 pandemic. Several countries did local closures that affected millions of students. This policy impacts about 70% of the world's student population. The United Nations Educational, Scientific, and Cultural Organization or UNESCO states that's about 300 million students in the world are disrupted by their school activities and threatened their education rights in the future (UNESCO, 2020).

In Indonesia, patients were increasingly infected with Covid-19 every day. The education ministry of Indonesia revealed the policy of learning from home in an emergency of the Covid-19 pandemic. Learning at home is a decisive step in breaking the chain of Covid-19 spreads. Online media is an alternative used in the learning process to deal with this problem. In the past, some educational institutions have implemented online learning around the world. There has been a lot of research saying that online learning is also effective in the learning process. Online learning also provides opportunities to learn where and whenever they want without limited time or a specific schedule (Ali et al., 2018). Some of the great benefits offered by online learning are that because connectivity between one student and another is connected, they can share knowledge and achieve the goal of learning together, thus reducing the number of dropouts students (Yuan et al., 2014).

The change in learning patterns due to Covid-19 is that face-to-face learning that is replaced by online learning can undoubtedly affect the quality of learning and students' success in achieving learning goals. The change of traditional knowledge into online education requires significant effort in designing learning by teachers. The effectiveness of online learning depends on the content of the learning materials developed, motivated interactions between instructors and learners, good preparation, and supportive instructors (Sun & Chen, 2016). Some new approaches to online learning, such as massive online open courses (MOOCs), virtual reality (VR), and gamification, have been designed for students in different countries that support their respective cultures (Panyajamorn et al., 2018).

Furthermore, a study is needed regarding students' perception of how the online learning process went through by students during the Covid-19 pandemic. Students' perception of the online learning process affects their interest in attending and completing courses or taking other additional online courses (Matsunaga, 2016). Therefore, obtaining information about students' perceptions of the online learning process will determine whether online learning is effective or not (Otter et al., 2013). Furthermore, it is important to know students' perceptions to provide information to administrators and educators in designing learning (Platt & Yu, 2014).

The learning environment can have an impact on students' enthusiasm and learning effectiveness. The relationship between the learning environment and student achievement has been the result of studies by researchers, and based on some literature has revealed that there is a relationship between the educational environment and student learning outcomes, satisfaction, and student success (Ali et al., 2018; Lizzio et al., 2010). Having the motivation to participate in the online learning experience, students are expected to succeed (Baturay & Yukselturk, 2015). Because the learning and education environment dramatically affects students' achievement and success, it is essential to get feedback from students regarding their learning experiences (Bakhshialiabad et al., 2015).

Fully online learning, especially at Muhammadiyah University Makassar, is new for students, and it causes various obstacles faced by students. Based on the results of interviews with biology education lecturers at the Muhammadiyah University of Makassar. During the online learning process running for one semester, some students sometimes did not participate in the course, joining the teleconference class without using their camera, and some students' academic achievement has decreased. Many factors cause this, such as limited information technology (IT) capabilities and inadequate facilities to support online learning.

One of the barriers for students to follow and participate in online learning is the lack of student knowledge related to technology. Some students with good technology backgrounds can allow them to easily use various devices in e-learning and improve their e-learning experience without many obstacles (Mamattah, 2016).

The purpose of this study is to identify students' perception toward online learning of Biology Education Students at the University of Muhammadiyah Makassar. A previous study Wei & Chou (2020) said that the student's perception of online learning can work on their readiness to learn. According to Alqurashi (2019) Instructors/lecturers need to assess how students' perception on their learning to increase the quality of online learning. Then, an investigation by Rockinson-Szapkiw et al (2016) proves that students' attitudes to online learning can be a predictor of student learning outcomes.

METHOD

This research uses a mixed-method approach with the sequential design of the explanatory. The first phase is collecting and analyzing quantitative data and then the second phase is followed by collecting and analyzing qualitative data (Creswell et al., 2018). The reason for using mixed methods is because quantitative data is not enough to obtain detailed information, for example, the constraints that students experience during online learning. The answers to these questions will vary so much that they are difficult to obtain quantitatively. Quantitative data will provide an overview of student perception in general and qualitative data will provide detailed information that is not covered by quantitative data.

The study used two types of instruments, namely student perception questionnaires and open-ended questions that are delivered by using goggle form. Questioner is used to collect quantitative data of students'

perception toward online learning and open-ended question is used to collect qualitative data for getting information deeply about students' online learning experiences during Covid-19.

