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AN INVESTIGATION INTO THE EFFECTS OF ONLINE ENGLISH LESSONS ON THE ATTITUDES, ACHIEVEMENTS, MOTIVATION AND COGNITIVE LOADS OF THE EFL LEARNERS

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ÖZET

Amaç: *Bu çalışmanın amacı, üniversite öğrencilerinin çevrimiçi dersler sırasındaki motivasyon, başarı, tutum ve bilişsel yük düzeylerini incelemektir.*

Yöntem: *Çalışma karma araştırma desenine sahiptir. Katılımcılara bir anket formu gönderilmiştir ve algı ve tutumlarını öğrenmek için katılımcılarla yarı yapılandırılmış görüşmeler yapılmıştır.*

Bulgular: *Araştırmanın sonunda motivasyonu yüksek öğrencilerin düşük motivasyona sahip öğrencilere göre daha başarılı olduğu sonucuna varılmıştır. Çevrimiçi öğretime karşı olumlu tutumları olan katılımcıların, çevrimiçi kurslara düşük zihinsel çaba harcadıkları anlaşılmıştır. Başka bir deyişle, çevrimiçi derslerde çok yüksek zihinsel çaba harcayan, yüksek bilişsel yüke sahip öğrencilerin çevrimiçi öğrenmeye yönelik olumsuz tutumlara sahip olduğu sonucuna varılmıştır*

Sonuç ve Öneriler: *Çalışma, üniversite öğrencilerinin çevrimiçi İngilizce derslerindeki tutumlarını, motivasyonlarını, başarıları ve bilişsel yüklerini araştırmıştır. Bu çalışma 50 öğrenci ile sınırlıdır. Sonraki çalışmalar daha fazla öğrenci ile yapılabilir ve farklı sonuçlar elde edilebilir. Ön test ve son test uygulanabilir. Böylece karşılaştırmalı bir çalışma yapılabilir.*

Anahtar Kelimeler: Bilişsel Yük, Uzaktan Eğitim, Online dersler, İngilizce Öğretimi,

Abstract

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Purpose: *The purpose of this study is to investigate university students' levels of motivation, achievement, attitude and cognitive loads during the online courses.*

Method: *The study has a mix research design. A questionnaire form was sent to the participants and semi-structured interviews were carried out to find out perceptions and attitudes of the participants.*

Results: *At the end of the study, it was concluded that the students who had high level of motivation were more successful than those having low motivation level. The participants who had positive attitudes to online teaching invested low mental effort in online courses. In another words, the students who invested very high mental effort in online classes also had negative attitudes to online learning.*

Conclusion and Suggestions: *The study investigated attitudes, motivation, achievements and cognitive loads of university students in online English courses. The study is limited to only 50 students. The further studies can be carried out with a lot more students. Pre-test and post- test can be administered. Thus, a comparative study may be performed.*

Keywords: Cognitive Loads, Distant Education, Online Courses, Teaching English,

INTRODUCTION

Today the people all around the world have been experiencing hard times since the early 2020s on account of the Corona virus pandemic. In our country the pandemic has brought a great deal of alterations in people lives and the authorities have been proceeding to make compulsory regulations in several areas such as flexible working hours, quarantines and curfews. In order to minimize the spread potential of the pandemic, the authorities have made some decisions. "Social distance "and "wearing mask" have become indispensable for our "new normal" lives. One of the measures taken to struggle with the pandemic has been distance education. Students have to take distance and online education during this exceptional period. Online courses and distance education have some effects on students' motivation, attitude and achievement levels and also on their cognitive loads. Cognitive load refers to the load that is imposed on working memory while performing a particular task. According to Sweller (2005) based on our knowledge of the human cognitive architecture, cognitive load theory (CLT) addresses the limitations of working memory capacity and the construction of schema automation in long-term memory. In this direction the study aims to find answers to the following questions;

1. What are the students' attitude, motivation and cognitive load towards online English courses?
2. Is there a difference in the attitudes, motivations and cognitive loads of the students according to their achievement levels?

Literature Review

Cognitive load theory is concerned with the learning of complex cognitive tasks that occur with the amount and interaction of information that must be simultaneously processed before learning begins, and focuses on cognitive processes (Paas, Renkl, & Sweller, 2004). In information processing processes, it is assumed that people have limited working memory and unlimited long-term memory. Working memory capacity is limited to only seven elements (Miller, 1956). Sweller, Van Merrienboer and Paas (1998) state that the information stored in long-term memory is an indicator of individuals' true mental powers. Mental structures, which are one of the components of cognitive architecture and stored in long-term memory, can be defined as a network of certain information or a classification of elements to be used in a subject. People have to develop different mental structures to use them in solving certain problems. As a result of the development of mental structures, the load on the working memory decreases. For this reason, the aim of learning-teaching processes should be to help students develop their mental structures (Anglin, Vaez, & Cunningham, 2004). Cognitive load refers to the resources used by working memory in a certain period of time. Three types of cognitive load are generally mentioned: intrinsic load, extranous load / ineffective load and effective/germane load (Sweller et al., 1998; Paas, Tuovinen, Tabbers, & Van Germen, 2003). Intrinsic load is the type in which the loading occurs in the working memory, depending on the content that is difficult to learn. When the information presented is complex, the actual load will be high. Usually the real burden is high, as there are many things people have to learn. Extra-subject load is the loading of working memory as a result of poorly designed teaching materials and poor instructional design. The designed learning environment, inappropriate information or other materials that negatively affect the information processing process the off-topic load will be high. The effective load occurs in the processes that enable the formation and regulation of mental structures. It is under the control of instructional designers as the extra-subject and effective load is affected by instructional design. What is important is that the sum of the actual load, extraneous load and effective load does not exceed the capacity of the working memory, in other words, the expected learning takes place due to the absence of excessive cognitive load. For this reason, when designing multiple

