

# THE EFFECT OF MAKEY MAKEY USE ON STUDENTS' ACADEMIC ACHIEVEMENT AND ATTITUDES IN PRIMARY LITERACY TEACHING WITH TECHNOORGANIC EDUCATION MODEL

## EL EFECTO DEL USO DE MAKEY MAKEY EN EL RENDIMIENTO ACADÉMICO Y LAS ACTITUDES DE LOS ESTUDIANTES EN LA ENSEÑANZA DE LA ALFABETIZACIÓN PRIMARIA CON EL MODELO DE EDUCACIÓN TECNOORGÁNICA

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### ABSTRACT

This study investigates the impact of using a techno-organic education paradigm in primary reading and writing teaching on students' academic progress and attitudes, particularly using Makey Makey kit applications, and solicits feedback from educators and students. The quantitative part of the research sample comprises of first-grade kids from a rural school in the Ceylanpnar district of Anlurfa. The quantitative dimension research group consists of 35 kids identified by the group matching approach. In contrast, the qualitative dimension study group comprises the experimental group of students, their parents, and classroom teachers. While the experimental group used the Makey Makey kit to instruct, the control group proceeded with the present curriculum.

One of the mixed-method designs employed in the study was the explanatory sequential mixed method design. In the quantitative component of the research, a quasi-experimental design was utilized, and in the qualitative dimension, a phenomenology design was used. According to the data analysis findings for the quantitative component of the study, a statistically significant difference in the accomplishment tests of the experimental and control groups was discovered in favor of the experimental group. According to the results, students' attitudes toward the techno-organic education paradigm and the Makey Makey kit were favorable, drawing students' interest and enhancing their enthusiasm to study.

**Keywords:** Techno-organic education; Makey makey; reading; writing; students' attitudes.

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## RESUMEN

Este estudio investiga el impacto del uso de un paradigma de educación tecno-orgánica en la enseñanza primaria de lectura y escritura en el progreso académico y las actitudes de los estudiantes, en particular mediante el uso de aplicaciones del kit Makey Makey, y solicita comentarios de educadores y estudiantes. La parte cuantitativa de la muestra de investigación se compone de niños de primer grado de una escuela rural en el distrito de Ceylanpnar de Anlurfa. El grupo de investigación de la dimensión cuantitativa consta de 35 niños identificados por el enfoque de emparejamiento de grupos. En contraste, el grupo de estudio de la dimensión cualitativa comprende el grupo experimental de estudiantes, sus padres y maestros de aula. Mientras que el grupo experimental usó el kit Makey Makey para instruir, el grupo de control procedió con el plan de estudios actual. Uno de los diseños de métodos mixtos empleados en el estudio fue el diseño de métodos mixtos secuenciales explicativos. En el componente cuantitativo de la investigación se utilizó un diseño cuasiexperimental y en la dimensión cualitativa se utilizó un diseño fenomenológico. De acuerdo con los hallazgos del análisis de datos para el componente cuantitativo del estudio, se descubrió una diferencia estadísticamente significativa en las pruebas de rendimiento de los grupos experimental y de control a favor del grupo experimental. De acuerdo con los resultados, las actitudes de los estudiantes hacia el paradigma de la educación tecnoorgánica y el kit Makey Makey fueron favorables, despertando el interés de los estudiantes y aumentando su entusiasmo por estudiar.

**Palabras clave:** Educación tecnoorgánica; Makey Makey; lectura; escritura; actitudes de los estudiantes.

## INTRODUCTION

Education is the most fundamental notion that influences an individual's behavior, attitudes, and thoughts in all aspects of his life. Education, which occurs informally in the home and social environment, is formalized in order to lead the person to the desired behaviors inside specific programs within institutions and to keep them away from the undesirables (Kaya, 2017). While the individual is being developed in terms of conduct, when he enters primary school age, he is introduced to education in the academic sense. The first step in expanding education in this way is literacy instruction. Primary literacy education is the most fundamental and challenging step of an individual's educational journey (Güneş, 2013). The initial literacy skill is critical for the child's life in general, as it influences the effectiveness of the child's Turkish lessons at all levels, particularly elementary school (Parlakylidz, 2014). As a result, the initial literacy course serves as the foundation for all future courses in the system. It is the goal of elementary literacy instruction to develop four core language skills: reading, writing, listening, and speaking. Because these abilities are also useful in students' everyday lives and social relationships, quality in elementary literacy instruction should be prioritized (Yücedağ, 2021).

