

## Preservice Social Studies Teachers' Views of the Use of Quizlet in a Physical Geography Course

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### SUMMARY

This study aims to examine the views of preservice social studies teachers on the use of Quizlet in a physical geography course. The participants of the study consisted of 56 preservice social studies teachers who were second-year students in the social studies education program of the educational faculty of a state university and were taking the "physical geography of Turkey" course. At the end of a 5-week-long application of Quizlet, the qualitative data were collected using a questionnaire consisting of open-ended questions that were designed by the researcher. Participants' responses to the open-ended questions on the questionnaire were analyzed using qualitative descriptive analysis. Results showed that preservice social studies teachers found the use of Quizlet in the physical geography course as useful mostly because it was instructive and easy to use, allowed revising and permanence of knowledge, and the presentation of geography terms with visuals in Quizlet sets helped them to learn geography concepts. The most preferred modes among the categories in Quizlet sets by the participants were "flashcards", and their "match" in the games category. The majority of the participants did not have any problems when using the Quizlet study sets, but concerning the modes, some students had problems with the device, and they had problems with the internet connection. Based on the results of this research, using Quizlet in teaching the physical geography course and for teaching geography concepts are recommended.

**Keywords:** Quizlet, geography teaching, physical geography course, preservice social studies teachers

### INTRODUCTION

Today, the speed, change, transformation, and adaptation seen in all areas of life also manifest themselves in education, and new learning areas and a wide range of technological possibilities for both learners and educators are expanding every other day. Technological opportunities that offer alternative learning methods for both face-to-face and distance education have become a necessity for education with the pandemic. Today, technology is not only an element/option of efficiency, productivity, or diversity for educational settings but it also has become a component of education (Yetik et al., 2020). Since the subject to be taught, the target, and the qualifications of the teacher differ according to the structure of the teaching process for high-quality education, this component of education should be handled as a combination of content, pedagogy, and technology and should be used suitable for different needs (Kılıçer, 2012).

The geography course has a wide range of subjects (Öztürk, 2017) and involves many concepts. It is important to understand these concepts correctly and to eliminate misconceptions so that individuals can come up with ideas about this scientific field (Sever et al., 2009). Indeed, there are many geography concepts even in primary education subjects. Most of these concepts are related to physical geography (Alkış, 2005). Physical geography subjects are already important because they are related to human and economic geography. In other words, the reason for choosing the physical geography course as the subject of this research is that it involves basic subjects for learning other geography subjects. There are many concepts in the physical geography course, and students have problems with these concepts. For example, many studies have shown that students experience difficulties with concepts in the physical geography course (Akbaş et al., 2013; Alkış, 2006; Alım et al., 2008; Aydoğan et al., 2003; Başibüyük et al., 2004; Bozyiğit & Kaya, 2017; Cin & Özçelik, 2002; Coşkun, 2003; Demirkaya & Kayacan, 2016; Doğar & Başibüyük, 2005; Dove, 2016; Kızılcıoğlu, 2009; Nelson et al., 1992; Sever, 2005). The preservice social studies teachers included in the current study are going to be teachers who will teach geography subjects in the future. Some studies (Gülüm, 2010; Kuzey & Değirmenci, 2019; Pınar & Akdağ, 2012) that reveal preservice social studies teachers' misconceptions in physical geography show that physical geography topics and geography concepts are important issues to be emphasized in geography teaching.

Social studies teachers are the first to teach many geographical terms to students and to present a lot of information about physical, human, and economic geography. The physical geography course in the undergraduate social studies teaching program in Turkey is offered as a 2-hour General Physical Geography course a week in the first semester of the first year and the Physical Geography of Turkey course in the first semester of the second year. Preservice teachers, who have completed limited course hours, should know the subjects and concepts in physical geography well when they graduate because this is important for all the physical, human, and economic geography subjects. Therefore, creating an online learning environment is a necessity of the age to provide effective learning for preservice teachers within two-course hours, and developing a course tool that they can always access out of

classes in line with their needs is important. For these reasons, we chose and utilized Quizlet in the physical geography course in this study.

