A Convergent Parallel Mixed-Method Research into Blended Learning via Video Streaming Websites in Teacher Education: Classroom Engagement Levels and Opinions of Prospective Teachers

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Abstract
The aim of the study was to analyze the use of blended learning via video streaming websites in teacher education. The research examined the classroom engagement levels in and the opinions of prospective teachers about blended learning via video streaming websites. Thus, the study was designed as a convergent parallel mixed-method research in which both quantitative and qualitative methods were used simultaneously. Blended learning was conducted at activity level during spring semester in 2019-2020 academic year, and the application lasted for 7 weeks, 14 hours. YouTube was preferred among other video streaming websites by the researcher/instructor because it is one of the most popular video streaming websites and contains numerous educational videos. 27 volunteer prospective teachers taking curriculum development in education course at a faculty of education at a state university in Turkey constituted the study group in quantitative part of the research while 10 volunteer prospective teachers participated in the qualitative part of the research. Classroom engagement level of prospective teachers was determined via "Classroom Engagement Inventory" developed by Wang, Bergin, and Bergin (2014) and adapted to Turkish by Sever (2014). The data about opinions of prospective teachers were collected via unstructured and conversational focus group interview. Descriptive analyses were used to determine the classroom engagement levels in quantitative part of the research, and content analysis was used to analyze the opinions of the prospective teachers in the qualitative part of the research. The findings of quantitative data revealed that prospective teachers were *often* engaged affectively, they were *always* engaged behaviorally and compliant, they were *often* engaged behaviorally and effortful, they were *often* engaged cognitively, and they were *never* disengaged in the classroom. The findings of qualitative data showed that the application had both positive and negative aspects. Positive aspects included *being prepared for the classes beforehand*, *reinforcing the topics*, *active participation*, *studying regularly and systematically*, and *the opportunity to use the notes in the future*. On the other hand, negative aspects included *being time-consuming*, *being bored*, *inability to identify key points*, and *problems about the Internet*. Based on the conclusions of the study, teacher educators are also recommended to create and use their own short videos each of which covers one single learning objective as a pre-lecture activity to enable prospective teachers have a firm understanding of the materials.
Keywords: Blended learning, video streaming websites, YouTube, classroom engagement, opinions, prospective teachers.

INTRODUCTION

The advancement in information and communication technology and the students belonging to generation Z, who are now digital natives, have led instructors and universities to change their behaviors and mindsets. A basic characteristics of generation Z, who were born after 1997, is the keenness for technology, especially for the Internet and social media. For generation Z, technology is a crucial element in all aspects of their lives. Johnson, Adams Becker, Cummins, Estrada, Freeman and Hall (2016) emphasized that "Students today would appear to be more digitally literate than previous generations because many have grown up immersed in technology-rich environments" (p.24). Therefore, universities are trying to improve academic performance and engagement of their students as well as giving them enjoyable learning experiences. In order to achieve it blended learning has been applied all over the world since 2000s with the development of educational technologies (Warren, Reilly, Herdan & Lin, 2021). Poon (2014) asserted that blended learning is likely to become the leading teaching approach in the 21st century, and Long (2014) expressed that blended learning is becoming the standard approach for most of the undergraduate students.

Blended learning has been defined differently in the literature. Thorne (2003) identified it as a mixture of e-learning technologies, such as video streaming, virtual classes, and online text animation combined with face-to-face classroom applications. While Shroff and Vogel (2010) defined it as a delivery program that utilizes more than one method to provide information to students, Yaman and Graf (2010) described it as a hybrid learning concept that integrates traditional classroom applications and e-learning elements to combine the benefits of both types.

According to Torrisi-Steele (2011), blended learning is "enriched, student-centered learning experiences made possible by the harmonious integration of various strategies, achieved by combining face to face interaction with information and communication technology." Graham, Allen and Ure (2003) summarized the three most commonly used definitions as combining (a) instructional modalities/delivery media, (b) instructional methods, and (c) face-to-face and online instruction. In this study, blended learning is used as a combination traditional/face-to-face learning and e-learning/online methods (Ho, Nakamori, Ho & Lim, 2016).

Blended learning provides students opportunities to learn timely, continuously and flexibly (Prasad, Maag, Redestowicz & Hoe, 2018; Zhang, Cao, Shu, & Liu, 2020). It improves interaction and social communication at university settings, it helps students gain deeper knowledge increasing learning quality, it encourages self-directed and collaborative learning, it improves aptitude, self-reliance and critical thinking (Bailey, Ifenthaler, Gosper, Kretzschmar, & Ware, 2015; Al-shami, Aziz, & Rashid, 2018; Baragash & Al-Samarraie, 2018). Briefly, it is generally used to create a self-paced, flexible and student-centered approach (Tang & Chaw, 2016). Blended learning not only emerges as a crucial model in order to minimize the negative effects of both the face-to-face learning and online learning (Kristanto, 2017) but also includes more opportunities for authentic activities (Gikandi, Morrow, & Davis, 2011). Improvement in academic achievement, student engagement and satisfaction are among the positive outcomes of blended learning (Tsai, Shen & Tsai, 2011; Martínez-Caro & Campuzano-Bolarín, 2011; Fulton, 2012; Smith, Groves, Bowd & Barber, 2012, Baepler, Walker & Driessen, 2014; Gilboy, Heinerichs & Pazzaglia, 2015).

