OPEN PRAXIS

Investigation of Kyrgyz Learners' Engagement in Online Courses

RESEARCH ARTICLE

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INTERNATIONAL COUNCIL FOR OPEN AND DISTANCE EDUCATION

ABSTRACT

This study aimed to investigate Kyrgyz learners' engagement in online courses. In this respect, the Student Engagement Scale and appropriate open-ended questions were employed in order to obtain data from learners. The sample covers 400 undergraduate learners studying at Kyrgyz-Turkish Manas University. The study has a mixed research design, hence both quantitative and qualitative approaches were employed. The results of the study revealed that behavioral engagement has a significant effect on learner achievement. The study also demonstrated that the engagement of Kyrgyz learners in online courses differs in terms of their gender and their prior online course experience. The majority of Kyrgyz learners had limited access to the Internet and computers; therefore, they experienced problems in online courses. The other problems facing Kyrgyz learners are due to insufficient house conditions, frequent power failures, health problems, and a lack of interactivity in online courses.

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KEYWORDS:
Achievement; engagement; mixed method; online learning; survey; university learners

TO CITE THIS ARTICLE:
Afacan Adanır, G., Muhametjanova, G., & Akmatbekova, A. (2022). Investigation of Kyrgyz Learners' Engagement in Online Courses. *Open Praxis*, *14*(2), pp. 110–121. DOI: https://doi.org/10.55982/openpraxis.14.2.158

INTRODUCTION

Online learning provides various advantages for learners, instructors, and institutions. Through the use of appropriate technologies, online learning facilitates communication and relations among instructors and learners. Online learning provides cost efficiency since it decreases the costs required for the travel or construction of classrooms. The learner differences are considered in online learning; hence, adapted content and activities can be provided to learners. Furthermore, learners have a chance to learn at their own pace through online learning. Therefore, this results in an increase in satisfaction and a decrease in the stress level of learners (Arkorful & Abaidoo, 2015).

In recent days, one significant benefit of online learning was observed in the majority of countries. Due to the COVID-19 epidemic, schools were temporarily required to be closed in most countries. Hence, online learning has been applied in most of the countries during pandemic (Nambiar, 2020). Therefore, all the face-to-face courses at all levels, from primary schools to universities, were provided through online means. This demonstrates that online learning became a remedy for continuing education during the epidemic.

As one of the developing countries, Kyrgyzstan also initiated the use of online learning at the university level. The university courses previously provided in face-to-face settings were provided in virtual classes in Kyrgyzstan during the 2019–2020 spring term. Therefore, instructors taught the university courses only on online platforms, while learners participated in these platforms to learn the course topics. Yet, the transition from traditional courses to online courses was performed so quickly for the continuation of university education in the country. While developed countries had more experience in online learning and performed this transition successfully, developing countries faced some problems in this process. For instance, instructors' and learners' lack of online learning experience and countries' limited technology infrastructure resulted in problems with the proper implementation of online learning.

It was also observed that there are crucial problems regarding the implementation of online learning in Kyrgyzstan. One of the problems is related to learners' lack of engagement in online courses. On the other hand, engagement is vital for the learning and satisfaction of learners in online learning (Martin & Bolliger, 2018). Therefore, it is essential for instructors and researchers to examine learners' engagement in online courses (Dixson, 2010).

Although there are previous studies that investigated learner engagement in online learning in other countries, there is not such a prior study that was conducted in the Kyrgyz Republic. While online learning is gaining significance, it is becoming necessary to develop understanding related to learners' engagement in online learning environments (Kahn et al., 2017). In this respect, this study mainly investigates Kyrgyz learners' engagement in online courses provided at the university level. Furthermore, the study analyzed Kyrgyz learners' problems in the context of online learning and shared the corresponding results in this paper.

LITERATURE REVIEW

Learners' engagement can be investigated at two different levels, which are college-level engagement and course-level engagement. College engagement is related to learners' involvement and experience in the campus environment (Butler, 2011). Course-level engagement can be defined as "the student's psychological investment in and effort directed toward learning, understanding, or mastering the knowledge, skills, or crafts that academic work is intended to promote" (Newmann et al., 1992, p. 12).

