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Face-to-Face Instruction and Blended Learning Related to Students' Commitment in Science Courses

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Abstrak

Perubahan cara pembelajaran yang terjadi dapat memicu berbagai persepsi dan komitmen pembelajaran yang berbeda, terutama pada perkuliahan yang identik dengan praktik praktik sains, seperti mata kuliah sains. Penelitian ini bertujuan untuk menganalisis persepsi mahasiswa terhadap mode blended learning dan tatap muka pada mata kuliah IPA terkait komitmen belajar pasca pandemi Covid-19. Dengan menggunakan metode fenomenologi, penelitian dilakukan dengan enam siswa sebagai partisipan. Pengumpulan data dilakukan dengan teknik wawancara, observasi, dan dokumentasi. Triangulasi digunakan untuk memvalidasi data, sedangkan teknik analisis data menggunakan Miles dan Huberman. Hasil penelitian menunjukkan bahwa terdapat perbedaan persepsi dan komitmen mahasiswa pada mata kuliah IPA dengan kedua mode pembelajaran tersebut. Siswa cenderung memandang pembelajaran tatap muka lebih positif dibandingkan pembelajaran campuran karena kegiatan dilakukan lebih interaktif. Komitmen siswa lebih baik pada pembelajaran tatap muka dibandingkan pembelajaran blended learning. Berdasarkan hasil penelitian ini disimpulkan bahwa persepsi positif membentuk komitmen belajar lebih baik dibandingkan persepsi negatif.

***Kata kunci*:** *Persepsi, komitmen, Mahasiswa, blended learning, Tatap muka*

Abstract

Changes in instructional modes that have occurred can trigger various perceptions and different learning commitments, especially in lectures that are identic to perform hands-on science, such as science courses. This study aims to analyze students' perceptions of blended learning and face-to-face modes in science courses related to learning commitment after the Covid-19 pandemic. Using phenomenological method, the research was conducted with six students as participants. The data was collected by interview, observation, and documentation techniques. Triangulation was used to validate the data, while a data analysis technique is using Miles and Huberman. The results show that there are differences in students' perceptions and commitments in science courses with both learning modes. Students tend to perceive face-to-face learning more positively than blended learning because activities perform more interactively. Students' commitments are better during face-to-face learning than during blended learning. Based on the results, this study concludes that positive perceptions shape better learning commitments than negative perceptions.

Keywords: Perception, Commitment, Students, Blended learning, Face-to-face

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1. INTRODUCTION

The global Covid-19 pandemic that occurred simultaneously in various countries starting in 2020 had a tremendous impact on the education sector. The government was forced to enforce changes in learning modes as a form of prevention of the spread and transmission of the Covid-19 virus especially in higher education (Ferdianto & Dwiniasih, 2019; Lusiyani & Dara Anindya, 2021). In the end, the increasingly controlled rate of transmission of Covid-19 opened up the opportunity to carry out limited face-to-face learning, namely by the blended learning mode (Adnan, 2020; Liando et al., 2021). Blended learning is a strategic blend of face-to-face and online learning with the use of technology in it. The learning process can take place with synchronous and asynchronous activities or a combination of both (Heilporn et al., 2021; Learning, 2017; Stein & Graham, 2020). Blended learning mode is considered more suitable for ongoing conditions and more compatible for all subjects and courses (Dahry & Avana, 2021; Yunita Anindya et al., 2019), including science subjects and/or courses. Even so, evidently the sustainability of the blended learning mode in one of the public universities in Yogya (further referred to as Universitas "X") is not