Blended learning can be applied at four levels which include activity, course, program and institutional levels. Instructors or designers are more involved in blending at course and activity levels while students' discretion is more important in blending at program and institutional levels (Graham, 2006; Caner, 2012). Activity-level blended learning occurs when an activity includes online and face-to-face components. The use of technological tools when carrying out an activity in the classroom makes the activity more original. Activity-level blending may contain online emails, discussion forums, or other web-based communication tools in the actual classroom. Course-level blended learning is the most comprehensive type of blended learning, and it includes online activities in addition to face-to-face activities as a part of the course. Course-level blending may engage students in different circumstances, and support online and face-to-face activities that overlap over time, or may eliminate the time block to be brought chronologically without overlapping each other. Program-level blended learning usually requires two models. In the first model, students choose a combination of online courses and face-to-face courses while in the second model, the program determines the mix of courses. In institution-level blended learning, institutions make a commitment to blend face-to-face courses and online courses. Many companies, as well as higher education institutions, create models at institutional level (Graham, 2006; Caner, 2012).

Traditional lecturing still seems indispensable for teaching large groups; however, if the lectures are not well-planned, teaching content-driven and difficult subjects via lectures may cause cognitive overload on students (Merrouche, 2017; Hadie, Hassan, Ismail, Ismail, Talip, & Rahim, 2018). Simply put, courses with abstract and heavy content can be difficult to learn for students. Therefore, trying new and innovative instructional approaches to provide prior knowledge and to prepare students to integrate and apply knowledge in more student-centered learning environments will provide alternatives for teaching, and blended learning is among these alternatives. Blending can be achieved by encouraging students to watch videos or read texts that are directly related to the material to be discovered in subsequent courses as pre-lecture activities (Davies, Dean & Ball, 2013). Having become an important part of higher education, videos are the cornerstone of many blended and online courses as well as traditional courses (Brame, 2016; Choe et al., 2019).

Pre-lecture activities help students to be more self-regulated and autonomous, because these activities are usually handled before students attend face-to-face classes. Structured pre-lecture activities can be done providing some examination and observation of students' preparations. Pre-lecture activities should be planned and designed in such a way that it can effectively instill prior knowledge. There are plenty of pre-lecture activities, and online provision of learning materials is one of them which addresses differences in students' paces and learning styles. In addition, students with prior knowledge have scored better on assessment tasks than students with little or no prior knowledge. It has been proven that the use of web-based resources and e-learning tools help students build prior knowledge. Video streaming websites are examples of these tools as they are easily accessible for students. Moreover, students can learn at their own pace because they can stop, start and replay the videos when they need (Kinsella, Mahon & Lillis, 2017).

When the recent literature was reviewed, it was observed that there was a variety of research about blended learning. Çakıt and Karadeniz (2020) investigated the effect of blended learning environments on the development of basic skills in handball in a quasi-experimental design and found out that experimental group had improved

more in terms of handball basic skills. The students in experimental group performed better and satisfied more than the students in control group. Dikmen and Ocak (2020) analyzed the opinions of students about blended learning environment prepared for mobile programming and concluded that it contributed to student learning, the students did not encounter any problems, they wanted to learn different courses and subjects by blended learning, and their expectations were met. Gürdoğan and Bağ (2020) examined the effect of blended learning on academic achievement and motivation for science learning in a quasi-experimental design and revealed that blended learning increased achievement and the motivation towards science learning. Likewise, Kadirhan and Korkmaz (2020) found out in their quasi-experimental study that blended science course contributed to academic achievement and attitudes toward science course.

Blended learning in teacher education research have focused on educational leadership (Ross, Adams, Bondy, Dana, Dodman & Swain, 2011; Adams & Ross, 2014; Namyssova, Tussupbekova, Helmer, Malone, Tajik & Jonbekova, 2019), academic achievement (El-Deghaidy & Nouby, 2008; Jahjouh, 2014), teaching skills and competencies (El-Deghaidy & Nouby, 2008; Collopy & Arnold, 2009; Yeh, 2010; Alayyar, Fisser & Voogt, 2012; Jahjouh, 2014), attitudes (Khine & Lourdusamy, 2003; Lin, 2008), peer-to-peer cooperation (El-Deghaidy & Nouby, 2008), professional knowledge (Turvey, 2010), and educational technology (Demirer & Sahin, 2013).
In Turkey, Sungur Alhan and Şimşek (2020) analyzed the effects of Science Methods Course-II designed with blended learning on prospective teachers' technological pedagogical content knowledge. They revealed that there was a significant difference between experimental and control group in the favor of the experimental group. Yılmaz and Malone (2020) investigated opinions and experiences of prospective teachers at the department of early childhood education about blended learning. They found out that prospective teachers' experiences and opinions about blended learning were generally positive, and that they preferred blended learning to face-to-face or online learning. Sungur Alhan (2020) examined prospective teachers' opinions about blended learning via qualitative research. She revealed that prospective teachers had positive opinions about blended learning, and blended learning could be used at different courses and grades. On the other hand, prospective teachers mentioned about the lack of computer and internet access and the inability to use the keyboard fast as negative aspects.

