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Effectiveness of Flipped Learning on Academic Emotions in Arak University Students

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ABSTRACT

Background: Positive and negative academic emotions serve a significant mediating role in motivating learners throughout the teaching process. Understanding what teaching methods can influence academic emotion can help teachers improve students' learning quality. Therefore, the present study was carried out to investigate the effectiveness of flipped learning on students' academic emotion in the university course 'History of Islam'.

Methods: This quasi-experimental study entailed a pre-test and a post-test with a control group. The population of the study included all undergraduate students of Arak University in the course 'History of Islam' in 2022, who were randomly divided into control and experimental groups. The sample size was estimated to be 33 for each group. There were 33 participants in the control group and the experimental groups, respectively. The control group was trained conventionally by lectures and the experimental group was trained through flipped learning. The data collection instrument was Academic Emotions Questionnaire presented by Pekrun et al. (2006). The content validity of Pekrun's (2006) Academic Emotions Questionnaire was confirmed by five members of the faculty of Psychology. In addition, the questionnaire's internal consistency which was estimated through Cronbach's alpha turned out to be 0.72. Analysis of covariance was used to analyze the data

Results: The participants in the two groups were girls, and their field of study was Psychology. The average age of the experimental group was 23.22 (SD=1.54), and that of the control group was 23.43 (SD=1.58). They also indicated that flipped learning had a significant effect on boredom (P=0.007), and anger (P=0.036), and had no significant effect on enjoyment (P=0.054), hope (P=0.655), pride (P=0.878), shame (P=0.147), and anxiety (P=0.423).

Conclusions: According to the findings, given that flipped learning have a significant effect on students 'academic emotion, and given that academic emotion—as a mediating variable—can affect students' learning, it is recommended that university faculty members apply this approach in their classes.

Keywords: Flipped learning, Academic emotion, History of Islam, Curriculum, Students

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Introduction

Recent research on learning has generally focused on learners' cognitive, motivational, behavioral, and functional dimensions. Besides, many studies have also focused on learners' emotions in educational environment. Along with cognition and motivation, emotion is a core component of human mental operations (1). Excitement is one of the personality dimensions of learners that is present throughout the learning process and affects learning (2). Emotions specific to the process of learning, education and academic progress can be identified and introduced as academic emotions. Academic emotions are directly and indirectly related to how to do academic activities (3). Learners experience several emotions in the learning environment, which are related to their motivation, learning strategies, cognitive resources, self-regulation, and academic achievement and affect their psychological and physical health. These emotions include those ensuing from success or failure in academic activities (e.g., pride, anxiety, and shame) as well as activity-related ones (e.g., enjoyment of learning, boredom during learning, and anger over requirements of the assignments) (4, 5).Some researchers consider positive emotional behaviors as indicators of adjustment in school (6). Studies also indicate a relationship between academic emotion and academic performance (7). According to Pekrun, Goetz, Frenzel, Barchfeld, and Perry (quoted in Hintsanen and Pyhalta) (8), academic emotions are directly related to educational activities such as studying, teaching, learning, and development and they produce wide and profound effects on learning in different stages of education.

A study of the literature shows that different types of academic emotions play a prominent role in students' academic performance and learning (9). For example, Huang, Han, Li, Jong, and Tsai (10) showed that positive academic emotions (e.g., enjoyment and happiness) can lead to a greater interaction between educators and students. In contrast, negative academic emotions (e.g., anxiety and impatience) can prevent academic engagement and learning (11). Oh and Lee (12) noted that students' interactions are related to anxiety and continuity of learning in the learning environment. Similarly, Baker, D'Mello, Rodrigo, and Graesser (13) found that wide variation in students' academic emotions may significantly affect their learning retention. According to the literature, academic emotion is the main predictor of learning retention. In addition, students' academic feelings were used as a facilitator and mediator in the proposed model to further investigate the relationship between students' interaction and learning retention (14).

Studies show that academic emotions are highly influenced by learning and teaching processes. For example, research indicates that achievement goals (15), how homework is perceived (16), and people's beliefs and expectations about learning and the classroom affect their academic emotions. Empirical studies also suggest that there is a direct relationship between the instruction method in the classroom and academic emotions. Lack of proper structure and progress pressure in educational environments are positively related to anxiety, boredom, and anger and negatively related to enjoyment and happiness (9). Moreover, there is a relationship between teacher's support and students' emotions (17). The teacher's controlling style in setting assignments and reviewing them is associated with negative emotions, and paying attention to self-regulation and independence is associated with positive emotions. In addition, teacher's feedback has a significant effect on arousing academic emotions, so that appropriate and conscious feedback affects experiencing desirable emotions by learners (18, 19) and setting assignments in line with the learners' needs leads to positive academic emotions (16); therefore, there is an obvious relationship between the teaching method and academic emotions.