media, researchers are using pictures and graphics and examining how to use animations by taking into account the cognitive load theory is important for learning processes to be effective and efficient (Anglin, et al., 2004; Baron, 2004; Paas, Tuovinen, et al., 2003).

In order for these three types of loads not to exceed the capacity of the working memory, instructional designers emphasize the need to reduce the extraneous load and suggest alternative teaching designs and processes at this point. When the extraneous load and the intrinsic load are high, it is very important to try to reduce the extraneous load as these two types of loads are added on top of each other. When the intrinsic load is low, the level of the extraneous load is less important as the sum of these two types of loads will not exceed the capacity of the working memory. Therefore, if the content to be learned is difficult, instructional designers need to make more effort to reduce the cognitive load. High extraneous load, which is stated to be affected by the instructional design process, prevents learning, while effective load increases learning. Therefore, reducing the irrelevant burden, it will allow more room for effective load and more effort to be made to build mental structures. The formation of mental structures will reduce the intrinsic burden. The relationship between these three loads is asymmetrical and in the form of a loop. The reduction of extraneous load with the effective structuring of the instructional design process will allow the space in the working memory to be divided into effective load and thus mental structures can be formed easily. With the formation of mental structures, the actual load will decrease in the next stage. For this reason, efforts are made to develop teaching techniques to reduce the extraneous burden in the instructional design process. In cases where the actual load is assumed to be constant, the successful reduction of the extraneous load with these principles results in an increase in the effective load required for the formation of mental structures (Paas, Renkl, & Sweller, 2003; 2004).

Cognitive load theory is concerned with developing effective teaching methods that will enable individuals to use their limited information processing capacity effectively, considering the three types of cognitive loads mentioned. The cognitive load theory is based on the cognitive architecture that interacts with long-term memory, enables the processing of visual (visual) and auditory (verbal) information consists of two partially independent channels and includes limited working memory. Cognitive load theory, which aims to ensure the effective use of working memory capacity by developing new teaching methods, focused on working memory and the limitations of this memory in the instructional design process (Paas, Tuovinen, et al., 2003).

When literature is reviewed, it is seen that there are several studies on cognitive load theory. In their studies, Chen and Cheng Chang (2009) investigated the relationship among three variables- cognitive load, foreign language anxiety and task performance. They found out that the students with higher foreign language anxiety were caught with a higher cognitive load.

Küçük, Yılmaz and Göktaş (2014) studied augmented reality in learning English and they explored the levels of attitude, achievement and cognitive loads in students learning with augmented reality applications. At the end of their research, the authors found that the students learning English with these applications had low anxiety and they were pleased with these kinds of applications and they had low cognitive loads.

Coşğun and Satıcı (2017) carried out a research on the effect of principles for extraneous processing in multimedia learning on learners' cognitive load, recall and transfer performance. They obtained the fact that multimedia caused more cognitive load and affected learning transfer performance in a negative way. Furthermore they showed the extraneous cognitive load had no impact on the recall performance.

METHODOLOGY

Methodology

Participants

The participants of the study consisted of 51 non-English major students enrolled in a 4-year program at a state university in Erzurum, Turkey. There were 20 male students and 31 female students. All of the participants were from level A. Their ability levels were measured by the placement test that the school conducted at the beginning of the academic year to judge English proficiency. The subjects ranged from 18 to 22 years of age. They all had previously undergone nine years English from primary school to high school.

Instruments

The Cognitive Load Subjective Rating Scale (CLSRS) (Paas, Van Merrienboer, 1994) and a semi structured interview form were used in the study. In the case of the CLSRS, the participants were asked to estimate how much mental effort they invested during the online classes, listening to an English audio file or the teacher on a 9- point scale ranging from "very

very low" corresponding to the number 1, to "very very high", corresponding to the number 9. The scores that were obtained from this rating scale were used as an indicator of cognitive load.

In addition the participants were administered a semi-structured interview form consisting of 9 questions in order to find out their levels of attitude and motivation toward online English courses. The questions were about the courses duration, content of the topics, the external factors affecting the students' motivation such as weak internet connection and certain system failures and their own environment during the online course.

Finally the participants experienced an exam consisting of multiple choices. Considering their language level, the exam had elementary level questions; the results were used as the indicators of achievement levels of the participants.

Procedures

The study began with the administration of English exam. According the results of the exam 10 participants were elected. Out of 10 participants, 4 had the highest exam grade, 3 the lowest and 3 participants had medium level. Then the semi-structured interview was carried out. The participants were reminded that they were supposed to answer the questions based upon the English tasks including the fall semester. In the last step, CLSRS was administered to the participants.

