Achievement Emotion: What Do Students Feel When Studying Online?

Putri Sukma Deri[1], Rahmah Rezki Elvika[2], Izzanil Hidayati[3]

{psukmaderi@fpk.unp.ac.id[1]}

Universitas Negeri Padang, Padang, Indonesia[1,2,3]

Abstract. Emotions were found to be a predictor of the success of implementing the learning process. In particular, emotions can have an influence on individual academic achievement, motivation, self-regulation and cognitive processes. In the field of education, emotions that are directly related to learning achievement activities and learning achievement results are called achievement emotions. This research was conducted to explore the achievement emotion description of students who took part in the synchronous and asynchronous online learning process. The subjects in this research were 494 undergraduate students who took part in synchronous and asynchronous online learning. Data collection was carried out using the Achievement Emotion Questionnaire - a Short Form instrument. The results of this research show that there are 4 emotions that are higher than others when learning synchronously and asynchronously, namely the emotions of enjoyment (M= 15.555; 14.727), hope (M= 15.093; 14.763), pride (M= 16.318; 15.729) and anxious (M= 13.433; 12.725). Meanwhile, the emotions that are not very prominently felt by students are anger (M= 8.326; 8.745), hopelessness (M= 9.395; 9.664), boredom (M= 9.690; 9.733); shame (M = 11.561; 11.158).

Keywords: achievement emotion, online, syncronous, asynchronous

1 Introduction

The education sector is one part in our live that is also affected by the pandemic conditions. Many changes and adjustments must be made in implementing the learning process. In Indonesia, many methods have been tried to be implemented so that the learning process continues well during the pandemic situation. These methods are still maintained even though the pandemic has turned into an endemic. One form of learning adaptation that is still being carried out is to continue implementing online learning even though face-to-face learning can be implemented. The level of education that is still actively implementing online learning is higher education. Higher education providers in Indonesia are implementing a blended learning process, namely mixed learning with a maximum composition of 50% offline and 50% online. Mostly, the online learning process is carried out asynchronously through e-learning and synchronously through meeting applications such as Zoom and Google Meetings.

A synchronous learning environment can be described as a learning condition that is carried out in real time and in which activities such as lectures from teachers, collaborative activities and student questions and answers will occur. All students in the class will enter the class

meeting simultaneously. Meanwhile, an asynchronous learning environment is a condition where students are involved in activities independently of the teacher and other friends in the class. This asynchronous learning consists of reviewing learning modules that have been previously created, discussing on the platform provided and/or chatting via electronic messages with teachers or other classmates[1].

Previous research related to online learning shows that students appreciate distance learning because it facilitates accessibility, use of technology, sharing ideas with other students, flexibility and interactive tools. Several studies show the success of online learning compared to traditional learning. On the other hand, it was also found that online learning is not ideal because it requires costs to print materials, organize materials and takes time to prepare materials [1]. Research also shows that students who study online are more likely to fail in their studies. Synchronous and asynchronous learning was found to have certain benefits, especially students indicated that they understood more and could show good performance when participating in synchronous learning. Furthermore, students also enjoy flexibility and work processes that can be managed by themselves when learning in an asynchronous environment [1].

The implementation of the online learning process triggered various responses from students. There are quite a few obstacles arising from this online learning process. For example, problems with technology, signals, difficulty focusing on the screen and feelings of isolation due to not meeting other people [2]. On the other hand, there are also advantages to organizing online learning, such as the ease of accessing information from various places and times. The advantages of online learning can cause positive emotions in students, for example: feelings of joy, hope, pride and relief. On the other hand, the limitations of online learning can cause negative emotions such as: anxiety, shame, anger, sadness, disappointment and helplessness. In the field of education, emotions that are directly related to the activities of achieving learning achievements and the results of learning achievements are also called achievement emotions [3], [4]. This achievement emotion theoretical framework can be categorized into 3 dimensions, namely valence (positive and negative), physiological arousal (high and low), and object focus (activity related or outcome related). In this study, the measurement of emotions in research subjects will be carried out based on the dimensions of valence, namely positive and negative [3]. Positive emotions consist of enjoyment, hope, pride and relief. Meanwhile, the negative emotional dimension consists of anger, anxiety, shame, hopelessness and boredom [3], [5], [6], [7]

