EXPLORING STUDENT PERCEPTIONS OF SYNCHRONOUS, ASYNCHRONOUS, AND BLENDED LEARNING APPROACHES: AN INVESTIGATION STUDY ON EDUCATIONAL GOALS

Usman Mulbar[1], Nur Ismiyati[2], Ahmad Zaky[3]
[1,3]Universitas Negeri Makassar
[2]Universitas Balikpapan
[1,3]Mallengkeri Raya Street No. 44, Makassar, South Sulawesi, Indonesia
[2]Pupuk Raya Street, Gn. Bahagia, Balikpapan City, East Kalimantan
Email: u_mulbar@unm.ac.id[1], nurismiyati@uniba-bpn.ac.id[2], ahmadzaki@unm.ac.id[3]

Abstract:
This study aims to explore student perceptions of learning with synchronous, asynchronous, and blended learning approaches. This study is quantitative descriptive research with a survey approach, which refers to the National Student Survey, consisting of 9 aspects: teaching methods, learning opportunities, assessment and feedback, academic support, organization and management, learning resources, learning communities, student opinions, and overall satisfaction. The participants were 120 students. The results showed that the mean scores of the synchronous approach were higher on teaching methods, learning opportunities, assessment and feedback, learning resources, and overall satisfaction aspects; blended learning on organization and management, learning community, and student opinion aspects; and had the same on academic support aspect. Although the findings are limited, they can be used to inform and improve future pedagogical approaches in optimizing more effective student learning. Recommendation for further research requires guidance in designing learning by collaborating asynchronously and synchronously by paying attention to these aspects.

Abstrak:
Tujuan dari penelitian ini untuk mengeksplorasi persepsi mahasiswa tentang pembelajaran dengan pendekatan pembelajaran sinkronous, asinkronous dan *blended learning*. Penelitian ini menggunakan deskriptif kuantiatif dengan pendekatan survei yang merujuk pada *National Student Survey*, terdiri dari 9 aspek: metode pengajaran, peluang belajar, penilaian dan umpan balik, dukungan akademik, organisasi dan manajemen, sumber belajar, komunitas belajar, pendapat mahasiswa, dan kepuasan secara menyeluruh. Sebanyak 120 mahasiswa yang berpartisipasi. Hasil penelitian menunjukkan bahwa nilai rata-rata pendekatan sinkronous lebih tinggi pada aspek metode pengajaran, kesempatan belajar, penilaian dan umpan balik, sumber belajar, dan kepuasan secara keseluruhan, dan *blended learning* pada aspek organisasi dan manajemen, komunitas belajar, dan pendapat mahasiswa, dan keduanya sama pada aspek dukungan akademik. Walaupun temuan terbatas akan tetapi dapat digunakan untuk menginformasikan dan meningkatkan pendekatan pedagogis masa depan dalam mengoptimalkan pembelajaran mahasiswa yang lebih efektif. Rekomendasi penelitian selanjutnya perlu adanya panduan dalam merancang pembelajaran dengan mengkolaborasikan asinkronous dan sinkronous dengan memperhatikan aspek-aspek tersebut.

Keywords:
Synchronous, Asynchronous, Blended Learning, National Student Survey, Perception

How to Cite: Mulbar, U., Ismiyati, N., & Zaky, A. (2023). Exploring Student Perceptions of Synchronous, Asynchronous, and Blended Learning Approaches: An Investigation Study on Educational Goals*. Lentera Pendidikan : Jurnal Ilmu Tarbiyah dan Keguruan,* 26(2), 343-353. https://doi.org/10.24252/lp.2023v26n2i9.

INTRODUCTION

At the beginning of 2020, the world was shocked by the emergence of the 2019 coronavirus disease (COVID-19), which was found at the end of December 2019 to have a huge impact on people's lives. The World Health Organization (WHO) has designated this pandemic (Mahase, 2020). The dangerous situation due to the COVID-19 pandemic has caused the Indonesian government to issue various policies that change the order of the nation's life in various sectors, one of which is education. The COVID-19 outbreak prompted online learning testing that was once conducted simultaneously (Sun, Tang & Zuo, 2020) for all elements of education, both high school and college levels. The sudden wave of online learning due to the COVID-19 pandemic has changed the face of education in Indonesia and caused unpreparedness for educators and students. Kusnayat, Muiz, Mansyur, & Zaqiah (2020) stated that online lectures conducted by lecturers accompanied by many assignments during the COVID-19 pandemic made it difficult for students to move in completing their assignments through interaction between students as usual.