In the current context, curriculum development in education course includes abstract and heavy content, so the researcher/instructor aimed at easing the cognitive load of prospective teachers by the help of pre-lecture activities using blended learning via video streaming websites. YouTube was preferred as the video streaming website since it is the most frequently used web streaming website by the youth, and it includes plenty of educational videos. Moreover, there seems a lack of evidence about the effect of pre-lecture activities on prospective teachers' classroom engagement and opinions. Similarly, the feasibility and applicability of pre-lecture activities using videos under the umbrella of blended learning have not been adequately explored in the context of teacher education. Consequently, the aim of the study was to examine blended learning via video streaming websites in teacher education. In order to achieve this aim, the following research questions were set forth:
1. What are the classroom engagement levels of prospective teachers in blended learning via video streaming websites?
2. What are the opinions of prospective teachers about blended learning via video streaming websites?

METHOD
Research Design
A convergent parallel mixed-method research was applied in the study. First of all, both quantitative (classroom engagement inventory) and qualitative data (focus group interview) were gathered. Next, quantitative and qualitative data were analyzed separately. Then, the results from the analyses of both datasets were compared. Finally, the results were interpreted whether the results support or contradict each other (Creswell, Plano Clark, Gutmann, & Hanson, 2003; Creswell & Plano Clark, 2007; Creswell, 2011). The convergent parallel mixed-methods design used in the study was given in Figure 1.
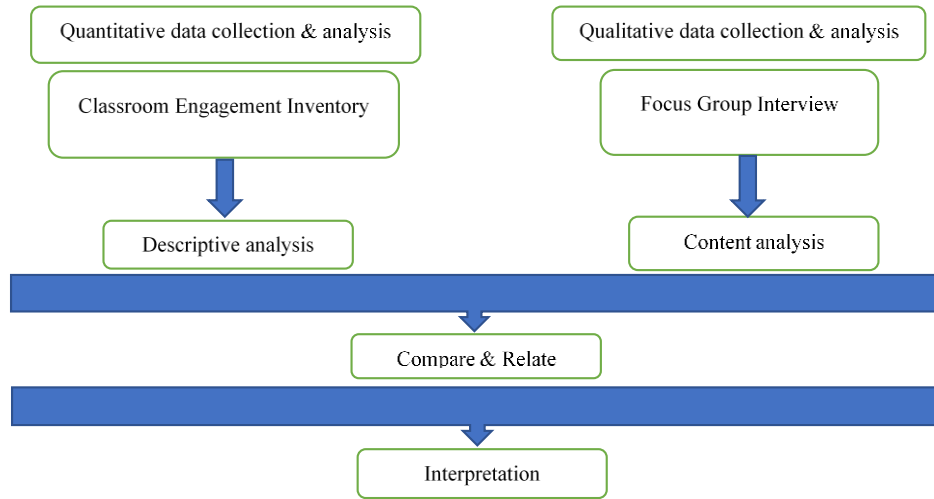
Figure 1. The convergent parallel mixed-method design used in the study

Study Group

27 prospective teachers taking curriculum development in education course at a faculty of education at a state university in Turkey constituted the study group in quantitative part of the research while 10 prospective teachers participated in the qualitative part of the research. Criterion sampling method was preferred in the qualitative part of the study and the sampling criterion was including prospective teachers studying in different departments in order to reflect diverse opinions. Volunteer prospective teachers participated in the research. Demographic features of the study group were given in Table 1.