Nowadays, learners' wide and fast access to information, made possible by advanced technologies and online teaching, has increased learners' desire and preference

for collaborative learning besides utilization of online resources. Hence, traditional teaching methods such as lecturing, in which the learner does not play a significant role in the educational process, have lost their effectiveness, especially when it comes to using new technologies. Inclusive and constructivist approaches develop communication skills, interaction, collaboration and teamwork, and shouldering responsibility (20). One of the teaching methods that meets these needs is flipped learning.

Flipped learning is an educational approach in which the traditional pattern of the teacher lecturing and learners completing their assignments undergoes a change (21). In a flipped learning, whatever was traditionally carried out in the class is carried out outside the classroom and vice versa (22). In this method, the content to be presented by the teacher in the classroom is provided to learners before the class meets. The content, mostly in form of videos, experiments, audio files, or texts, is previewed by the learners outside the classroom before attending the class, and the online or in-person classroom becomes an environment for discussing knowledge. In lieu of teaching, there are posing questions, providing answering, doing class exercises, and solving problem. In fact, teaching in the classroom is replaced by discussing the activities and assignments formerly completed at home, so the term 'flipped learning' (23). A flipped learning consists of two main parts: communicative and interactive learning taking place inside the classroom and teaching with the help of new technologies, e.g., computers and mobile phones, outside the classroom. Therefore, a flipped learning integrates traditional and modern methods to achieve the pedagogical goals intended (24).

A number of studies have been conducted on flipped learning and its impact on learners. The findings by Farrah and Qawasmeh (25) show that flipped learning increases autonomy and self-regulation and ultimately leads to better learning. Additionally, the participants in the study found flipped learning exciting, motivating, and engaging. Murillo-Zamorano, López Sánchez, and Godoy-Caballero (26) explored flipped learning in higher education. The results of their study led to development of a model indicating a causal relationship between knowledge, progress, skills, and involvement in the course in question on the one hand and learners' satisfaction increase on the other. They noted a positive and direct effect of flipped learning on advancing students' knowledge and skills. Badeleh et al. (24) compared the effect of laboratory, multimedia and lecture-based classrooms with flipped learning in the course'technology' and illustrated that among the studied methods, only flipped learning had a significant effect on students' learning. Also, Liaghatdar et al. (27) and Jafarikamangar et al. (28) have noted the positive effect of flipped learning on learners' learning.

According to the literature on flipped learning, this method has significant effect on students' learning and their attainment of higher learning levels compared to traditional teaching methods. While most of these studies have focused on the effectiveness of this method at different levels of learning, its effect on academic emotions such as enjoyment, happiness, anxiety, anger, and adjustment in school, which directly affect academic performance, has not received much attention. Also, considering that the 'History of Islam' course is taught as a general course in undergraduate courses in all fields and universities in Iran, the results of this research can be used in the universities of the country to improve the quality of teaching this course. This study is an attempt to investigate the effect of this constructivist method, i.e., flipped learning, on students' academic emotions in the course 'History of Islam'.

Methods

Study Design

This quasi-experimental study entailed a pre-test and a post-test with a control group.

Setting: The population of the study included all undergraduate students of Arak

University in the course 'History of Islam' in 2022. The participants took this course in the field of psychology in the 8th semester. In fact, History of Islam is one of the general courses offered to all undergraduate students in all universities of the country, and students are required to take this course.

Participants

The sample size was estimated based on the formulas in the experimental studies of Borm, Fransen and Lemmens (29). At the significance level of 0.5 and the test power of 0.70, it turned out to be 33 participants in each group. Then the participants were randomly assigned to the experimental and the control groups. It should be noted that in the control group, two individuals refused to take the posttest and were excluded from the study. Thus, there were 31 and 33subjects in the control and experimental groups, respectively .The control group was trained in a conventional and instruction-based manner through lectures and the experimental group was trained through flipped learning.