so long, only takes place in the odd semester of the 2022/2023 academic year. Towards the end of 2022, the transmission of Covid-19 is increasingly controlled, so the President of the Republic of Indonesia revoked the implementation of restrictions on community activities or PPKM at the end of 2022. Through the revocation of PPKM, teaching and learning activities within at universities are no longer restricted. Therefore, in the even semester of 2022/2023 academic year, the implementation of lectures at the university is organized in face-to-face mode again. Face-to-face mode is a planned action based on learning principles in the form of a interaction process between educators, students, learning materials, and learning environments, making it easier for educators to evaluate students (Hasanah, 2022; Limbong et al., 2021). Actually, since the Covid-19 pandemic, the lecture process is indirectly required to be more flexible, it must be able to be done online from the location of each student (including as part of blended learning) and also face-to-face again for all courses, including science courses. This means that science courses which identic to hands-on activities must be prepared with changes in instructional modes that can occur at any time. These changes can trigger various perceptions and different learning commitments in science courses. This is proven by previous study which shows that blended learning is perceived more negatively due to limited interaction and participation in blended learning classes (Mali & Lim, 2021). So, students do prefer face-to-face learning and have a positive perception of face-to-face learning. However, it turns out that the facts in the field based on research by other study showed that not all students easily adapt to the transition period of face-to-face learning again (Manuaba, 2017; Wedayanti & Wiarta, 2022). Changes in the learning process that occur are not easy, especially for students. This incident is very likely to encourage changes in commitment among students.

One of the phenomena of changes in learning commitment is the level of students' participation in the transition stage of blended learning from conventional learning to online learning is low. This implicitly suggests that students' commitment during the blended learning process is low. Ideally, there should be no difference in the level of students's engagement or commitment in face-to-face and blended learning (Baharuddin et al., 2019; Fatkhulloh & Haryanto, 2020; Pakpahan, 2020). Commitment is an agreement made by someone and is reflected in certain actions/behaviours voluntarily or forced, so that commitment in the learning context can be interpreted as the proportion of time and seriousness of students in devoting all their efforts to achieving a desire based on the needs needed in achieving their learning goals. In other words, commitment is the ability to link one's intentions, determination, and actions. However, various existing researches have not referred to the perceptions of Primary Teacher Education or PGSD students about face-to-face mode post blended learning in relation to learning commitment, especially in science courses after the Covid-19 pandemic. Research on perceptions of the implementation of blended learning and face-to-face modes and student learning commitment in science courses is necessary and important to do, because perception and commitment are important factors in supporting learning performance and learning outcomes (Tlonaen & Blegur, 2014). Identification of student perceptions and commitment is an important part for evaluating the lecture process, can find out the needs of students in lecture activities, and can provide recommendations regarding an effective lecture process and the improvements needed to increase student learning commitment. This study aims to analyze students' perceptions of blended learning and face-to-face modes in science courses related to learning commitment after the Covid-19 pandemic.

2. METHODS

This research seeks to answer the main problem regarding students' perceptions of the mode of study undertaken in relation to commitment. Therefore, the research method used is

a qualitative approach with a phenomenological research type. This type of phenomenological research relates to a person's lived experience of a phenomenon (Creswell, 2014). The most communicative students selected from each of the blended learning and face-to-face classes as participants in this study, they were enrolled in Primary Teacher Education Study Program at Universitas "X". They were also selected based on the highest, medium, and lowest final grades in the science courses to find out and further analyze whether there are differences in perceptions and commitment from the three different learning outcomes. The data was collected by interview, observation, and documentation techniques. At the interview stage to explore student perceptions, which includes understanding about the object, view about the object, action toward the object, and hope or expectation. The four dimensions of perception become the development of the research flow of thought. In relation to commitment, researchers referred to the indicators of good learning commitment proposed before (Luh et al., 2019; Safitri et al., 2020), they include being more serious (focus) in the learning process, contributing to the learning activities, continuously participating, being able to take responsibility and uphold learning activities, and being involved and having solidarity in learning groups. Triangulation was used to validate the data, while data analysis techniques used with in vivo and descriptive coding methods (Miles et al., 2014).

3. RESULTS AND DISCUSSION

Results

The findings and discussion regarding students' perceptions of blended learning and face-to-face modes in relation to students' commitment in science courses are described in this section. The research findings are analysed based on the students' answers to the interview questions related to their views and involvement to gain a deeper understanding of the students' perceptions and their commitment during the courses. The results are divided into five sections: students' perception of blended learning mode in science courses, students' perception of face-to-face mode in science courses, students' commitment during blended learning mode, students' commitment during face-to-face mode, and summary of the results.