RESULTS

The attitudes of the participants to distance education and online courses could be said to be quite negative. Majority of the students think that online English courses are not efficient enough for them. Furthermore they believe that formal teaching is better than online teaching in terms of interaction between the teacher and the students. Some of them stated that they found online classes boring and sometimes they did not follow the whole lesson. On the other hand, the participants, in general think that their course book is enjoyable and it helps them learn better. In addition there are a few who think online education has many advantages such as watching the recorded course videos again and thus taking notes and asking the teacher in the student information system.

Motivation is also one of the topics that the participants were requested to talk about. The participants were asked to explain what demotivated them during the online classes. They mostly answered similar problems such as internet connection, course system errors, weak connection, power cuts and circumstances at home as the things that make them less

enthusiastic about online English courses. Unlike these common complaints, touching upon another critical matter, one of the participants stated the excuse that caused her to feel less motivated as follows;

"As I have no computer, I have to connect to online courses via my smart phone. The screen is not wide therefore I cannot see the content of the lesson and I cannot write practically so it is difficult to attend the class actively. This situation discourages me to listen to the lesson."

Some participants stated that listening parts are responsible for losing motivation during the lessons. They told they could not follow the listening parts and could not give the answer. As a result they were not willing to the lesson. When the participants were asked the motivation resources in the online English courses, they answered several factors. The most given answer was teacher's interaction with the students. They particularly remarked the energy and tone of voice in the lecturer reflected to them positively and they were motivated positively. One of them stated as follows;

"The teacher's smiling face, the energy in her voice and her asking us all about our state, before the lesson, raise my mood. I suddenly feel ready for learning. We haven't met her face to face but we have a solid relationship"

The course material and the exercises during the course were also given as motivating factors. In addition, the participants are of the opinion that English course hours ought to be short. They felt that if the lesson hour lasted longer than usual duration, their interests for the lesson moved away. End of topic activities are also found useful and enjoyable but some who have no microphone think if the microphones are on, this might cause noise and they cannot adapt to lesson.

When the participants compare online English teaching to formal teaching, they mostly agreed that face to face learning would be better and more productive. In formal education the students think that they will be able to express themselves better. They claim they would be more active if the lessons were face to face. A participant explains his ideas on online English lesson as follows;

"Not everyone has a microphone, and English is a lesson in which the students are required to speak and answer the questions verbally. Thus this is a disadvantage. Even if ı have microphone, I cannot use it because of the noise at home. I am of the opinion that formal education will be better."

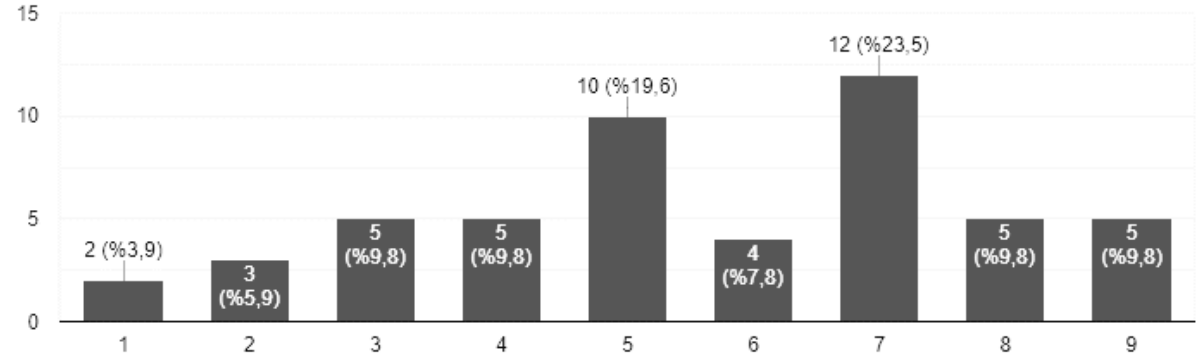
Another stated that:

"I have a crowded family so I can easily spoil my attention when I see or hear something at home during the course. I can never stay alone; sometimes I cannot attend online classes. I believe that I will do better in formal education."

As understood from the interview results, the majority of the participants are not pleased with the online classes. They think that they will be more successful when the lessons are face to face. They do not feel motivated. They are freshmen at university and they have never attended formal lessons before. Therefore some of them indicated that they did not feel like student as they did not go to classrooms. As mentioned above connection failures, system-related problems and home environment have mainly negative effects on student attitudes to English lesson and their motivations. Considering their exam results, we can say that the highest grade students have, the less they complain about online classes. The participants taking the lowest grades in the exam were seen to be less motivated to online lessons and they are not willing to take distance education. The others who have medium level do think there is no big difference between the online English courses and face to face English lesson.