Data Collection Tools

The data collection instrument used was Academic Emotions Questionnaire developed by Pekrun, Goetz, Frenzel & Barchfeld (30). The questionnaire consists of 155 questions and eight dimensions (categories), including enjoyment, hope, pride, anger, anxiety, shame, hopelessness, and boredom. The questionnaire included the components of enjoyment (items 1, 5, 11, 24, 32, 41, 49, 67, 71, and 76), hope (items 4, 7, 9, 13, 16, 20, 23, and 37), pride (items 30, 40, 46, 53, 60, 70, 74, 77, and 80), anger (items 8, 28, 39, 44, 54, 59, 69, and 73), anxiety (items 3, 6, 12, 15, 17, 19, 21, 25, 35, 50, 56, 65, and 78), shame (items 27, 34, 38, 43, 47, 52, 58, 62, 64, 68, an d72), hopelessness (items 2, 10, 14, 18, 22, 31, 48, 55, 75, and 79) and boredom (items 26, 29, 33, 36, 42, 45, 51, 57, 61, 63, and 66). The scoring method of the scale is 5-point Likert from 1) completely disagree to 5) completely agree. The minimum and maximum score for positive academic emotions will be in the range of 22 to 110 and for negative academic emotions in the range of 53 to 265 (31). The validity and reliability of the questionnaire have been confirmed in previous studies. For example, Kadivar et al (31) used Cronbach's alpha coefficient and confirmatory factor analysis to evaluate the reliability and validity of the questionnaire. The results of their study were in line with those of Pekrun et al. (30), showing that the questionnaire has an acceptable internal consistency. The Cronbach's alpha coefficients in the questionnaire subscales are between 0.74 and 0.86. The content validity of Pekrun's (2006) Academic Emotions Questionnaire was confirmed by five members of the faculty of Psychology. In addition, the questionnaire's internal consistency which was estimated through Cronbach's alpha turned out to be 0.72.

Statistical Method

In this study, analysis of covariance was used to analyze the data. In addition, to estimate the effect size, Cohen's formula (32) was used. Furthermore, SPSS software (version 25) was used for data analysis.

Intervention

The instruction method used in the experimental group was flipped learning. This method was implemented in such a way that the teacher identified his pedagogical goals and materials before the beginning of the semester and prepared the necessary resources for teaching accordingly. The resources needed for the course in question, i.e., 'History of Islam', included textbooks and supplementary books, articles, pamphlets, and films. In the first session, the pedagogical goals and the teaching methods were explained to the students. The professor provided the students with the required materials through Education Management System (LMS) developed by Arak University. Generally, an instructional video of 15–20 minutes was prepared for each session to introduce the content of the session. At the end of the film, one or two questions were posed as learners' assignment or task. Supplementary materials

were uploaded on LMS for the students in form of excerpts from historical films and articles in case the learners needed sources for further study. The students were required to think about the topics or issues raise dafter watching the films prior to the class and expand their knowledge by using supplementary books, articles, and websites—and websites were most extensively used for their wide accessibility, if necessary.

The procedure for presentation of the content was almost the same throughout the semester. The classes were as long as 70–75 minutes, held virtually via Adobe Connect. At least two days prior to each session, the teacher would prepare an educational video based on the specified goals related to the upcoming session, and uploaded it in the system. This video was between 20 and 35 minutes, and the students had to watch the desired video before the beginning of the session.

At the beginning of each session, the teacher reviewed the topic or issue raised in the instructional video and then provided further explanation. He then allotted a time for discussion among the students and randomly divided the students into groups of six members, on average. Each group held its discussions in a separate virtual room. In the rooms, the students could enter into audio or text conversations. As a great capability of Adobe Connect rooms, the members in each room did not have access to the contents and discussions in progress in the other rooms. Moreover, the members could not change their room. Only the professor could enter all the rooms and listen to or see the audio or text discussions in the rooms. The students in the groups were required to turn on their microphones or use messages in the chat section to talk about the topic and express their viewpoints. At the end of the discussion time in the rooms, usually lasting10-15 minutes, the students were directed from the group rooms to the main room, where all the students were present and students' microphones were muted by the teacher. The teacher would call a member from each group and provide their access to the microphone so they could speak to the audience. The student selected from the first group usually summarized the answers discussed in his/her group and then presented his/her own viewpoint, whether in line with or in contrast to the others' in the group. The members from the other groups were also asked to summarize the viewpoints expressed in their group as well as express their personal viewpoint according to what was mentioned by the previous speakers(s) while avoiding repetition and at the same time criticizing them. Having reviewed and summarized the viewpoints expressed by the students, the professor put forward his own viewpoint and criticized the students'.