Quizlet is an online learning tool that can be used for geography teaching (Bayrak & Özeke, 2019; Srithar & Selvaraj, 2015). It has many advantages for education. Students can access Quizlet from both computers and mobile devices whenever they want (Wright, 2016). Quizlet has learning and game modes, in which students can choose to practice what they have learned. Team activities that teachers and students can perform together on Quizlet allow both to revise already studied topics and to develop collaboration and teamwork skills (Perevelova et al., 2020). The software allows students to learn at their own pace and teachers to add their content and recognize and focus on the learning needs of their students (Srithar & Selvaraj, 2015). It is a preferred learning tool for lessons that require reinforcement and revision and practice with visuals (Bayrak & Özeke, 2019). Educators can use Quizlet for students of all ages and all subjects (Sari, 2019). While Quizlet is a technology that takes students outside the walls of the classroom in face-to-face education, it is also one of the technologies that students can benefit from outside the classroom in the distance education process. Students can access study sets prepared on different subjects and follow their progress. In addition, with the Quizlet Plus subscription, the learning assistant evaluates and interprets what has already been learned, and does not repeat what users have learned well.

Teachers using Quizlet can create a Quizlet virtual classroom for free and include their students in this online classroom. They can see who studies the sets created and give feedback to them. They can also see which modes in the sets have been used and completed by how many students and evaluate student scores. They can also obtain information about when each student studied each set and how many times students used each mode in these sets. They can see which mode students started and completed and which mode they have not yet completed on their pages. Also, they can see the scores of the games in the sets prepared (Quizlet, 2021).

Quizlet has some advantages and disadvantages for the physical geography course that is the subject of our study. It allows the creation of sets by adding explanations to visuals and maps for physical geography subjects, it can provide students with a lot of visuals, and sets of images and names can be created to introduce landforms. It also allows for creating sets of concepts related to the subject of the lesson, creating visuals and definitions for the cards to be created for concepts, and designing sets of concepts that students have difficulty in understanding or confuse. Geography is not a science of rote learning. Quizlet sets aim to create a learning space for learners with visuals and explanations, to create a space for reinforcement and revision, and to make learning enjoyable with games. Despite Quizlet has many advantages, one of the disadvantages might be that students can see it as a material that needs to be memorized. Students should not see Quizlet as an area of rote learning. The teacher's guidance and feedback in the process are important to show that Quizlet is not a rote learning environment. Besides, students may need internet, smart phone or a computer for using Quizlet.

Despite the suitability of Quizlet for geography teaching, there is almost no study on the subject in the literature (Srithar & Selvaraj, 2015). Current studies on Quizlet are mainly in the field of language teaching (Andarap, 2019a; Andarap, 2019b; Anjaniputra & Salsabila, 2018; Arslan, 2020; Babtist, 2018; Barr, 2016; Çinar, 2019; Dizon, 2016; Ersoy Özer & Koçoğlu, 2017; Lander, 2016; Körlü & Mede, 2018; Okkan & Aydın, 2020; Sanosi, 2018; Sari, 2019; Setiawan & Wiedarti, 2020; Toy, 2019; Wright, 2016). It is expected that the study will both give an idea about the education of prospective teachers by sharing experiences and contribute to the literature.

This study aimed to examine the views of preservice social studies teachers about the use of Quizlet in the physical geography course. For this purpose, the study sought answers to the following questions:

1. According to the views of preservice social studies teachers, what are the advantages and disadvantages of using Quizlet in the physical geography course?
2. According to the views of preservice social studies teachers, what is the effect of using Quizlet on their learning of physical geography concepts?
3. Which mode in Quizlet study sets did preservice social studies teachers prefer using the most? Why?
4. Have preservice social studies teachers experienced any problems while using Quizlet study sets? If so, what are these problems?