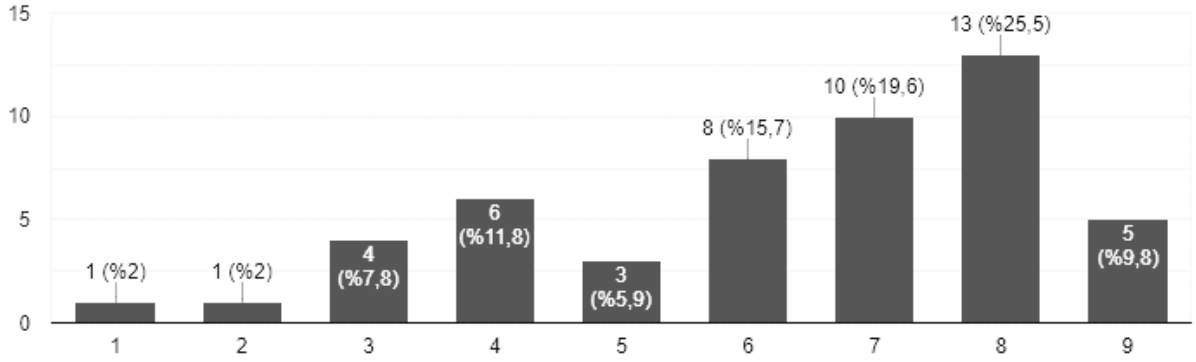
The other data collection method in the study was administered in order to measure cognitive loads in the participants. In the Cognitive Load Subjective Rating Scale (CLSRS) (Paas, Van Merrienboer, & Adam, 1994), 15 items were included and cognitive load levels were measured according to the answers of 51 participants. All of the participants are between the ages 18-30. The CLS (cognitive load scale) was administered to all participants to assess the 14 week online English courses. CLS measures how much mental effort the individual invested in studying or in solving a task in a complex learning environment, from very, very low mental effort to very, very high mental effort. It is a 9-point scale. "9" refers very very high effort and "1" refers to very very low effort.

In the first item, the participants were observed to have cognitive load considering the results. The item is "While I am listening to online English lesson, I invest mental effort." The graphic 1 that show the cognitive level of the students is as follows;



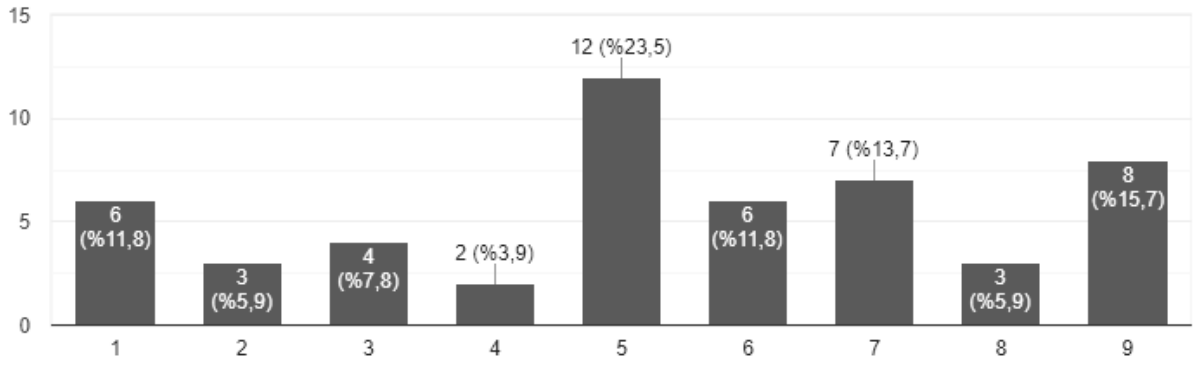
Graphic 1. "While listening to online English courses"

As it is understood from the Graphic 1, the percent of the participants who invest high mental effort while listening to online English lessons are 23.5. Out of 51, 12 participants think that they invest high mental effort. The points of extremely high mental effort and very high mental effort have %9 share and the lowest point is shared by only two participants. %19 of the participants are found to have neither low nor high mental effort in listening to online lessons.



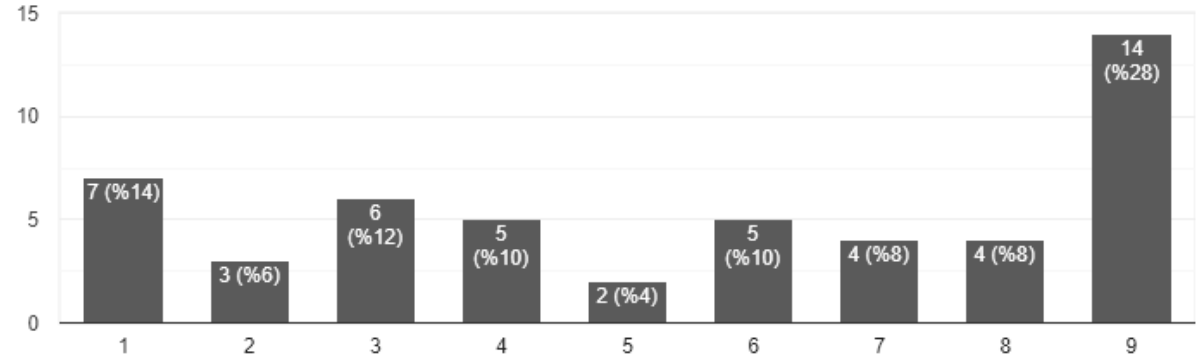
Graphic 2. "When learning a new subject in English"

Graphic 2 shows the cognitive loads assessments of the participants when they are taught a new topic in an online English lesson. %25 of the participants are seen to have very high mental effort and this means the quarter of all the participants. The graphic tends to increase toward the high. That is to say, we could say that the students have mental effort in learning new topics. The number of those who say that they have no cognitive load in learning a new topic in online classes is quite low.



