

¹Are Students Already Connective? Insights on Teaching English Through a Connective Approach

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This research aims to investigate if information and communication technologies (ICT) supported activities prepared by the researchers can contribute to academic success in developing listening skills in EFL when they are presented in a connective approach and what the participants think about the content and approach used. The sample includes fifth-grade students (aged 11-12) in different numbers in five applications carried out in seven weeks in spring term of 2020-2021 academic year. The research employed mixed method integrated action research in which quantitative data were collected through achievement tests developed by the researchers and qualitative data through participants' and researcher's diaries and semi-structured interview form, all collected online. A website was developed, and the ICT-supported content was presented through it to participants while all applications were carried out in online synchronous classroom sessions. The results show that in all applications there is a statistically significant difference between pre- and post-tests, indicating a moderate to high level effect on academic success in EFL listening skills. The researcher's and participants' diaries include mostly positive attitudes towards ICT-supported activities presented in a connective approach. Besides, data from diaries and the semi-structured interview form signals various student behaviors such as retrieving information, establishing connections with peers and online sources, and discovering individually that are triggered by connective approach.

Keywords: foreign language teaching, connectivism, content development, mixed method integrated action research, developing EFL listening

¹ This article is summarised from the PhD dissertation prepared by the first author under the supervision of the second author.

INTRODUCTION

The education is not just about teaching in the endless information age we live in; now the main concern is to activate the learning potential. The role of the school as a social and learning environment, which is limited in space and time, takes a new form with time and place-independent approaches such as online education environments and courses/lectures. Both formal and non-formal education can reach to more people under more favorable conditions – both for them and for the institutions/organizations that provide education– with the opportunities offered by the internet and computer. Therefore, there should no more be a debate about whether education benefits from technology or not; what needs to be discussed now is how technological opportunities and limitations should be arranged in accordance with the education. As the technology has recently had an important role in the learning process by affecting the cognitive processes previously carried out by the learner, such as receiving, organizing, and storing information (Siemens, 2005), the educators need a guide to integrate it with the learning and in line with this situation, the idea of connectivism was put forward by Siemens (2006) to describe the pedagogical approach necessary to solve the problems that arise or may arise in the integration of education and technology and to better understand this phenomenon.

While the knowledge from the past was divided into qualitative and quantitative, Siemens proposed a third type of knowledge (Hung, 2014): connectivist. According to Siemens, the theories of behaviorism, cognitivism, and constructivism have some limitations. First, these learning theories approach learning from an individual perspective. Second, they ignore learning that can occur outside of humans. Third, these theories focus on how to learn and ignore the value of what is learned (Chetty, 2013). Moreover, the rapid increase in knowledge makes it a dynamic phenomenon, and the new ways in the production and sharing of knowledge have brought with it the necessity of having more than one way of looking at knowledge (Clarà & Barberà, 2013). Accordingly, learners must actively participate in the education process and leave their role that only passively receives and stores information and is dependent on the instructor. Instead, learners today help to decide not only when and how to learn, but also how to interact and shape information based on the context in which they are located. Whereas traditional learning focused on gathering facts for knowing and learning, today's learners must discuss and construct meaning through constructivist and connectivist approaches. It is a process where knowing is no longer a fixed object to be acquired, but rather a process by which knowledge is acquired and used to construct meaning and solve problems in the context in which the learner needs to act (Grooms & Reid-Martinez, 2014).

While both social constructivism and connectivism define learning as a social process in which learning occurs through social interaction, connectivist learning occurs not only through social interaction but also through interaction with and between networked nodes (people, media, places), because knowledge dispersed in a network of connections. Thus, while social media is a network (tool) for interaction in social constructivism, it is an extension of the mind in connectivism. The connective learning, therefore, consists of the ability to build and navigate through and between these networks (Downes, 2007). Within the scope of connectivism, an e-learning program supports activities that provide and direct critical thinking and problem solving and a large amount of information (Ghofrani & Hollister, 2011), and this theory, also called distributed learning, is more appropriate for the age of technology, where action can be taken by using information from external sources without knowledge acquisition (Mattar, 2010).

In connectivist learning, the network refers to a set of nodes that are interconnected by relationships in one or more ways. In the example in Figure-1, the network consists of four nodes (A, B, C, and D) and the connections among them. A node is anything that can be

connected to and connectivism identifies three types of it: cognitive, conceptual, and external. At the conceptual level, the network includes concepts, ideas, and thoughts connected by conceptual connections such as similarity and positive association. At the external level, the network consists of people, books, websites, programs, or databases connected to the internet, or intranet (AlDahdouh et al., 2015). From the connectivist learning perspective, what is important when organizing learning activities is student participation in interactions that result in the formation of different types of networks (cognitive, conceptual, and external) supported by technology. Therefore, the learning activity should be designed in a way that fosters, supports, and sustains networking and human connections (Siemens, 2005). Accordingly, two features seem to be central to the concept of a connected learning activity design: i) a motivating learning activity that asks students to create a product using their networks linked to other social networks and allows them to do so; ii) a technologically driven environment that promotes meaningful communication and collaboration.

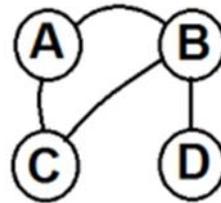


Figure 1. A connective network with four nodes

The network metaphor is similar to the concepts of "know-how" and "know-what", which are the cornerstones of many learning theories, but refers to a completely different point with the concept of "know-where" (understanding where to find the information when needed) (Sitti et al., 2013). In this theory, practical knowledge does not necessarily exist in the mind of the individual, it is sufficient if it exists outside (in the fields of external storage and databases or social networks). Then the learning consists of recalling needed pieces of information from these sources and linking them to each other. Here, the ability to make connections between sources of information is more important than the knowledge itself in the mind (Brocca, 2020).

The connectivism paradigm needs a lot more research to settle into the education system as more than a rhetorical tool because there is a clear, intuitive appeal to the insights suggested by this new "ism" that certainly encourages further research (Klinger, 2011). However, much of the literature on connectivism has focused on higher education, at the level at which it emerged, because it is easier to implement in higher education settings where learner autonomy and connection (learning networking), enhanced self-regulation and motivation are higher. There are few empirical studies investigating the value of this approach among middle school students in formal education settings (Smidt et al., 2017; Rice, 2018). Connectivism has hardly been incorporated into traditional (pre-tertiary) classroom settings, possibly because it is assumed to be incompatible with these grades. However, connectivism is a theory that explains how people acquire knowledge; so connective networks should be available in all classroom settings. One of the most important principles of connectivism is that learning takes place through networks, using both technology and face-to-face interaction with peers. Therefore, connectivist strategies can be applied to all classroom settings that are conducive to networks, including traditional classroom settings (Rice, 2018). There are four strategies for learning in connective network environments: student autonomy, resource openness, networking, and diversity of ideas that can be found in any classroom setting, and these four strategies can

be applied in any classroom setting, including traditional classrooms, so connective strategies can and should be applied in all classrooms (Smidt et al., 2017).

It is impossible for foreign language education not to be affected by the digital transformation mentioned so far, and indeed it is likely to be one of the most affected areas; because in addition to the flow of information experienced in other courses, communication channels that allow higher interaction should also be activated in foreign language courses. Moreover, thanks to the technology, the amount of “input” that is critical for foreign language learning has increased significantly in parallel with the increase in accessible resources. Besides, the inputs that can be chosen by the learner have become more personalized, remarkable, and original, and alternative ways of accessing information have emerged (Fan, 2018). Therefore, it is necessary for teachers who can see and evaluate the contextual factors (the disadvantaged situations of the students) on the spot, and therefore are/expected to be the closest source to the solution, to use of the technology and integrate ICT into education, because fulfilling students’ needs and expectations rather than forcing them to adopt to ready-made digital resources, and preparing or adapting digital resources that respond to their requests can only be achieved by teachers who are the most familiar with them. While doing this, teachers should take educational philosophies as a reference point and adopt the most appropriate approach for the age. Accordingly, it is necessary to ensure that teachers manage this transformation in a way that appeals to the interests and needs of their students, and they should be supported at this point. In this context, in order to ensure that students benefit from ICT-supported foreign language teaching at the highest level, it is necessary to conduct case studies and present them to teachers to guide the process. At this point, it is aimed to guide the development and applicability of ICT-supported activities within the framework of the connectivist learning theory, which is presented as a theory on learning with technology and evaluate its effect on the development of English listening skills.

