European Journal of Alternative Education Studies
ISSN: 2501-5915
ISSN-L: 2501-5915
Available on-line at: www.oapub.org/edu

doi: 10.5281/zenodo.3758588 Volume 5 | Issue 1 | 2020

THE EFFECT OF WEB 2.0 EDUCATIONAL TOOLS ON THE SUCCESS OF SECONDARY SCHOOL 5TH GRADE STUDENTS IN AFFIX-ROOT TEACHING

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Abstract:
In this study, it was aimed to determine the effect of Plickers, which is one of the Web 2.0 education tools, on success in affix-root teaching to 5th grade students. In the study, random design with pretest-posttest control group, which is one of the real trial models, was used. The study group of the study was determined by homogeneous sampling from the purposeful sampling methods. The study group consisted of 28 students studying in the 5th grade of a secondary school in the district of Yakutiye, Erzurum in the academic year 2019-2020. The 'Achievement Test', developed by the researcher and consisting of 20 multiple-choice questions, was used to measure the success of the students regarding the affix-root subject. The data obtained were analyzed with SPSS 22.0 package program. In the analysis phase of the data meeting the normality assumptions, t-Test for Independent Samples was used, and the non-parametric Mann Whitney U Test was used in the analysis phase of the data that did not meet the normality assumptions. As a result of the study, it was determined there was a significant difference between the pre-test scores of the control and experimental group students in the affix-root test, there was no significant difference between the post-test scores of the control and experimental group students in the affix-root achievement test, and there was a significant difference between the pre-test and post-test scores of the experimental group students in the affix-root achievement test.

Keywords: Turkish education, Web 2.0 tools, Plickers

1. Introduction

While the behavioral education approach, which is one of the traditional education approaches, expects the student to learn the transferred information directly, the constructivism, which is one of the modern education approaches expects the student to know the ways to access the information and to structure the information. Increasing

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technological developments have influenced many areas and have enabled different approaches, methods, techniques etc. to be adopted in the field of education. Today, with the development of technology, the ways of accessing information have also changed. School is not the only place where the student can get information and the only person for this is not the teacher. It is a well-known fact that educational contents that appeal to different senses are important for students to develop themselves cognitively. "*Considering that 21st century students are members of the Z generation intertwined with technology, it can be said that the use of new technologies in learning-teaching environments is important in terms of students' internalizing knowledge according to different intelligence areas (visual intelligence, verbal intelligence, personal intelligence, etc.).*" (Korkmaz, Vergili, Çakır and Uğur Erdoğmuş, 2019, p. 17).

Since students use technological tools such as computers, tablets and mobile phones very frequently and intensively in their social lives, the use of these tools in education can also be seen as an imperative. While Drucker (1996) expresses his ideas about new learning technology, he states that computer and television have become high technology for 20th century education, just as printed books were high technology for 15th century. It can be stated that the use of the opportunities provided by technological developments in the educational environment is a necessity for today's students and they will be remarkable for the students. The fact that technological developments increase the ways of accessing information necessitates the development of different skills. In an environment where the sources to reach information are abundant, it is important for students to use high-level thinking skills such as accessing correct information, questioning the information reached, comparing more than one information reached on the same subject, classification, consolidation and evaluation. In other words, in an environment with a changing world and continuously developing technology, it is necessary to provide students with the skills to become equipped. In this context, in the program that took place for the first time in the Turkish Lesson Teaching Program prepared in 2017 and was revised in 2018; "*The competences, which are the ranges of skills the students will need in their personal, social, academic and Professional lives in both national and international level, were determined within the Turkey's Frame of Competencies (TFC)*" (MEB, 2018). These competencies are expressed in the program as follows:

1) Communication in the mother tongue;
2) Communication in foreign languages;
3) Mathematical competence and basic competencies in science / technology;
4) Digital competence;
5) Learning to learn;
6) Social and civic competencies;
7) Taking initiative and entrepreneurship;
8) Cultural awareness and expression.

In the 2019 program, which is a revised version of the 2018 program, digital competence is explained as, "*It encompasses the safe and critical use of information communication technologies for business, daily life and communication. This competence is*

supported by basic skills such as using computers for accessing information and the evaluation, storage, production, presentation and exchange of information, as well as participation in common networks and communication through the Internet." At the same time, the importance of using technology was emphasized in the "Learning and Teaching Approach" section of the program: "*Information and communication technologies should be used as much as possible during the learning and teaching process. The use of these technologies will enrich teaching strategies, while at the same time supporting students' learning. Students should be encouraged to use computer programs in collecting, organizing and classifying data, writing, arranging and presenting the findings they obtain*". (MEB, 2019). Based on the program, the necessity of using technological tools in Turkish lessons also arises.