Based on the Joint Decree of the Minister of Education and Culture, Minister of Religious Affairs, Minister of Health, and Minister of Home Affairs of the Republic of Indonesia Number 03/KB/2021, Number 384 of 2021, Number KH.01.08/MENKES/4242/2021, and Number 440-717 of 2021 concerning Guidelines for Implementing Learning during the Coronavirus Disease 2019 (COVID-19) Pandemic that learning in universities is held with limited face-to-face learning and/or online learning.

The Ministry of Education and Culture has issued policies in the new normal era, especially in higher education. The health and safety of students, lecturers, staff, and the community is a priority in the policy-making process and program implementation in the era of adaptation to new habits. Online learning with various approaches in higher education is carried out to implement instructions from the government about the new-normal-era policy. The learning approach carried out by lecturers includes synchronous and asynchronous approaches or combining the two, known as blended learning. The asynchronous learning approach considers that the presence of lecturers and students can be distinguished. The synchronous learning approach is the opposite. The lecturers' and students' attendance should be simultaneous, and they should meet online on whichever platform they decide to work on and work together as they would in class. In contrast, blended learning is a combination of both learning approaches, namely synchronous and asynchronous.

The synchronous learning approach is when students and lecturers exchange information and interact simultaneously in an online learning community using a set time using learning technology, including internet conference, satellite, video

teleconference, and chatting (Lewis & Clarke in Narayana, 2016). In addition, a synchronous learning environment is where lectures and students meet on a special online platform to teach and communicate about a lesson (Amiti, 2020). Mick & Middlebrook (2020) also argue that during the synchronous learning approach, students have a real-time engagement, which tends to be associated with student satisfaction, student learning, and lower rates of reduction.

Furthermore, the approach of asynchronous learning is learning freely without being limited by time, where students can interact with specific material and each other at a time of their choice, students can post their thoughts on a self-determined day, and other students can provide comments such as discussion forums (Hosier & Allison in Narayana, 2016). Moreover, the asynchronous environment provides material to students in the form of audio or video lectures, handouts, articles, and PowerPoints that can be accessed anytime and anywhere (Perveen, 2016).

Blended learning is a combination of web-based technologies to achieve learning objectives, face-to-face learning with learning using technology, and a combination of various pedagogic approaches (Darma, Karma, & Santiana, 2020; Mariani, 2020; Prohorets & Plekhanova, 2015). Output with or without technology teaching is a combination of technology teaching with assignments. Al-Qahtani & Higgins in Alghamdi, Hall, & Millard (2019) stated that students attend classes face-to-face but otherwise have to access online learning activities to increase knowledge, such as reading a lot, browsing relevant websites, exercises, self-assessments, group-based assignments, and discussion forums. Online learning is flexible and accessible in terms of time and place, with more opportunities for online discussion interaction. It is more efficient and provides the opportunity to consider individual differences between students who can determine which parts of the material they want to focus time and effort on. Blended learning, as an intentional combination of online and classroom activities, is designed to enable and support learning that is differentiated into synchronous (learning process with real-time participation from all participants) and asynchronous (learning process at different times and spaces for each participant) in online learning activities (Tomej, Liburd, & Bilchfeldt, 2022).