As another capability of Adobe Connect, the professor could ask the students to agree or disagree with what was said by a student by 'Q & A' or 'Agree & Disagree' polls in the main room. The difference between these polls was that in the Q & A poll, it could not be seen which student had voted for which option, yet the exact number of students who voted and the percentage of the votes cast for each option were available to the professor as the each student's response in form of agreement or disagreement appeared besides his/her name.

Generally, two topics were discussed in each session, and at the end of the session the professor set the assignment of the session, which included addressing the same topic(s) brought about prior to the class and expressing a final viewpoint in LMS after the class was over. The students' final grades were estimated based on these assignments and their activity in the class.

Given the content to be covered or the overall time of the class, the teacher did not use material such as pedagogical films in some sessions; these sessions were held by lecturing (sessions 5, 8, 12, and 15). Also, in some sessions, there was not enough time to cover more than one topic, so after discussion of the first topic was over in the groups, the teacher would continue the class by lecturing. In these cases, there was only one assignment to be completed by the students or no assignments were set at all by the teacher. It should be noted that low quality

of internet, New Year holidays (lasting two weeks), and approaching the final exams were also influential in shrinking the amount of the assignments to be completed. Last but not least, because the students were not provided with any file for the first session, the assignment was given to the class by the professor during his lecture (Figure 1).

The teaching method in the control group included direct teaching and lecturing. The teacher in this class was the same teacher in the control group and held the classes for this group in cyberspace and through Adobe Connect as well. In this group, the professor stated the pedagogical goals at the beginning of the semester and then during the semester, he presented the lesson by lectures and meanwhile, depending on the discussion, asked students to make comments about the topic by providing their access to the microphone. The professor subsequently would ask the other students to express their agreement or disagreement with the previous student's comment by asking and answering questions via 'Q&A' or 'Agree or disagree' polls in Adobe Connect. At the end of the session, the topics discussed during the class were considered as assignments for the session held, and each student was required to submit his/her viewpoint with respect to the topics. Students' final grades were calculated based on their answers to the assignments and their class activity.

Results

The participants in the two groups were girls, and their field of study was Psychology. The average age of the experimental group was 23.22 (SD=1.54), and that of the control group was 23.43 (SD=1.58). Overall, the results of the study indicated that flipped learning had a significant effect on students' academic emotion in 'History of Islam'.

Table 1 presents the descriptive results, including the means and standard deviations of the experimental and the control groups. The analysis of the hypothesis is presented in Table 2.

The comparison of the pre-test scores in table two shows that there is no significant difference between the experimental and control groups in the research experiments (P>0.05). There is a difference between the mean scores of enjoyment, hope, pride, anger, anxiety, shame, hopelessness, and boredom in the treatment and control groups in the pre-test and post-test stages. The results of the univariate analysis of covariance, presented in Table 2, indicate that flipped learning had a significant effect on anger (P<0.03) and boredom (P<0.007) but not on enjoyment, hope, pride, shame and hopelessness (P>0.05).