It is thought that students will be interested in using technological tools in the education environment in general and in the Turkish education process in particular. However, in order to provide this environment, teachers should be aware of the developing technological education tools. On the one hand, there are students who use things like portable computers, smart phones, internet networks, social media effectively, and on the other hand, there are teachers who are away from technology trying to provide education to these students. Prensky (2001) named these students as "digital natives" and teachers as "digital immigrants". In this context, it is important for teachers to catch up with the speed of students in following the development of technological tools and using these tools.

Interactive boards, which started to be used in schools with the FATİH Project, provide an effective environment for teachers to use technological tools in the issue of the utilization of technology. In addition, in-service trainings are provided for teachers to use technology tools in classroom environment. The prominent element in these trainings is the Web 2.0 training tools that teachers can easily use in the classroom environment.

Web 2.0 tools are called social software and bring the transformation from web readership to web literacy. The Internet ceases to be an environment where information is prepared, transmitted, and ready information is consumed, and it turns into a platform where content is produced, shared, combined and transferred with participants. Students using Web 2.0 tools turn into active groups of students who produce and manipulate information, question the source and produce new information from individuals who only consume the information given in the classroom (Elmas & Geban, 2012). It can be said that the lessons planned using Web 2.0 tools in education can turn students into active and information-producing groups, as in constructivist learning theory. Web 2.0 tools allow students to actively participate in the process in the learning-teaching environment and to intervene in the content (Horzum, 2010). Harris and Rea (2009, p. 141) express the benefits of Web 2.0 tools as follows:

- Students become part of the lesson.
- From the classroom, anything in the world can be reached. The world becomes like classroom.
- Cooperation and competition when using technology increases learning.
- Classroom provides 24/7 service.

Web 2.0 tools can also be used functionally to create a classroom climate. According to Elmas and Geban (2012, p. 251), Web 2.0 tools provide a more active and participatory classroom environment and positively affect students' attitudes and behavior towards each other in the classroom environment.

Web 2.0 technologies can be specified as online book preparation, animation creation, mind / concept maps development, digital panel and word clouds preparation, poster and infographic creation, presentation tools development, augmented reality applications development, blog, wiki, file sharing services, podcast services, RSS feeds programming environments, measurement and evaluation tools development (Korkmaz, Vergili, Çakır and Uğur Erdoğmuş, 2019).

There are different program options that are frequently used in the learning-teaching environment, make learning fun and offer digital measurement. One of these programs is Plickers, which also offers formative evaluation. The program allows the teacher to collect data using cards with figures on them. The teacher can download and print up to 63 different Plickers cards from Plickers' Website and download the app to a smartphone or tablet. Before distributing the cards, the teacher fills in a simple e-table that associates each student with a card. The teacher can add class sections, student lists to the Web site, following the online instructions. Before the exam, each student is given a numbered visual card. After the question is asked, students hold the Plickers cards face up with one of the four options they think is correct and answer the question. (Students who think the answer is "A" will turn the Plickers card with "A" facing up.) When all students raise their own card, the teacher scans the student cards using the Plickers app's camera feature on the mobile device. The software immediately shows the teacher a visual bar chart that shows how many students responded as A, B, C and D. The teacher can see if the class has understood the concept being evaluated (Howell, Tseng and Colorado-Resa, 2017).

In the literature, in addition to the studies on the effect of Web 2.0 tools on learning and their use in the learning process, studies investigating the effect of a single Web 2.0 tool on learning were found. (Collis and Moonen, 2008; Duffy, 2008; Harris and Rea, 2009; Grosseck, 2009; Fahser-Herro and Steinkuehler, 2009; Archambault, Wetzel, Foulger and Williams, 2010; Deperlioğlu and Köse, 2010; Bower, Hedberg and Kuswara, 2010; Doherty, 2011; Adcock and Bolick, 2011; Elmas and Geban, 2012; Howell, Tseng and Colorado Resa, 2017; Vergara, Mezquita and Vallecillo, 2019).

There are also studies on the opinions, perceptions of students, teacher candidates and teachers about Web 2.0 tools and the frequencies with which they use these tools. (Albion, 2008; Rosen and Nelson, 2008; Horzum, 2010; Yuen, Yaoyuneyang and Yuen, 2011; Gülcü, Solak, Aydın and Koçak, 2013; Özel and Arıkan, 2015; Tatlı, İpek-Akbulut and Altınışık, 2016; Korucu and Sezer, 2016; Özerbaş and Akın-Mart, 2017; Tetik and Korkmaz, 2018; Karaca and Aktaş, 2019; Saraçoğlu, 2019).