Since the unexpected development of the COVID-19 epidemic process caught educators off guard, traditional education, which usually focuses on printed materials, has experienced significant problems in moving to the digital environment. It has been revealed that there is an important theoretical deficiency in the development of materials in the digitalized learning-teaching process and especially in how students learn in this process. At this point, "Connective Learning Theory" can provide an important perspective for educators who must make significant progress in incorporating technology into education and making it an important part of the learning and teaching process for students who are already significantly intertwined with technological opportunities. The main purpose of the research is to evaluate the application process (problems in the application, the strengths, and weaknesses of the developed content) of the ICT-supported content prepared according to the "connective" approach through the views of the practitioner and participants and to determine whether it is effective in improving fifth graders’ English listening skills.

RESEARCH QUESTIONS

The overall research question was: “Can ICT-supported foreign language listening skills teaching activities based on connectivist learning theory be applied to improve the listening skills of fifth-grade students in a foreign language?” and following sub-questions were formed depending on it:

1. Is there a significant difference between the pre-test and post-test scores of the students in the five units (Movies, Party Time, Fitness, The Animal Shelter, and Festivals) where distance education activities are prepared in the fifth-grade English lesson?

2. What are the students' views on the distance education activities prepared by the researcher for five units in the fifth-grade English lesson?
 - a. What opinions about the related activities are found in the students' diaries?
 - b. What opinions are there on the relevant activities in the semi-structured interview form?
3. What are the opinions in the researcher's diaries regarding the distance education activities prepared for five units in the fifth-grade English lesson?
4. Which connective behaviors were observed in students' performances, diaries, and interviews?

METHODOLOGY

DESIGN

The Mixed Method Integrated Action Research (MMIAR) method was used to improve the listening skills of fifth grade students learning English as a foreign language through connectivism-based ICT-supported activities. It has been evaluated that MMIAR will be the most appropriate method for the research, since it is aimed to solve the problem determined within the scope of the research with an innovative approach by going directly to the source, that is, to the classroom, and to be both the mediator and the observer of the change that the researcher wants to reveal in this process, and the applicability of the developed contents and the evaluation of the effect on academic success. Mills (2011) stated that although qualitative methods seem more suitable for action research studies, they may require teacher-researchers to use both quantitative and qualitative data sources, especially when research questions need to include classroom observations and student achievement data to support qualitative narratives. In action research, it is possible to collect both qualitative and quantitative data depending on the researcher's level of training and research topic (Kock, 1997 as cited in Ocak & Akkuş-Baysal, 2019).

PARTICIPANTS

The participants of the research include students studying in the fifth grade in the 2020-2021 academic year at Yusuf Hakiki Baba (state) secondary school located in the central district of Aksaray province in Turkey (see Table 1).

Table 1. Number of Participants in Applications

Application	N	Female		Male		Age
		N	%	N	%	
Pre-information meeting	26	18	69.2	8	30.8	11
Movies	17	10	58.8	7	41.2	
Party Time	17	11	64.7	6	35.3	
Fitness	16	9	56.2	7	43.8	
The Animal Shelter	15	9	60.0	6	40.0	
Festivals	16	10	62.5	6	37.5	

The number of participants in the research, which was conducted with distance education tools (Zoom platform and the website developed by the researcher), both in the information and application process, differed according to the applications. The participants were fifth grade students aged 11 and studying at a public secondary school in Aksaray city of Turkey in 2020-2021 spring term. 26 students from the class attended the preliminary information meeting held at the beginning of whom 18 (69.2%) were females and 8 (30.8%) were males. There were 17 students in the first application (Movies), 10 (58.8%) females and 7 (41.2) males. The number of participants were the same in the second application (Party

Time) while the number of females was 11 (64.7%) and males was 6 (35.3%). In the Fitness unit, there were 16 participants 9 (56.2%) of whom were females and 7 (43.8%) were males. The lowest number of participants in the applications was in The Animal Shelter unit with 15 participants in total with 9 (60.0%) females and 6 (40.0%) males. In the last application (Festivals unit), there were 16 participants 10 (62.5%) of whom were females and 6 (37.5%) were males.

PROCEDURE

In this study, mixed method was integrated with the action research, as it was required to use the qualitative and quantitative data together in both the evaluation of the practices with the views of the students and the researcher, and the determination of their effects on academic success. The steps offered by Ivankova (2015) was followed in integration of mixed method into the action research. Accordingly, the first stage is called diagnosis, and the literature review was conducted at this stage to identify the source of the problems experienced in foreign language teaching in Turkey, and the communicative foreign language teaching method focused on speech and ignored the listening skill has been determined as a critical issue. During the exploration phase, the next stage, the possible causes of the problem in teaching English as a foreign language were investigated through the literature review; and it was seen that listening skill was not given sufficient importance and the role of technology in the classroom was unclear and inconsistent, and it was decided to focus on this issue in solving the problem. Data were collected through literature review and expert opinions in the development of the content to be used in the action during the planning phase; in addition, to evaluate the effect of the action on academic success, achievement tests were created based on the relevant sources, and the validity and reliability studies of these tests were carried out with pilot applications. The next stage is the action stage, and at this stage, the content developed by the researcher is presented to the target audience. The content presentation lasted two days for each applied unit; the pre-test was applied on the first day of each application and the post-test on the second day. During the application process, which started with the pre-test, the lessons were conducted with live participation via the Zoom platform, and the content was presented through the website developed by the researcher. Detailed information about the development, publication, and editing of the website using different tools (h5p platform, Google forms, etc.) could not be explained in detail due to the word limit of the article, but detailed information can be obtained by examining the doctoral thesis that forms the basis of this study. In the evaluation phase, quantitative data were collected through achievement tests before and after each application, and qualitative data were collected through students' diaries, researcher's diary, and semi-structured interview form. During the observation phase, retrospective and forward-looking arrangements were made in the action plans by evaluating the data.

DATA COLLECTION TOOLS

In order to determine whether the developed digital content is effective in improving the listening skills of the participants, achievement tests -one multiple choice test for each unit- were developed by the researcher. The exploratory sequential mixed method design was used in the development of these tests. In this method, firstly qualitative data and then quantitative data are collected. Accordingly, in order to create the questions, first of all, the contents, exercises, and sample questions of the units included in the research subject in the 5th grade English textbooks and 5 support materials belonging to 2 different publishing houses, which were approved by the Ministry of National Education and accessed via EBA, were examined. After this review, draft achievement test questions were created for each unit. Expert opinion was sought to ensure the content validity of the achievement tests

prepared according to the topics that the fifth graders would study in the spring term of 2020-2021. In addition, exploratory factor analysis based on tetrachoric correlation and confirmatory factor analysis were performed for construct validity. The Kuder-Richardson 20 (KR-20) coefficient was calculated for reliability as it is one of the methods of calculating the internal consistency of tests including two-result items (particularly multiple-choice items evaluated as true-false or answered as agree-disagree) (Cohen & Swerdlik, 2010, p. 148). KR-20 provides a correlation measure between 0 and 1 and 0.8 is recognized as the minimal acceptable value (El-Uri & Malas, 2013). As the KR-20 values of the 5 achievement tests were between .81 and .92, the tests were accepted as reliable tools. Although detailed information about the achievement tests could not be given due to word restrictions, detailed information can be found in the doctoral dissertation, which is the basis of this article. In sum, there were 5 multiple choice achievement tests for each unit that were used as pre- and post- tests and applied online through the website developed by the researcher.