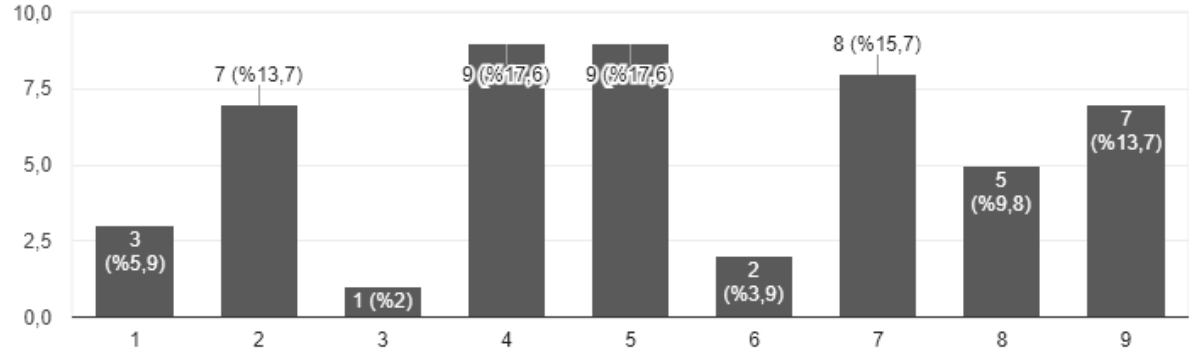
Graphic 3. "When the environment where I attend the online English course is crowded and noisy,…"

It is understood from graphic 3 that the environment does not have a direct effect on cognitive loads of the students. That is because the majority of the students, %23.5, think that they do invest neither low nor high mental effort in the environment in which they attend the online English classes. It is seen that the highest rate is %15 and the lowest rate is similarly %11.8.



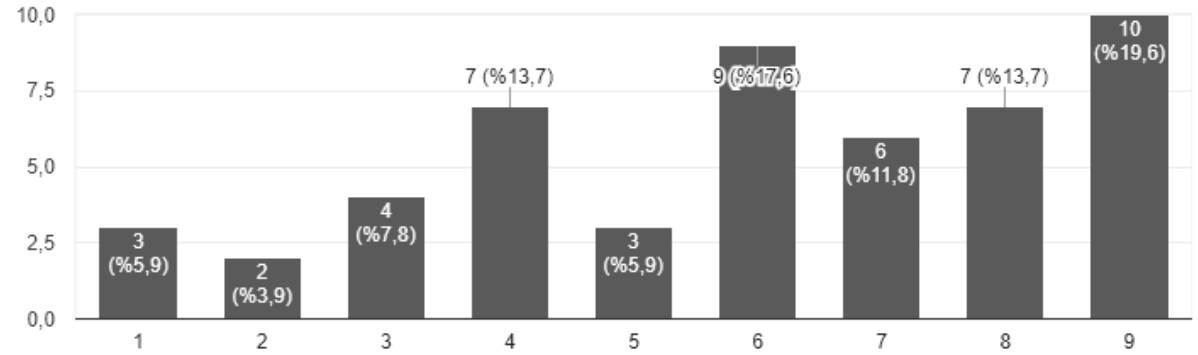
Graphic 4. "When the internet connection is weak, bad and I continuously have to connect again"

Graphic 4 shows a consistency between the cognitive loads results and the interview results of the participants. The rate of the participants who have very very high mental effort when they have difficulties with the internet connection and certain system failures is %28. This ratio is twice the one of the very very low mental effort. Cognitive loads are clearly seen in case of an unwanted situation during online English courses.



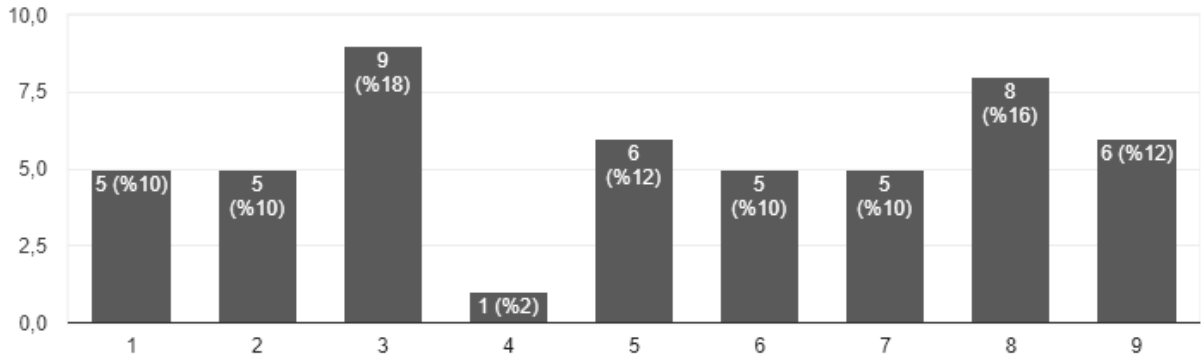
Graphic 5. When the instructor speaks in English in online classes

When the instructor speaks English during online classes, graphic 5 shows the cognitive load level of the participants in a low degree. The result shows that 9 participants have neither low nor high level cognitive load. In addition 9 participants have quite low mental effort while listening to the teacher's speaking in English. It is seen that %15 of them invest high cognitive load.