Participants in this study were all biology education students of the class of 2017 who were active in courses. The number of participants in this study was 58 students. In the phase 1 (quantitative phase), qquestionnaires that's used are adaptations of Faleh (2011) with four dimensions to be measured namely 1) self-learning ability through online learning, 2) interaction between students and learning content, 3) interaction with lecturers in online learning, and 4) interaction between students in online learning. The scale on the questionnaire was based on a likert scale with 5 points scale i.e., 1 = strongly disagree, 2= disagree, 3= neutral, 4=agree, and 5=strongly agree. This stage used descriptive data analysis. The purpose of this analysis to interpret students' perceptions of online learning during covid-19. Descriptive data analysis has an important role in reading and observing phenomena. The criteria for interpretation of scores based on the interval in the Table 1.

Table 1. Students perception score category

No	Value	Category
1	$1 < \overline{\overline{R}} < 2$	Very Low
2	$2 < \overline{\overline{R}} < 3$	Low
3	$3 < \overline{\overline{R}} < 4$	Average
4	$4 < \overline{\overline{R}} < 5$	High
5	$= \overline{\overline{R}}\ 5$	Very High

Based on the results of quantitative data analysis, researchers continued to collect qualitative data through open-ended questions to find what challenges students faced during the online learning process (In the phase 2, collecting and analyzing qualitative data). There are four items that are asked: 1) obstacles during the online learning process, 2) the positive impact they have got in online learning during Covid-19, 3) applications that are students interested in online learning, and 4) advice given to lecturers to make online learning run more effective. The thematic qualitative analyst was used to analyze the qualitative data. Thematic qualitative analysis is an analysis that can be used widely in qualitative research (Nowell et al., 2017).

RESULTS AND DISCUSSION

The data at this stage is quantitative data obtained using a questionnaire of students' perception of online learning during the covid-19 pandemic. The student perception questionnaire consists of four dimensions, namely: 1) the ability to learn independently through online learning, 2) student interaction with teaching materials, 3) interaction between students, and 4) interaction with lecturers.

Independent learning skills is important for student in learning success. If the student has a lack of independent learning skills, it could affect the effectiveness and efficiency of their learning (Field et al., 2015). That's why, it's very important to asses students' perception about their independent learning ability, especially in online learning during Covid-19 pandemic. The results of data analysis on this dimension were presented in Table 2.

Table 2. Analysis of student perception data on the ability to learn independently through online learning

No	Items	Score					Average
		1	2	3	4	5	
1	In online learning, I can learn anywhere and anytime	1	11	14	12	16	3.203
2	In online learning, I can learn at my pace	2	14	22	10	6	3.074
3	Online learning allows me to review my learning at any time	2	4	23	17	8	3.462
4	In online learning, my learning is personal.	0	1	23	21	9	3.666
5	Online learning enables immediate feedback.	3	7	27	13	4	3.148
6	Online learning makes it possible to fit my own learning style.	2	8	25	16	3	3.462
7	Online learning allowed me to do an evaluation.	2	5	30	12	5	3.240
8	Online learning provides appropriate technical support	2	18	21	8	5	2.907

Based on the result of data analysis results that shows in Table 2, the most approved item by students was their learning in online learning is personal with an average score of 3,7. Based on categorization, the value is in the moderate category. The least approved item by students was online learning presenting appropriate technical support with an average score of 2, 9 whish's in the low category. In general, students' perception of the ability to learn independently through online learning is average. The lack of students' response toward ability in learning independently means that students' ability in learning independently is low, thus it might

because student's academic achievement decreased through online learning during Covid-19 pandemic. Learning independently is process of students in doing task, taking a decisions and overcoming the problem by them self without expecting a help from others (Novantri et al., 2020). That's why designing online learning to make students being able to learn independently is very important especially during Covid-19 without lecturer and other student existing with them in learning process. Data analysis results interaction between students and content, is showed in Table 3.

Table 3. Analysis of interaction data between students and content in online learning

No	Item	Score					Average
		1	2	3	4	5	
1	Online learning facilitates the learning process	6	10	21	10	7	3.037
2	Online learning encourages me to learn more	4	17	23	7	3	2.777
3	Online learning increases my capacity	4	14	30	4	2	2.740
4	Online learning increased my motivation to learn	4	11	30	7	2	2.851
5	Online learning increased my motivation to learn	5	12	27	7	3	2.833
6	Online learning helped me in time management and self-discipline	4	7	15	17	11	3.444
7	Online learning encourages me to increase my learning time	4	9	24	11	6	3.111
8	I prefer to do tasks and tests online	6	11	23	7	7	2.962
9	I prefer to get my score (study results) online	7	6	23	14	4	3.037
10	My results in online learning are better than those I receive in traditional learning	8	16	21	8	1	2.592
11	My results in online learning are better than those I receive in traditional learning	5	19	23	6	1	2.611
12	Online learning meets my expectations	4	15	29	6	0	2.685
13	I enjoy online learning	6	10	26	7	5	2.907
14	I feel freely to learn through online learning	3	12	21	12	6	2.740
15	Online learning boosts my confidence	7	7	28	10	2	2.870