Considering the developmental features of primary school children, it is clear that attracting the attention of the pupils is critical for the educational process. Children of this age are reported to have a maximum attention span of 15 minutes per hour (Yayci, 2018). The short attention span also explains why it is critical to maintain the student's interest at a high level and on a consistent basis. If we accept this condition as a prerequisite, we must establish learning environments as the

foundation of education. Enriching learning surroundings, organizing them in a way that draws the child's attention, and locating resources relating to the intended subject in the environment all help to promote latent learning. While enhancing learning environments, concrete materials can be used as well as technology.

We are confronted with fast growing technology in all aspects of our life, even as we go about our regular lives practically every day. This alteration affects youngsters born in the twenty-first century as well. When smartphones, tablets, and laptops are not used in a supervised manner, access to hazardous information becomes simpler, digital games confine youngsters, and this leads to technology addiction. When children, who are constantly dealing with technology at home and in their social lives, are given the chance to be directly associated with technology in learning environments, the use of technology will be both appropriately oriented and successful. The active use of technology in the education process has positively affected the speed of accessing information, as well as development in children in terms of diversity, individual and rapid education, and creativity (Erdoğan, 2014). The use of technology also transforms the education process into an economical, efficient and permanent form, for reasons such as "saving the time of drawing the visuals, providing memorability through video demonstration instead of event narration, and facilitating the reproduction and concretization of examples" (Yücedağ, 2021). However, at this point, it is very important to carry out the process in a balanced way. A technology-oriented education process alone will not have a positive effect on primary school children. As a result, natural ecosystems should be included in the process. This is why the introduction of organic education is becoming increasingly important, particularly at a young age. To achieve balance, the rate of education based on organic education should be raised as age falls, while the rate of education based on technology should be increased as age grows. However, for a youngster who has not reached the stage of abstract operations, the rate of technology-supported teaching should not exceed 50% (Turan, 2022).

Many researches on technology aided education and the technoorganic education paradigm have been undertaken. Gürol and Yıldız (2010), for example, investigated the impact of computer-assisted schooling on the development of children's basic literacy abilities. As a consequence of the study, it was established that it had a good influence on the experimental group's reading speed and reading abilities, but did not indicate a significant difference in their dictation skills. Büyükkarcı and Müldür (2017) sought to investigate the impact of technology materials on students' writing skills in their research. As a consequence of the applications, it was revealed that although the use of technology contributed to the general writing process, it reduced the interest in writing and negatively affected the writing skill. In his study, Can (2019) aimed to determine the effect of the application of the technoorganic education model in the 3rd grade mathematics course on the academic achievement and attitudes of the students towards the course. As a result of the study, it was observed that there was a significant difference between the students' attitude scores. It was concluded that the comments of the students about the technoorganic education model were positive. In their study, Turan and Emir (2018) consulted educators' views on technology and education togetherness, and as a result of the study, they concluded that educators support the inclusion of technology in the process and that they think that it will enable the child to be active in the lesson. In addition, Turan (2022) mentioned in his study titled "TechnoOrganic Education" that the technoorganic education model is a model that meets the physiological and psychological needs of individuals without being behind the times, and that the concepts of technology-supported education and organic education are carried out in a balanced way. After reviewing the studies, it is decided that the integration of technology with education is required and needed in practically every subject of education. However, studies have

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shown that a wholly technology-oriented education would dull pupils and have a detrimental impact on the teaching process. To avoid this predicament and to balance technology in education, organic education is required.

Organic education is defined as a formal education model that systematically supports the process of creating desired behavior, which is the primary goal of education, with natural instructional materials and experiences, while allowing the individual to establish strong connections between his daily life and school life in a natural environment (Çalışkan, 2015). The primary goal of this concept is to provide education to children by linking them with nature (Yücedag, 2021). It is intended to be a paradigm that does not alienate 21st century children born into technology from nature and life itself, while also preventing technology addiction. The activity areas envisaged in this direction will also take place in nature. Playgrounds have been added in nature for play, which is the most fundamental requirement of young children, since the age of technology usage has decreased. Children play with spinning tops, marbles, steel rods, hopscotch, and other items in these spaces (Turan, 2020). Other sectors of activity designed for students who waste their energy by playing games continue to carry out the academic education process.