Learner engagement is especially important in online course environments in which learners may feel isolated or disconnected (Dixson, 2010). In order to achieve the expected level of learner engagement, it is important to benefit from various approaches related to the design and development of online courses. In this respect, Meyer (2014) proposed the use of learning theories that encourage the participation of learners. For instance, he advocated the utilization of active learning, collaborative learning, authentic learning, and experiential learning strategies.

In the context of learner engagement, Jones (2008) proposed three important dimensions, which are named as cognitive engagement, behavioral engagement, and emotional engagement. Cognitive engagement considers learners' beliefs and values (Jones, 2008) and is defined as "a psychological state in which students put in a lot of effort to truly understand

a topic and in which students persist studying over a long period of time" (Rotgans & Schmidt, 2011, p. 466). In other words, cognitive engagement occurs when learners employ a great deal of mental effort to understand the learning content (Richardson & Newby, 2006). Cognitive engagement is considered an essential requirement for meaningful learning as well as for achievement since cognitively engaged learners are able to construct new knowledge and gain higher-level understanding related to course content (Shukor et al., 2014).

Behavioral engagement focuses on the habits and skills of learners (Jones, 2008), hence refers to "observable behaviors during the course, such as attention, asking questions, contributing to class discussion" (Li et al., 2014, p. 49). Behavioral engagement is based on the concept of participation and considers learners' participation in academic, social, and extracurricular activities (Fredricks et al., 2004). Learners' behavioral engagement in online learning activities was found to be a significant predictor of achievement in courses (Tsay et al., 2018). In addition, learners' continued participation can result, and their dropouts can be prevented by learners' appropriate behavioral engagement (Fredricks et al., 2004).

Emotional engagement considers learners' motivation and feelings (Jones, 2008). Emotional engagement was defined as learners' "enthusiasm, interest, enjoyment, vitality, and zest with regard to the class" (Cho & Cho, 2014, p. 25). Emotional engagement is established when learners react positively to their learning and the class setting involving the instructors, other learners, and the institution (Louwrens & Harnett, 2015).

Learner engagement in online learning environments can be investigated by considering system logs such as learners' allocation of time for online learning as well as the amount of access to online course materials and activities. In addition to the collection of learner log data, researchers and instructors can obtain self-reported data from learners through the use of surveys, reflections, discussions, and appropriate formative tools (Gray & DiLoreto, 2016). For instance, the Online Student Engagement Scale (OSE) was developed to examine learners' tasks (actively and cognitively), feelings about their learning, and their interactions with the content, the instructor, and other learners. OSE mainly considers the factors as learners' skills, participation, performance, and emotion related to the engagement process (Dixson, 2015).

In order to examine learner engagement in online learning environments, Sun and Rueda (2012) proposed the Student Engagement Scale based on the prior studies (i.e. Fredricks et al., 2004; Fredricks et al., 2005). This scale attempted to analyze learners' cognitive, behavioral, and emotional engagement with corresponding items. In this study, the Student Engagement Scale was found appropriate for the analysis of learners' engagement since it is appropriate for online environments, and it consists of the whole domains related to engagement. In spite of various existing research, the review of literature explored that there is no previous study examining Kyrgyz learners' engagement in online learning. This study thus becomes the first in this respect. Online learning is becoming essential in each country. Therefore, the need also emerged for the examination of learners' engagement and problems related to online learning. The information acquired from such an investigation helps instructors improve the online courses; hence, the satisfaction and engagement of learners will increase.

METHODOLOGY

CONTEXT OF THE STUDY

Kyrgyz-Turkish Manas University digitally transformed their courses during the 2019–2020 spring term. That is, all courses were provided through a learning management system (LMS), and instructors and students were enrolled in online courses. Instructors mainly shared digital course materials and performed regular live sessions in virtual classrooms, which learners participated in to learn the course topics.