The qualitative data, on the other hand, were collected through students' and the researcher's diaries and semi-structured interview form. The participants were asked to write a diary in order to reflect their experiences, feelings, positive and negative opinions etc. about the activities after the lesson and data was collected online through Google Forms. Researcher's diaries that were kept on the researcher's personal computer included notes over participants' actions during the online courses and reactions to the developed online content. The interview form which was the third qualitative data collection tool required for triangulation strategy that aims to improve the validity of the research (Flick, 2004, p. 178) included four questions asking about personal experiences with and thoughts on the developed content and collected online through Google Forms.

DATA ANALYSIS

The content analysis method was used in the analysis of the qualitative data collected within the scope of the study. Content analysis is a method used to organize large volumes of data. Many texts containing many words and phrases are compressed into a few key categories, themes, or ideas so that large amounts of data can be summarized succinctly using content analysis. Key content analysis highlights key features found in a dataset and regularly reports results in a summarized fashion. Such empirically based summaries are valuable resources for defending an idea and taking action. Undoubtedly, the quality of such summaries is higher when readers can quickly identify in detail how the researcher performed data reduction and data analysis (Drisko & Maschi, 2016: 34). After identifying the aspects that make up the main categories in content analysis, the next step is to determine what is said about them in the data. At this point, the researcher can make use of what he already knows (found in the research questions) before looking at the data, for example, certain concepts in a concept-oriented way (deductively) or can look at what is in the data and work based on the data (through induction) or both methods (Schreier, 2012: 60). The qualitative data analysis process is shown in Figure 2 (see next page).

In the analysis of qualitative data, firstly, the data collected online via Google Forms were transferred from the internet to the researcher's computer in the order of application (first, second, etc.); then the data were first coded according to the senders (S1, S2, etc.). At this stage, the first control was made for the sentences that were not understood, or had missing words, etc. to check unsuitable data for analysis. The data was carefully read several times by the researcher and the coding phase started. At this stage, Atlas.Ti, a qualitative data analysis program, was used for data analysis. The data for each application was transferred to the program separately and the coding was done accordingly. In coding, two different approaches were followed. An inductive approach was preferred to identify students' reflections about the content and a deductive approach was followed to identify

the connective behaviors of the participants. The coding phase was followed by the creation of the themes; At this stage, codes pointing to similar phenomena were brought together under inclusive headings. After determining the themes, deductive and inductive processes were operated by making forward and backward readings.

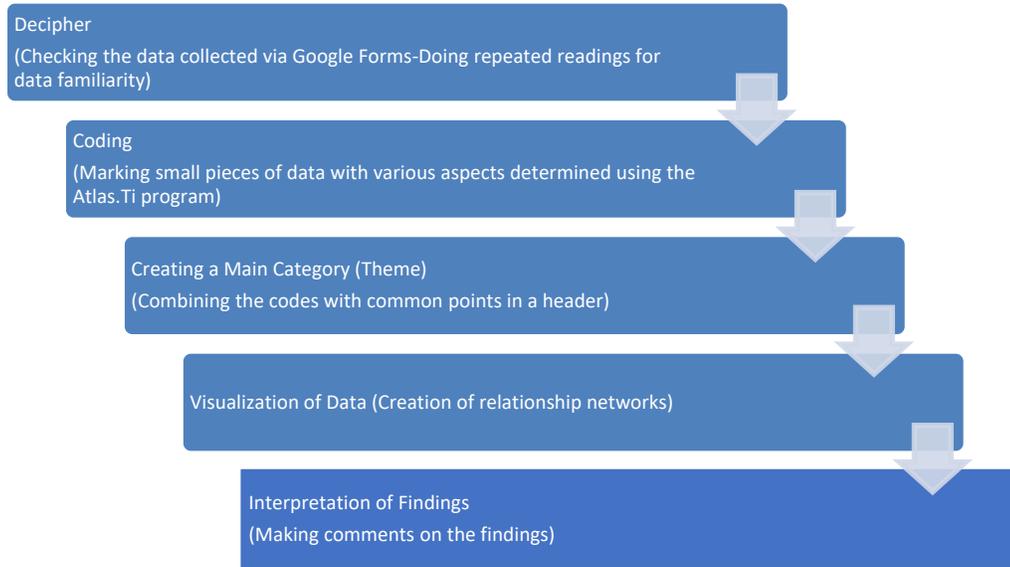


Figure 2. Qualitative data analysis steps

The data collected through the diaries of students and the interview form were coded independently by the researcher and co-observer; then, the inter-coder reliability of the coding was evaluated by calculating the Weighted Kappa Coefficient (see Table 2).

Table 2. Inter-coder Weighted Kappa Coefficient Values

Data Source	Weighted Kappa Compatibility Index			
	Value	Standard error	<i>p</i>	
Content-Related Student Diaries	Application-1 (Movies)	.901	.066	.000*
	Application-2 (Party Time)	.886	.076	.000*
	Application -3 (Fitness)	.874	.084	.000*
	Application-4 (The Animal Shelter)	.911	.061	.000*
	Application-5 (Festivals)	.889	.073	.000*
Interview Form on the Content	.900	.034	.000*	
Student Diaries on Connective Learning	.847	.145	.000*	
Interview Form on Connective Learning	.860	.097	.000*	

**p* < .001

While different reference points by different researchers have been pointed (for example, Landis and Koch (1977) .81-1.00 values almost perfect; Popping (1988) at least higher than .80; Banerjee et al. (1999) pointed out that .75 and above are the perfect fit, free from the luck factor) .80 and above is seen as the general acceptance point in weighted kappa results. Accordingly, it was found out that the researcher and inter-coder agreement in the codings of the collected qualitative data was over .80 in all data sources and these values were significant (*p* = .000; *p* < .001) (see Table 1) and the agreement between the coders was reliable.

As the parametric 1-sample t-test requires a sample more than 20 (Grech & Calleja, 2018), the significance of the difference between pre- and post- tests were tested using

Wilcoxon Signed Rank Test in all applications in the study while analyzing quantitative data. In addition, if the difference between the pre-test and post-test results of the study group was significant, the effect size (Pearson r) used to estimate the effect that may occur in the universe from the effect size in the sample and provide an objective measure of how important the effect is (Field, 2009, p. 56-57) was calculated.

FINDINGS

Detailed findings related to the sub-questions created within the scope of the research are presented in this section. First, the results of the pre-tests and post-tests were given in order to examine the effect of ICT-supported listening activities developed by the researcher and presented with a connectionist approach on academic achievement.

FINDINGS RELATED TO SUB-QUESTION-1

Table 3. Pre- and Post-Test Results of the Applications

Unit	Test	<i>N</i>	<i>NR</i>	<i>PR</i>	<i>ER</i>	<i>Z</i>	<i>p</i>	<i>r</i>
Movies	Pre-Post	17	0	17	0	-3.651	.000*	-.44
Party Time	Pre-Post	17	1	15	1	-3.676	.000*	-.60
Fitness	Pre-Post	16	0	13	3	-3.225	.001*	.83
The Animal Shelter	Pre-Post	15	0	15	0	-3.473	.001*	.45
Festivals	Pre-Post	16	0	15	1	-3.461	.001*	.93

* $p < .05$

As can be seen in Table-3, the results of pre- and post-test in Movies unit indicate that NR of the students was zero, PR was 17, and ER was zero. According to the Wilcoxon Signed Rank test result ($Z = -3.651$; $p = .000$; $p < .05$), the difference was found to be significant at the .05 level. The effect size ($r = -.44$) reveals a moderate level effect. A negative effect size sign is related to how the researcher coded the groups and should be interpreted as an absolute value (Field, 2009: 57). In the Party Time unit, the negative rank number (NR) of the students was one, the positive rank number (PR) was 15, and equal rank number (ER) was one. According to the Wilcoxon Signed Rank test result ($Z = -3.676$; $p = .000$; $p < .05$), the difference was found to be significant at the .05 level. The effect size ($r = -.60$) indicates a high-level effect.