Table 1. Demographic features of the study group

Features		Quantitative Data (f)	Qualitative Data (f)
Gender	Female	21	8
	Male	6	2
Age	19-20	20	7
	21-22	7	3
Department	Preschool Teaching	10	3
	Primary School Mathematics Teaching	6	2
	Physical Education and Sports Teaching	3	1
	Social Sciences Teaching	3	1
	Guidance and Psychological Counseling	2	1
	English Language Teaching	2	1
	German Language Teaching	1	1
Total		27	10

Instruments

Classroom Engagement Inventory

Classroom engagement level of prospective teachers was determined via "Classroom Engagement Inventory" developed by Wang, Bergin, and Bergin (2014) and adapted to Turkish by Sever (2014). Classroom Engagement Inventory consists of 23 items, 20 of which were positive and the rest 3 of which were negative. The inventory was graded as "never", "rarely", "sometimes", "often" and "always", and 3 negative items were reversed in coding only for the total engagement level. The inventory has five factors as "affective engagement", "behavioral engagement-compliance", "behavioral engagement-effortful classroom participation", "cognitive engagement" and "disengagement". As a result of the adaptation study, Cronbach Alpha coefficients of the factors were found to be .87, .82, .74, .89 and .69, respectively. Values were NNFI=0.97, CFI=0.97 and NFI=0.95 and IFI= 0.97 and model data fit was perfect, which confirmed 5-factor structure of the inventory (Sever, 2014). In this study, Cronbach Alpha coefficients of the factors were .81 for affective engagement, .74 for behavioral engagement-compliance, .70 for behavioral engagement-effortful classroom participation, .72 for cognitive engagement, .69 for disengagement, and 78 for the overall inventory.

Focus Group Interview

The data about opinions of prospective teachers were collected via focus group interview. Focus group interviews are often used to understand the elements related to students' thoughts and behaviors. In addition, as opposed to personal interviews, participants can think aloud and feel free to say what they think, discuss with the others about counter-arguments, and change their opinions as the discussion proceed like in informal life settings in focus group discussions (Krueger & Casey, 2000). Due to the social interaction among the participants, the information is deeper than personal interviews (Yıldırım & Şimşek, 2011). The focus group interview made in the study was unstructured and conversational. The prospective teachers were asked to express their demographic features at the beginning of the interview. Then, they were asked to share their opinions and experiences about blended learning via video streaming websites.

Procedure

Blended learning enriching face-to-face learning was conducted at activity and course levels in this study as in Graham (2006)'s classification. At activity and course levels, instructors are more likely to be involved in planning and designing blended learning (Graham, 2006; Caner, 2012). Both online and face-to-face elements are included in activity-level blending in the classroom. In enriching learning, new applications rather than radical changes are added to the learning environment. Different resources and supporting materials were added to traditional face-to-face learning in the study. Therefore, in this study, blending at activity and course levels were used because the instructor has had the initiative to design the course at these levels. In addition, the application was designed after the agreement of the prospective teachers.

In the first week of curriculum development in education course, which was two hours a week, the course content was explained to prospective teachers, and they were offered two options. The first one was to conduct the course in a traditional way using course books and lecture notes as the main sources. The second option was to conduct the course by blended learning using video streaming website YouTube. YouTube was preferred among other video streaming websites by the researcher/instructor because it is one of the most popular video streaming websites and contains numerous educational videos (Chorianopoulos, 2018). In addition, mobile network operators provide special tariffs for students in Turkey, in which they have unlimited quota on YouTube, and students prefer YouTube to other video streaming websites. In line with positive opinions of the prospective teachers, it was decided to carry out the course applying blended learning via video streaming website YouTube. The instructor informed the prospective teachers about some YouTube contents and let them to decide one of the contents because in blended learning, forcing learners to use a pre-determined content or ignoring their content preferences may create obstacles in achieving expected learning outcomes (Ash, 2012).The prospective teachers examined YouTube contents during the week and discussed the contents on the WhatsApp group, which included the instructor, and decided the YouTube content to be followed.

The prospective teachers were asked to watch the video(s) related to the topic each week, to take notes in their own handwriting, to deliver the notes they took to the instructor after face-to-face courses, and to create a portfolio containing their notes. The prospective teachers' weekly notes were evaluated by the instructor and returned to them the following week. In addition, the prospective teachers were asked to take notes about what they did not understand and prepare questions while watching the video(s) in order to ask in face-to-face courses.

The prospective teachers had got preliminary information about the topics when they attended the classes. In face-to-face courses, the issues that were not understood and the questions prepared while watching the video(s) were explained by other students or the instructor. Then, the topics were summarized with the participation of all the prospective teachers; and thus, the topics were reinforced. Moreover, since prospective teachers have to take public personnel selection examination to be appointed as a teacher after graduation, the courses were mostly covered with sample questions related to public personnel selection examination and questions included in the previous public personnel selection examinations. To illustrate, after the review of each topic, the instructor shared a link of an online quiz on the WhatsApp group during face-to-face courses. The quizzes included the questions in previous public personnel selection examinations and some sample questions about the topic. When the quiz period was over, the results were shared with the prospective teachers immediately, and the answers were discussed. In other words, face-to-face courses were completed by analyzing questions related to public personnel selection examination and discussing the answers. As the prospective teachers attended the courses after watching the video(s) and taking notes, they had the opportunity to analyze more questions and explain the reasons for the correct/incorrect answers in face-to-face courses, which also reinforced the topic. Although blended learning via video streaming website YouTube was planned to be applied during the whole spring semester in 2019-2020 academic year, it could only be carried out during first half of the semester because of COVID-19 pandemic as all schools and universities were shut down in the second half of the semester not only in Turkey but also in other countries. Therefore, the application lasted for 7 weeks, 14 hours.