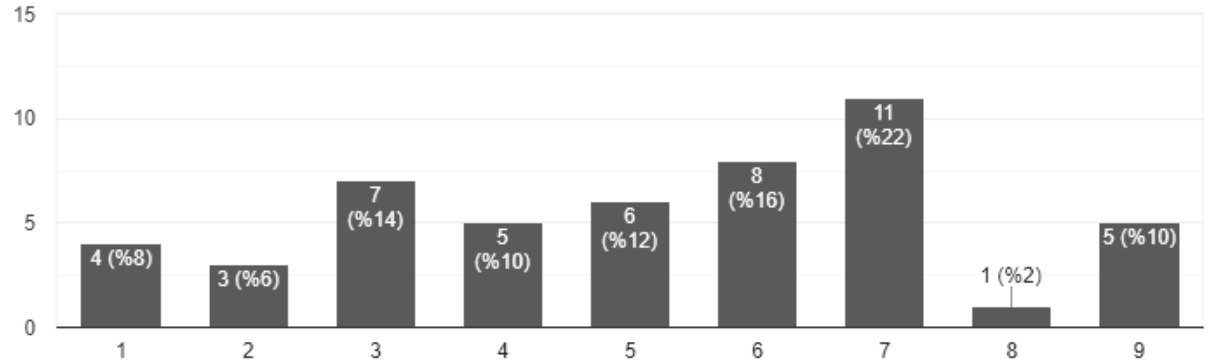
Graphic 6. "In order to understand English listening parts, I invest…"

As it is seen in the graphic 6, the participants have very high cognitive loads. The graphic tends to go up to point 9. The majority of the participants mentioned in the interview that they have difficulties in listening parts and when they do not understand they are demotivated. Therefore we can say that motivation and cognitive loads are inversely proportional as the results show that when the cognitive loads are high, motivation is found low.



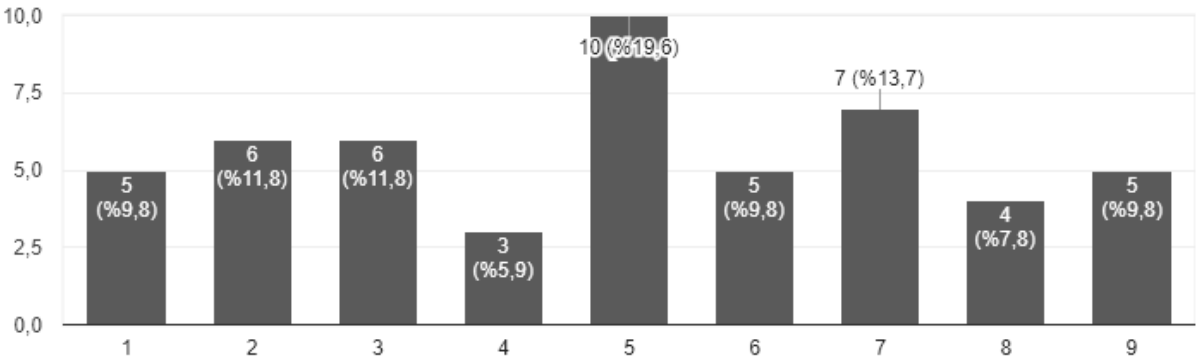
Graphic 7. "Doing English homework, I invest…"

As it is seen in the graphic 7, cognitive loads are not so evident when it comes to doing homework. The participants who have the highest ratio in the graphic is %18 and it refers to low effort. Very very low effort is also %10 and in a similar manner the same ratio belongs to very low effort. The neutral cognitive load is represented by %12. This ratio is equal to very very high effort. On the other hand %18 of the participants invested very very high mental effort in doing homework.



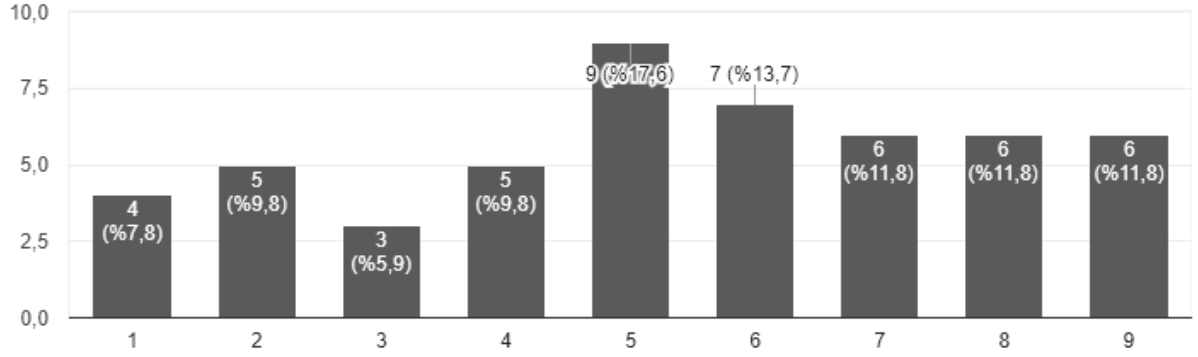
Graphic 8. "Understanding the course material"

As it is seen in the graphic 8, course material is reported to be enjoyable and useful in the interview forms. However the cognitive loads while the students study with the material are seen to be quite high. This number is %22. 11 participants stated they invest quite high mental effort in understanding the course book.