According to the results of the achievement tests (pre-tests and post-tests) applied before and after the activities in the Fitness unit, NR was zero, PR was 13, and ER was three. Wilcoxon Signed Rank test results ($Z = -3.225$; $p = .001$; $p < .05$) show that the difference was significant at the .05 level. The effect size ($r = .83$) reveals a high level of effect.

The results of pre- and post-test in The Animal Shelter unit indicate that NR of the students was zero, PR was 15, and ER has been zero. According to the Wilcoxon Signed Rank test result ($Z = -3.473$; $p = .001$; $p < .05$), the difference was found to be significant at the .05 level. The effect size ($r = .45$) reveals a moderate level effect.

The results of pre- and post-test in Festivals show that NR was zero, PR was 15, and ER was one. According to the Wilcoxon Signed Rank test result ($Z = -3.461$; $p = .001$; $p < .05$), the difference was found to be significant at the .05 level and the effect size ($r = .93$) reveals a high level of effect.

FINDINGS RELATED TO SUB-QUESTION-2

The second sub-question within the scope of the research is "What are the students' views on the distance education activities prepared by the researcher for five units in the fifth-grade English lesson?" Data were collected through student diaries and a semi-structured interview form to answer this question. The findings related to students' diaries are given in Table 4 below.

Table 4. Findings Related to Student Diaries

		Movies	Party Time	Fitness	The Animal Shelter	Festivals	Total
Theme	Category	frequency	frequency	frequency	frequency	frequency	frequency
Positive	Understandable	2 (8.7%)	4 (22.22%)	4 (22.22%)	7 (30.43%)	5 (17.86%)	22 (20%)
	Educational/Instructional	7 (30.43%)	5 (27.78%)	8 (44.45%)	7 (30.43%)	10 (35.71%)	37 (33.64%)
	Interesting/Beautiful	14 (60.87%)	9 (50%)	6 (33.33%)	9 (39.14%)	13 (46.44%)	51 (46.36%)
	Total	23 (100%)	18 (100%)	18 (100%)	23 (100%)	28 (100%)	110 (100%)
Negative	Can/Should be Improved	7 (100%)	6 (100%)	4 (100%)	7 (100%)	-	24 (100%)

Nine students submitted diary data for the Movies unit, which focuses on movie genres and adjectives used to express physical and personal characteristics. As a result of the analysis made on these data, a total of 30 codings were made under the categories of Understandable, Educational/Instructional, Interesting/Beautiful, and Can/Should be Improved, and these were placed under “Positive” (*frequency* = 23; 76.66%) and “Negative” (*frequency* = 7; 23.34%) themes. There are three categories under the Positive theme in the Movies unit, and the most frequently repeated category was Interesting/Beautiful (*frequency* = 14; 60.87%). In this category, for example, S1 said, “The puzzle about movies is very good.”; S2 “The activities were interesting.” and S4 “The exercises were very good. It was different. I loved them all.”. The second most repeated category in this theme was “Educational/Instructional” (*frequency* = 7; 30.43%). According to this, S8 explains that “I learned the movie characters and adjectives in English.”, S2 “I learned about movies and movie characters.” and S9 “I learned about movie characters. I learned their features. I learned the traits of my favorite character.” The least repeated category in this theme was “Understandable” (*frequency* = 2; 8.70%). S3 described her view on this category as follows: “I had no difficulty in understanding the videos and doing the exercises.” and S7 stated “The listening parts were understandable.”

In students’ diaries related to this unit, a single category related to the Negative theme was determined and its frequency was seven. According to the students’ opinions, content improvements should be made indicating that the sound should be more understandable and that the content should be enriched with technical improvements. Accordingly, S1 said, “The sound in the videos can be a little better.” and S2 spelled out “I liked the videos, but they could have been better. I wish there were more characters.” That emphasize two different points under this category.

Eight students submitted diary data for the Party Time unit, where the focus was on words related to party supplies (food, drink, ornaments, etc.) and asking permission (Can I...) and understanding the positive and negative responses to it. As a result of the analysis made on these data, a total of 24 codings were made over the categories (Understandable, Educational/Instructional, Interesting/Beautiful, and Can/Should be Improved) obtained from the previous data, and these were again placed under “Positive” (*frequency* = 18; 75.00%) and “Negative” (*frequency* = 6; 25.00%) themes. The most frequently repeated category was Interesting/Beautiful (*frequency* = 9; 50.00%). S2 said that “Pictures and videos were very nice.” and S3 stated “The videos were good, and I watched them over and over again.” The second most recurring category in this theme was “Educational/Instructional” (*frequency* = 5; 27.78%). Accordingly, S3 said “I learned the words about the party. I learned how to say them in English.” and S5 explains “I also learned the words related to the party.” The least repeated category in this theme was “Understandable” (*frequency* = 4; 22.22%). S6’s opinions about this code was “I understood the English words while listening.” and S8 said “The videos were understandable and entertaining.”

In the diaries related to this unit, a single category related to the Negative theme was determined and its frequency was six. The quotations emphasize two different points under

this code. According to the students' opinions, the instructions should be more understandable and content improvements should be made indicating that the content should be enriched with technical improvements. Accordingly, S1 said, "*I had difficulty in the activity. I couldn't understand how to do it.*"; S5 pointed out that "*I had a hard time doing the activity at first, but then I understood it.*" and S8 explained "*I studied this unit very quickly. The number of activities was low.*"

Seven students submitted diary data for the Fitness unit, which focuses on vocabulary about sports types and explaining liked/disliked sports. As a result of the analysis made on these data, a total of 22 codings were made over the categories (Understandable, Educational/Instructional, Interesting/Beautiful and Can/Should be Improved), and these were again placed within "Positive" (*frequency* = 18; 77.78%) and "Negative" (*frequency* = 4; 22.22%) themes. In the fitness unit, the most recurring category under the Positive theme was Educational/Instructional (*frequency* = 8; 44.44%), unlike the other units so far. S1 explained it as "*I learned a lot of sports. I learned to talk about the sports I like and dislike.*"; S2 "*I learned to say what I like and dislike about sports.*" and S5 "*Just like the sports words I learned. I learned how to say words.*" The second most frequently repeated category was Interesting/Beautiful (*frequency* = 6; 33.33%). The situation related to this was expressed by S4 as "*I liked the activities, they were good.*" and S3 as "*The videos were fun.*" The least recurring category in this theme was "Understandable" (*frequency* = 4; 22.22%) as in the other units. S6 put his thoughts into words as "*I didn't have any difficulties in making the matching. I did it quickly.*" and S3 said "*I did not have any difficulties while doing the activities. I did it easily.*"

In the diaries related to this unit, a single category related to the Negative theme was determined and its frequency was four. According to the students' opinions, the instructions should be more understandable, and content improvements should be made, indicating that the number of questions should be reduced by reorganizing the content and the video speed should be reduced in order to make it more understandable with technical improvements. These were explained by S5 as "*... but I had difficulties in the second time. I watched it a few times because it was so fast and there were so many questions.*"; S4 "*I had a hard time doing the activity at first, but then I understood it.*" and S1 "*The second activity was difficult, I mixed it up. I watched it over and over.*"