Based on Table 3, most of the respondents chose neutral across items. An item with the highest approval rating is online learning can help them with time management and discipline. Structured materials and tasks in the application of online learning, make the more discipline then before. The lowest approval response item was learning outcome in online learning was better than learning outcome that I got from traditional learning with a score of about 2,6 in the low category. It means that online learning didn't help a student in learning achievement. This case is contradicting with a study by Murray et al., (2012) said that online learning can help students access the latest resources and can lead them to high grades. Based on the research, it can be said that there are several conditions that allow online learning cannot to run properly so that it has an impact on the performance and achievement of academic achievement.

Results of data analysis of students' perceptions on dimensions students' Interaction with lecturers in online learning presented in Table 4.

Table 4. Students perceived on students interaction with lectures

No	Item	Score					Average
		1	2	3	4	5	
1	I prefer to communicate with instructors through online learning rather than face-to-face	11	15	19	5	4	2.552
2	Online learning improves communication with Lecturers	10	8	24	8	4	2.777
3	I build a productive relationship with lecturers	7	7	29	8	3	2.870
4	Online learning facilitates discussion with lecturers	7	14	22	8	3	2.740
5	Online learning encouraged me to discuss with lecturers	3	16	25	8	2	2.814
6	I like to contact lecturers through online learning	4	12	25	10	3	2.925
7	I like to contact lecturers through online learning	5	14	28	6	1	3.259

Based on the result of data analysis in Table 4. In this dimension, the item that gets the best response from students is in online learning, I received more attention from lecturers with an average score is 3,259 which is in the moderate category. Meanwhile, the item with the lowest approval score is that I prefer to communicate with the lecturer through online learning, with a score of 2, 5 which is in the low category. However, of the overall items, the majority of students choose neutral for each item. Results of data analysis of student perception in this on this dimension are showed in Table 5.

Table 5. Data analysis of student perception on student's interaction with other students in online learning

No	Item	Score					Average
		1	2	3	4	5	
1	I choose to communicate with other learners online as opposed to face-to-face	7	21	19	5	2	2.518
2	Online learning improves my communication with other students	3	14	18	16	3	3.037
3	I build productive relationships with other students	6	11	19	17	1	2.925
4	Online learning facilitates discussion with other students	4	14	23	12	1	2.851
5	Online learning encouraged me to participate in discussions with other students.	3	15	24	10	2	2.870
6	I like to make contact with other students online	2	19	18	11	4	2.925
7	Online learning enhances cooperation with other students	9	10	19	10	6	2.888

Based on data in the Table 5, items that obtain the highest approval value that is online learning improves my communication with other students with score about 3,037 with a category of medium. The data obtained, showing that students did not agree if online learning could increase cooperation between other students. Study by Moore et al (2016) said that most students choose not to work in groups in online classes. To see the average student's perception of online learning for all items in each dimension, look at Table 6.

Table 6. Average grades of student perception of each dimension

No	Dimensions/Items	Average	Description
1	The ability to learn independently through online learning	3.3	Average
2	Interaction between students and content	2.9	Low
3	Interaction between students and lecturers	2.8	Low
4	Interaction between students and lecturers	2.8	Low

Based on the data analysis results in Table 6, showing that students' perceived the ability to learn independently through online learning are not so high, the score of this dimension obtained about 3.3 (average). It means that students do not agree that online learning is independent learning. This case certainly affects the student's academic performance. Studying independently can help students to improve their academic performance (Cukurova, 2014)**.** The other three dimensions get a score that is in the low category.

Quantitative data that was obtained for provides information of students' perception toward online learning during covid-19 is a poor response. Therefore, researchers continue to collect qualitative data through open-ended questions. The data is analyzed using a thematic qualitative analysis approach. Here's an analysis of qualitative data in Table 7.

Table 7. Thematic qualitative analyst results

No	Dimension	Category	Total (%)
1	Challenges in Online Learning	Bad Network	53
		Cellular Data Plan	18
		Learning Materials	3
		Amenities (PC, Laptop, smartphone)	3
		Interaction	5
2	Positive Impact	Communication with Lecturers	5
		Family	11
		Flexibilities	20
		Time Management	10
		Technology Information capabilities	4
		Practical	3
		Efficient	2
		Reducing the Spread of Covid 19	1
3	The Most Interested Application	Google Classroom	24
		WhatsApp	12
		zoom	6
		Google Meet	7
		Moodle	15
		Telegram	9
		Skype	1
4	Advice for lecturer	Learning Strategy	10
		Tolerance	12
		Timeliness	13
		Video	5
		Innovation	1

As shown in the thematic qualitative analysis in Table 6, in the category of constraints in online learning, there are various problems faced by all students, but the most problems experienced by 98% of students are related to the network. Respondent's statement regarding the constraints in online learning as follows: 1) lack of understanding of the material provided by lecturers, 2) lack of internet network and limited cost to buy internet package, 3) the problem is that the network is difficult in the village so I have to find a place to find a good network, 4) student interaction is becoming less, 5) the problem is the network so that online lectures can be hampered, 6) my constraints are internet package and network, and 7) the facilities used are less supportive.