## **BACKGROUND**

### **1. Technoorganic Education**

The primary purpose for the emphasis on nature and the natural in organic education is to remove the individual from a technology-dependent lifestyle. With technology infiltrating every part of our life, it is evident that even youngsters play their games on computers, cellphones, and tablets, raising screen-dependent and sedentary generations, playgrounds remaining vacant, and children remaining inert (Turan and Çalışkan, 2015). At this point, technoorganic education enters the picture, with the goal of channeling children's interest in technology into the appropriate areas, as well as establishing a technology-nature balance by blending the use of technology in lessons and all other areas included in the education process with the organic education process. The approach is planned to take an active role in the education process of the students. At the same time, with special applications for all ages and grades, the use of technology is reduced and organic education is increased for children who are in the concrete operational stage, while an approach in which the use of technology is increased with the intangible operational period is exhibited. As a result, pupils will not be constrained to a particular topic of study during their education, but will instead be educated in many learning contexts. A healthy and productive education process is provided independent of academic accomplishment, taking into account the unique peculiarities of the children, who are supplied with activities based on their interests and talents.

Technoorganic education is an education model that follows technological developments without removing the child from his daily life, integrates these developments into the understanding of education, transforms the use of technology into a conscious and controlled manner by channeling the use of technology to the appropriate fields, and aims to achieve a technology-nature balance in education. However, in order for this approach to be applied, a school atmosphere is required (Yücedağ, 2021). It is envisaged in the designed school model to teach lessons in organic education settings at times and technology education environments at other times. These layouts were also used to design classrooms and recreation spaces. The goals of the technoorganic education model can be expressed as follows: It adopts an education process that gives importance to multiple intelligences

in which individual differences are taken into account. Efforts are made to raise conscious individuals by ensuring that students get to know nature and technology well with the guidance of their teachers. Students are subjected to process-oriented evaluations and result-oriented evaluation is used as an alternative. By combining technology and nature, students’ creativity and interest in different fields are observed. The basis of the educational studies in the fields of activity is always the work to gain moral values and the right attitude. Ensuring the child’s development in a multi-dimensional way (physical, social, cognitive, emotional, motor and language development) is one of the most basic goals (Can, 2019). The activities of techno-organic schools have been grouped within ten fields: Techno-Organic Education Field, Techno-Organic Playground, Techno-Organic Agricultural Field, Techno-Organic Orchard, Techno-Organic Art Field, Techno-Organic Nutrition Area, Techno-Organic Zoo, Techno-Organic Aquatic Life Center, Techno-Organic Research-Study Field, and Techno-Organic Travel-Observation Field (Turan, 2022).

## 2. Teaching Process in Technoorganic Education Model

The education process under the technoorganic education model is carried out using a hybrid method that combines technical and organic aspects. However, the balance of both parts is critical in this case. The educational method is designed with the student’s age and developmental stage in mind. These characteristics are also used to define the balance of the fundamental components. As a result, the rates of technology-supported education and organic education fluctuate on a regular basis. Turan (2022) highlights that the rate of technology-supported education should rise as one progresses from pre-school to high school, while the rate of organic education should fall. He explains this by referring to the individual’s psychosocial, cognitive, and emotional abilities’ developmental condition (Figure 1).



Figure 1. Distribution Ratio of The Techno-Organic Education Model By Age (Turan, 2022)

Learning and teaching settings should be varied and enhanced based on the student’s age, level, temperament, interest, desire, and motivation. It is inconvenient to carry out the full educational process in entirely organic or completely technologically aided modes. Education procedures can be carried out in a hybrid manner based on both organic and technology-supported teaching, depending on the child’s age, growth, interest, and motivation. The child should not encounter technology-supported education before the age of 2. From the age of 2, technology-supported education can be started. As age decreases, the rate of education based on organic education increases until a certain period of time, and the rate of technology-supported education increases as age increases. Until



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the child's age of transition to the abstract operational stage, a teaching process based on at least 50% organic education should be carried out. From the age of 11, technology-supported teaching processes can be carried out at a rate of more than 50%. Technology-supported teaching processes in education should be carried out at a maximum rate of 80%. Because humans are bio-social and cultural creatures, organic education processes should be implemented at a rate of 20% in teaching processes for people over the age of 14. A certain amount of organic education is required in the learning-teaching processes of education, just as a human need water, air, and food to exist. As a result, education that is entirely based on technology is unsuitable for human nature and may result in irreversible damage in the future. Organic and technology-supported education curricula can be adjusted (Turan, 2022).