Blended Learning VS Face-to-Face Mode for Science Courses: Student Perceptions

This section discusses student perceptions of blended learning and face-to-face modes in science courses. These perceptions are constructed based on the experiences gained during attending science courses with both instructional modes. Students' perceptions of the blended learning' implementation in science courses are presented in Table 1 and described descriptively.

Table 1. Student Perceptions of Blended Learning Mode in Science Courses

No	Students' Response	Correlation between Students' Response
1	Science lectures with blended learning mode is more flexible.	Students' perceptions of blended learning mode in science courses tend to be negative.
2	The lectures process for each class is different, some combine face-to-face lectures (live synchronous) with online lectures (virtual synchronous) at the same time, some run face-to-face lectures (live synchronous) and self-directed asynchronous lectures, and some tend to be face-to-face lectures (live synchronous).	
3	Communication with the lecturers during science lectures is limited and the lecturers are not responsive, so	

No	Students' Response	Correlation between Students' Response
	miscommunication can occur.	
4	Hands-on science tends to be independent (out of lecture hours), lacks facilities, and lacks lecturer guidance.	
5	There are differences in quiz scores between students who attend live synchronous and virtual synchronous lectures.	
6	More easily distracted, easily worried and fearful.	
7	Many obstacles, such as: weak signal, sluggish laptop, lecture material is not finish, and only 50% of lecture material can be understood.	
8	The blended learning mode of science lectures seems too demanding for students to be independent and unhelpful, in fact not all students come from science majors at the previous education level. As a social student in high school, I had to try hard to like and learn science materials with very limited interaction.	
9	Blended learning is not effective for science courses, I have to struggle to engage myself, there are no interaction and no hands-on activities.	

Based on the student responses presented in **Table 1**, students tend to express unpleasant experiences. The blended learning' implementation in each class is different and the differences may cause ambiguity about the blended learning' concept among students. In addition, the practicum activities tends to be independent (taking place outside of lecture hours), so the interaction in the blended learning mode is very limited, even the blended learning mode seems unable to build concrete science activities and their interactions, either for students who are in class or in their respective domiciles. Students feel that they are too pressured to be independent. Based on student responses (point number 8), it is also known that not all students are able to learn science material independently, because students from Primary Teacher Education Study Program come from diverse/heterogeneous educational backgrounds (not all of them come from science majors at the high school). Therefore, the blended learning mode with its limited interaction is considered unable to help students who come from other majors to understand the science material properly. In the end, students considered that the blended learning mode is not effective for science courses which are identic with practicum activities. This shows that students' perception of blended learning mode in science courses tends to be negative. Furthermore, this section also discusses student perceptions of the face-to-face implementation in science courses. These perceptions are also constructed based on the experience gained by students while attending science lectures with face-to-face mode. Student perceptions are shown descriptively in Table 2.

Table 2. Student Perceptions of Face-to-Face Mode in Science Courses

No	Students' Response	Correlation between Students' Response
1	The lecture process same as a standard lecture, where lecturers and students meet in person in the same place at the same time.	Students' perceptions of the face-to-face mode in science courses tend to be positive.
2	It was fun because there were direct activities (simple practicum) and direct interaction, so I felt more active and involved in the lecture.	

No	Students' Response	Correlation between Students' Response
3	It's more structured because lectures are always scheduled, which spurs to be more discipline.	
4	It is easier to understand the lecture material, because when you get confused you can immediately ask and get feedback faster without waiting long (especially from the lecturer).	
5	Lecturers and students can be equally communicative and responsive.	
6	Science lectures with face-to-face mode are not easily distracted.	
7	The face-to-face mode is very helpful for students to get a better understanding of science material, especially students who did not come from science majors at the previous level of education.	
8	The face-to-face mode is the most effective instructional mode for science courses and also builds student commitment, because all interactions and activities occur directly.	
9	Sometimes the classroom and its tables and chairs are not sufficient for all class members, so they have to squeeze in during lectures.	

The students responses presented in Table 2 show that students tend to have a positive experience. Based on these responses, key information was found: the lectures process brings the students and the lecturers together in the same space and time, so that all activities and interactions occur directly without intermediaries or tools. Students also feel positive emotions such as excitement and feel more involved in lectures, because concrete science activities and their interactions occur during lectures, especially for students who did not come from science majors in previous education level. This means that the face-to-face mode is able to create a lectures process that is in accordance with the characteristics of science courses. In the end, students assess that the most effective lectures mode for science courses is face-to-face mode. This shows that students' perceptions of the face-to-face mode tend to be positive.