## **METHOD**

### **Study Design**

This study aimed to examine the views of prospective social studies teachers about Quizlet as a result of their experiences with this application. The study used a qualitative case study design. The case study as a qualitative method, allows researchers to investigate and describe a case in detail in a predetermined time (Creswell, 2013). In this study, the researcher describes and investigates a case of using Quizlet application in a physical geography lesson.

## Study Group

The study group consisted of preservice social studies teachers who were attending the second year of the undergraduate social studies education program of the educational faculty of a state university where the study was carried out. The participants were taking the "physical geography of Turkey" course. The reason for choosing preservice social studies teachers in the study is that they will perhaps be the first people to teach many concepts related to physical geography when they become teachers. A total of 56 preservice teachers (36, 64.3% females - 20, 35.7% males) participated in the study. Of the preservice teachers, 91.1% (f = 51) had not heard of Quizlet before, and none of them had used it in the educational setting. Also, 80.4% (f=45) had Internet access. All of the pre-service social studies teachers had a smartphone, and 66% (f=7) of them did not have a computer (Table 1).

Table 1. Information about preservice social studies teachers

Gender	Female		Male	
	f	%	f	%
	36	64.3	20	35.7
	<b>Yes</b>		<b>No</b>	
	f	%	f	%
To be heard about Quizlet before	5	8.9	51	91.1
Using Quizlet in the educational setting before	-	-	56	100.0
Having constant access to the Internet	45	80.4	11	19.6
Having a computer	19	33.9	37	66.1
Having a smartphone	56	100.0	-	-

## Data Collection Tools

The researcher collected the study data using the questionnaire technique, which is used effectively in the survey model. Questionnaires can be developed as a measure consisting of open-ended and closed-ended questions suitable for the objectives of the research (Büyüköztürk, 2005). The researcher designed the questions of the questionnaire in the study by reviewing the literature and arranged the statements by referring to the views of two experts. One of them was a faculty member in the Educational Sciences field the other expert was a faculty member in Computer Education and Instructional Technology.

The questionnaire has two parts. The first part has 6 questions. The questions ask (1) the gender of the preservice teachers and some yes-no type questions about (2) whether they had heard of Quizlet before, (3) they had used it for educational purposes, (4) they had constant access to the Internet, and (5) they had a computer or (6) a smartphone. In the second part, there are four open-ended questions: *What are your thoughts about using Quizlet in the physical geography lesson?; What are your thoughts about the effect of using Quizlet on your learning of physical geography concepts?; Which mode in Quizlet study sets did you use most? Why?; Have you had any problem using Quizlet? If yes, what are these problems?*

## Data Collection and Analysis

The Physical Geography of Turkey course, in which the study data were collected, is offered 2 hours a week in the undergraduate program. This application was carried out during face-to-face education. The lecturer of the course created a virtual classroom for the Physical Geography of Turkey course on quizlet.com.tr for the application of Quizlet at the beginning of the semester. The study used the free content of Quizlet, which is offered for free by signing up. The paid subscription packages, such as "Quizlet Plus" and "Quizlet for Teachers" were not used.

The lecturer carried out the normal teaching process during class hours and planned the application of Quizlet as an extracurricular activity. The study was planned for a total of 7 weeks. Of these, students use of Quizlet took 5 weeks. The Quizlet activity process was as follows chronologically.

*Week 1:* The lecturer carried out the lesson using the presentation technique, provided information about Quizlet to the preservice teachers at the end of the lesson, and showed sample sets. The students were informed about the content of the categories and modes on Quizlet. The lecturer shared the code of the virtual Physical Geography of Turkey class created on Quizlet with the preservice teachers and provided participation in the class. During the first two weeks, students who were not in the class on the day when the system was introduced were assisted, so that the whole class could participate in the class created on Quizlet.