In general, there are a lot of researches that reveal the use of Web 2.0 tools in language teaching, its effect on language teaching and try to reveal the use and effect of Web 2.0 tools in the fields of Turkish education, Turkish education for foreigners. (Kartal,

2005; Sykes, Oskoz ve Thorne, 2008; Stevenson and Liu, 2010; Jee, 2011; Shih, 2011; Brodahl, Hadjerrouit and Hansen, 2011; Wang and Vazquez, 2012; Cephe and Balçıkanlı, 2012; Chartrand, 2012; Aytan and Başal, 2015; Gün, 2015; Baş and Turhan, 2017; Güllülü and Çetinoğlu, 2017; Özdemir, 2017; Karatay, Karabuğa and İpek, 2018; Mete and Batıbay, 2019; Göker and İnce, 2019).

There are also studies related to Plickers, which is one of Web 2.0 tools used in measurement and evaluation process. (Zengin Bars and Şimşek, 2017; Chng and Guruitch, 2018; Korkmaz, Vergili, Çakır and Uğur-Erdoğmuş, 2019).

The aim of this study is to reveal the effect of Plickers, which is one of the Web 2.0 education tools and which provides formative evaluation in teaching of roots and affixes to secondary school 5th grade students. In this context, answers to the following questions were sought:

1) Is there a significant difference between the pre-test scores of the experimental group students who were evaluated using the Web 2.0 education tool (Plickers) after the affix-root teaching and the control group students who were evaluated without the use of the Web 2.0 education tool (Plickers)?
2) Is there a significant difference between the post-test scores of the experimental group students who were evaluated using the Web 2.0 education tool (Plickers) after the affix-root teaching and the control group students who were evaluated without the use of the Web 2.0 education tool (Plickers)?
3) Is there any difference between the pre-test and post-test scores of the experimental group students who were evaluated using the Web 2.0 training tool (Plickers) after the affix-root teaching?
4) Is there a significant difference between the pre-test and post-test scores of the control group students who are evaluated without using the Web 2.0 training tool (Plickers) after affix-root teaching?

2. Method

2.1 Pattern of the Study

In the research, random design with pretest-posttest control group, which is one of the real experiment models, was used. In this pattern, firstly, two groups are selected from random pool of predefined subjects. One of the groups is determined randomly as the experimental group and the other as the control group. The subjects in the two groups are measured regarding the dependent variable prior to application. In the application process, the experimental process, the effect of which is tested, is given to the experimental group and not to the control group. Finally, the measurements of the subjects in the groups belonging to the dependent variable are obtained again using the same tool or form. (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz and Demirel, 2013, p. 205).

2.2 Study Group

In determining the study group of the research, homogeneous sampling method, one of the purposeful sampling methods, was used. In homogeneous sampling, only a privileged homogeneous subgroup is selected based on the purpose (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz and Demirel, 2013, p. 91). In this context, the study group was selected from a secondary school where the relationship of students with technological tools in their social life was not very high relatively. The study group of the research consists of 24 students studying in the 5th grade of a secondary school in the district of Yakutiye in Erzurum in the academic year 2019-2020.

2.3 Data Collection Tools

The 'Achievement Test', which was developed by the researcher and which consisted of 20 multiple choice questions, was used to measure the success of students regarding the affix-root subject. According to Metin (2015, p. 192), the achievement test is prepared in seven stages:

1) Determining the purpose of preparing the achievement test,
2) Determination of the scope of the test and creation of the table of specifications,
3) Determining the type of question to be used in the test,
4) Preparation and review of test items,
5) Preparation and implementation of the trial form,
6) Item analysis of the test,
7) Creation of the final test.

Basically, following these steps, the following processes were carried out in creating the achievement test:

a) The achievements related to the affix-root subject to be measured by the achievement test were determined according to the Turkish lesson curriculum.
b) In order to find out whether the created items included the sub-areas related to the affix-root subject, a literature review was conducted.
c) Based on the literature, the multiple choice question type was preferred for measuring the subject. Because multiple choice questions are more suitable for developing a standard achievement test and performing statistical operations on the results obtained. (Metin, 2015, p. 195).
d) Three experts were consulted to review the 35 items in the trial form prepared in terms of scope, scientificity, language and expression, and technical features. As a result of expert opinions, the number of items in the test was updated to 20.
e) The trial form was applied to the trial group similar to the features of the study group of the study, the understandability of the form was tested, and the understandability of the test was revised. Thus, the test was given its final form.