Blended Learning vs Face-to-Face Mode for Science Courses: Student Commitment

This section discusses the students' commitment during the implementation of science courses with blended learning and face-to-face modes. In brief, commitment is an agreement that must be realized with appropriate effort or action. Thus, commitment in the learning context can be interpreted as the seriousness of students in devoting all their efforts to achieve learning goals (wants/needs). The description of students' learning commitment during the implementation of blended learning and face-to-face mode is represented by students' actions during the lecture. Table 3 provides an overview of student commitment during science and technology courses with blended learning mode.

Table 3. Students' Learning Commitment in the Blended Learning Mode

No	Students' Response	Correlation between Students' Response
1	Learn to love science courses and keep being on time.	Students'
2	Be more prepared, such as studying the lecture material	commitment during

No	Students' Response	Correlation between Students' Response
	first.	science courses with
3	Initiative to ask for help when facing difficulties.	blended learning
4	Easily distracted, so that they become lazy and do not pay attention to the lecturer.	mode tends to be bad.
5	Being less communicative and responsive, because the interaction during lectures is limited.	
6	Being reluctant to ask questions because you cannot get quick feedback from the lecturer	
7	Still often do other things when attending virtual synchronous lectures.	
8	Did not study the given material when it was my turn to attend self-directed asynchronous lectures.	
9	Been late for class, late for submitting assignments, and missed two quizzes in a row.	

Table 3 presents the findings obtained through interviews. These results are similar to the observation results obtained by researchers, where the actions taken during lectures are not always positive. Students' actions during science lectures with blended learning mode tend not to be in accordance with the indicators of good learning commitment. Points number 4-9 show that students have not been able to take responsibility and uphold learning activities, do not focus on the lectures process, and do not continuously participate in lectures activities. Students become more passive in lectures due to limited interaction during blended learning. In the end, students' actions in science lectures with blended learning mode represent poor commitment. Furthermore, this section discusses student commitment during the implementation of science lectures with face-to-face mode. The description of student learning commitment is represented through student actions during face-to-face lectures. The reality of student commitment is presented in Table 4 and discussed descriptively.

Table 4. Students' Learning Commitment in the Face-to-Face Mode

No	Students' Response	Correlation between Students' Response
1	Always attend lectures and submit the assignments on time.	Students'
2	Trying to get new knowledge by preparing more, such as finding out and studying the lectures material before the lectures schedule and reviewing the lectures material that has been studied.	commitment during science courses with face-to-face mode tends to be good.
3	Initiative to ask for help when facing difficulties.	
4	Active in group discussions and in working on group assignments.	
5	Engage in all science lectures activities and quickly respond to lecturers and fellow students.	
6	Listening and took notes the lectures material explained by the lecturer.	
7	Maintain a conducive classroom atmosphere.	
8	Sometimes I don't focus on the lectures (doing other activities such as talking to my friends or drawing) because I feel bored.	

The results obtained through interviews base on Table 4 same as the researchers' observations. Students tend to take actions that support the continuity of science lectures. Students are active in lectures and groups study, always try to solve lectures' obstacles, and build interactions with fellow students and lecturer of science courses and still maintain a conducive classroom atmosphere. The reality of tudents' actions during face-to-face mode in science lectures tend to be in accordance with the indicators of good learning commitment.

Student Perceptions of Blended Learning and Face-To-Face Modes Related to Students Commitment in Science Courses

This section provides a summary of student perceptions and commitment during the implementation of science courses with two different instructional modes. Students have better commitment in face-to-face lectures, because the mode is able to encourage students' active involvement in lectures. Face-to-face lectures are proven to provide positive feelings (pleasure) compared to blended learning. Students feel that they are more supported through face-to-face lectures because students can ask questions and get feedback in real time, making it easier to understand the lecture material. Students also feel more encouraged to be active in science and technology lectures with face-to-face mode than blended learning, because they can do practicum activities directly with friends with the guidance of lecturers. A summary of student responses about their perceptions and commitment during lectures is illustrated in Figure 1.