Data Collection
Due to COVID-19 pandemic, quantitative data were collected via an online survey system, and the link was shared with the prospective teachers on the WhatsApp group. It was verbally stated that the prospective teachers' participation in this study was on a voluntary basis, and that the data to be obtained would only be used for scientific purposes and evaluated collectively. Quantitative data were collected between 6th and 26th April 2020. 27 prospective teachers participated in the quantitative part of the research voluntarily.

For the qualitative part of the research, prospective teachers were informed that the interview would be recorded and the transcript would be produced. 10 prospective teachers approved to participate in the qualitative part of the research voluntarily. The communication about determining the date and time of the meeting was made on the WhatsApp group. Qualitative data were collected by focus group interview (a 40-minute Zoom meeting) on 10th May 2020, and the interview was recorded.

Data Analysis
So as to analyze quantitative data, the data were checked whether they provide normal distribution. After finding the realization of normal distribution, mean and standard deviation scores were determined. Class width formula (class range/number of classes) recommended by Tekin (2002) was used in the evaluation of mean scores. Class width was calculated by dividing the difference between the highest (5) and lowest score (1) by the number of classes (5). Class width levels used in the evaluation of the research findings were given below:

1-1.80	Never
1.81-2.60	Rarely
2.61-3.40	Sometimes
3.41-4.20	Often
4.21-5.00	Always

Content analysis was used to analyze qualitative data about opinions of the prospective teachers. Content analysis is considered as an attempt to uncover the consistencies and meanings of the qualitative data (Patton, 2014), and helps the researcher to reveal the hidden facts within the data (Yıldırım & Şimşek, 2011). The answers given by the prospective teachers were transcribed. After the answers were examined in general, similar opinions were coded and grouped into categories. Direct quotations were included in order to reflect opinions of the prospective teachers more accurately. While giving direct quotations, the letter "PT" for prospective teacher, numerical codes such as 1, 2, 3, 4 ... for the order of speech in the interview, and the letters "F" and "M" to indicate their gender were used. For example, the code "PT1F" was used for a female prospective teacher who talked at first in the interview. Then, the researcher invited the prospective teachers who participated in the interview to a Zoom meeting, shared the findings of the qualitative data, and they confirmed the findings. The aim of the second meeting was to get confirmation of the participants and ensure the reliability of the study. According to Lincoln and Guba (1985) reliability can be assured in qualitative studies using some strategies such as confirmation of participants (cited in Yıldırım & Şimşek, 2011). So as to ensure the validity of the qualitative part of the research, data coding and data analyses process were explained in detail. Sample sentences from explanations of the prospective teachers were selected to represent each category in the best way and included in the findings. Related studies were reviewed to ensure consistency and discussed in discussion (Yıldırım & Şimşek, 2011).

FINDINGS
1. What are the classroom engagement levels of prospective teachers in blended learning via video streaming websites?
Classroom engagement levels of prospective teachers in blended learning via video streaming websites were analyzed and the findings were given in Table 2.

Table 2. Classroom engagement levels of prospective teachers in blended learning via video streaming websites

Factors	Items	X	S.D.	Level
Affective Engagement	1. Feeling interested.	4.48	.50	Always
	2. Feeling proud.	4.11	.89	Often
	3. Feeling excited.	4.30	.77	Always
	4. Feeling happy.	4.11	.97	Often
	5. Feeling amused (smile, laugh, have fun).	4.00	.96	Often
	6. Not wanting to stop working at the end of the class.	3.93	.87	Often
Overall Affective Engagement		4.15	.60	Often
	7. Listening very carefully.	4.11	.64	Often
	8. Paying attention to the things they are supposed to remember.	4.59	.50	Always

Behavioral Engagement-Compliance	9. Completing their assignments.	4.59	.50	Always
	10. Getting really involved in class activities.	4.41	.50	Always
Overall Behavioral Engagement-Compliance		4.42	.31	Always
Behavioral Engagement-Effortful Classroom Participation	11. Forming new questions in their minds as they join in class activities.	3.41	.69	Often
	12. Actively participating in class discussions.	3.70	.86	Often
	13. Working with other students and learning from each other.	4.07	.61	Often
Overall Behavioral Engagement-Effortful Classroom Participation		3.72	.47	Often
Cognitive Engagement	14. If they make a mistake, trying to figure out where they went wrong.	4.48	.50	Always
	15. Asking themselves some questions as they go along to make sure the work makes sense to them.	4.00	.78	Often
	16. Thinking deeply when they take quizzes in this class.	4.22	.75	Always
	17. Searching for information from different places and thinking about how to put it together.	3.78	.69	Often
	18. If they are not sure about things, checking their book or using other materials like charts.	4.33	.62	Always
	19. Trying to figure out the hard parts on their own.	4.19	.83	Often
	20. Judging the quality of their ideas or work during class activities.	3.96	.85	Often
Overall Cognitive Engagement		4.13	.24	Often
Disengagement	21. Being "zoned out", not really thinking or doing class work.	1.48	.70	Never
	22. Letting their mind wander.	1.44	.50	Never
	23. Just pretending like they are working.	1.52	.84	Never
Overall Disengagement		1.48	.40	Never
Overall Classroom Engagement		4.18	.21	Often