RESEARCH QUESTIONS

The purpose of this study is to investigate Kyrgyz learners' engagement in online courses. In this regard, the study mainly aimed to explore three types of engagement (behavioral, emotional, and cognitive) in online courses. The study considered the effect of engagement on learner achievement. It also aimed to reveal the impacts of demographics on the types of engagement.

In addition, learners' difficulties related to online learning were examined. Research questions for this study were defined as follows:

1. What are the factors that have a significant effect on learner engagement in online courses?
2. Is there any effect of learner engagement on learner achievement?
3. Is there any difference in learners' engagement in online courses according to their genders?
4. Is there any difference in learners' engagement in online courses according to their previous online course experience?
5. What challenges did learners experience in online courses?

RESEARCH DESIGN AND PARTICIPANTS

This study was performed during the 2019–2020 spring term. The study has a mixed-methods design that involves quantitative and qualitative approaches. Quantitative data consider learners' engagement scores collected by the survey, and qualitative data consider learners' difficulties related to online courses.

In the context of the study, an online survey was developed utilizing online forms. Then, the online survey was shared with the learners by sending emails. Through the use of the online survey, both quantitative and qualitative data were collected from learners. The sample consisted of 400 learners studying at undergraduate levels at Kyrgyz-Turkish Manas University. The demographic profiles of participant learners are provided in Table 1.

Table 1 Analysis of demographic data of participants.

CATEGORY	SUB-CATEGORIES	FREQUENCY (*f*)	PERCENTAGE (%)
Gender	Male	107	26.8
	Female	293	73.2
Faculty	Engineering	114	28.5
	Science	134	33.5
	Communications	14	3.5
	Economy	27	6.8
	Education	57	14.2
	Vocational School	54	13.5
	Total	400	100
Computer access	Yes	194	48.5
	No	206	51.5
Mobile access	Yes	392	98.0
	No	8	2.0

The demographic results demonstrated that there were participant students from each faculty of the university. According to the analysis, more than half of the learners are not able to access computers. On the other hand, nearly all learners have mobile access.

DATA COLLECTION AND ANALYSIS

For the collection of data, an online survey was employed. The survey was designed to cover three major sections. The first section of the survey includes multiple-choice questions for identifying participants' demographic profiles. The second section includes 19 items, which are 5-point Likert-type questions for investigating learner engagement in online courses. The items of the scale were based on the Student Engagement Scale (Sun & Rueda, 2012) and consist of rankings ranging from strongly disagree to strongly agree. The scale together with its items are provided in Appendix A. The original form of the scale was in English. Hence, the items of the scale were translated to Kyrgyz and shared with the participants. The third section includes one open-ended question for identifying learners' difficulties related to online courses.

Participants provided responses to the survey voluntarily, hence, reliability analysis was conducted based on responses of 400 participants. As a result of the reliability analysis, the Cronbach Alpha value was calculated as 0.81.

In order to analyze quantitative data, the study applied appropriate statistical tests, which involve descriptive analysis, factor analysis, t-tests, and ANOVA tests. The quantitative analysis was performed using the SPSS package. In order to analyze qualitative data, content analysis was employed. In the context of the content analysis, open coding (Strauss & Corbin, 1990) was applied, and an inter-coder agreement approach was employed for reliability. The coefficient was estimated as 0.73, which is within an appropriate range as offered by Krippendorff (2004).

RESULTS

RESEARCH QUESTION 1: WHAT ARE THE FACTORS THAT HAVE A SIGNIFICANT EFFECT ON LEARNER ENGAGEMENT IN ONLINE COURSES?

Initially, Kaiser-Meyer-Olkin and Bartlett's Tests were conducted to measure the sampling adequacy. The results are provided in Table 2. Kaiser-Meyer-Olkin Measure of Sampling Adequacy was found to be equal to 0.895, which is close to 1. In addition, the null hypothesis for Bartlett's Test of Sphericity is rejected since the p-value is 0.000. Therefore, data reduction becomes possible for this dataset.