### **3. Use of MakeyMakey Based on Technoorganic Education**

MakeyMakey is a gadget that connects computers and things to perform a variety of purposes. This gadget, created by Jay Silver and Eric Rosebaum, can convert things into control panels such as a touchpad, mouse, and keyboard (Erkoç, 2017). Essentially, it is an electronic circuit board that gives a control switch function to electrically conductive materials (Aytekin, 2018). Along with the electrical circuit, there is a USB cable, a jumper cable, and an alligator cable. With these cables, the objects and the circuit are connected to each other and the system is activated. When the object is contacted once the connections are formed, it executes the command that was assigned to it.

While the kid pays attention to items and situations that pique his interest in pre-school and the ensuing concrete operational phase, attention grows during the school-starting process (Demirova, 2008). As a result, experiences take precedence over facts and abstract representations for youngsters throughout this time period. MakeyMakey is supposed to have a facilitative impact and boost the student's attention span at the stage of passing the mental processes in the initial literacy phase. When letters and sounds are communicated using conductive items, the student's curiosity is piqued by the element of surprise, and the desire to participate in the process grows. The fact that the kid participates in the educational process with his own will and internal drive will also contribute to the success of the first literacy process.

In this research, the makeymakey kit supported primary reading and writing teaching process was conducted on the experimental group. For example, while teaching the letter m, mandarin, while teaching the letter k, kiwi, while teaching the letter D, date (date) while teaching the letter O, fruits such as orange, and while teaching the letter g, grapes (grape) were used and each sound was tried to be taught with the initial sound of a fruit word. For example, when teaching the word dog; Date, orange and grape objects were attached to the makeymakey kit and the children learned these words by touching them with computer aided hands-on practice. Relevant images are attached.

In this study, answers to the following questions were sought in line with the Technoorganic Education Model and MakeyMakey studies:

- 1) Does the use of "MakeyMakey" in the first reading and writing teaching with the technoorganic education model have a significant effect on the academic achievement of the students?
- 2) What are the opinions of students, parents and teachers about the application of the technoorganic education model and the use of "MakeyMakey"?

## **METHOD**

### **Research Model**

The study was constructed using a mixed pattern approach. One of the mixed designs was the explanatory sequential mixed method design. This design was employed in the research to acquire supporting results by collecting qualitative and quantitative data. In many study disciplines, a mixed design is utilized to evaluate and explain research problems by integrating qualitative and quantitative data groupings (Creswell, 2021b). The data collecting step is carried out individually in the exploratory sequential pattern. However, because the qualitative and quantitative elements are inherently interrelated, qualitative data serve as a supplement to quantitative data (Creswell and PlanoClark, 2020). Since the model developed in this study needs to be examined with comprehensive and detailed data, the exploratory sequential mixed design was used. Quasi-experimental design, which is one of the experimental design types in quantitative dimension, was applied. Studies in which groups were randomly matched before the study are called quasi-experimental designs (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel, 2016). This approach was utilized in this study since there was no way to interfere with the groups and there was a necessity to do research on pre-made groups. A pretest-posttest matched control group random design was used for the study. The method of qualitative phenomenology was applied. Phenomenology is used to evaluate people's experiences in their own words as objectively and thoroughly as possible (Ersoy, 2019). Because the study is based on the experience of the proposed education model and the material utilized, this technique was employed.