As seen in Table 2, prospective teachers were *often* engaged affectively in the classroom (X=4.15, SD=.60). When the items were analyzed, they *always* felt interested (X=4.48, SD=.50) and excited (X=4.30, SD=.77). They *often* felt proud (X=4.11, SD=.89), happy (X=4.11, SD=.97), amused (smile, laugh, have fun) (X=4.00, SD=.96) and did not want to stop working at the end of the class (X=3.93, SD=.87).

They were *always* engaged behaviorally and compliant in the classroom (X=4.42, SD=.31). When the items were examined, they *always* paid attention to the things they were supposed to remember (X=4.59, SD=.50), completed their assignments (X=4.59, SD=.50) and got really involved in class activities (X=4.41, SD=.50). They *often* listened very carefully (X=4.11, SD=.64).

They were *often* engaged behaviorally and effortful in classroom participation (X=3.72, SD=.47). When the items were analyzed, they *often* formed new questions in their minds as they joined in class activities (X=3.41, SD=.69), actively participated in class discussions (X=3.70, SD=.86), worked with other students and they learned from each other (X=4.07, SD=.61).

They were *often* engaged cognitively in the classroom (X=4.13, SD=.24). When the items were examined, they *always* tried to figure out where they went wrong if they made a mistake (X=4.48, SD=.50), thought deeply when they took quizzes (X=4.22, SD=.75) and checked their book or used other materials like charts if they were not sure about things (X=4.33, SD=.62). They *often* asked themselves some questions as they went along to make sure the work made sense to them (X=4.00, SD=.78), searched for information from different places and thought about how to put it together (X=3.78, SD=.69), tried to figure out the hard parts on their own (X=4.19, SD=.83), and judged the quality of their ideas or work during class activities (X=3.96, SD=.85).

They were *never* disengaged in the classroom (X=1.48, SD=.40). When the items were analyzed, they were *never* "zoned out" (X=1.48, SD=.70), they *never* let their mind wander (X=1.44, SD=.50) and pretended like they were working (X=1.52, SD=.84). Finally, their overall classroom engagement was at *often* level (X=4.18, SD=.21).

2. What are the opinions of prospective teachers about blended learning via video streaming websites?
Opinions of the prospective teachers about blended learning via video streaming websites were analyzed and the findings were given in Table 3.

Table 3. Opinions of prospective teachers about blended learning via video streaming websites

Opinions of prospective teachers about blended learning via video streaming websites	
Positive Aspects	• Being prepared for the classes beforehand • Reinforcing the topics • Active participation • Studying regularly and systematically • The opportunity to use the notes in the future
Negative Aspects	• Being time-consuming • Being bored • Inability to identify key points • Problems about the Internet

As seen in Table 3, opinions of the prospective teachers about blended learning via video streaming websites were grouped into two categories as positive and negative aspects both of which included different codes. Being prepared for the classes beforehand was expressed as a positive aspect of the application. To illustrate, PT7F explained it by saying *"Since we attended the classes after watching videos, we have understood better what was explained. We have consolidated the knowledge. We listened to the instructor or our classmates deliberately, not idly. Since we already knew the topic, we reviewed it deeply in the classes."* Likewise, PT10F stated *"It helped me reinforce the topics I learned. Attending the classes preparedly, having a certain knowledge beforehand and participating the classes actively were the positive aspects."*

Another code was reinforcing the topics. PT8F expressed *"The fact that we had some ideas about the topics covered during the classes reinforced our knowledge even more. In other words, we attended the classes preparedly, and it reinforced what we learned. I think I have understood better."* In addition, PT2M stated *"It reinforced what I learned. I studied without congestion of topics."*

Active participation was also coded as a positive aspect as PT2M declared *"We were active every week, and it was student-centered. It was a good experience for me, because it was far from the system we were used to. I think it contributed me a lot."* Furthermore, PT8F expressed *"Watching the videos helped me be more active and improve myself."*

Studying regularly and systematically was another code as PT1F stated *"The most positive aspect was to be able to ask when I was confused. I determined and took notes what stuck in my mind, so I could ask them in the classes."* Similarly, PT6F expressed it as *"It provided permanent learning because we watched videos and took notes every week."*