Eight students sent diary data for The Animal Shelter unit, where the students were expected to catch the verbs used in the present tense in the sentences they heard. As a result of the analysis made on these data, a total of 30 codings were made over the categories (Understandable, Educational/Instructional, Interesting/Beautiful and Can/Should be Improved) obtained under "Positive" (*frequency* = 23; 76.64%) and "Negative" (*frequency* = 7; 23.33%) themes. The most frequently repeated category under the Positive theme in The Animal Shelter unit was Interesting/Beautiful (*frequency* = 9; 39.14%). Regarding this, S7 said "*Actually, the videos were fun. I also had fun while doing the activities. The right or wrong activity was good.*"; S5 "*The activities and videos were very nice. I had a lot of fun with some of them.*" and S1 "*The videos were very entertaining. The exercises were easy and beautiful.*" The frequency of the "Interesting/Beautiful" code was 7 (30.43%). The participants' opinions on this matter were explained by S1 as "*I knew some words, I said them. I learned what I did not know by turning the card. I repeated what I did not know. I learned what animals and people do.*" and S8 "*I learned to say what animals and people do. I learned a lot of words and repeated them.*" Regarding the "Understandable" category (*frequency* = 7; 30.43%), S5 points out that "*I didn't have any difficulties doing the activities, I immediately understood what I was going to do.*" and S6 said "*I didn't have any difficulties when I started the activities. I understood what to do.*"

In students' diaries related to this unit, a single category related to the Negative theme was determined and its frequency was seven. According to the students' opinions, the

instructions should be more understandable and content improvements should be made, indicating that the content should be rearranged, and the number of questions should be increased in order to make it more understandable with technical improvements. According to this, S2 said "... but I had some difficulties in the other (Activity-2). I listened several times for each question. But then I could (do it)."; S7 "The right-wrong activity was good. At first, I didn't understand what to do, but after trying it a few times, I understood." and again S7 "I wish there was another activity like it or there were more questions."

Seven students submitted daily data for the Festivals unit, where students were expected to understand simple texts about festivals celebrated around the world and to study numbers between 100 and 1000. As a result of the analysis made on these data, a total of 28 codings were made under the only positive theme (*frequency* = 28; 100.00%) over the categories (Understandable, Educational/Instructional, Interesting/Beautiful). The most recurring category under the Positive theme was Interesting/Beautiful (*frequency* = 13; 46.44%). Under this code, S1 said "The activities were difficult but good. While I was doing it, I watched the videos a few times, but the videos were very good, so I was not bored. I wish we always worked like this..."; S4 "I didn't have any difficulties when I started the activities, and I understood the videos easily and I liked them very much. I think it was very fun. There was a video in which people escaped from the bull, I laughed a lot. I watched that video several times." and S5 "The activities were fun and good." The frequency of the "Educational/Instructional" category was 10 (35.71%). Under this category, their opinions were expressed by S5 as "I learned a lot of different holidays and festivals. I learned their names. In the first activity, I tried to find out what people do during the holidays."; S4 "There were holidays on the cards at the beginning of the unit. I learned how to say them." and S6 "I saw very good events in the festivals and holidays unit. I learned what people do." Regarding the "Understandable" category (*frequency* = 5; 17.86%), S7 said "I understood what to do in the activities. The activities were not difficult." and S2 said "I had no difficulty in figuring out what to do."

When all applications were completed, a semi structured interview form was sent to the participants and the data collected through it were coded independently by the researcher and the co-observer; accordingly, nine categories (Educational/Instructional, Fun/Good/Nice, Different Content, Easy Content, Easy Website, Difficult Content, Technical Problems, Lack of Hardware and Complex Website) were determined in the qualitative data and they were divided into two themes (positive and negative). The findings regarding the positive theme and its categories are as follows (Table 5):

Table 5. Findings on the Positive Theme

Category	frequency	%
Educational/Instructional	18	23.7
Fun/Good/Nice (Content)	30	39.4
Different (Content)	2	2.6
Easy (Content)	14	18.5
Easy (Website)	12	15.8
Total	76	100.00

The positive opinions of the students about the developed content were coded under five categories (see Table-5). The first of these emerged from the statements under the title of Educational/Instructional (*frequency* = 18; 23.7%) that students are aware of engaging in learning activities through the website. For example, S1 said "It was nice to work on the Internet. I was happy to use the internet while learning English." and S5 made a comparison by explaining "I was very excited and happy while listening and watching. Everything was great. I think studying on the Internet is better than studying on a book."

The category with the highest frequency was called as Fun/Good/Nice (Content) (*frequency* = 30; 39.4%) and includes the positive attitudes that students developed as a result of interaction with the content. For example, S8 “*I loved using the site. I have experienced and learned many wonderful things. It was so much fun to watch and listen to the videos.*” while S4 said “*..., the applications were very good. The videos were very colorful.*” and S6 “*I had a lot of fun while doing the exercises. I loved the videos.*” The category with the lowest frequency under this theme is named as different content (*frequency* = 2; 2.6%) and includes students' views on studying English by going beyond the traditional (book-notebook) method. S3 “*... I liked this situation because we did something different in English.*” and S7 stated that “*The exercises were different and fun. The videos were good. I had a lot of fun doing the exercises.*” The third most recurring category in this theme was named as easy content (*frequency* = 14;18.5%) and it reveals that students do not have problems with the content and exercises different from the printed materials they are accustomed to. S9 said, “*I understood what I was going to do in the exercises, and I did it easily.*” and S5 said, “*I didn't have any difficulties trying to do the exercises.*” Another frequently repeated category in this theme is about the easy use of the website (*frequency* = 12; 15.8%) and reveals that the students have no problems in navigating the website and using the content. For example, S11 said “*It was very nice to browse the website. What to do was written on every webpage.*”, and S9 “*I had no difficulty using the site. I could easily navigate between pages. I'm not lost.*”

The findings related to the negative theme in the interview forms are given in Table 6 below:

Table 6. *Findings related to the Negative Theme*

Category	frequency	%
Lack of Hardware	3	14.29
Complex (Website)	6	28.57
Technical Problems (Internet/Device etc.)	4	19.05
Difficult (Content)	8	38.09
Total	21	100.00

Students' negative opinions were coded in four categories (see Table-66. *Findings related to the Negative Theme*). One of them was determined as the lack of hardware (*frequency* = 3; 14.29%) indicating the absence of the devices such as computer, tablet computer, smart mobile phone, etc. or the internet connection required to access the content presented through the website. Regarding this, for example, S2 expressed the situation as follows: “*I had some difficulties while working because I did not have a computer.*” The second code in this theme was determined as the complex website (*frequency* = 6; 28.57%). The emergence of this code comes from the technical specifications of the exercises (drag-and-drop, drag-match, etc.) and the instructions for navigating between pages and what to do in the exercises. For example, S4 said, “*I had some difficulty dragging the answers in some exercises.*” and S12 “*Sometimes I did not know where to click, but I asked my friends and they told me.*” On the other hand, S7 “*I did not know how to navigate the site.*” and S6 “*I could not understand what to do in an exercise. I had some fun while doing it ...*” Another category in this theme was created from the device and connection-related technical problems and was given under the title of technical problems (*frequency* = 4; 19.05%). For example, S5 explained it “*Sometimes I had to wait when the internet was slow.*” and S7 “*I had some difficulties while connecting to the internet.*” S13 said “*It was difficult to navigate the site from the phone because of the fact that the website is not mobile-friendly.*” *I dragged in the wrong place while doing the drag-and-drop exercises.*” The most frequently occurring category within this theme was coded as difficult content (*frequency* = 8; 38.09%). The category, as the name suggests, relates to the inability to

understand the listening content offered through the website. S3 said, "*I didn't understand the videos sometimes, but I watched them again.*", S6 "*Sometimes I could not understand the videos.*" and S7 stated "*I had a hard time working. I watched some videos, but I couldn't understand what they were saying.*" On the other hand, S1 said, "*I had a little difficulty in some exercises because I could not hear the sounds.*"

FINDINGS RELATED TO SUB-QUESTION-3

The third sub-question of the research is "What are the opinions in the researcher's diaries about the distance education activities prepared for five units in the fifth-grade English lesson?" and the relevant findings are given hereinafter.