*Week 2:* The lecturer carried out the lesson (river topography) in accordance with the curriculum. At the end of the lesson, she checked the participants in the virtual class and answered students' questions about Quizlet. After

ensuring full participation in the class, the researcher shared the first set about river topography, which she taught in the lesson, in the virtual physical geography of Turkey class (river topography-28 concepts).

*Week 3:* The lecturer carried out the lesson (volcanic topography) and shared the set related to the lesson (Volcanic topography-12 concepts).

*Week 4:* The lecturer carried out the lesson (karst topography) and shared the set related to the lesson (Karst topography-15 concepts).

*Week 5:* The lecturer carried out the lesson (glacier topography) and shared the set for the lesson (Glacier topography-13 terms).

*Week 6:* The lecturer carried out the lesson (coastal topography) and shared the set related to the lesson (Coastal topography-12 terms).

*Week 7:* At the end of the lesson, the preservice teachers filled out the questionnaires.

The data collection process included an introduction to the virtual class in the first week, the presentation of five sets with a total of 80 concepts for five weeks, and an evaluation of the process for a week.

The open-ended questions of the study were analyzed using the qualitative descriptive analysis method. Frequency and percentage tables were created based on the frequency of the codes of the themes. While evaluating the statements of the preservice teachers, they were coded as Teacher-1 (T1, T2...), and these abbreviations were used in the quotations presented in the findings section. For the reliability evidence for the data analysis, the same two experts that had been consulted in the questionnaire development stage were also consulted after analyzing the data.

## FINDINGS

### Preservice social studies teachers' views on the advantages and disadvantages of using Quizlet in the physical geography course

Table 2 presents the views of the preservice teachers about the positive and negative sides of using Quizlet in the physical geography course.

Table 2. Frequency (f) distribution of the preservice social studies teachers' views of the advantages and disadvantages of using Quizlet in the physical geography course

Themes	f	Codes (Participants)
Advantages	14	Instructive T4,T5,T14,T16,T27,T32,T34,T39,T40,T41,T42,T46,T54,T56)
	9	Ease of use (T1,T7T,9,T12,T22,T23,T24,T37,T48)
	9	Opportunity to revise (T3,T6,T10,T21,T30,T38,T49,T53,T55)
	6	Permanence (T8,T15,T17,T31T,T33,T36)
	5	Entertaining (T19,T26,T68,T29,T45)
	5	Constant access (T2,T13,T35,T50,T51)
	2	Intelligible (T11,T44)
	2	Available everywhere (T20,T25)
	2	Time-saving (T18,T43)
	1	Interesting (T47)
Disadvantage	1	Not useful (T52)

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As seen in Table 2, almost all of the preservice teachers found the use of Quizlet in the physical geography course beneficial. Views of the benefits of Quizlet gathered under 10 themes, namely, instructive, ease of use, opportunity to revise, permanence, entertaining, constant access, intelligible, available everywhere, time-saving, and interesting. Regarding the theme "not finding technology useful in education", only one participant expressed a negative view about using Quizlet in the physical geography lesson by saying, "*I think writing is the best way to understand something. I do not find it right for technology to override paper and pencil in education. I do not find it useful because I do not have a positive view of it (T52)*".

The preservice teachers found the use of Quizlet beneficial in terms of its instructive aspect most (f =14). Ease (f=9) and opportunity to revise (f =9) ranked second place and permanence (f =6) third place. These themes were followed by entertaining, constant access, intelligible, available everywhere, and time-saving, and the fewest views were expressed for the “interesting” theme. Some of the views of the preservice social studies teachers about the positive and negative aspects of using Quizlet in the physical geography course were as follows:

*“I always have a problem with concepts in the geography course. I think it has increased my knowledge of concepts.”(T5- Instructive)*

*“I have found it easier as it is more intelligible and clearer with a short summary.” (T7-Ease of use)*

*“I used it more to reinforce what I have learned. I have been able to revise the concepts I have learned in the lessons.”(T3-Opportunity to revise)*

*“I can say that especially visuals have made what I learned permanent.” (T8-Permanence)*