Table 2 Results of Kaiser-Meyer-Olkin and Bartlett's Test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.895
Bartlett's Test of Sphericity	Approx. Chi-Square	2825.183
	Df	171
	Sig.	.000

Next, a Principal Component Factor Analysis was conducted. The result of the rotated component matrix suggested three different factors. Factor loadings for all variables were found to be greater than 0.437, and factor loadings for items are provided in Table 3.

Table 3 Factors of Learner Engagement.

	COMPONENT		
	1	2	3
Factor 1: Cognitive Engagement			
17. If I do not know about a concept when I am learning in the online class, I do something to figure it out.	.755		
16. I read extra materials to learn more about things we do in the online class.	.801		
15. When I read the course materials, I ask myself questions to make sure I understand what it is about.	.748		
14. I try to look for some course-related information on other resources such as television, journal papers, magazines, etc.	.737		
13. I study at home even when I do not have a test.	.684		
12. I check my schoolwork for mistakes.	.610		
19. I talk with people outside of school about what I am learning in the online class.	.597		
18. If I do not understand what I learn online, I go back to watch the recorded session and learn again.	.485		
Factor 2: Emotional Engagement			
10. I feel happy when taking online class.		.851	
9. I am interested in the work at the online class.		.829	
8. The online classroom is a fun place to be.		.815	
6. I like taking the online class.		.742	
11. I feel bored by the online class.		–.620	
7. I feel excited by my work at the online class.		.481	
Factor 3: Behavioral Engagement			
1. I follow the rules of the online class.			.699
5. I complete my homework on time.			.579
4. I am able to consistently pay attention when I am taking the online class.			.564
2. I have trouble using the online class.			–.437

The first research question aimed to analyze the factors that influence learner engagement in online courses. According to the results of the factor analysis, cognitive engagement, emotional engagement, and behavioral engagement are identified as three factors. Only one item of the survey (i.e, 3. When I am in the online class, I just 'act' as if I am learning) did not involve any type of engagement. The three factors explained 43.22% of the variance.

RESEARCH QUESTION 2: IS THERE ANY EFFECT OF LEARNER ENGAGEMENT ON LEARNER ACHIEVEMENT?

Multiple regression analysis was conducted to investigate the effects of learner engagement on learner achievement. Learner achievement indicated participants' GPAs in the 2019–2020 spring term. GPA is a numerical variable in the range between 0 and 4. The corresponding results were provided in Table 4.

Table 4 Effects of Learner Engagement on Learner Achievement.

MODEL	UNSTANDARDIZED COEFFICIENTS		STANDARDIZED COEFFICIENTS	t	SIG.	95,0% CONFIDENCE INTERVAL FOR B	
	B	STD. ERROR	BETA			LOWER BOUND	UPPER BOUND
(Constant)	1.244	.616		2.019	.048	.010	2.479
Behavioral Engagement	.427	.166	.356	2.574	.013	.095	.759
Emotional Engagement	–.094	.144	–.089	–.651	.518	–.383	.195
Cognitive Engagement	.029	.139	.030	.206	.838	–.251	.308

According to the analysis, it was found that behavioral engagement significantly predicts Kyrgyz learners' achievement. On the other hand, emotional engagement and cognitive engagement were found to have no effect on learner achievement.

RESEARCH QUESTION 3: IS THERE ANY DIFFERENCE IN LEARNERS' ENGAGEMENT IN ONLINE COURSES ACCORDING TO THEIR GENDERS?

The ANOVA was employed to examine the difference in learners' engagement in online courses with respect to their genders. The corresponding results were provided in Table 5.

Table 5 Significance of Learners' Engagement According to their Genders.