2.4 Analysis of Data

The data obtained were analyzed with SPSS 22.0 package program. Firstly, it was determined whether the data obtained from the affix-root achievement test showed a

normal distribution. Shapiro-Wilk test, arithmetic mean, mode and median values, kurtosis and skew coefficients, Histogram Graph, Normal QQ Graph, Slope Free Normal QQ Graph, PP Graph, Box Graph and Trunk Leaf Diagram of the data were examined and it was decided that the data did not show normal distribution. In the analysis phase of the data that meet the normality assumptions, t-Test for Independent Samples was used, and the non-parametric Mann Whitney U Test was used in the analysis phase of the data that do not meet the normality assumptions.

Mann Whitney U Test is used to investigate whether there is a significant difference between the ranks of the measurement results of two groups that are not related to each other (Kilmen, 2015, p. 224). This test is the non-parametric equivalent of the t-Test for Independent Samples. T-Test for Independent Samples is used to test the significance of the difference between the means of two unrelated samples (Büyüköztürk, 2012, p.39). This test is a parametric analysis technique for determining the difference between two measurements belonging to the same group (Seçer, 2015, p. 66).

3. Findings

In this section, the findings obtained from the students in the control and experimental groups are included.

Table 1: Mann Whitney U Test Results Related to the Pre-test Scores of the Control and Experimental Group Students in the Affix-Root Test

Pre-Test	Groups	n	$\overline{X}$	SD	U	p
General Average	Experimental Group	13	8.04	104.50	13.500	.001
	Control Group	11	17.77	195.50		

According to Table 1, it was concluded that there was a significant difference between the groups as a result of the Mann Whitney U Test conducted to determine whether the pre-test scores of the control and experimental group students in the affix-root achievement test differed significantly ($p< .05$).

Table 2: T-Test Results for Independent Samples Related to Post-Test Scores of Control and Experimental Group Students in Affix-Root Test

Post-Test	Groups	n	$\overline{X}$	Ss	t	p
General Average	Experimental Group	13	63.57	14.86	1.654	.112
	Control Group	11	52.00	19.46		

Based on the data in the table, it was determined that there was no significant difference between the averages of as a result of the t-test for the Dependent Samples conducted in order to determine whether there was a significant difference between the post-test achievement scores of the control and experimental group students in the affix-root test. ($p> .05$).

Table 3: T-Test Results for Dependent Samples Related to the Pre-test and Post-test Scores of Experimental Group Students in the Affix-Root Test

	Tests	n	$\overline{X}$	Ss	t	p
Experimental Group	**Pre-Test**	13	25.38	5.57	-9.689	.000
	Post-Test	13	64.23	15.25		

Based on the data in the table, it was determined that there was a significant difference between the averages of the students as a result of the t-Test for the Dependent Samples conducted to determine whether there was a significant difference between the pre-test and post-test achievement scores of the experimental group students in the affix-root test. (p< .05).

Table 4: T-Test Results for Dependent Samples Related to the Pre-test and Post-test Scores of Control Group Students in the Affix-Root Test

	Tests	n	$\overline{X}$	Ss	t	p
Control Group	**Pre-Test**	11	45.45	19.03	-.967	.356
	Post-Test	11	52.27	18.48		

Based on the data in the Table 4, it was determined that there wasn't a significant difference between the averages of the students as a result of the t-Test for the Dependent Samples conducted to determine whether there was a significant difference between the pre-test and post-test achievement scores of the control group students in the affix-root test. (p> .05).

4. Conclusion

In this section, the results obtained from the affix-root achievement test, which was applied at the beginning and at the end of the study in order to reveal the effect of Web 2.0 education tools on success in affix-root teaching to secondary school 5th grade students, are presented.

A significant difference was found between the pretest scores of the control and experimental group students in the affix-root test. When the average scores of the groups were evaluated, it was seen that the average score of the experimental group was 8.04 and the average of the control group was 17.77. For this reason, it can be said that the control group students had a higher average score compared to the experimental group students before the experimental process.

It was concluded that there was no significant difference between the post-test scores of the control and experimental group students in the affix-root achievement test. However, considering the post-test mean scores obtained after the experimental process, it was seen that the average score of the experimental group (63.57) was higher than the average score of the control group (52.00). Although there was no statistically significant difference between the post-test scores, it can be stated that when the difference between the mean scores of the experimental and control groups was taken into consideration and

the pretest-posttest mean scores of the experimental group students were compared, the scores increased in favor of the experimental group.

It was seen that there was a significant difference between the pre-test and post-test scores of the experimental group students in the affix-root test. On the other hand, it was determined that there was no significant difference between the pre-test and post-test scores of the control group students in the affix-root test. In this context, it can be said that Plickers is effective in affix-root teaching to 5th grade students.

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