*“I never liked the geography lesson. For the first time, I have learned a subject of geography by having fun and without getting bored.”(T45-Entertaining)*

*“Since I am constantly engaged in my smartphone, I have been able to look at it whenever I want.”(T13- Constant access)*

*“I have found the application quite intelligible. I have been able to understand the concepts which I could not fully understand from the book with visuals on Quizlet.”(T44-Intelligible)*

*“Since it is available at any moment, you can study it everywhere.” (T20- Available everywhere)*

### **Views of preservice social studies teachers on the effect of using Quizlet on their learning of physical geography concepts**

The data was analyzed and results are presented in Table 3.

Table 3. The distribution of preservice social studies teachers’ views of the effect of using Quizlet on their learning of physical geography concepts

<b>Themes</b>	<b>Codes (Participants)</b>	<b>f</b>
<i>Learning</i>	The effect of the presentation of the concepts using visuals (T16, T30, T32, T38, T39, T40, T41, T43, T48, T50, T51), Learning new concepts (T6,T11,T34,T44,T46,T49), Correcting misconceptions about the concepts (T5,T28,T54,T56), A positive approach to the concepts (T4,T23,T29), Learning difficult concepts (T1,T2,T25), Time-independent learning (T21,T33), Learning the concepts confused (T20,T35)	31
<i>Ease of use</i>	Concepts have become shorter, clearer, and more comprehensive (T9,T19,T22,T31,T37,T42,T45,T55) Easy access to concepts (T3,T7)	10
<i>Permanence</i>	Opportunity to revise (T8,T10,T14,T17,T24), Effect of visuals on permanence (T13,T15,T27)	8
<i>Entertaining</i>	Learning with fun (T12,T18,T26)	3
<i>Liking</i>	Making the concepts likeable (T47,T53)	2
<i>Difficult</i>	Always finding the concepts difficult (T36,T52)	2
<b>Total</b>		<b>56</b>

The majority of the pre-service social studies teachers expressed positive views of the effect of using Quizlet on learning physical geography concepts (f =54) but that only two of the participants had negative views. The preservice teachers who had a negative idea stated that they found learning those concepts difficult both before and after using Quizlet. The statements of the preservice teachers were as follows:

*“Using Quizlet had no effect on me; concepts are still difficult.” (T36- Learning)*

*“I find the geography lesson difficult in general. I do not like the concepts at all. Even the applications related to geography haven’t made them likable.” (T52-Difficult)*

The views of the preservice teachers on positive statements gathered under five themes. These themes were named learning, ease of use, permanence, entertaining, and likable (Table 3). The preservice teachers’ views mostly concentrated on the learning theme (f=31). The effect of presenting concepts with visuals on Quizlet on learning

was stated as follows, respectively: learning (f=11); learning new terms (f=6); correcting misconceptions about concepts (f=4); developing a positive approach to concepts (f = 3); learning difficult concepts (f=3); learning at any time (f =2); and learning the concepts confused (f=2). Positive views also included the themes of ease (f=10), ease of understanding thanks to the briefness of the concepts, and ease of accessing, which ranked second place, and permanence (f=8), the opportunity to revise concepts, and the effect of the presentation of the concepts with visuals on permanence, which ranked third place. Furthermore, pre-service teachers stated the application led to learning with fun and making the concepts likable.

Some of the positive statements of preservice social studies teachers about using the Quizlet application to learn physical geography concepts were as follows:

*"Seeing the concepts with visuals helped me to learn better. Games and tests supported revision."* (T16-Learning)

*"Presentation of the concepts with pictures was beneficial to me. There were a few concepts that I confused. The application helped me to understand better."* (T20-Learning)

*"It was easier to reach the concepts that I didn't know. I used it as a dictionary and reached the concepts I forgot easily."* (T3-Ease of use)

*"A concept is presented at least three or four times. This makes it easier to retain."* (S14- Permanence)

*"I did not procrastinate it because I perceived it as a game, not a lesson. I studied whenever I wanted to by having fun."*(T18-Entertaining)

#### **Views of the preservice teachers in about which mode in the study sets prepared about physical geography they mostly preferred using and the reasons for their preferences.**

The modes preferred by the preservice teachers and their reasons are presented in Table 4.