		SUM OF SQUARES	*df*	MEAN SQUARE	*F*	SIG.
Cognitive Engagement	Between Groups	.004	1	.004	.006	.939
	Within Groups	284.040	398	.714		
	Total	284.044	399			
Emotional Engagement	Between Groups	.594	1	.594	1.064	.303
	Within Groups	222.154	398	.558		
	Total	222.748	399			
Behavioral Engagement	Between Groups	3.612	1	3.612	7.697	.006
	Within Groups	186.763	398	.469		
	Total	190.375	399			

The results demonstrated that there is a significantly statistical difference in learners' behavioral engagement with respect to their genders. According to the results of the posthoc test, female learners had greater behavioral engagement in online courses than male learners.

RESEARCH QUESTION 4: IS THERE ANY DIFFERENCE IN LEARNERS' ENGAGEMENT IN ONLINE COURSES ACCORDING TO THEIR PREVIOUS ONLINE COURSE EXPERIENCE?

Participants were grouped in terms of their level of online course experience (i.e. students with prior online experience and students without online learning experience). Online course experience was determined as a numerical value. If students have no prior experience, then their experience was coded as 0. If students have prior experience, then their experience was coded as 1. The ANOVA

was conducted to investigate the difference in learners' engagement in online courses with respect to their previous online course experience. The related results were provided in Table 6.

		SUM OF SQUARES	*df*	MEAN SQUARE	*F*	SIG.
Cognitive Engagement	Between Groups	.047	2	.024	.033	.967
	Within Groups	283.996	397	.715		
	Total	284.044	399			
Emotional Engagement	Between Groups	4.686	2	2.343	4.266	.015
	Within Groups	218.062	397	.549		
	Total	222.748	399			
Behavioral Engagement	Between Groups	1.690	2	.845	1.778	.170
	Within Groups	188.685	397	.475		
	Total	190.375	399			

Table 6 Significance of Learners' Engagement According to their Previous Online Course Experience.

According to the results, there is a significantly statistical difference in learners' emotional engagement with respect to their prior experience. That is, the results of the posthoc test explored that emotional engagement differs among learners who did not have any prior online course experience and those who took one course previously.

RESEARCH QUESTION 5: WHAT CHALLENGES DID LEARNERS EXPERIENCE IN ONLINE COURSES?

Kyrgyz learners indicated various problems related to their online learning experience. These problems can be explained as follows:

The majority of the learners indicated problems related to Internet access. The Internet infrastructure of the Kyrgyz Republic is not operating at sufficient rates. Especially learners living in rural or hilly areas have limited Internet access; hence, they were generally not able to access live sessions. For example, one of the learners stated that "Internet access is not good because I live in a mountainous area, so I have difficulty." Also, the increasing use of the Internet results in connection problems. For instance, some of the learners indicated that they could not hear the voices of their instructors and peers in online lessons due to poor Internet connections. One of the learners stated that "Sometimes I find it difficult to hear the voices of my teacher or classmates." The other access problem is related to the limited Internet package of the learners. When learners exceed the Internet connection limit of their mobile phones, they will not have further access. One student stated that "There are times when my credit is over and I can't attend classes." Hence, due to Internet-related problems, learners will not have a chance to access online courses at the expected rates. A similar problem is related to learners' limited computer access. The ones without computer access could not perform their homework assigned in the context of the online courses. For instance, one of the learners stated that "the absence of my computer is a problem because it is necessary to do some homework on the computer."

Electricity failure is the other problem that learners generally experience in the Kyrgyz Republic. Because of the frequent power failures, learners could not turn on their computers or charge the batteries of their mobile phones. Therefore, in these times, learners were not able to access live sessions of the courses. For example, one of the learners indicated the problem as follows: "I can't attend online classes when there is no electricity."

Insufficient conditions in houses are the other problem for learners. Since Kyrgyz families have crowded populations, learners experienced problems while focusing on their courses. Especially the noise in the house disturbs learners; hence, they had problems understanding what instructors taught in the live courses. For example, one learner stated that "it is noisy because there are so many people at home." At the same time, house duties prevent learners from completing course-related studies. The learners living in rural areas may be required to do agriculture work, and some learners may be required to do housework; they may not allocate sufficient time to their homework and courses. For instance, one learner stated that "There is a lot of homework; we can't keep up because there is a lot of work in the village." The other

learner indicated that "I have responsibilities such as cooking at home, caring for my brothers, and teaching them." "I get tired with housework, and I can't focus on my own lessons."