Achievement emotion is an important factor in the learning process. Emotions have been found to have an influence on individual academic achievement, motivation, self-regulation and cognitive processes [5], [8], [9]. Furthermore, the emotions that students feel can be an important predictor in determining their level of well-being [4]. On the other hand, negative emotions arising from online learning can hinder the effectiveness of learning activities. Various previous studies found that emotions significantly influence students' involvement/participation in learning [3], [6], [10]. Based on preliminary research conducted on 30 students at one of universities in Indonesia, it was found that students felt happy when studying online but at the same time also felt bored and anxious. This condition is interesting to explore because there are two emotional valences felt by students in one condition, because each emotion has a different contribution to the learning process [11].

Through this research, it will be explored which emotions are dominantly felt by students during the synchronous and asynchronous learning process. The aim of this research is to become a basis for developing further research related to emotions in online learning. It is also hoped that this research can become a basis for decision making for higher education administrators in developing an online learning implementation system that will support student learning success.

2 Method

This research is quantitative research with a comparative descriptive type. In this research, the conditions referred to are synchronous and asynchronous learning. The main output of this research is a description of the achievement emotions of students who study online synchronously and asynchronously. The research location is Universitas Negeri Padang, with a population of active Universitas Negeri Padang students who are taking online lectures. In this study, the student population is limited from year 1 to year 3, with the assumption that most of year 4 students in the second semester will no longer take online lectures and will focus more on their final assignments. The sample in this study was determined using a stratified random sampling technique. This technique is used to represent all class levels at Padang State University according to predetermined population limits. Data collection was carried out by distributing an online form to students in each faculty with stratification according to the number of each student's academic class. The final distribution of the research samples collected were 116 students (year 3), 123 student (year 2), 255 student (year 1).

Student data related to descriptions of emotions of enjoyment, hope, pride, anger, anxiety, shame, hopelessness and boredom were obtained through distribution. Achievement emotion Questionnaire - Short Form (AEQ-S) questionnaire [2]which has been adapted into Indonesian and has gone through language translation and trials before being distributed to respondents. Emotion measurements were carried out after the 1 semester learning period ended. Students are asked to assess one of the courses where lectures are carried out using blended learning, then students are asked to assess each learning process when carried out synchronously and asynchronously. The reliability of the AEQ-S instrument used in this research has a Cronbach's α value in the range of 0.798 – 0.911.

Table 1. Reliability of Research Instruments

Emotions	Cronbach's α
enjoyment	0.870
hope	0.885
pride	0.892
anger	0.844
anxiety	0.896
shame	0.798
hopelessness	0.907
boredom	0.911

3 Result and Discussion

The research succeeded in collecting respondent data from 494 Universitas Negeri Padang students consisting of three levels of academic year. Based on descriptive data processing with the help of JASP, data was obtained as can be seen in table 2. The data displayed in table 2 shows the mean value and standard deviation of each emotion in the synchronous and asynchronous online learning settings. As a reference, the lowest value for each emotion is 5 and the highest value is 20. Categorization is carried out by dividing 3 levels, namely low, medium and high. Emotions are categorized as low when they are in a value range of less than 9.5. Emotions are considered moderate when they are in the range 9.5 – 14.5. Meanwhile, the emotions felt are strong (high) when it get a point value of more than 14.5.

Based on statistical calculations that have been carried out, it is known that the emotion of enjoyment is in the high category for synchronous (M= 15.555, SD = 3.002) and asynchronous (M=14.727, SD = 3.303); the emotion of hope is in the high category for synchronous (M=15.093 , SD=3.053) and asynchronous (M=14.763, SD=3.424); the emotion of pride was in the high category for synchronous (M=16.318, SD=2.954) and asynchronous (M=15.729, SD=3.395); the emotion of anger was in the low category for synchronous (M=8.326, SD=3.667) and asynchronous (M=8.745, SD=4.041); anxious emotions are in the moderate category for synchronous (M=13.433, SD=3.228) and asynchronous (M= 12.725, SD=3.715); shame emotions are in the moderate category for synchronous (M=11.561, SD=3.547) and asynchronous (M=11.158, SD=3.745); hopelessness emotions are in the low category for synchronous (M=9.395 , SD=3.802) and moderate category for asynchronous settings (M=9.664, SD=3.908); while boredom is in the moderate category for synchronous (M=9.690, SD=3.780) and asynchronous (M=9.733, SD=3.829).