Many studies have explored students' perceptions of different learning methods in higher education after the COVID-19 pandemic. Saputra, Yuniarti, & Gunawan (2021) found that students prefer an online learning model that allows independent and convenient learning. Suwarno & Hendi (2018) found that blended learning, a combination of face-to-face and online teaching, has a positive effect on student competence. However, Mufidah, Fadilah, & Afifah (2022); Nugroho (2021) found that students consider blended learning less effective and prefer face-to-face teaching. Moreover, Junus & Andula (2020) further revealed that the use of Moodle and collaborative learning in blended learning does not significantly increase student learning. This research highlights the need for further research to understand the complex factors that influence students' perceptions of different learning methods. Therefore, there is a need for further research to understand the complex factors that

influence students' perceptions of different learning methods. This study examined the factors that affect the learning process and pay attention to what aspects need full attention when doing learning both synchronous, asynchronous and blended learning. It is a constantly changing situation after the COVID-19 pandemic of the new normal era, so it is important to explore student perceptions of learning with synchronous, asynchronous, or a combination of both. One method that can be used to explore this is survey-based research. It specifically and effectively collects large amounts of respondent data and has been used previously to investigate perceptions of college students.

RESEARCH METHOD

This research is a quantitative descriptive research using a survey approach. Data was obtained using a survey that refers to the National Student Survey to determine student experience in the learning process with a synchronous, asynchronous, or blended learning approach. The instrument used was a questionnaire. Data collection was carried out by distributing questionnaires through Google Forms with a simple random sampling of research subjects consisting of 120 students of Mathematics Education Study Programs in universities. The participants were from Mathematics Education Study Program, whose learning process during the new normal era was one of synchronous, asynchronous, or blended learning. The data analysis technique used in this study was quantitative descriptive data analysis. The survey used a Likert scale of 26 question items divided into 9 aspects: teaching methods, learning opportunities, assessment and feedback, academic support, organization and management, learning resources, learning communities, student opinions, strengthening about COVID-19, and overall satisfaction. The questionnaire instruments are described in Table 1 as follows.

Table 1. Survey Questionnaire

No.	Aspect	Questionnaire Items
1.	Teaching methods	Lecturers are good at explaining many things according to the courses taught.
		Lecturers have created an interesting topic for each meeting.
		Every course taught is intellectually stimulating.
		Every course taught has challenged me to achieve the best job.
2.	Learning opportunities	Every course taught has given me the opportunity to explore ideas or concepts in depth.
		Each course taught has given me the opportunity to gather information and ideas from different topics.
		Every course taught has given me the opportunity to apply what I have learned.
3.	Assessment and feedback	The criteria used in the assessment are clear beforehand.
		The assessment is fair.

		Feedback on my work or tasks is timely.
		I have received helpful comments about my work or duties.
4.	Academic support	I can contact staff or lecturers when I need help.
		I have received sufficient advice and guidance with respect to the chosen course.
		Good advice is available when I need to choose courses in my study program.
5.	Organization and management	Each course is well organized and runs smoothly.
		Timescale to work efficiently for me.
		Any changes in courses or teaching have been effectively communicated.
6.	Learning resources	IT resources and facilities provided have supported my learning well.
		Learning resources (e.g., books, online services, and study spaces) have supported my learning well.
		I can access resources on IT facilities (e.g., LMS) and libraries (e.g., books, online services, and study rooms) when I need them.
7.	Learning communities	I feel part of a community of faculty and students.
		I had ample opportunity to work with other students as part of my college.
8	Student opinions	I have ample opportunity to give feedback on my lectures.
		Lecturers value students' views and opinions about the material taught.
		Student associations effectively serve the academic interests of students.
9.	Overall satisfaction	Overall, I am satisfied with the quality of my virtual learning experience in each course.

Source: National Student Survey modified

RESULTS AND DISCUSSION

The survey of students was carried out because the COVID-19 pandemic was a changing situation, so limited face-to-face learning rules were issued. It is important to know student perceptions about synchronous, asynchronous or blended learning approaches for students in Mathematics Education Study Programs. The survey referred to the National Student Survey (Finlay, Tinnion, & Simpson, 2022) to determine student perceptions of teaching and learning in synchronous, asynchronous or blended learning after the COVID-19 pandemic and compare the effectiveness of the three learning approaches. The data could also influence future government and institutional policies on teaching and learning or as an alternative form of education. Comparison of student perceptions in synchronous, asynchronous, or blended learning can help in course

decision-making. Data related to student needs was obtained from the distribution of questionnaires provided online through the Google Form via a link bit.ly/5urveyPersepsiMahasiswa, which was randomly taken to 120 students so that the results of student responses were analyzed through the ANOVA test which had met the test of normality and homogeneity of variance using JASP Programme. ANOVA test results can be seen in Table 2 as follows.