### **Population and Sample**

The sample of the study was formed in two dimensions as quantitative and qualitative. Quantitative dimension consists of 35 students from the 1st grade of Şanlı Primary School in Büyükçaylı village of the Ceylanpınar district of Şanlıurfa. In this sample, there are 18 students in the experimental group and 17 students in the control group. Groups were determined by random placement using the group matching method. The study group in the qualitative dimension consists of 8 students in the experimental group and their parents, and 5 classroom teachers. While forming the study groups, it was determined that both of the groups were going to read the first grade for the first time and their success levels were equal. Since the main purpose of the study is to examine the primary literacy education, the sample was composed of 1st grade students.

### **Data Collection Tools**

At the beginning of the research process, the "Literacy Detection Form" was applied to measure the equivalence of the experimental and control groups. The form included 29 letters in the alphabet, and the letters were shown to the students and the students were evaluated under 3 main headings on recognizing/distinguishing the sound, reading and writing the letter. It was concluded that all of the students gave negative responses to these stages.

"Reading Comprehension Test", "Dictation Study Text" and "Reading Speed Measurement Text" were used while collecting quantitative data. In the reading comprehension test, 5 texts determined by the experts were read to the students and they were asked to write down the answers to the questions about the texts. The texts of the dictation work were determined as 4 texts with expert opinions after a

pool was created from the texts collected from different sources. The students were asked to read the texts to the students by the teacher and the students were asked to write down the text they listened to. The development of basic language skills in dictation is important in terms of developing the habit of writing in accordance with spelling and spelling rules (Yücedağ, 2021; Baştuğ, 2015). In the analysis of dictation texts, Okatan and Özer's (2020) "Letter of Legibility of Student Writings" scale was used. The final version of the scale was determined with the items included in the scale by the researcher, and it is given in the table 1.

**Table 1.** Dictation Scale

	Legibility Articles	Experiment Group				Control Group			
		D1	D2	D3	D4	D1	D2	D3	D4
1	Writing in lowercase when it should be capitalized	3	8	0	3	4	3	5	7
2	Writing in lowercase when it should be capitalized	2	16	2	2	5	0	1	3
3	Writing separately when they should be written together	0	0	0	0	0	0	0	0
4	Misspelling	9	6	5	12	11	4	2	5
5	Writing missing letter	61	48	39	43	66	70	29	44
6	Writing much letter	17	24	23	24	18	17	23	16
7	Leaving too much space between words	14	0	5	1	4	1	5	2
8	Not leaving enough space between words	51	94	37	52	42	28	9	38
9	Not writing letters according to the basic letter rules	6	5	12	13	32	5	8	3
10	Writing missing word	52	74	62	40	191	269	198	154
	Total	215	275	185	190	373	397	280	272

The reading speed measuring text was constructed by selecting texts to be utilized based on expert comments from the researcher's resource pool. It was critical to have enough discerning capacity while picking the texts. Its goal is to achieve natural results by allowing children to read at their own speed.

The data collection process in the qualitative dimension was carried out with semi-structured interview forms. Semi-structured interview questions are prepared in advance but can be revised during the interview, providing flexibility to the researcher and participant, allowing more detailed and comprehensive information to be obtained (Ekiz, 2015). The interviews were conducted in three distinct interview formats with three different groups: parents, instructors, and students. The questions were meant to allow participants to observe the study in terms of several groupings.

### Data Collection Process

The study was conducted with first-grade pupils from an Primary School in Büyükçaylı village, Ceylanpınar district, Şanlıurfa province. The application has been granted the necessary permissions. The research's "Literacy Detection Form" was used to assess the equivalency of the study groups. The



activities carried out in the first two letter groups designated by the Ministry of National Schooling were employed in the experimental group’s daily lesson plans produced for the study, while the control group maintained their regular education. Before and after the application, the same pre-test and post-test were administered to both groups. At the conclusion of the study, interviews were performed with the experimental group kids, their parents, and classroom teachers to ascertain their perspectives on the application procedure and the model. The interviews, which lasted an average of 5 minutes, were taped to aid in the analytic process.

In the analysis of quantitative data, mean (x), percentage, frequency, standard deviation (SD) distributions were used. The sample size ( $n \geq 30$ ) was determined for the normality distribution of the study groups (Cevahir, 2020). Since it was determined that the groups did not show normal distribution, statistical differences were determined with the Mann-Whitney U Test. A value of 0.05 was accepted as a reference for the p value in the test. Content analysis method was used in order to make a detailed and comprehensive analysis in the analysis of qualitative data. Content analysis is utilized to make sense of and categorize qualitative data (Aybek, 2019).