When the researcher's diary for the Movies unit was examined, it was found out that students showed a positive attitude towards the puzzle activity; they had difficulty in their self-study station due to their incomplete information. It was seen that they exhibited behaviors showing that they liked the content about the movies and/or that they found it attractive; there was no problem in transitioning between the pages; they understood what to do in the activities without any problems, and students pointed a technical problem related to a file placed in the content.

The researcher's diary related to the Party Time unit included observations that the students had a positive attitude towards the first activity. They easily understood what they needed to do; sufficient performance could not be achieved with watching once in the self-study station; there was a problem arising from the instruction regarding the activity in the unit and it was not understood how to do the activity. Despite these, it was seen that the students liked the activity and found the content technically understandable.

When the researcher's diary of the Fitness unit was examined, the notes indicate the students participated in the activity at the self-study station but needed rewatching; the audio file presented in the content could be understood by the students. Although they did not have any problems in understanding the content in the second activity, it was seen that they had difficulties in an activity that they had not done before, and that they could understand what they needed to do in the achievement test section and did it easily.

The notes in the researcher's diary of The Animal Shelter unit explain that the activity in the introduction was understood by the majority of the students, and the instruction had to be updated for the others; there is no problem in the self-study station, there is an interaction among the students and between students and the teacher. There was no problem in surfing between webpages; the students liked the content in the activities and there was no problem in doing the activities; Although no problems were detected in the achievement tests, it was seen that the content presented in a different type (voice only) attracted the attention of the students.

Examining the researcher's diary of the Festivals unit revealed that students did not have any problems with the activity at the beginning and could understand what to do; the presented content was interesting to students; activity in the self-study station was adapted, but watching only once was not sufficient; the content presented in the activities allowed the students to have fun. They were able to do the activity in general, but they expressed a problem with the sound. In the second activity, unlike the previous one, the presentation of the content through independent videos attracted the attention of the students; it was seen that the presence of only audio files in the achievement test sections attracted the attention of the students.

FINDINGS RELATED TO SUB-QUESTION-4

The fourth and last sub-question of the research is "Which actions to be evaluated within the scope of connectivist theory have been performed by the students who participated in the distance education activities prepared according to this theory in the fifth-grade English

lesson, and to what extent?" and the findings obtained through the student (see Table 7) and researcher diaries (Table 8) and the semi-structured interview form (Table 9) related to it are presented hereinafter.

Table 7. *Findings Related to Connectivist Behaviors in Student Diaries*

Data Source	frequency	%
Student Diaries-1 Movies	1	9.09
Student Diaries-2 Party time	4	36.37
Student Diaries-3 Fitness	4	36.37
Student Diaries-4 The Animal Shelter	2	18.17
Student Diaries-5 Festivals	0	0
Total	11	100.00

Table 7 shows that no findings were found regarding the behavior that can be evaluated within the scope of the connectivist learning theory in one of the five applications (Festivals). On the other hand, a total of eleven codings were made regarding connective behaviors (interaction with learners and networks, establishing new relationships, information retrieval, organization, individual discovery, etc.); 1 in the Movies, 4 in the Party Time, 4 in the Fitness and 2 in the The Animal Shelter. For example, in the Movies unit, S4 said, "I didn't know some movies, I researched on them on the internet." In the diaries about the Party Time unit, S1 indicated that "I had difficulty in the activity. I couldn't understand how to do it. I asked my friends and then I did it."; S4 "I looked up the meaning of some words on the internet."; S5 "... I also explained my friends who asked how to do it." and S6 "I asked my friends when I did not understand." All explaining the connections they have established.

In the diaries that the researcher kept in the online classes he attended for observation and support, there are findings related to the behaviors of the students explained in the connectivist learning theory (information acquisition/organization/individual exploration, interaction with other learners, and networks, establishing new relationships, etc.). Eleven codings were done in these diaries, which were kept during six applications (Table 8).

Table 8. *Findings Related to Connectivist Behaviors in the Researcher's Diaries*

Unit	frequency	%
Movies	4	40.00
Party Time	1	10.00
fitness	1	10.00
The Animal Shelter	1	10.00
Festivals	3	30.00
Total	10	100.00

In the researcher diaries, unlike the student diaries, it is seen that there are findings related to the behaviors predicted in the connectionist learning theory in each unit. It is seen that connective behavior defined as getting information and establishing new relationships were exhibited, and it was explained as follows: "*Many students asked if there would be a translation or tried to translate the words with Google Translate because they did not know the Turkish equivalents of the adjectives used to express personal characteristics in the self-study station.*" Again, in this unit, another connective behavior called interaction with other learners and networks is explained in the notes as follows: "*While doing the first activity on the subject, the students gave information about the movies they had watched before (although they were not asked to do so) and asked questions to find out what the other students knew about the movies they had not watched.*"

In addition, it is pointed out that the students showed information-seeking behavior: “Some students stated that they did research on the internet about the movies they did not watch.”

The data collected with the semi-structured interview form were coded independently by the researcher and the co-observer; accordingly, three categories (Information Retrieval, Individual Discovery, and Interaction with Other Learners and Networks) were determined in qualitative data, and these were gathered under the theme of Connectivism. The findings regarding the categories are as follows (Table 9):

Table 9. *Findings on the Connectivity Theme in Interview Forms*

Category	frequency	%
Information Retrieval	2	8.00
Individual Discovery	12	48.00
Interact with Other Learners and Networks	11	44.00
Total	25	100.00

Seven students returned the question about connectivism in the semi-structured interview form sent to them, and it was determined that there were three categories in the data. The most recurring category was named Individual Discovery (*frequency* = 12; 48.00%) and relates to students networking to explore more than content directly found in learning activities. Regarding this, S2 said, “...I also did a search for the pictures I saw in some videos. There was a movie, I found it online and watched it.” S3 “I saw many beautiful places in the Festivals unit. The festivals there were very interesting. I did research on the ice festival. There were Chinese sites and there were English sites. I couldn't find much in Turkish, but I looked at the pictures. I would like to see it.” and S4 “There was also a puzzle at the beginning of the Movies unit. When I clicked on the link there, I went to the website with a lot of puzzles. I solved a few puzzles there.” The second most frequently repeated category was Interaction with Other Learners and Networks (*frequency* = 11; 44.00%). This category emerged from the fact that students created bonds by interacting with their peers and/or other resources (other websites) over the internet, even though they were not required direct. For example, S4 stated that “I went to the website of the music group (which has videos on the self-study station on the website). There were a lot of videos out there. I watched some of them. I saved that site to my favourites.”; S1 “(Referring to the Youtube channel with animations developed by the researcher for the website) I started to follow that channel. I watched them too. I told my friends to follow the channel too.” and S6 “I also sent some of my classmates the link of that channel (created by the researcher) and told them to subscribe. So we can be notified when a new video is added.” The least coded category was Information Retrieval (*frequency* = 2; 8.00%) and this category describes the connective actions that students take to help them better understand the content on the website. For example, S2 “I looked at some words I saw on the website from Translate.” and S5 “When there are words that I do not know, I looked up their meanings on the internet.”