Table 2. Comparison of Learning Approach Survey Results

Aspect	Blended Learning ($n = 70$)		Synchronous ($n = 30$)		Asynchronous ($n = 20$)		F	Sig.
	Mean	SD	Mean	SD	Mean	SD		
Teaching methods	15.86	2.56	15.93	2.56	15.40	2.56	0.30	0.74
Learning opportunities	12.14	1.93	12.33	1.77	11.60	2.19	0.90	0.41
Assessment and feedback	15.66	2.77	15.93	2.83	15.50	2.72	0.17	0.85
Academic support	12.27	2.29	12.27	2.46	11.65	2.37	0.58	0.56
Organization and management	11.96	2.10	11.83	1.86	11.35	2.66	0.62	0.54
Learning resources	12.07	2.14	12.20	2.47	11.10	2.10	1.76	0.18
Learning communities	7.93	1.54	7.33	2.04	6.85	1.35	3.83	0.02
Student opinions	12.21	1.78	11.67	2.12	10.80	1.91	4.51	0.01
Overall satisfaction	3.84	0.90	4.10	0.76	3.55	0.88	2.42	0.09

The analysis results using the ANOVA test with a significant level of $\alpha = 0.05$ shown in Table 2 above are clearly described as follows.

1) Data was obtained from student perceptions of student learning The survey was conducted on 120 students. The results showed that there were 30 students whose learning process had a synchronous learning approach, 20 students whose learning process had an asynchronous learning approach, and 70 students whose learning process had a blended learning approach.
2) There are 9 aspects asked in the survey, including teaching methods, learning opportunities, feedback assessment, academic support, organization and management, learning resources, learning community, student opinions, and overall satisfaction.
3) In the aspect of teaching methods, learning opportunities, assessment and feedback, academic support, organization and management, learning resources, and overall

satisfaction obtained $sig > \alpha$ means that the average learning approach consisting of blended learning, synchronous and asynchronous based on aspects of teaching methods, learning opportunities, assessment and feedback, academic support, organization and management, learning resources, and overall satisfaction is the same so that it can It said there was no significant difference.

4) The aspects of teaching methods, learning opportunities, assessment and feedback, academic support, organization and management, learning resources, and overall satisfaction did not have significant differences. However, suppose you look at the output of multiple comparisons on average differences. In that case, it shows that (a) blended learning has a better impact on students than asynchronous learning on aspects of classroom teaching, learning opportunities, assessment and feedback, organization and management, learning resources, and overall satisfaction; (b) blended learning has a better impact on students than synchronous learning on organizational and management aspects and learning resources; (c) synchronous learning has a better impact on students than blended learning on aspects of teaching methods, learning opportunities, assessment and feedback, learning resources, and overall satisfaction; and (d) synchronous learning has a better impact on students than asynchronous learning on learning opportunities, assessment and feedback, academic support, organization and management, learning resources, and overall satisfaction.
5) In the aspect of learning community and student opinions, $sig < \alpha$ means that there are at least 2 different averages between learning approaches consisting of blended learning, synchronous and asynchronous based on aspects of the learning community, student opinions, and overall satisfaction. The learning community aspect refers to the output of multiple comparisons with $sig = 0.01$ and aspects of student opinion with SIG. =0.004 indicates that there is a significant average difference between blended learning and asynchronous with $sig. < 0.05$. The asynchronous learning approach has an impact on students being part of a learning community and having ample opportunities to collaborate with other students, provide feedback and value students' opinions as part of the course.

Experiences in the new normal era after the COVID-19 pandemic, and face-to-face learning is limited to learning with synchronous, asynchronous, or both approaches. According to Huang, Spector, & Yang (2021), learning experiences can affect students' perceptions, responses, and performances through interaction with the learning environment, educational products, resources, and so on.