Table 4. Frequency (f) and percentage (%) distribution of preservice social studies teachers' views about which mode they mostly used in Quizlet study sets in the physical geography lesson.

The preferred mode	f	Themes for reasons	f
Flashcards	30	Instructive	15
		Entertaining	5
		Opportunity to revise	4
		Ease of use	3
		Interesting	2
		Liking	1
Learn	20	Instructive	11
		Permanence	3
		Ease of use	2
		Entertaining	2
		Opportunity to revise	2
Match	3	Entertaining	2
		Instructive	1
Write	1	Opportunity to revise	1
Listen and write	1	Opportunity to revise	1
Test	1	Self-evaluation	1
Total	56		56

As seen in Table 4, the preservice teachers in the study used the flashcards, learn, write, listen-write, test, and match modes in the Quizlet set. Of these modes, they used the flashcards most (f=30). They stated that the most important reason for preferring the flashcards mode was that they found it instructive (f=15). The second reason was that it was entertaining (f =5). This was followed by an opportunity to revise, ease of use, being interesting, and liking, respectively.

The learn mode was the second most preferred mode by the preservice teachers (f=20). This mode was also preferred mostly because it was instructive (f=11). The second reason was permanence (f=3). This was followed by other reasons: ease of use, fun, and opportunity to revise, in the learning mode.

Three participants who preferred the match mode most stated it was because they found it fun (f=2) and instructive (f=1). Write, listen-write, and test modes were the least preferred modes. The write mode was preferred only by

one participant because it provided an opportunity to revise, and the test mode was preferred only by one participant because it provided self-evaluation.

Some of the views expressed by the preservice teachers regarding their reasons for choosing the mode they used most were as follows:

*"Since I don't know most of the concepts, I have to learn their definitions. To do this, I used the flashcards mode frequently." (T23-Cards-Instructive)*

*"I use the learn mode to do more revision." (T36-Learn-Opportunity to revise)*

*"I found the concepts on the flashcards easy. The concepts were given briefly and clearly, so it was easy, and I used the cards mode." (T45-Cards-Ease of use)*

*"When I studied in the learn mode, it helped me retain better." (T18-Learn-Permanence)*

*"I can see my own knowledge best there. That's why I find Quizlet tests more useful than others." (T5-Test-Self-evaluation)*

*"I used match mode most because it attracted my attention a lot, and it was one of the things I enjoyed doing." (T6-Match-Fun)*

### **Have the preservice social studies teachers experienced any problems while using Quizlet study sets? If so, what are these problems?**

The problems experienced by preservice social studies teachers while using Quizlet study sets are presented in Table 5.

Table 5. Distribution of problems experienced by preservice social studies teachers while using Quizlet study sets

<b>Theme</b>	<b>Codes (Participants)</b>	<b>f</b>
<i>Problems with modes</i>	Write mode accepts correct answers as incorrect due to spelling and punctuation mistakes (T6, T19, T20, T29, T33, T41, T45, T53, T54), Games do not run (T2, T11, T12, T15), Failure to complete listen-write activities because this mode gives error due to spelling mistakes (T16, T21) Some visuals and maps do not load on the phone (T39, T41)	17
<i>Device problems</i>	Lack of a computer (T8,T32)	2
<i>Internet problems</i>	Inability to access the Internet (T43)	1
Total		20

While 64.3% (f = 36) of the preservice social studies teachers did not experience any problems while using Quizlet study sets, 35.7% (f=20) had device and Internet problems related to the modes. The majority of the problems were related to the modes (f=17). The problems regarding the modes were as follows, respectively: the write mode accepts correct answers incorrect due to spelling and punctuation mistakes (f=9); games do not run (f=4); the listen-write mode fails to complete the session because this mode gives error due to spelling errors (f=2); some visuals and maps do not load on the phone (f=2). Also, the preservice teachers stated that they experienced device problems, such as not having a computer and not being able to access the Internet.