RESULTS AND DISCUSSION

Based on the problems experienced in foreign language education in Turkey, within the scope of this research focusing on the development of English listening skills, contents aiming to develop fifth-grade students listening skills determined by the Ministry of National Education were developed. The efficiency of the content was tested through achievement tests developed by the researcher. The developed content was presented through a website and therefore required a device (smartphone, tablet computer, etc.) with an internet connection, and participation was limited due to the socio-economic opportunities of the sample. On the other hand, the post-test results of the students participating in the study were statistically significantly better than their pre-tests on the

five subjects, and the effect size calculations revealed that the effect was high in two units and moderate in three units. Accordingly, it can be evaluated that the ICT supported content developed by the researcher is an effective tool in acquiring the achievements related to English listening skills determined by the Ministry of National Education. Concerning student-centered work in ICT-supported education, the report by Condie and Munro (2007) analyzes the results of more than 350 published articles demonstrating the positive impact of ICT use on student performance in schools. The related study highlights the fact that ICT has a major impact on student performance when included as a regular part of the classroom experience. In this study, as it was determined that there was a statistically significant difference in the academic achievement levels of the participants in five subjects with ICT supported activities applied for seven weeks, and it seems to be compatible with the results of the studies examined by Condie and Munro (2007). Research has also shown that the use of ICT increases motivation and engagement, resulting in greater persistence and deeper understanding among students (Underwood, 2009). In this study, it was determined that the students found ICT-supported activities interesting and beautiful, and accordingly, it can be concluded that the motivation of the students towards the lesson was positively affected. In this sense, it can be evaluated that the results of Underwood (2009) are similar to the results of this study.

Ratminingsih et al. (2018) stated that students have higher motivation and therefore a better learning success in learning English with the ease provided by ICT-based activities. According to the researchers, there are two important results achieved by using ICT-based activities. First, through these activities, students can more easily learn different elements of language such as vocabulary, sentences, grammar and spelling, and such activities can help students improve their cognitive abilities. In this study, it was determined that the students improved their English listening skills with ICT-based activities, in other words, an improvement was achieved in their cognitive abilities. According to Ratminingsih et al. (2018), such activities can also facilitate the development of students' non-cognitive skills, secondly. It has been stated that they can learn in cooperation with their friends in an interesting, happy, cheerful, and motivating situation, especially by creating a fun learning environment, thus helping them to make faster progress in their studies. In this study, students stated that they especially had fun while performing ICT-based activities with their peers in online classes, and in this sense, it can be evaluated that the results of the studies are similar.

According to the results of this research, ICT supported foreign language listening activities organized according to the connectivist learning theory have a statistically significant positive effect on the academic achievement of the students. As stated before, ICT and connectivism-based applications in the literature generally yield positive results in different contexts. Therefore, in the context of Turkey, it can be concluded that students of the “internet generation” have the potential to achieve significant success with ICT-based activities, and educators need to develop listening skills in a foreign language and employ ICT activities organized according to the connectivist learning theory in all other fields in order to reach their students. In order for the foreign language learning problem in Turkey not to become more chronic and students to overcome this problem effectively, it is clear that traditional practices (classroom and book-based) must now change, and the content created within the scope of this research has revealed that it has the potential to create an important alternative to these traditional practices. So, educators can help these “new generation” students to “new generation” learning habits/methods/understandings, etc., with both pre-service and in-service training. They should be equipped with the competency to create appropriate content and move from a ready-made content consumer to a content producer who can create, edit, and deliver the most appropriate content to their target audience. At this point, the resources that make up the education policy need to take

urgent measures against the relevant deficiencies and create policies that will enable teachers to reveal their full potential. There is no guarantee that difficulties like pandemics will not arise again in the future of education, which often had to be done completely remotely due to the pandemic conditions; therefore, it is very important to start the preparations for distance education, which seems inevitable in the long term, to protect the future years.

It is known that perceived ease of use in ICT supported activities has a significant and positive moderate correlation with perceived usefulness. The element that can explain this correlation is the technological competence of the students. When the activities offered require only basic technology knowledge, students can easily use them after receiving minimal training/direction from the instructors. In addition, the convenience and accessibility of using ICT supported content anywhere and anytime explains the moderate but positive correlation between ease of use and usefulness (Chang et al., 2012). Therefore, in this study, students' perceptions of the ease of use of ICT-supported activities offered to them and perceived ease of use have a strong correlation with the perceived usefulness and attitude towards use and it is compatible with the literature (Chang et al., 2012; Gyamfi & Sukseemuang, 2013).

According to the results of the research, the opinions of the participants about the ICT-supported activities based on connectivism are very positive, and as explained so far, studies conducted in different contexts generally reveal similar results. Although there are always differences between generations, the difference between the 21st century internet generation and the previous generations seems to be more than all other intergenerational differences due to technological possibilities. Regardless of education or social life, the internet and related technologies are at the center of today's Z generation students. Teachers who want to speak their language must develop and use materials that will catch their interests. The fact that students find the connectivism-based and ICT-supported materials developed within the scope of this research interesting, entertaining, educational-instructive is compatible with their behaviors that overlap with their current daily life habits. Because they tend to prefer the internet and websites and interacting with their friends through them, and this is exactly what the participants did in this research. The fact that students have a mostly positive attitude towards the content presented to them within the scope of this research contains an important message for educators: the teacher should be a guide who helps students in learning through technological tools such as the internet and computers, tablet computers, smart phones that they love and always use. The teacher should be with the students while running the connectivism-based ICT supported activities; should provide support to them and encourage their interactions, connections, etc. Education will not be without a teacher for students whose mother tongue is "digital", but the teacher must quickly adapt to this new role.

In ICT-supported learning environments, teamwork, group projects and collaborative peer feedback enable students to learn from each other. In such a context, it can be expected that students will have a deeper learning experience by establishing purposeful connections and discussing academic issues with their peers (Liton, 2021) As another problem within the scope of the research, it is aimed to examine which connectivist behaviors the students exhibited and at what level. In the student diaries and semi-structured interview forms, it is seen that connectivist actions such as "Individual Discovery" related to the students' networking to investigate more than the content directly found in the learning activities; "Interaction with Other Learners and Networks", which emerges from the interaction of students with their peers and/or other resources (other websites) over the internet, even though they were not required by activities in the website, and "Information Retrieval" behaviors that define the activities they carry out to help peers better understand the content on the website have been performed. This shows that ICT-assisted learning includes

connective learning, where learning must be flexible and connected to the outside world through social networks and technology tools (Mattar, 2018).

When the results of the research are evaluated as a whole, positive opinions about the content developed with the support of ICT and presented via the website in all units are higher than negative opinions and academic achievement is statistically significantly higher at the end of the applications, but It is seen that the effect size is higher in terms of academic achievement in the two units where positive opinions and behaviors related to the connective learning theory are relatively higher. Accordingly, it can be concluded that ICT-supported activities organized according to the connectivist learning theory are effective in improving students' listening skills in a foreign language, and if they are applied correctly, they have a positive effect on academic achievement on a regular basis. Carrying out research on high school students during a semester in chemistry class, Lajmiri (2016) stated that there was a significant difference in terms of academic achievement and the continuity of learning was observed in the applications based on connectivism and supported by communication tools, and it is seen that the results are similar in this sense. The fact that similar results have emerged in different places and fields can be interpreted as the fact that activities based on the connectivist learning theory and ICT supported have the potential to play a key role in making schools more effective.

Connective learning has the potential to increase individual participation and contribution to learning processes (Koukis & Jimoyiannis, 2017) which is an important need encountered in traditional education in the classroom and its reflection on distance education due to the pandemic process. According to the results of this research, e-social learning processes, which students perform by interacting with their peers and other information sources, have emerged through individual discovery, in which they reached other pieces of information, especially based on the content presented to them, through connectivist learning-based ICT supported activities. Therefore, it can be concluded that learning processes designed according to the connectivist learning theory make distance education more participatory and collaborative.