Some of the learners indicated problems related to the implementation of online courses. For instance, some learners, especially those with limited Internet connection, expected to access course recordings. For instance, one learner explained that "if there is something we do not understand during the online lesson or if the Internet is weak, we are not allowed to watch the lesson recording again." When we ask the teachers, they say that there is no access. Currently, the university cannot record the course sessions due to the expenses required for storage. If there is an opportunity for the recordings of online courses, learners have a chance to access these recordings and compensate for their absence in live sessions. Furthermore, some learners indicated the lack of course-related applications in online environments. For instance, instructors could not teach the laboratory sections of the courses. One learner indicated the problem as follows: "Teachers explain the lessons quickly, and there are no practical lessons." The lack of interactivity in the online courses was stated as the other failure. For instance, one of the learners indicated that "I think our current online teaching method can be improved." "For example, I can say that there is a need for employing other additional programs and enhancing interactivity in online courses." The more interactivity in online courses, the greater the increase in learner motivation and achievement.

Some minor numbers of learners stated health-related problems. Staying in front of the computers for a long time resulted in eye or headache problems in these students. For instance, one of the learners indicated the problem in the following way: "We have to look over the phone. For example, our classes can be from 8 a.m. to 3 p.m. Our eyes hurt in these days."

DISCUSSIONS AND CONCLUSION

In this respect, this study was mainly conducted to investigate Kyrgyz learners' engagement in online courses. In addition, the study attempted to examine learners' problems related to online learning. In total, 400 Kyrgyz learners studying at university level participated in this study.

Learners' access to technology is important since it provides a technological basis for their engagement in online courses. The study revealed that Kyrgyz learners are not able to access computers at adequate levels. Technology infrastructure was found one of the key challenges of online learning during pandemic (Heng & Sol, 2021). Similar results were obtained in another study, in which 34.2% of Kyrgyz participants could access the Internet through their personal computers (Muhametjanova et al., 2020). Learners without computer access were also found to display lower levels of cognitive engagement in online courses compared to learners having computer access. This is an anticipated result since the lack of computer access prevents learners from performing online course activities.

On the other hand, it was found that approximately all Kyrgyz learners had mobile access. It is an expected result since the mobile penetration of the country was announced to be higher than the population (Datareportal, 2019). Although mobile tools allow learners to participate in online classes and access course materials, a lack of computers prevents learners from conducting assignments provided in the context of online courses. Therefore, there is a crucial need in Kyrgyzstan that learners be equipped with computers for high-level engagement in online courses.

In the context of the results, it was found that there are three major factors related to Kyrgyz learners' engagement in online courses. These factors are cognitive engagement, behavioral engagement, and emotional engagement. It was explored that behavioral engagement has a significant effect on Kyrgyz learners' academic achievement. This implies that learners who obeyed the rules of online classes obtained higher grades. On the other hand, Kyrgyz learners' achievements are not affected by their emotional and cognitive engagement. The various results are similarly revealed in the existing literature. Yet, one critical factor for the effectiveness of online learning is learners' participation in learning activities. That is, the more learners engage in online learning, the more benefits they gain (Hu & Li, 2017).

Female learners were found to show higher levels of behavioral engagement in online courses than male learners. That is, female learners were better at following the rules of the online class, completing homework on time, and paying attention during the course. The parallel results were also revealed in the prior studies (e.g, Wang et al., 2011; Li & Lerner, 2011) that

females were considered to have more "active, goal-directed, flexible, and positive actions and practices towards learning activities" than males (Engels et al., 2016, p. 1202).