The most important positive aspect was the opportunity to use the notes in the future because almost all the prospective teachers mentioned about it. To exemplify, PT7F declared *"While preparing for the exam, we didn't have to take notes because we had notes."* In the same vein, PT3M expressed it as "*I think my notes will be effective in public personnel selection examination in the future. I think it also contributed me a lot now."* Moreover, PT6F stated *"Our notes became documents both for the exam and the future. Normally notes taken for the exams were thrown away after the exams, but we can put them aside and use them in the future."*

In terms of negative aspects, being time-consuming was the most mentioned code. PT3M expressed it by saying *"Watching videos every week caused problems in terms of time, which was the downside."* PT7F said *"It limited our time as we have to study for other courses."* PT10F simply declared *"It was a very time-consuming application."* PT4F stated her opinion by expressing *"Since this model was applied every week, it could not be advantageous in terms of time. I think the model was useful for learning the topics, but I do not think it was advantageous in terms of time."*

Another negative code was being bored. To illustrate PT8F explained it in details by saying *"Watching videos every week was a little boring. Because we sometimes had homework/assignments in other courses, and, frankly, I had difficulty in arranging my time in those weeks. I even quickly watched some of the videos in order to do the assignment without understanding it on the last day, which was a very negative feature. It was a very good application, I have understood better, but as I said, I sometimes couldn't catch up with my other assignments and I watched them at the last moment and took notes quickly without fully understanding. It would be great if there was no shortage of time."* Similarly, PT9F stated *"It was a good system, it worked but I was sometimes tired of watching videos and taking notes."*

Inability to identify key points was also declared as one of the negative sides by one of the prospective teachers. PT1F said *"It was sometimes hard for me to distinguish what was more important."*

Finally, problems about the Internet were a negative aspect mentioned by one of the prospective teachers. PT5F declared *"I had some trouble with the Internet. I had access and connection problems."*

DISCUSSION AND CONCLUSION
The aim of the study was to analyze blended learning via video streaming websites in teacher education. The research examined the classroom engagement levels in and the opinions of prospective teachers. Thus, the study was designed as a convergent parallel mixed-method research in which both quantitative and qualitative methods were used simultaneously.

The findings achieved from quantitative data revealed that prospective teachers' overall classroom engagement was at *often* level. They *often* engaged affectively in the classroom. In terms of affective engagement, they *always* felt interested and excited. They *often* felt proud, happy, amused (smile, laugh, have fun) and did not want to stop working at the end of the class. These findings are consistent with the findings of the qualitative data in the study since most of the prospective teachers declared that they *studied regularly and systematically in the course*. In the same vein, in a recent study applied in mathematics, blended learning increased academic self-efficacy and enhanced student experience (Warren, Reilly, Herdan & Lin, 2021).

The next finding showed that prospective teachers were *always* engaged behaviorally and compliant in the classroom. When behavioral engagement-compliance was examined, they *always* paid attention to the things they were supposed to remember, completed their assignments and got really involved in class activities and, they *often* listened very carefully. Another finding was that prospective teachers were *often* engaged behaviorally and effortful in classroom participation. In scope of behavioral engagement-effortful classroom participation items, they *often* formed new questions in their minds as they joined in class activities, actively participated in class discussions, worked with other students and they learned from each other. Similarly, the findings of the qualitative data in the study displayed that they *actively participated in the courses*. In parallel with these findings, Vaughan (2014) pointed out that blended learning provides ways to improve "how we deal with content, social interaction, reflection, higher order thinking, problem solving, collaborative learning, and more authentic assessment in higher education, which could potentially lead to a greater sense of student engagement" (p. 248).

Another finding of the study reflected that prospective teachers were *often* engaged cognitively in the classroom. In terms of cognitive engagement, they *always* tried to figure out where they went wrong if they made a mistake, thought deeply when they took quizzes and checked their book or used other materials like charts if they were not sure about things. They *often* asked themselves some questions as they went along to make sure the work made sense to them, searched for information from different places and thought about how to put it together, tried to figure out the hard parts on their own, and judged the quality of their ideas or work during class activities. Likewise, the findings of the qualitative data in the study revealed that prospective teachers were *prepared for the classes beforehand*, they *studied regularly and systematically*, they *actively participated in the courses*. In addition, Vaughan, Cleveland-Innes and Randy Garrison (2013) emphasized that what is learned cannot be separable from how it is learned. Thus, the most important issue is to design instructional processes that will enable students in collaborative and purposeful activities enhancing reflection and discourse. Based on these findings and the literature, blended learning applied in the study can be considered to be designed effectively.