The fact that they create and develop networks to go beyond the content offered to them, learn more by making connections with external resources and mediate the learning of others can be interpreted as students' readiness for connective learning. Accordingly, it is not the only alternative to organize the lessons that must be conducted remotely during the epidemic period in such a way that the students participate passively as listeners. The results of this study show that students will have the opportunity to develop themselves in an e-social constructivist way, especially when ICT-supported activities, which will be created by the instructors, taking into account the achievements of the students in the curriculum, are carried out under the guidance of the teacher in live lessons. So, instructors should organize their lessons in such a way that they support students to independently connect with various internal (peers, books, teacher, etc.) and external (all content available via the Internet) resources. In this sense, while providing a self-directed learning opportunity, it should also offer limited guidance to prevent learners from straying from the target. At this point, lecturers should be supported in terms of technical knowledge and opportunities and encouraged to use such activities in their lessons.

REFERENCES

- AlDahdouh, A. A., Osório, A. J., & Caires, S. (2015). Understanding knowledge network, learning and connectivism. *International Journal of Instructional Technology and Distance Learning*, 12(10), 3-21.
- Attar, M. (2018). Connectivism theory a noteworthy necessity in the process of making schools smart. *3rd International Conference on Psychology, Educational and*

- Behavioral Sciences* (pp. 1-6). Tahran: Civilica. Retrieved from <https://www.sid.ir/FileServer/SE/612E20180301.pdf>
- Banerjee, M., Capozzoli, M., McSweeney, L., & Sinha, D. (1999). Beyond kappa: A review of interrater agreement measures. *Canadian Journal of Statistics*, 27(1), 3-23.
- Brocca, N. (2020). Social media in education and foreign language teaching. *heiEducation*, 9-23. doi:/10.17885/heiup.heied.2020.5.24155
- Chang, C., Yan, C., & Tseng, J. (2012). Perceived convenience in an extended technology acceptance model: Mobile technology and English learning for college students. *Australasian Journal of Educational Technology*, 28(5), 809-826.
- Chetty, D. (2013). Connectivism: Probing prospects for a technology-centered pedagogical transition in religious studies. *Alternation Special Edition*, 172-199.
- Clarà, M., & Barberà, E. (2013). Learning online: Massive open online courses (MOOCs), connectivism, and cultural psychology. *Distance Education*, 129-136.
- Cohen, R., & Swerdlik, M. (2010). *Psychological testing and assessment*. Burr Ridge, IL: McGraw-Hil.
- Condie, R., & Munro, R. (2007). The impact of ICT in schools: A landscape review. Strathclyde: University of Strathclyde.
- Downes, S. (2007). *What connectivism is*. Retrieved from Half an Hour: <http://halfanhour.blogspot.com/2007/02/what-connectivism-is.html>
- Drisko, W. J., & Maschi, T. (2016). *Content analysis*. NY: Oxford University Press.
- El-Uri, F., & Malas, N. (2013). Analysis of use of a single best answer format in an undergraduate medical examination. *Qatar Med J.*(1), 3-6. doi:10.5339/qmj.2013.1.
- Fan, J.-H. (2018). On computer and foreign language teaching and learning in big data era. *iJET*, 13(05), 236-245.
- Field, A. (2009). *Discovering statistics using SPSS introducing statistical method* (3. b.). London: Sage Publications.
- Flick, U. (2004). Triangulation in qualitative research. In U. Flick, E. v. Kardorff, & I. Steinke (Eds.), *A Companion to qualitative research* (pp. 178-183). London: SAGE Publications Ltd.
- Ghofrani, P., & Hollister, M. C. (2011). Connectivism as an emerging trend in elearning in large organizations. DETT.
- Grech, V., & Calleja, N. (2018). WASP (Write a Scientific Paper): Parametric vs. non-parametric tests. *Early Human Development*, 123, 48-49. doi:10.1016/j.earlhumdev.2018.04.014
- Grooms, L. D., & Reid-Martinez, K. (2014). Leadership resilience: Employing constructivism and connectivism in cross-cultural leadership development. *Concepts & Connections*, 3-6.
- Gyamfi, G., & Suksemuang, P. (2017). FL learners' perceptions, practices and achievement with the online learning program tell me more. *Contemporary Educational Technology*, 8(4), 338-358.
- Hung, N. M. (2014). Using ideas from connectivism for designing new learning models in Vietnam. *International Journal of Information and Education Technology*, 76-84.
- Ivankova, N. V. (2015). *Mixed Methods Applications in Action Research*. California: SAGE .
- Klinger, C. (2011). 'Connectivism': A new paradigm for the mathematics anxiety challenge? *Adult Learning Mathematics: An international journal*, 6(1), 7-19.
- Koukis, N., & Jimoyiannis, A. (2017). Designing MOOCs for teacher professional development: Analysis of participants' engagement. *Proceedings of the 16th European Conference on eLearning, ECEL 2017* (s. 271-280). Porto: ACPI.

- Lajmiri, L. (2016). The effects of applying communication tools based on connectivism theory on students' academic achievement and the value of their engagement. *The Turkish Online Journal of Design, Art and Communication, Special Edition*, 1849-1859. doi:10.7456/1060AGSE/067
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 3, 159-174.
- Liton, H. A. (2021). Social media tools accentuating self-directed personal learning trajectories: Underpinning autonomous learning hub. *Advance*, 1-19. doi:10.31124/advance.13669196.v1
- Mattar, J. (2010). Constructivism and connectivism in education technology: Active, situated, authentic, experiential, and anchored learning. *Technology*, 1-16.
- Mattar, J. (2018). Constructivism and connectivism in education technology: Active, situated, authentic, experiential, and anchored learning. *Revista Iberoamericana de Educación a Distancia*, 21(2), 201-217. doi:: http://dx.doi.org/10.5944/ried.21.2.20055
- Mills, G. E. (2014). *Action research: A guide for the teacher researcher*. Essex: Pearson Education Limited.
- Ocak, G., & Akkaş-Baysal, E. (2019). Eylem araştırmasını anlamak. In G. Ocak (Ed.), *Eğitimde eylem araştırması ve örnek araştırmalar* (2. ed., pp. 1-42). Ankara: Pegem.
- Popping, R. (1988). On agreement indices for nominal data. In W. E. Saris, & I. N. Gallhofer (Eds.), *Sociometric research: Volume 1, data collection and scaling* (Vol. 4, pp. 90-105). New York: St. Martin's. doi:10.1007/s11135-009-9258-3
- Ratminingsih, N. M., Mahadewi, L. P., & Divayana, D. G. (2018). ICT-based interactive game in TEYL: Teachers' perception, students' motivation, and achievement. *International Journal of Emerging Technologies in Learning*, 13(9), 190-203. doi:10.3991/ijet.v13i09.8170
- Rice, R. (2018). Implementing connectivist teaching strategies in traditional K-12 classrooms. *5th International Conference HCIBGO 2018* (s. 645-655). Las Vegas: Springer International Publishing. doi:10.1007/978-3-319-91716-0_51
- Schreier, M. (2012). *Qualitative content analysis in practice*. London: Sage Publications.
- Siemens, G. (2005). *Connectivism: A learning theory for the digital age*. Retrieved from <http://www.elearnspace.org/Articles/connectivism.htm>
- Siemens, G. (2006). *Connectivism*. Retrieved from Altamirano: <http://altamirano.biz/conectivismo.pdf>
- Sitti, S., Sopeerak, S., & Sompong, N. (2013). Development of instructional model based on connectivism learning theory to enhance problem-solving skill in ICT for daily life of higher education students. *13th International Educational Technology Conference* (s. 315-322). Atina: Procedia - Social and Behavioral Sciences.
- Smidt, H., Thornton, M., & Abhari, K. (2017). The future of social learning: a novel approach to connectivism. *Proceedings of the 50th Hawaii International Conference on System Sciences 2017* (pp. 2116-2125). Hawaii: HICSS. Retrieved from <http://hdl.handle.net/10125/41410>
- Underwood, J. (2009). *Digital education resource archive (DERA)-the impact of digital technology*. Retrieved from UCL Institute of Education: https://dera.ioe.ac.uk/10491/3/A9RF934_Redacted.pdf

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