Most students feel limited in material access if internet facilities are inadequate and not efficient (Apuke & Iyendo, 2018). As seen in the results of qualitative data analysis, the major challenges that students face are weak internet networks around their environment. This problem restricts students to access online learning. Difficulty in accessing the internet is one of the big problems in Indonesia. A study by Febrianto et al (2020) also said that some students in some areas have difficulty in accessing the internet.

Another obstacle that students found was the interaction between students and instructors. Asynchronous online learning with inadequate internet networks makes communication not smooth. This is in line with research by Kearns (2012) that communication between students in online courses by using asynchronous technology through email, discussion boards, blogs, or wiki causes a slow response from both students and instructors.

The second dimension, related to the positive impact that students feel from online learning during Covid-19, the most mentioned category by students is related to flexibility. They feel online learning is more flexible. Furthermore, time management and improving digital literacy capabilities can also be gained through online learning. Statement of students response on questions related to the positive impact felt by students in online learning during Covid 19: 1) we can do the course anywhere, 2) more independent in doing tasks, 3) I spend more time staying at home and with my family, 4) I can review learning material anytime and anywhere, 5) the positive impact is that it is not necessary to go to campus to follow the course, 6) helping students to improve their technology and information skill by using various learning applications, and 7) I can manage my time more.

Based on qualitative analysis results, the most positive impact expressed by students is flexibility. Online learning makes them able to learn anywhere without being limited by space and time. That students look more flexible both in terms of time and space in completing tasks that suit their learning style (Gilbert, 2015). Online learning can provide world-class education, to anyone, anywhere, and anytime as long as internet access is available (Nguyen, 2015). Students reveal that the main advantage of online learning is that it is possible to do and learn anywhere (Luaran et al., 2014). Furthermore, based on data, they can improve their technology and information skill through the implementation of online learning. The other Positive impact through online learning is that they are trained to make a good time management, and also, they are happy to have more time together with their family.

The next category is related to the learning application that students like the most during the online learning process. Google Classroom is the most popular application by students which is 41.37% of students revealed it. Students feel that Google Classroom is a tool that can help in improving the performance of their presentation across multiple courses and other topics (Iftakhar, 2016). Google Classroom is a learning app that is very helpful to students in Indonesia. The Google classroom has the opportunity to save more time both for students and teachers because the setup process in   Google Classroom is fast and too easy to use (Sudarsana et al., 2019).

The second most preferred application is Moodle with a score of 26%, as well as the use of WhatsApp group as an additional communication tool in online learning 21%. All three apps are asynchronous. Asynchronous online learning supports communion between students and instructors even if it's not online at the same time. This is the key of flexible learning (Hrastinski, 2008). Based on student responses, using synchronous applications in online learning requires a strong network and a large data plan, which causes most students prefer to asynchronous applications. Zoom, Google meet, and Skype are synchronous apps, and only a few students are interested in them.

The most dominant category mentioned by students is to tolerate students regarding the extension of task collection time, the learning strategies used are further improved. Besides, students also provide advice to create learning videos related to material explanations rather than using synchronous applications. Instead of just text and image learning resources, videos in learning are very helpful to students. Using other source-integrated videos on new knowledge can prepare students to learn well and have an impact on good learning outcomes (Scagnoli et al., 2019).

CONCLUSION

The student response based on quantitative data, most of the students choose neutral in each item of questioner perception and it means giving not very good and also not very bad response toward online learning that runs during the Covid 19 pandemic. The weakness that's experienced by students in online learning is comparable to the positive impact they got. This is the reason why most students do not respond very well and also do not respond very poorly to online learning, in other words, most students choose neutral in every dimension. Researchers assume that if the challenges they face can be overcome properly, then they will likely give an excellent approval response to online learning. Google class and Moodle are the most impressive learning applications that students choose during the Covid 19 learning process.

Later, lecturers are expected to prepare learning materials in videos to overcome students who have difficulties to join synchronous online learning because. In addition, the online learning strategy that can be used by lecturers is by combining synchronous and asynchronous online learning. Thus, students who cannot join in synchronous online learning through teleconference, then they can follow asynchronous online learning provided by lecturers on certain online learning platforms.

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