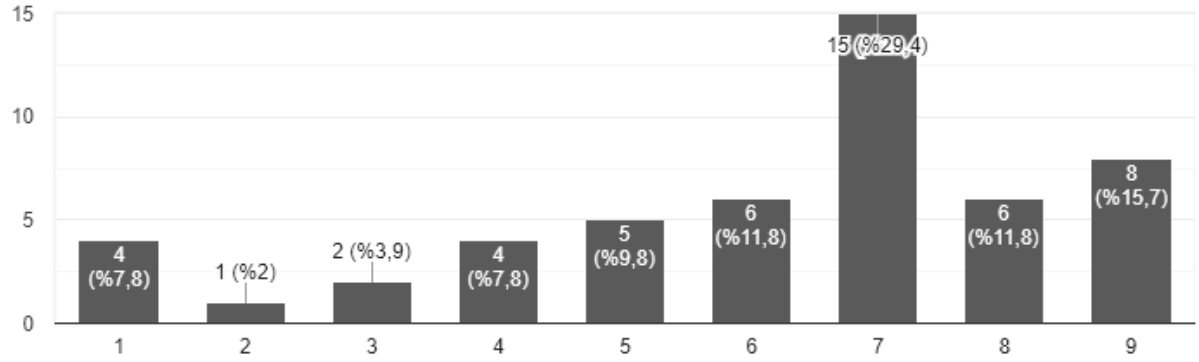
Graphic 9. "While following English lessons, I invest…"

Graphic 9 shows the cognitive loads level of the participants while they follow the English lessons. Neither low nor high mental effort is invested in this situation.



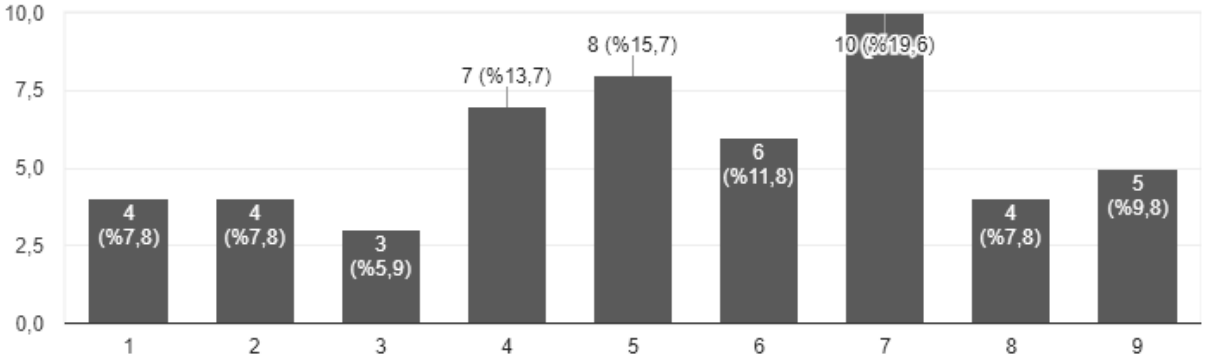
Graphic 20. "In order to answer the questions of the teacher, I invest…"

The percentages are seen to be the equal in the last three columns in the graphic. All of the three columns represent high mental effort. The participants in fact have a cognitive load while they are supposed to give an answer when a question is asked by the teacher. However, the percentage is the highest (%17) in the fifth column. This means the majority of the participants invest neither low nor high mental effort in answering a question.



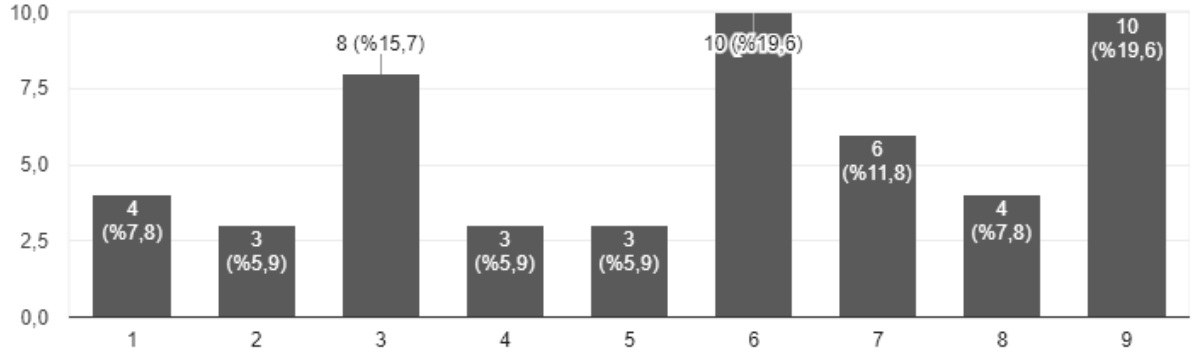
Graphic 31. "While studying for online English exams,…"

Online English exams are reported to cause a cognitive load in students as the highest percentage is 29.4 and this ratio refers to high mental effort.