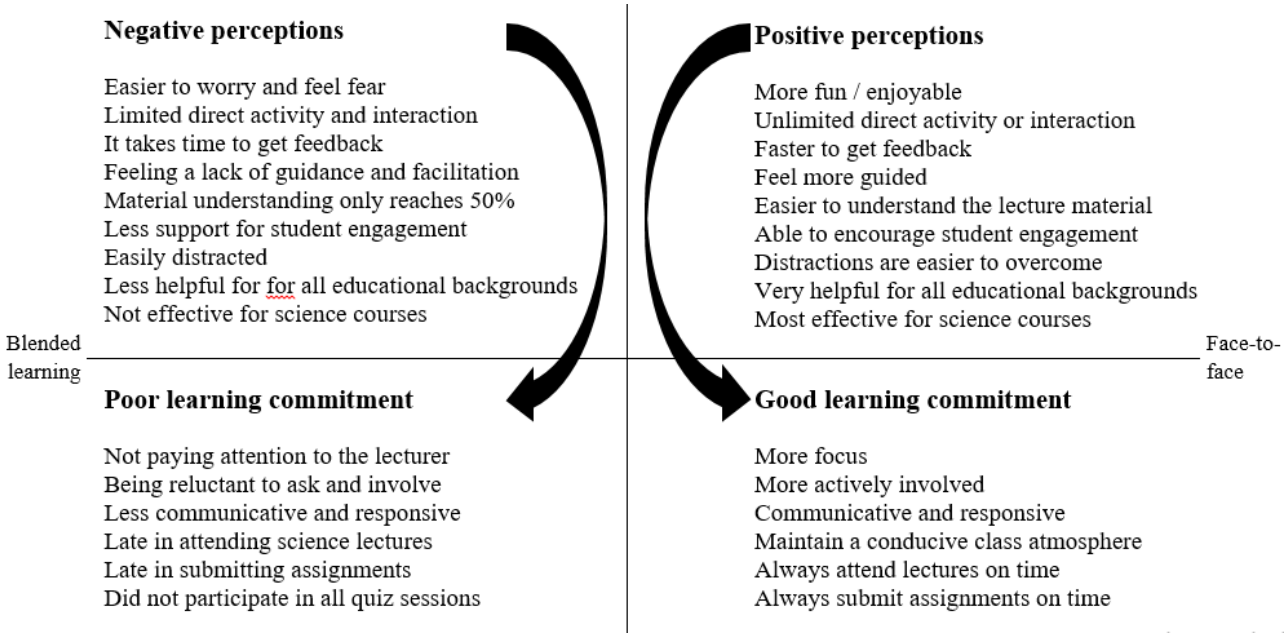

Figure 1. Summary of Results

Figure 1 illustrates a summary of student perceptions and commitment to each instructional mode. Students' perceptions of the face-to-face mode tend to be positive and the learning commitment formed during science courses with face-to-face mode is good, whereas students' perceptions of the blended learning mode tend to be negative and the learning commitment formed during science courses with blended learning mode is not good. Face-to-face mode is more able to provide advantages through direct activities and interactions that occur than blended learning mode. Based on the results obtained, it turns out that a person's perception of an object can be related to the person's commitment.

Discussion

As as previously stated, in the 2022/2023 academic year, University X re-implemented the face-to-face mode in even semesters after implementing the blended learning mode in the previous semester. Data analysis shows that students' perceptions of the science lectures process with face-to-face mode tend to be positive, while students' perceptions of the science lectures process with blended learning mode tend to be negative. The formation of these perceptions is inseparable from the environment and students' experiences. Based on the results of this study, students' perceptions are part of the memory schemata process (not as a direct reaction to something that is sensed), which corresponds to Richard Gregory's constructivism theory of perception. According to constructivism theory, perception is an active process that occurs indirectly, namely through the participation of prior knowledge and experiences that a person already has. So, a person can construct perception after interacting with past experiences that help understand an object. In this case, students' perceptions are constructed by students with their own perspectives based on the appearance of the instructional modes as part of the knowledge and learning experiences experienced by students.