Some of the statements of the preservice social studies teachers regarding the problems they experienced while using Quizlet study sets were as follows:

*"Yes, I have. Some concepts were troublesome in the write mode. That's when you write the concepts in the flashcards mode in the write mode, it evaluates your answer incorrect when a letter is different, capital-low letter use is incorrect, or you don't leave a space after a full stop." (T45-Problems with modes)*

*"In the write mode, it pays attention to suffixes and dots, so when it evaluates your answer as incorrect, it can be demoralizing." (T30- Problems with modes)*

*"I couldn't access Gravity and Live games from my mobile phone." (T15- Problems with modes)*

*"I don't have a computer. It didn't sometimes run on my phone. That's why I sometimes had trouble reaching the sets." (T8- Device problems)*

*"I can't always have access to the Internet. I had problems because of the Internet." (T43-Internet problem)*

## **DISCUSSION AND CONCLUSION**

In this study, the views of the pre-service social studies teachers regarding the use of Quizlet in physical geography lessons were examined. Almost all of the participants found the use of Quizlet practical in the physical geography course, but one student did not find it useful because he did not have a positive approach to technology in education. The preservice teachers found the use of Quizlet in physical geography lessons useful firstly because it was instructive. Ease and allowing revising ranked second place, and permanence third place. Many studies have shown the benefits of Quizlet for students. For example, Srithar & Selvaraj (2015) concluded in their study that Quizlet was used for students to learn and study complex matters easily. Also, students in this study expressing views for the geography lesson stated that Quizlet helped them to learn with fun, their learning and exam performances would be better when the software was used regularly, and that it could bring a positive attitude towards geography. Köse et al. (2016) aimed to determine the benefits of using Quizlet in the process of French learning, and they found it useful for listening, reading, speaking, and writing skills in learning French. Dizon (2016) stated that students found Quizlet useful in terms of vocabulary learning, ease of use, and using it everywhere. Despite the benefits of Quizlet, some students cannot give up traditional methods, as in our study. As a matter of fact, Lander (2016) concluded that some university students preferred traditional methods as understood from their views of Quizlet.

According to the data obtained from the study, the majority of the pre-service social studies teachers had positive thoughts about the effect of using Quizlet on learning physical geography concepts, but only two participants had negative views about it. Participants who had positive thoughts expressed views under learning, ease of use, permanence, entertaining, and liking themes related to the concepts. The majority of the views were on the learning theme regarding the geography concepts. In this context, Quizlet was found to be practical in learning geography concepts. The preservice teachers stated that what helped them learn most was the presentation of the concepts with visuals. Andarap (2019b) concluded that visuals helped to learn vocabulary on Quizlet. In our study, the preservice teachers expressed views about learning geography concepts on Quizlet mostly using the “concepts are short, intelligible, and easy” code of the ease of use theme and “opportunity to revise” code of the permanence theme. The results of the Anjaniputra & Salsabila (2018) are in line with the results of our study. In this study, too, students saw Quizlet as a fun tool in addition to its learning and permanence effect. Çinar (2019) concluded that Quizlet contributed to learning, permanence, and having fun. Also, although not specific to geography concepts, there are studies investigating the effect of using Quizlet on vocabulary learning (Andarap, 2019a; Babtist, 2018; Barr, 2016; Dizon, 2018; Ersoy Özer & Koçoğlu, 2017; Körlü & Mede, 2018; Okkan & Aydın, 2020; Sanosi, 2018; Toy, 2019).

The preservice teachers who negative views had stated that they found these concepts difficult before and after using Quizlet and that it did not help them to learn at all. In their study investigating the effect of Quizlet on foreign language vocabulary learning, Ersoy Özer & Koçoğlu (2017) concluded that there was no significant difference between the use of Quizlet and vocabulary notebook between the groups in terms of learning vocabulary and retention.