Table 2. Descriptive Result of Student's Achievement Emotions

Emotions	Mean	Std. Deviation	Category
Enjoyment Syc	15.555	3.002	High
Enjoyment Asyc	14.727	3.303	High
Hope Syc	15.093	3.053	High
Hope Asyc	14.763	3.424	High
Pride Syc	16.318	2.954	High
Pride Asyc	15.729	3.395	High
Anger Syc	8.326	3.667	Low
Anger Asyc	8.745	4.041	Low
Anxiety Syc	13.433	3.228	Moderate
Anxiety Asyc	12.725	3.715	Moderate
Shame Syc	11.561	3.547	Moderate
Shame Asyc	11.158	3.745	Moderate
Hopelessness Syc	9.395	3.802	Low
Hopelessness Asyc	9.664	3.908	Moderate
Boredom Syc	9.690	3.780	Moderate
Boredom Asyc	9.733	3.829	Moderate

Note: Minimum score 4 and maximum 20, Likert scale 1-5.
M = 12, SD = 2.6, (High = > 14.5, Moderate = 9.5 – 14.5, Low = < 9.5)
Syc = Syncrhronous Learning, Asyc = Asynchronous Learning

The dominant emotions felt by students during synchronous learning were pride, enjoyment and hope, respectively. Meanwhile, the emotions that stand out during asynchronous learning are pride, hope and enjoyment. The emotions that are not very prominent among students when studying synchronously and asynchronously are anger, hopelessness and boredom. Meanwhile, emotions of anxiety and shame have started to approach the high category. Based on the descriptive data in table 2, it is known that positive emotions tend to be more prominently felt by students in the online learning process, compared to negative emotions. In Figure 1, a spider plot is also presented to show the gap for each emotion that has been measured. From this picture it can also be seen that the gap between all the emotions felt during synchronous and asynchronous learning is not too big.
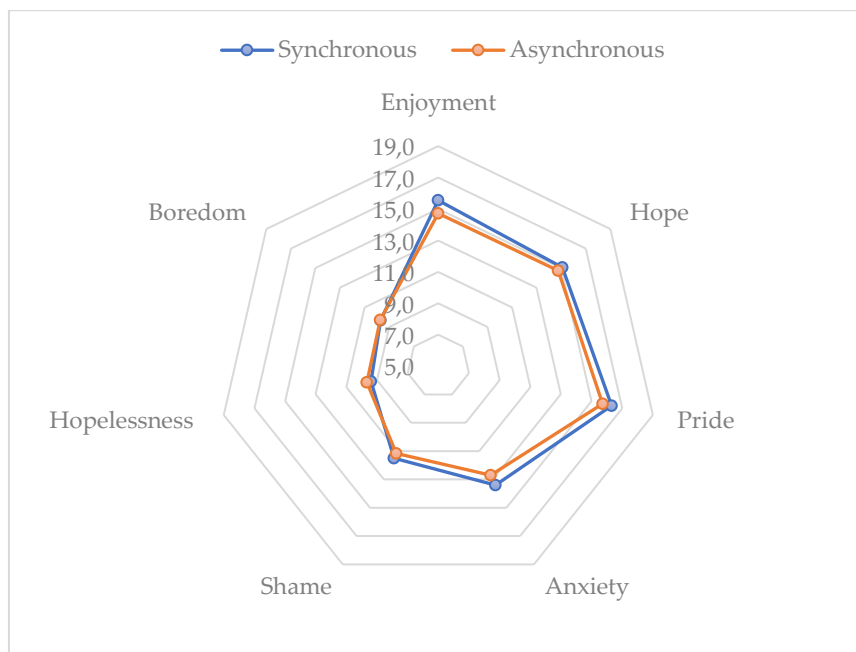