The appearance of the science courses' implementation with face-to-face mode is same in all classes, which takes place in a permanent physical environment. This is in accordance with the definition of face-to-face mode in various literatures, as a form of conventional learning that brings students and educators together in the same learning room (Limbong et al., 2021; Nasution et al., 2021). The implementation of science lectures with face-to-face mode is in line with the learning plan that has been made by the team of science lecturers. The implementation of science lectures delivered by students is in accordance with the observation results obtained by researchers, i.e. all activities and interactions occur directly in each class, including hands-on science activities. Indeed, there is no time allocated for the practicum activities in science courses, but each lecturer still try to build concrete activities by integrating simple practicum into the lectures process according to the topics listed in the learning plan.

Different from the homogeneous implementation of face-to-face mode, the implementation of blended learning mode in each class is quite diverse. Even so, the various implementations are still in line with the concept of blended learning proposed (Kazakoff et al., 2018; Learning, 2017). In 1C class, science lectures more often run synchronously in class for all students. In 1E class, science lectures more often take place with virtual synchronous learning (virtual face-to-face learning). In 1F class, science lectures run synchronously in class for 50% of students and asynchronously for the other students. The implementation of hands-on science in each tends to be independent and takes place without the lecturer' guidance. The differences in the implementation of the blended learning mode can occur because here is no consensus on the blended learning concept in the literature, so that the lecturers of science courses in each class have their own perception (understanding) of the basic concept of blended learning (Owston & York, 2018; Stein & Graham, 2020). Later, the diverse implementation might potential to produce a new understanding (change in understanding) about the basic concept of blended learning among students that is not same with the expectations of the previous understanding, so that the blended learning mode tends to be perceived negatively by students (Heilporn et al., 2021; Lakhal et al., 2020). The various impacts and positive emotions felt by students are inseparable from the advantages of the face-to-face mode, such as: (1) Able to build and maintain a good two-way interaction between students and lecturers and among fellow students; (2) Able to encourage student and lecturer involvement during lectures (feel free to carry out direct activities and interactions that can encourage student activeness in lectures); dan (3) Able to provide an ideal environment for learning (Alam & Jackson, 2013; Istiningsih & Hasbullah, 2015). This

indicates that the limitations experienced during the face-to-face mode are not as many as the blended learning mode, especially in the interaction aspect. Interaction in face-to-face lectures is different from blended learning. Basically, the implementation of the face-to-face mode does require direct social interaction (Andhika & Hamdi, 2020; Dios & Charlo, 2021; Mather & Sarkans, 2018), therefore the face-to-face mode is more capable to build interaction during the lecture process. Interactions that occur in an ideal environment for learning are able to build and maintain two-way communication between fellow students and between students and lecturers (students and lecturers are equally communicative and responsive) so that they can encourage students to have an interest in learning and ultimately students become more active in learning (Alam & Jackson, 2013; Hasanah, 2022).

In the end, all participants in this study chose face-to-face mode as the most effective instructional mode for science courses, with the provison the lecture environment (especially classroom and campus facilities) must be considered. This is further strengthened by (Gok, 2015; Kummitha et al., 2021), courses that require more experiments and exercises such as science courses are more appropriate with face-to-face learning, because the face-to-face mode can provide more direct learning experiences in accordance with the characteristics of science courses. Based on students' perceptions, it is clear that the face-to-face mode is superior from the blended learning mode. The description above emphasizes that the formation of individual's perceptions is inseparable from the individual's experience and environment. Perception is like a transaction, where experiences, person, and environment are intertwined. An individual's view as an observer of his or her environment depends on past experiences as well as present attitudes and motivations. Past experiences will be projected into the present situation in relation to the fulfillment of the individual's needs (Boelens et al., 2017), in this case, the efforts to fulfill individual needs cannot be separated from individual involvement through attitudes or real actions taken.