## RESULTS

### Quantitive Findings

The results of the achievement tests conducted in the quantitative dimension of the research are presented below.

The Mann-WhitneyU test results regarding Reading Comprehension Texts are given in Table 2.

**Table 2.** Mann-Whitney U Test on Reading Comprehension Test Scores

Text No	Groups	N	Rank Mean	Rank Total	U	Z	p
1	Experiment	18	20.17	363.00	114.000	-1.616	0.106
	Control	17	15.71	267.00			
	Total	35					
2	Experiment	18	20.72	373.00	104.000	-2.115	0.034*
	Control	17	15.12	257.00			
	Total	35					
3	Experiment	18	22.64	407.50	69.500	-3.036	0.002*
	Control	17	13.09	222.50			
	Total	35					
4	Experiment	18	22.19	399.50	77.500	-3.129	0.002*
	Control	17	13.56	230.50			
	Total	35					
5	Experiment	18	20.61	371.00	106.000	-1.733	0.083
	Control	17	15.24	259.00			
	Total	35					

\*p<0.05

When Table 2 is examined, it is seen that the students in the experimental group have scores for Reading Comprehension-1 (SO= 20.17), while the students in the control group have scores for Reading Comprehension-1 (SO= 15.71). When the results of the Mann-Whitney U Test regarding the achievement scores of the experimental group and control group students in the Reading Comprehension Text-1 are examined, it is seen that (U= 114.000 and p= .106 > .05). If p>0.05, the H0 hypothesis is accepted and it means that there is no difference between the scores of the two groups. Based on this, it was determined that there was no statistically significant difference between the Reading Comprehension Text-1 scores of the experimental group and control group students.

It is seen that the scores of the Reading Comprehension Text-2 in Table 2 (SO= 20.72) and the scores of the students in the control group regarding the Reading Comprehension-2 (SO= 15.12). When the Mann-Whitney U Test results regarding the achievement scores of the experimental group and control group students in the Reading Comprehension Text-2 are examined, it is seen that (U= 104.000 and p= .034 < .05). . Based on this, it was determined that there was a statistically significant difference between the Reading Comprehension Text-2 scores of the experimental group and control group students.

When Table 2 is examined, it is seen that the students in the experimental group have Reading Comprehension-3 scores (SO= 22.64), while the students in the control group have Reading Comprehension-3 scores (SO= 13.09). When the Mann-Whitney U Test results regarding the achievement scores of the experimental group and control group students obtained in the Reading Comprehension Text-3 are examined, it is seen that (U= 69.500 and p= .002 < .05). Based on this, it was determined that there was a statistically significant difference between the Reading Comprehension Text-3 scores of the experimental group and control group students.

It is seen that the scores on Reading Comprehension-4 in Table 2 (SO= 22.19) and the scores on Reading Comprehension-4 (SO= 13.56) of the students in the control group. When the Mann-Whitney U Test results regarding the achievements of the experimental group and control group students in Reading Comprehension-4 are examined, it is seen that (U= 77.500 and p= .002 < .05). Based on this, it was determined that there was a statistically significant difference between the Reading Comprehension 4 scores of the students in the experimental group and the control group.

When Table 2 is examined, it is seen that the students in the experimental group have Reading Comprehension-5 scores (SO= 20.61), while the students in the control group have Reading Comprehension-5 scores (SO= 15.24). When the Mann-Whitney U Test results regarding the achievements of the experimental group and control group students in Reading Comprehension-5 are examined, it is seen that (U= 106.000 and p= .083 > .05). Based on this, it was determined that there was no statistically significant difference between the Reading Comprehension Text-5 scores of the experimental group and control group students.

The Mann-Whitney U test results for Dictation Skills Texts are given in Table 3.