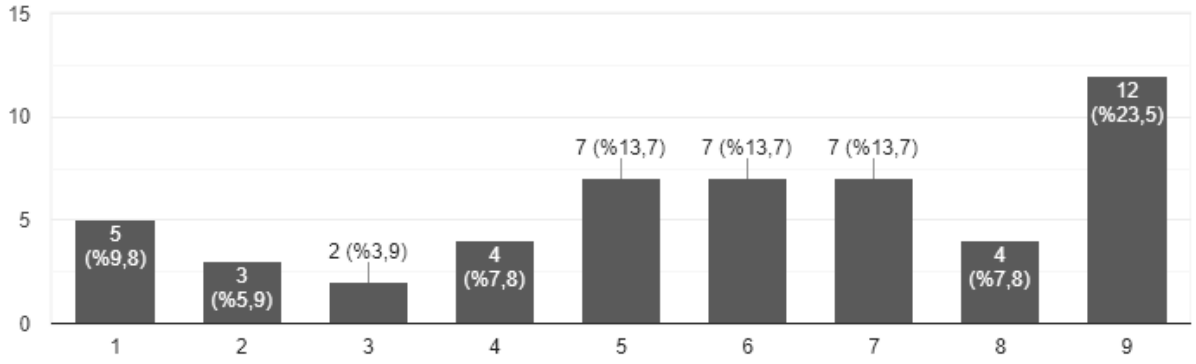
Graphic 42. "While attending to online English courses"

Attending the online English lessons were found to lead to cognitive loads in students considering that the highest percentage is 19.6 and it refers to high mental effort.



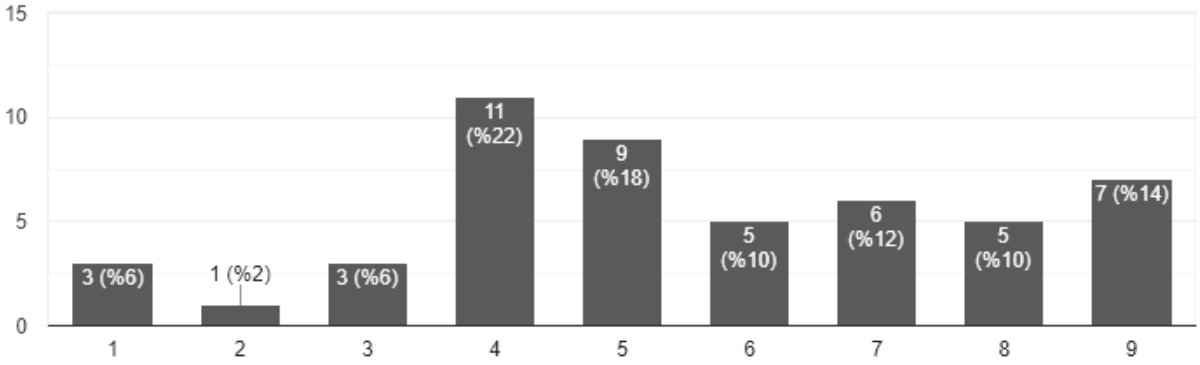
Graphic 53. "When compared to face to face English lessons, in online English lessons I invest…"

Graphic 13 shows the cognitive loads level in students in online classes when compared to formal classes. The results show that the participants have more cognitive loads in online classes than face to face classes. The highest two percentages are respectively 19.6 and 19.5. and these are evident for mentioning very high mental effort.



Graphic 64. "When I speak English"

The graphic shows that the 5 participants do not have a load in speaking English. However %23 is seen to have extremely mental effort and this result verifies their interview analyses.



Graphic 75. "While I write in English"

According to the graphic 15, the results show that the participants have low mental effort in writing English considering that the majority of the students (11 people) have low cognitive load. On the other hand %14 of them have very very high cognitive loads.

CONCLUSION

The present study provides some evidence of the attitudes, motivation, achievements levels of university students and their cognitive loads in online courses. The findings are mostly consistent with the author's expectation that learners who have less motivation and low exam grade have much more cognitive loads than the ones having high motivation and high exam grades. The students who invest very high mental effort in online classes also have negative attitudes to distance learning. Their attitudes to the online courses somehow reflect

their motivations as well. The study explored the levels of cognitive loads, attitudes and motivation of the university students in online English classes. We found that the motivation and cognitive load are inversely proportional. In addition the attitudes of the participants toward online English classes show differences according to their achievements in English lesson. In general the results show that almost all of the participants agree that some kind of problems about online courses are discouraging and they feel bored and want to get rid of these challenges. These problems can be ranged from the internet connection failures, weak connection and certain systematical errors to the students' environments, their family circumstances and lack of English grammar background. The majority can be said to feel inefficient in online classes. Moreover they think they will do better in formal classes. Their cognitive loads can become as a result of their attitudes and motivations and these can be classified as discouraging factors of online classes.

On the other hand, the participants who have high achievement and high motivation appear to have positive attitudes toward online classes. They consider the advantages of attending classes at home as comfortable. Staying at home and taking online courses, feeling relaxed at home and that they have the opportunity to watch the recorded lessons when they do not attend the class are the factors that they find advantages of distance education.

SUGGESTIONS

This study investigated attitudes, motivation, achievements and cognitive loads of university students in online English courses. The study is limited to only 50 students. The further studies could be carried out with a lot more students. In addition, the study covered the students of Atatürk University. The number of university may be increased. Pre-test and post-test can be administered as well in order that a comparative study may be performed.

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