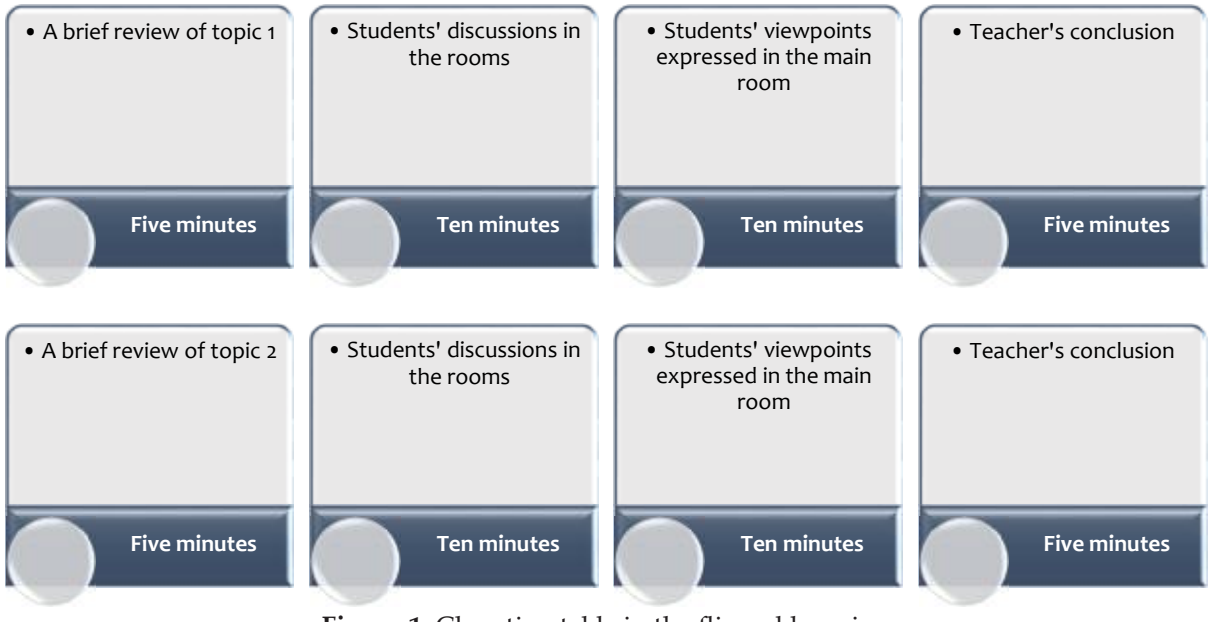

Figure 1: Class timetable in the flipped learning

Table 1: Content of 'History of Islam' course in the lecture-based and flipped learning

No.	The topic discussed in the class	Assignment or task
1.	An overview of course, pedagogical goals, and procedure The period before the Holy Prophet Muhammad's first revelation1	The reason for the emergence of Islam in the Arabian Peninsula Tribal traditions in the present age
2.	The period before Prophet Muhammad's first revelation2	Events at the birth of the Prophet (PBUH)
3.	The period before Prophet Muhammad's first revelation3	The status of women in different societies The importance of poetry in Arabic
4.	The rise of Islam in the Arabian Peninsula	Destructing idols at the beginning of the invitation The historical role of the Qur'an in the spread of Islam
5.	Difficulties of invitation to Islam in Mecca	—-
6.	Migration to Medina	The story of Abu Bakr's companionship The difference between the people of Mecca and Medina
7.	The actions of the Prophet (PBUH) in Medina	Formation of revolution in different societies The function of mosques in the time of the Prophet (PBUH) and the current era
8.	The Prophet's (PBUH) wars	—-
9.	The Prophet (PBUH) and the spread of Islam	The role of Sīrah (prophetic biography) in the spread of Islam
10.	The story of the Saqifa	Shiite views on the story of Saqifa Imam Ali's silence
11.	The Caliphate of Abu Bakr and the Wars of Radha	Hypocrisy in societies False claimants
12.	Caliphate of Umar ibn al-Khattab and Uthman ibn Affan	—-
13.	Explorations in the era of the caliphs	The behavior of the Arabs towards the defeated nations Coercion to change the views of Iranians
14.	The rule of Imam Ali (AS) and Imam Hassan (AS)	The reasons for the superiority of Imam Ali from the Shiites' point of view Implementation method of Imam Ali's corrective actions
15.	The story of Karbala	—-

According to Cohen's effect size table (31), the effect size for enjoyment was high, the effect size for hope was low, the effect size for pride was low, the effect size for anger was high class, the effect size for anxiety was moderate, the effect size for shame was moderate, the effect size for the hopelessness was moderate, and the effect size for boredom was high.

Discussion

The results of the study showed that flipped learning has a significant effect on academic emotions, which is consistent with previous studies (9, 16, 18, 19, 33). It can be said that unlike conventional teaching methods, which are mainly based on behavioral and linear approaches, flipped learning is mainly based on constructivist approaches, which emphasize on learners' participation, their interactions throughout the learning process, and their feelings. Consequently, flipped learning affects learners' emotions. On the other hand, as Yang, Lin, and Chen (11) have shown, negative academic emotions (e.g., anxiety and boredom) can prevent academic

Table 2: Means and standard deviations of the variables of the groups in the pre-test and post-test stages