**Table 3.** Mann-Whitney U Test on Dictation Test Error Numbers

Text No	Groups	N	Rank Mean	Rank Total	U	Z	p
	Experiment	18	13.08	235.50			
1	Control	17	23.21	394.50	64.500	-2.925	0.003*

Text No	Groups	N	Rank Mean	Rank Total	U	Z	p
	Total	35					
	Experiment	18	13.67	246.00			
2	Control	17	22.59	384.00	75.000	-2.587	0.010*
	Total	35					
	Experiment	18	13.06	235.00			
3	Control	17	23.24	395.00	64.000	-2.955	0.003*
	Total	35					
	Experiment	18	13.72	247.00			
4	Control	17	22.53	383.00	76.000	-2.558	0.011*
	Total	35					

\*p<0.05

When Table 3 is examined, it is seen that the number of errors related to Dictation Text-1 of the students in the experimental group (SO= 13.08) and the number of errors related to the Dictation Text-1 of the students in the control group (SO= 23.21). When the Mann-Whitney U Test results regarding the number of mistakes made by the experimental group and control group students in the Dictation Text-1 are examined, it is seen that (U= 64.500 and p= .003 < .05). Based on this, it was determined that there was a statistically significant difference between the number of Dictation Text-1 errors of the students in the experimental group and the control group.

It is monitored that the number of errors related to Dictation Text-2 in Table 3 (SO= 13.67) and the number of errors related to Dictation Text-2 of the students in the control group (SO= 22.59). When the Mann-Whitney U Test results regarding the number of errors in the Dictation Text-2 of the experimental group and control group students are examined, it is seen that (U= 75.000 and p= .010 < .05). Based on this, it was determined that there was a statistically significant difference between the number of Dictation Text-2 errors of the students in the experimental group and the control group.

When Table 3 is examined, it is seen that the number of errors related to Dictation Text-3 of the students in the experimental group (SO= 13.06) and the number of errors related to the Dictation Text-3 of the students in the control group (SO= 23.24). When the Mann-Whitney U Test results regarding the number of errors in the Dictation Text-3 of the experimental group and control group students are examined, it is seen that (U= 64,000 and p= .003 < .05). Based on this, it was determined that there was a statistically significant difference between the number of Dictation Text-3 errors of the students in the experimental group and the control group.

It is seen that the number of errors related to Dictation Text-4 in Table 3 (SO= 13.72) and the number of errors related to Dictation Text-4 of the students in the control group (SO= 22.53). When the Mann-Whitney U Test results regarding the number of errors in the Dictation Text-4 of the experimental group and control group students are examined, it is seen that (U= 76.000 and p= .011 < .05). Based on this, it was determined that there was a statistically significant difference between the number of Dictation Text-4 errors of the students in the experimental group and the control group.

The Mann-Whitney U test results for Speed Reading Skills Texts are given in Table 4.

**Table 4.** Mann-Whitney U Test for Reading Speed Measurement Test Scores

Text No	Groups	N	Rank Mean	Rank Total	U	Z	p
	Experiment	18	10.33	186.00			
1	Control	17	26.12	444.00	15.000	-4.557	0.000*
	Total	35					
	Experiment	18	10.19	183.50			
2	Control	17	26.26	446.50	12.500	-4.640	0.000*
	Total	35					

\*p&lt;0.05

When Table 4 is examined, it is seen that the scores of the students in the experimental group regarding the Reading Speed Measurement Text-1 (SO= 10.33) and the scores of the students in the control group regarding the Reading Speed Measurement Text-1 (SO= 26.12). . When the results of the Mann-Whitney U Test regarding the achievement scores of the experimental group and control group students in the Reading Speed Measurement Text-1 are examined, it is seen that it is (U= 15.500 and p= .000 < .05). Based on this, it was determined that there was a statistically significant difference between the Reading Speed Measurement Text-1 scores of the experimental group and control group students.

It is seen that the scores of the Reading Speed Measurement Text-2 in Table 4 (SO= 10.19) and the scores of the students in the control group regarding the Reading Speed Measurement Text-2 (SO= 26.26). When the results of the Mann-Whitney U Test regarding the achievement scores of the experimental group and control group students in the Reading Speed Measurement Text-2 are examined, it is seen that (U= 12.500 and p= .000 < .05). Based on this, it was determined that there was a statistically significant difference between the Reading Speed Measurement Text-2 scores of the students in the experimental group and the control group.