Figure 1. Spider Plot of Student's Achievement Emotion

The findings in this study are in line with research conducted by Vo, Lam and Nguyen [2]on students who took online lectures during the covid-19 pandemic. Vo et al found that students who studied online using M-learning and synchronous felt positive emotions at a high level and negative emotions at the medium level. Vo et al also found that the positive emotions felt by students while studying can reduce the obstacles felt during online lectures. Similar to these findings, the dominant positive emotions felt in Vo et al's research were enjoy and hope. In this research, it was found that the emotion felt at the medium level was boredom, while other negative emotions at the low level, such as: anger, shame and hopelessness. Other research has found that high levels of control over the learning process will determine high levels of

positive achievement emotions in technology-based learning environments. [12], [13], [14], [15], [16]

Through the control value theory, Pekrun [3] explains that the emotion of enjoyment arises when students feel that they can control their activities and focus on the success they will get. The emotion of hope arises when students hope that they have complete control. In the hope emotion, students feel that success and failure are subjectively uncertain. Meanwhile, the emotion of pride arises when students feel that they are the person who is the reason they are successful, their good learning performance is achieved because of their own abilities. This means that in synchronous and asynchronous online learning, it was found that students felt they had control over the learning process they were undertaking. Students also feel that they are confident enough to achieve learning success when learning is carried out online. Apart from that, they also feel that when studying online synchronously and asynchronously, their ability is the main factor that will make them successful in achieving learning success [17]

Daniels & Stupnisky [18] stated that students have more control when they are in an online learning environment. Marchand [19] indicated that the control previously vested in the teacher shifted to the students. For example, if learning is carried out asynchronously, students have greater flexibility when they follow lectures directly and participate in class activities. They can also have a place to study, rest time and study while doing other activities. The amount of opportunity to control learning is directly related to more pleasant emotions such as enjoyment, relief, and pride.

Interestingly, the results of this research also found that students also have the emotion of anxiety which tends to be in the high category. Where according to Pekrun anxiety occurs when there is partial control only, implying that success and failure are subjectively uncertain, and the focus is on failure [3], [20]. These results indicate that when studying online, students may feel they have control over their lectures but there are still doubts because the success and failure of the learning process is uncertain. In practice, learning that occurs online tends not to facilitate direct feedback. Especially when learning asynchronously, students tend to wait for the teacher to access the available elearning. Even in synchronous learning, the limitations of teachers in seeing students directly and various technical obstacles will make feedback from the learning process delayed. In the end, this situation makes students feel uncertainty which leads to anxious emotions. Basically this uncertainty implies for success and failure [3], [21]. Therefore, feelings of hope and anxiety may be mixed, as felt by the subjects in this study. However, positively this leads to students' desire to obtain successful outcomes. For example, when students want to get a high score on an assignment they do online, but don't know whether they can do it well or not, the emotion of hope arises for a successful situation and at the same time the emotion of anxiety arises because they are afraid of failure.

It's the same with the emotional pairs of anxiety and hope. The emotion of shame can also appear simultaneously with the emotion of pride [3]. As in this study, the emotion of pride which was classified as high was accompanied by the emotion of shame which was classified as moderately high when learning was carried out online synchronously and asynchronously. The causes of these two emotions tend to be symmetrical, these emotions are directly related to self-related influences triggered by success and failure that are appraised as being caused by oneself. The emergence of the emotion of pride is due to success in getting good learning results due to the efforts that have been made and the abilities that one has [20], [22].

Likewise, the emotion of shame also arises because one feels that one's abilities and efforts are lacking. In this research, synchronous and asynchronous online learning apparently triggered subjects to assess the learning process and results they obtained because of their own abilities so that when their abilities were lacking, they would feel shamed.