Variable	Group	Frequency	Pre-test		P	Post-test		F	P	Cohens d
			Mean	SD		Mean	SD			
Enjoyment	Treatment	33	37.97	6.93	0.44	39.48	8.02	3.895	0.054	0.556
	Control	31	39.35	7.26		35.71	5.25			
Hope	Treatment	33	34.39	4.62	0.35	31.66	6.46	0.202	0.655	0.160
	Control	31	35.48	4.73		30.87	2.604			
Pride	Treatment	33	37.70	5.69	0.82	34.70	8.14	0.024	0.878	0.104
	Control	31	37.36	6.25		34	4.82			
Anger	Treatment	33	20.33	6.53	0.35	14.76	6.72	4.637	0.036	0.594
	Control	31	18.58	8.29		18.13	4.36			
Anxiety	Treatment	33	37.47	10.49	0.29	26.64	9.71	0.652	0.423	0.225
	Control	31	34.63	11.08		28.55	6.97			
Shame	Treatment	33	30.12	8.38	0.19	22.03	8.03	2.169	0.147	0.372
	Control	31	27.16	9.62		24.74	6.44			
Hopeless-ness	Treatment	33	22.41	7.27	0.38	17.51	8.36	2.169	0.15	0.440
	Control	31	20.61	8.62		20.58	5.20			
Boredom	Treatment	33	33.24	9.96	0.29	21.24	8.51	7.963	0.007	0.756
	Control	31	30.32	11.88		26.71	5.68			

engagement and, accordingly, academic performance.

Overall, there are many emotions in education that can be affected by flipped learning. The results of the present study show that flipped learning exerts a significant effect on boredom, emotion, and enjoyment. This is consistent with Huang, Han, Li, Jang, and Tsai (10). It can be said that flipped learning directly engages the learners with the content presented in the class. Engagement in learning can play an instrumental role in enjoyment of learning because the learner deeply understands the content by engaging in the learning process. In addition, based on Ausubel's concept of meaningful learning, if the learners have access to pre-organizers (what is already known) of the course content, they can relate the pedagogical content to what is already known and get a positive feeling of the classroom and the pedagogical content (34). Furthermore, paying attention to learners' perceptions and their viewpoints in flipped learning can inspire a sense of joy and self-worth in learners. Therefore, the learners experience enjoyment in such a class.

Also, for many students in the traditional classroom, the teaching process is associated with performing a series of mundane and repetitive activities for learning unoriginal materials irrelevant to real life, whereas in the flipped approach, original, situation-based, and diverse tasks are accompanied by deep engagement of the learners in the learning process. Thus, the learners find the tasks as rich opportunities for understanding the realities of work and life rather than as mere assignments. In such an atmosphere, not only do they not feel tired, but also enjoy the learning process. Additionally, a flipped learning environment is mostly informal and diverges from the linear and one-way learning mode, which are typical of traditional and behavioral approaches. This can lead to learners' enjoyment of learning.

The results also show that education carried out by flipped learning has a significant effect on anger, which is consistent with the findings by Putwain et al. (9) and Fernzel, Pekrun and Goetz (33). It can be said that for many learners, teaching in conventional approaches is inflexible and unattractive, which can confront learners with challenges such as unresponsiveness and lack of access to learning and, consequently, not achieving the pedagogical goals set, by which most learners experience failure, which in turn leads to anger. In fact, accessibility to learning helps

us understand how learning in traditional classrooms has been associated with anger and anxiety for many learners, and in contrast, how constructivist approaches, including flipped learning, lead to learners' relief since such learning reduces psychological challenges, including anger (35). Moreover, intensive competition, generally present in traditional classrooms, seldom exists in flipped learning. Lack of competition and the focus on learners' progress based on their own abilities can bring more relief to learners.

Limitations and Suggestions

One of the limitations of the researcher was the limitation of sending files of more than 60 megabytes in the official LMS education system, for this reason, the researchers used external systems to send files of more than 60 megabytes. Also, in relation to the control of intervening variables, since the researchers chose the sample randomly, it was difficult to control all the variables. Considering that the results of the research showed that filliped learning can strengthen students' positive emotions and positive emotions as a mediating variable can improve students' learning, as a result, it is recommended that faculty members seriously use the filliped learning approach. Also, since the entire period of the Corona epidemic has ended, it is a good opportunity to apply this approach, however, for its implementation, it is necessary to create a foundation in universities.

Conclusion

Based on the results of this study, faculty members are recommended to consider flipped learning in their work. Also, given that flipped learning requires technical and legal infrastructure, higher education administrators are suggested to encourage faculty members to apply flipped learning in their classes.

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Authors' Contribution

MHN collected the data and ran the study intervention. MN contributed to the design and reporting of the study data and developing literature and SM designed the study, and supervised the intervention process, data collection, and analysis.

Conflict of Interest: None declared.

Ethical Considerations

The Research Ethics Committee of Arak University approved the conduct of this study (IR.ARAKU.REC.1401.059).

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