Comparison of student perceptions in synchronous learning approaches, asynchronous learning, or blended learning can help in course decision-making. There are 9 aspects submitted to students through questionnaires given online through Google Forms, including teaching methods, learning opportunities, assessment and feedback, academic support, organization and management, learning resources, learning communities, student opinions, and overall satisfaction. The results of the student survey show that there are significant differences in aspects of the learning community and

student opinions between blended learning and asynchronous learning. Laffey, Lin G., & Lin (2006) argue that education is a social practice and successful learning facilitated by consistent social interaction. A view of social constructivism in which learners learn in a proximal zone of development on challenging tasks, and learners can pay attention to important aspects of decent information (Subban, 2006) does not separate cognitive and affective learning and emphasizes aspects of the learning community that can support academic success (Delfino & Manca, 2007). The results of preliminary research on student surveys show that students experience poor social interaction in asynchronous learning compared to blended learning due to a lack of face-to-face interaction with other students or lecturers. According to Caspi, Chajut, & Saporta (2006), the results of their research suggest that some students are very shy and more comfortable and show higher student involvement in asynchronous learning than in face-to-face. However, research by Ogbonna, Ibezim, & Obi (2019) said that the synchronous learning approach is more helpful for students in receiving lessons, can encourage student motivation, critical thinking, there is interaction in learning and improve student skills. In addition, a finding shows that students taught through a synchronous learning approach achieve a slightly higher acquisition of practical skills than the group taught through an asynchronous learning approach (Sife in Ogbonna, Ibezim, & Obi, 2019).

One of the most empirically revealing findings about online learning, according to Baepler, Walker, & Driessen (2014), is that students in blended learning achieve superior learning outcomes on average, and student satisfaction tends to be higher than online or face-to-face learning. This finding is in line with research by Rovai and Jordan in Agusta (2021), showing that learning with a blended learning model provides a sense of community with each other rather than with the usual face-to-face model. Blended learning that combines synchronous and asynchronous approaches has been widely recognized as an effective approach in the new normal era (Makarim & Fauzi, 2022; Purnama, 2020; Eriyaningsih, Hariyadi, & Nuryatin, 2022; Mahrunnisya, 2022). This approach that combines virtual face-to-face interaction and independent learning has proven to be very effective in increasing student understanding, engagement (Zainuddin, 2021; Eriyaningsih, Hariyadi, & Nuryatin, 2022). Sulistiyoningsih, Kartono, & Mulyono (2015); Hart (2019) revealed that blended learning does not reduce the interaction between lectures and students but increases the interaction of both parties because of the direct involvement of students in learning, flexibility, and continuous progress. Novitayati in Agusta (2021) emphasized that the blended learning model provides freedom for each student to express opinions without any supervision or criticism from classmates. McHone (2020) also provided empirical evidence that blended learning can be effective when social interaction is incorporated into the classroom face-to-face.

CONCLUSION

The study findings showed that overall, there was no significant difference between asynchronous, synchronous, and blended learning approaches. However, looking at 7 of the 9 aspects shows that the blended learning approach has a good impact.

The mean scores of the synchronous approach were higher in the aspects of teaching methods, learning opportunities, assessment and feedback, learning resources, and overall satisfaction; blended learning in the aspects of organization and management, learning community, and student opinions; and same in the aspect of academic support. The learning community aspect and student opinions show a significant difference between blended learning and the asynchronous learning approach because students become part of a learning community and have adequate opportunities to collaborate with other students, provide feedback, and respect student opinions as part of the course. This research highlights that asynchronous learning approaches must actively engage students to facilitate social interaction and consistent use of technology. Although the findings are limited to one study program, the conclusions of this study can be used to inform and improve future pedagogical approaches to optimizing student learning more effectively. Comparison of student perceptions in synchronous, asynchronous, or blended learning approaches can help lecturers choose to implement the learning process by paying attention to what aspects need to be improved so that the learning process runs optimally. The data obtained can also be used to influence government policies on teaching and learning as a form of alternative education and assist lecturers in making decisions in designing classroom learning. Further research recommendations need guidance or reference in designing learning by collaborating asynchronously and synchronously by paying attention to these aspects.

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