Finally, the study found out that prospective teachers were *never* disengaged in the classroom. For disengagement, they were *never* "zoned out", they *never* let their mind wander, or pretended like they were working. Similarly, in a quasi-experimental study, the students in experimental group were more successful and satisfied (Çakıt & Karadeniz, 2020). These two findings embrace each other that blended learning helps students engage in the classroom, perform better, and thus, satisfy more. Moreover, in this study, the issues that were not understood and the questions prepared while watching the video(s) were explained by other students or the instructor, which may have provided the prospective teachers with an opportunity to develop their reflective and critical thinking skills, to broaden their horizons, and to learn better.

The findings of qualitative data showed that the application had both positive and negative aspects. Positive aspects included *being prepared for the classes beforehand*, *reinforcing the topics*, *active participation*, *studying regularly and systematically*, and *the opportunity to use the notes in the future*. These aspects can be interpreted to lead to higher motivation and achievement. Thus, these findings are consistent with the recent findings in the literature in that blended learning increased attitude, motivation and academic achievement of students (Kadirhan & Korkmaz,

2020; Gürdoğan & Bağ, 2020). The findings echo that blended learning helps students express their learning, as well as testing the knowledge they have acquired (Aguti, Wills & Walters, 2014).

As negative aspects, prospective teachers declared that blended learning via video streaming websites was *time-consuming*, they sometimes got *bored*, and they had problems in *identifying key points*. Similarly, in a study in Kyrgyzstan, 78% of computer engineering students stated that the optimal video length should be 20 minutes or less, and only 6.4% of them did not mind the length of the videos (Jumabaeva, Sait kyzy, Baryktabasov & Ismailova, 2020). Another study also concluded that most of the students did not watch all the videos due to the length of the videos (Brame, 2016). These findings repeat one of the most significant features of generation Z because they are described with their impatience about time, and they want to get what they desire immediately. Based on these conclusions, teacher educators are recommended to create and use their own short videos each of which covers one single learning objective as a pre-lecture activity to enable prospective teachers have a firm understanding of the materials and not to let them get bored. Although mentioned one of the prospective teachers, problems about the Internet was another negative aspects. Likewise, the lack of computer and internet access and the inability to use the keyboard fast were expressed among the negative aspects of blended learning by prospective teachers (Sungur Alhan, 2020).

These findings of the study also revealed that some of the prospective teachers were not autonomous and self-regulated enough to benefit from the advantages of blended learning. It was an expectable conclusion because it was the first time for the prospective teachers who participated in this study experienced blended learning. Caner (2012) explained that workload of instructors when designing blended learning is discouraging since designing and developing online elements as well as planning face-to-face elements is really time-consuming. Constructing environments for blended learning needs studious instructors and they should be fond of technology and acquainted with possible challenges. In this respect, the same is true for prospective teachers. They are already keen on technology, so if they are more enthusiastic and have familiarity in time, they will easily get rid of these negative aspects and be more successful students. There are some research findings that negative opinions of prospective teachers changed to positive after the application of blended learning (Dikmenli & Eser Ünaldı, 2013; Marangoz, 2016; Sungur Alhan, 2020). These findings may result from the fact that prospective teachers are accustomed to traditional methods, and they are unfamiliar with recent applications (Turan & Göktaş, 2015). Moreover, if they get more opportunities as students, they will get the instruction practically, and they will effectively use blended learning in their own teaching practice in the future. As a consequence, teacher educators may be recommended to blend face-to-face courses with online courses or at least with online activities to help prospective teachers become familiar with common practices in their profession, to learn these instructional approaches practically, and to connect theory and practice.

Yoon and Lim (2007) pointed out that blended learning should be designed as a long-term project and the designers should consider long-term objectives of the course or the program in addition to possible institutional requirements. Blended learning also provides flexibility for both the instructor and students, enhances personalization, increases student outcomes, promotes the development of autonomy and self-learning, creates opportunities for professional learning, provides cost-effective qualifications, increases communication between the instructor and students (Spring, Graham & Hadlock, 2016; So & Brush 2008; Singh, 2003). Providing efficient pedagogical applications, blended learning enhances student-centered peer-to-peer learning strategies in addition to active learning strategies (Graham, Allen, & Ure, 2003). Therefore, this sample application may shed light on the issue that how prospective teachers can be supported to get used to blended learning during their studies before they begin to practice at schools, which may be particularly challenging for them whose main mode of study is traditional/face-to-face.

The current study has some limitations. First of all, the study was conducted in curriculum development in education course. Thus, further research may be carried out in other courses in teacher education, and the findings may be compared and contrasted. Second, the researcher/instructor used ready-made YouTube videos as pre-lecture activities, and some videos were longer than 20 minutes. In this respect, the researchers/instructors may record and upload their videos on YouTube, whose lengths will be 20 minutes or less. Although blended learning via video streaming website YouTube was planned to be applied during the whole spring semester in 2019-2020 academic year, it could only be carried out during first half of the semester because of COVID-19 pandemic as all schools and universities were shut down in the second half of the semester, which may be considered as another limitation. A whole semester application may reveal different conclusions since prospective teacher may think differently after they have got used to the application in time.

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