It was concluded that the preservice social studies teachers generally used the five modes (learn, flashcards, write, listen-write, test) in the study sets. However, the most preferred mode was flashcards among the categories in Quizlet sets. This was followed by the learning mode. In both modes, the leading reason for the preference was that it was instructive. The match mode in the game category was the third most preferred mode by the participants for it was fun and instructive. The write, listen-write, and test modes were the least preferred modes by the preservice teachers. In a study on the effect of Quizlet on secondary school students' attitudes towards vocabulary learning, Çinar (2019) found the most preferred mode on Quizlet was the “match”. Flashcard activities were the least preferred mode by the students. In a study on the effect of Quizlet on the vocabulary development of university students studying English for Specific Purposes, Arslan (2020) stated that students preferred gravity, live, and match games and listen-write and card modes because they found them fun, instructive, and practical. However, the write, learn, and test modes were not preferred because students found them boring. Hikmah (2019) stated that students were happy to learn through games. The modes students used on Quizlet and the positive effects of the feedback they received from these modes were effective in this result. It can be thought that students enriched their learning through various modes of Quizlet and benefited from the application. Seeing the scores in the modes of Quizlet affected students' progress positively (Bilcan, 2019; Lander, 2016). Also, completing tasks in different modes is important in terms of the effect of Quizlet (Okkan & Aydın, 2020; Sanosi, 2018).

In our study, the preservice teachers used only the match mode among the modes in the game category. This situation can be explained by the fact that although all of the preservice teachers had smartphones, only 19 of them had computers. Gravity and live games are played on the computer, and live is a team game. The match game can be played alone on a mobile phone. It can be thought that this situation caused preservice teachers to prefer this game.

The vast majority of the pre-service social studies teachers did not have any problems using Quizlet study sets. However, they experienced device and Internet problems regarding the modes. The leading problem was experienced with the write mode because it accepted correct answers as incorrect due to spelling and punctuation

mistakes. It is necessary to input one-to-one matching and correct answers on Quizlet (Bayrak & Özeke, 2019). Köse et al. (2016) stated that Quizlet caused students to feel disappointed when their answers were accepted as incorrect due to punctuation and spelling mistakes in their answers.

Other problems about the modes on Quizlet were as follows: games did not run, listen-write mode activities could not be completed because spelling mistakes caused errors, and some visuals and maps did not load on smartphones. It was also revealed that preservice teachers had device problems, such as not having a computer and not having an Internet connection.

### Recommendations based on the study result

- Quizlet can be used as a learning tool in the teaching of geography concepts in the physical geography course.
- Apart from physical geography, Quizlet can also be used in many human and economic subjects. It can be recommended for concepts in other geography courses and subjects that students confuse and do not like.
- Teachers who are planning to use Quizlet in courses can first determine the most preferred modes by their students with short applications and then they can enrich their learning environment using these modes.
- In our study, the preservice teachers found the Quizlet application instructive. To benefit from the instructive aspect of the application, students can be given support to create a set about geography within the course. For example, a student who finds the flashcards mode instructive may be asked to prepare a set of flashcards containing the subjects and concepts that he/she has a problem with. Thus, the student can use the flashcards he/she has prepared as course material.

### Implications for researchers

- In the literature, there is almost no study on the use of Quizlet in the Geography course. In this context, studies on the use of Quizlet in geography lessons can be carried out.
- This study was conducted with preservice social studies teachers; various studies can be conducted with preservice teachers of other disciplines about the use of Quizlet.
- Studies can be conducted to investigate the views of geography teachers about the use of Quizlet in geography lessons.
- In this study, the lecturer prepared Quizlet sets herself. Sets can also be prepared in cooperation with students. In this context, studies can be carried out to evaluate the student-created Quizlet sets.

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