Learners with prior online course experience displayed higher levels of emotional engagement compared to those without previous online course experience. This implies that while learners' online learning experiences are increasing, their emotional engagement is also increasing. Yet, it is also essential to achieve emotional engagement in the initial online learning experience of learners. For instance, Louwrens and Hartnett (2015) recommended that emotional engagement can be established through the use of instructional activities and the continuous development of online learning communities in which learners feel free to contribute.

Kyrgyz learners experienced several problems related to engagement in online learning. The major problem for learners is the lack of Internet access in the country. The Internet penetration rate of Kyrgyzstan was found to be 40.1%. That is, among the Kyrgyz population (i.e., 6,218.616 people), there are currently 2,493,400 Internet users in the country (Internet World Stats, 2019). Hence, the government and the information and technology (ICT) industry are currently trying to increase Internet access in the country. Learners are also expecting an improvement in Internet access. That is, the majority of the learners expected that countrywide Internet connection problems should be solved. In this way, learners will not experience problems accessing live sessions, performing homework, reaching course materials, or performing other duties in the context of online courses. Hence, this will also result in an increase in learner engagement in online learning.

Currently, the university cannot allow instructors to record virtual classes due to financial problems for obtaining storage infrastructure. Yet, this prevents learners from accessing recordings when they have a suitable time and place. On the other hand, learners need to access the recordings of virtual classrooms, which are held by instructors to teach the course content and conduct discussion activities (Afacan Adanır et al., 2020). Learners also indicated a lack of interactivity in the courses. Similar results were observed in the studies of Northrup (2002), Johnston et al. (2005), Morris (2012), Akuratiya and Meddage (2020), which concluded that interaction is an expected predictor for learner satisfaction in online learning. Interactivity in online courses is important in that there should be appropriate interactivity at three levels: instructor-learner, learner-learner, and learner-content. Interactivity can be satisfied through the development and implementation of interactive activities such as applying the strategies of active learning, collaborative learning, or problem-based learning. In addition, it is essential that instructors frequently communicate with learners and provide necessary feedback. This kind of approach will increase both learner engagement and satisfaction in online courses.

APPENDIX

Appendix A Student Engagement Scale.

	STRONGLY AGREE	STRONGLY DISAGREE
Behavioral Engagement		
1. I follow the rules of the online class.		
2. I have trouble using the online class.		
3. When I am in the online class, I just 'act' as if I am learning.		
4. I am able to consistently pay attention when I am taking the online class.		
5. I complete my homework on time.		
Emotional Engagement		
6. I like taking the online class.		
7. I feel excited by my work at the online class.		
8. The online classroom is a fun place to be.		
9. I am interested in the work at the online class.		
10. I feel happy when taking online class.		
11. I feel bored by the online class.		

(Contd.)

	STRONGLY AGREE	STRONGLY DISAGREE
Cognitive Engagement		
12. I check my schoolwork for mistakes.		
13. I study at home even when I do not have a test.		
14. I try to look for some course-related information on other resources such as television, journal papers, magazines, etc.		
15. When I read the course materials, I ask myself questions to make sure I understand what it is about.		
16. I read extra materials to learn more about things we do in the online class.		
17. If I do not know about a concept when I am learning in the online class, I do something to figure it out.		
18. If I do not understand what I learn online, I go back to watch the recorded session and learn again.		
19. I talk with people outside of school about what I am learning in the online class.		

COMPETING INTERESTS

The authors have no competing interests to declare.

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TO CITE THIS ARTICLE:
Afacan Adanır, G., Muhametjanova, G., & Akmatbekova, A. (2022). Investigation of Kyrgyz Learners' Engagement in Online Courses. *Open Praxis*, *14*(2), pp. 110–121. DOI: https://doi.org/10.55982/openpraxis.14.2.158

Submitted: 27 September 2021
Accepted: 25 March 2022
Published: 09 December 2022

Open Praxis is a peer-reviewed open access journal published by International Council for Open and Distance Education.

INTERNATIONAL COUNCIL FOR OPEN AND DISTANCE EDUCATION