When it is felt that success cannot be achieved and failure is certain to occur, hope and anxiety are replaced with feelings of hopelessness [3], [21]. In this study, the emotion of hopelessness was relatively low when the online learning process was carried out via synchronous learning. This indicates that students feel that they still have subjective confidence that they can achieve success in their learning process when online learning is carried out face to face with their lecturers. Meanwhile, asynchronous learning tends to trigger hopelessness in the medium category, but still tends to be low. This indicates that flexibility in seeking information independently can be the reason for the emergence of an assessment that learning success is not necessarily possible to achieve. This condition is explained in Coogle's findings that asynchronous learning makes it difficult for some students to organize their tasks well, this situation must be influence students' assessment of the success they will achieve [1]. Pekrun emphasized that the emotion of hopelessness arises when individuals feel that the negative outcome is subjectively certain and nonavoidability [3].

Pekrun [3], [20], [21] said that apart from control, the value of an activity is another reason that can trigger emotions. In this research, the emotions related to value are anger and boredom. In this study, the emotion of boredom was classified as moderate but tended to be lower than other emotions. This boredom emotion arises if the learning activity is valued neither positively nor negatively. The emotion of boredom which tends to be low indicates that synchronous and asynchronous learning is quite important or, conversely, quite unimportant for students. In reality, it can be interpreted that the demands placed on the synchronous and asynchronous learning process are not too high and not too low. Synchronous and asynchronous learning still poses certain challenges to students, although not too high. The existence of opportunities for lecturers to present varied learning can be the cause of the low level of boredom experienced by students.

The emotion of anger is relatively low felt by students when online learning is carried out synchronously or asynchronously. The emotion of anger basically arises when students feel they can control their learning process, but the activities they carry out require great mental and physical effort ([3]. This means that in online learning students do not feel that they have to expend great mental and physical effort.

Ch'ng found that basically emotions can have an influence on the development of the learning process. When students feel negative emotions, they will have difficulty participating in their learning. Meanwhile, when they feel positive emotions, students will find that it is easier for them to absorb the material they are studying. Therefore, it is very important for institutions to be able to keep the learning process more interesting [23].

The research that has been carried out can be an initial indicator to see how prepared and responsive students are when learning online synchronously and asynchronously. Positive emotions can also be a simple reflection of the level of well-being of students when studying online synchronously and asynchronously ([4]. Various previous studies found that emotions significantly influence students' involvement/participation in learning [3], [10], [22]. As a follow-up, it is necessary to carry out further research on the influence of positive emotions in

online learning on student engagement. Previous studies also found that engagement is also influenced by meeting the needs of the students themselves [24], [25]. Therefore, it is interesting to explore the relationship between emotions and the fulfillment of students' basic psychological needs.

This research shows that it is important to implement online learning processes that make students feel that they have control over what they are doing. Even though students do not meet with teachers directly, they need to be given clear guidance regarding what they will learn and how they will learn it. Situations that they can control are proven to generate positive emotions in students. The hope is that these positive emotions will encourage them to be more involved in learning, have good academic achievement, and adaptive self-regulation [5], [26], [27]. Apart from, it is important to trigger students to feel that the learning provided is an important thing to do. Providing value to learning activities can be done by setting learning demands that tend to be challenging, but neither too difficult nor too easy for students to follow. Providing a study load and giving deadlines that suit students' abilities is one way to make students more interested in participating in learning activities. Presenting interesting teaching media can also increase the value of the learning activities that students need to participate in.

4 Conclusions

The process of implementing online learning at University tends to trigger positive emotions in students rather than negative emotions, especially the emotions of pride, enjoyment and hope. Specifically, these positive emotions appear stronger in the synchronous online learning process. On the other hand, negative emotions, such as anger, hopelessness and boredom, tend to be felt lower than the previous three emotions. In contrast to the previous positive emotions, these negative emotions are felt more strongly when learning is carried out asynchronously compared to when it is synchronous. Although most negative emotions are relatively lower, the emotions of hope and shame are felt to be higher than the emotions of anger, hopelessness and boredom. This research shows that positive emotions and negative emotions can appear simultaneously when the online learning process is carried out synchronously and asynchronously.

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