Furthermore, students who have positive perceptions, specifically students who attend science courses with face-to-face mode tend to have better learning commitment than students who attend science courses with blended learning mode. Students who have good learning commitment will tend to seriously transform their learning experience. It can be seen from more maximum involvement and in accordance with the indicators of good learning commitment: (1) Being more serious (focus) in the learning process; (2) Contributing to the learning activities; (3) Continuously participating; (4) being able to take responsibility and uphold learning activities; also (5) Being involved and having solidarity in learning groups (Andika et al., 2017; Putra et al., 2021). Student involvement is a good start to increase interaction between fellow students and between students and lecturers, also to achieve academic success. Student involvement during lectures represents student commitment during lectures. Students who have good commitment usually tend to be more actively involved in the lecture process (Cavanagh et al., 2018; Christenson et al., 2012). The better students' commitment to study, the greater the effort made in study activities to achieve their goals. Indirectly, commitment is an important aspect to achieve success in the lecture process. The commitment of students enrolled in face-to-face lectures can be better than students enrolled in lectures with blended learning mode basically also inseparable from the supportive learning environment. The face-to-face mode that takes place 100% on campus certainly has a suitable environment for the teaching and learning process, so it can help students to involve themselves in the lectures process and later help students to get a meaningful learning experience (Andriani et al., 2021; Dhanapala, 2021).

Science lectures with face-to-face mode is more capable to provide direct learning experiences (Devi & Bayu, 2020; Dios & Charlo, 2021). Humans as social creatures will be more active when interacting directly (real) without intermediaries, so students are more able to commit (involve themselves) in face-to-face lectures through concrete actions that are in

accordance with the indicators of good learning commitment. Implementation of students' commitment who enrolled face-to-face lectures is more in line with the students' understanding and expectations about commitment. In the end, learning commitment when attending science courses with face-to-face mode tends to be good and in accordance with the reality of the students' commitment implementation, while learning commitment when attending science courses with blended learning mode tends to be bad because it does not match with the reality of the students' commitment implementation and indicators of good learning commitment (Priani et al., 2019; Putri et al., 2019). Students also perceive that the face-to-face mode is more suitable and effective for science courses as well as effective for build and maintain students' commitment, because the face-to-face mode is capable to provide direct learning experiences by including social aspects in it and also suitable with the characteristics of science courses which identic to perform hands-on science activities (Gok, 2015; Kummitha et al., 2021; Mali & Lim, 2021). Based on the findings of this study, it turns out that a person's perception can be related to the person's commitment, in this case students' perceptions of the instructional modes being undertaken are related to students' learning commitment during lectures. Positive perceptions are able to form a better learning commitment than negative perceptions. Basically, learning commitment is strongly influenced by internal and external factors, one of them is perception. Perception and commitment are important factors that cannot be ignored as they both play a role in supporting performance and learning outcomes beside learning facilities (Nawantara & Arofah, 2016; Tlonaen & Blegur, 2014).

At the end, the successful implementation of science lectures with blended learning and face-to-face modes depends on the guidelines agreed to be used by all parties involved. The agreement will form a common understanding among lecturers to students and also the ongoing lecture process and the provision of facilities. The same understanding will shape the same implementation of instructional modes in each class, and the same implementation may be more in line with students' expectations. Thus, students will have positive perceptions and later can stimulate students to be more commit to their studies. Because the face-to-face mode is able to form positive perceptions and also good learning commitment among students, the quality (technical implementation) of the lectures process becomes necessary and important to continue to be evaluated and improved in order to increase or maintain students' commitment, moreover the face-to-face mode is considered more suitable for the characteristics of science courses which identic to perform hands-on science. Similar research also needs to be carried out in other courses, so that later it can provide information about the implementation of instructional modes used holistically and can find out what students need in lectures activities in order to increase students' learning commitment.

4. CONCLUSION

Based on the analysis of the findings of this study, four conclusions were obtained. First, students' perceptions of the face-to-face mode in science courses tend to be positive, while perceptions of the blended learning mode tend to be negative. The positive perception is driven by the many positive impacts and positive emotions felt by students, while the negative perception of blended learning mode is driven by the many negative impacts and emotions felt. Second, students who have positive perceptions, specifically students who enrolled science courses with face-to-face mode have better learning commitment than students who enrolled blended learning mode. Third, students' perceptions of the instructional modes experienced can shape students' learning commitment during lectures. Last, the face-to-face mode is a more effective instructional mode for science courses and effective for building and maintaining student commitment.

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