### Qualitative Findings

The results gathered from the interviews conducted in the qualitative dimension of the research are as follows:

Teachers' overall opinion of the use of technology in elementary literacy teaching is good. In these evaluations, it is stressed that technology facilitates teaching, provides effective and efficient learning chances, saves time, attracts students' attention, and provides the possibility to embody information. Teachers' current tactics and strategies have been noted to revolve around problem solving, presentation, demonstration, and learning by doing. Teachers stated that they observed that the MakeyMakey kit had a positive effect on the teaching process in terms of including the first literacy education. They drew attention to the fact that it provides the opportunity to learn by having fun, especially because it arouses interest and curiosity, and these increases the motivation of the student. It was also mentioned that a good process provides permanent learning and thanks to the kit used, it provides students with the opportunity to connect with life. It has been determined that the impact of technological organic education apps on pupils in general is good throughout the learning process. In this context, emphasis has been placed on themes such as effective/permanent learning, activity, efficient learning, and multimedia applications.

In the interviews with the students, important results were obtained regarding the use of MakeyMakey in the first literacy education. While 87% of the students liked the process as they found it fun, exciting, happy and beautiful, 10% used unclear expressions such as “not boring”, “different”, and 3% said they found it boring. When asked whether they would like to use MakeyMakey in other lessons, one student stated that he did not want it because he had difficulty, while other students stated that they wanted to use it in other lessons because they liked it and found it fun. When it was investigated how the use of MakeyMakey during the first literacy education process affected the learning process of the students, the students evaluated this issue through the difficulty of the process. While 76% of the group stated that they made the process easier, 18% made it difficult, 6% did not express a clear opinion, saying that they were undecided.

In the interviews with the children's parents, their perspectives on the usage of MakeyMakey in early literacy education were solicited. Except for one, all of the parents said they found it beneficial. The father who opposed it stated that he thought it was unnecessary. When the situation is considered in terms of the learning process and the individual's achievements, it has been stated that it has a positive effect on learning as it provides permanent information, facilitates learning and provides applied learning opportunities, and also provides gains such as personal development and computer literacy. When parents were asked about their observations of the students' reactions and feedbacks despite the use of technoorganic education approaches in the initial literacy education, it was discovered that the overall opinion was good. While the students responded by having fun and celebrating, they indicated that the influence on the pupils was mostly in the form of empowering their motivation to work and leaving positive impressions.

## **DISCUSSION**

As a result of the “Literacy Detection Form” used at the start of the investigation, it was found in this study that the students in the experimental and control groups were illiterate and were equal in this regard. According to the findings of the pre-test and post-tests, there was a statistically significant difference between the pre-test and post-test scores in three of the five texts used to assess reading comprehension abilities. In his study, Şeflek Kovacıoğlu (2006) concluded that there is a significant relationship between the reading comprehension skill and the student's attitude towards reading. This study by Şeflek Kovacıoğlu (2006) supports this study by showing that it is important that the activities carried out during the skill acquisition phase are interesting. The variety of methods, techniques and materials used also had an effect in favor of student success in reading comprehension. Kutluca Canbulat (2013) also concluded that the method, technique, teaching materials used in his study as well as student characteristics affect meaningful reading holistically.

When the results of the dictation skill tests were compared to the pre-test and post-test success ratings, it was determined that there was a statistically significant difference between the experimental and control groups in all tests. This demonstrated that technoorganic teaching approaches improved dictation abilities. In his study, Yıldız (2010) concluded that multimedia experiences improve children's literacy skills. The technoorganic education paradigm allows students to encounter multimedia in the educational process by delivering multiple experiences and building a learning environment at their own speed and manner.

Speed reading is a talent that gets more significant as one progresses through the reading levels. The study's achievement tests revealed that there was a substantial difference between the experimental



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and control groups' pre-test and post-test achievement results. This finding is consistent with the findings of Gürol and Yıldız (2015). Gürol and Yıldız (2015) investigated the effects of computer-assisted education on students' first literacy skills in primary literacy teaching in the categories of reading skills, dictation skills, and speed reading skills, and found that it was beneficial to reading skill and reading speed development. Başaran and Kılınçarslan (2021), in their study with first-year students, concluded that letter/sound teaching with web 2.0 tools and letter teaching with traditional methods, as a result of letter teaching with web 2.0 tools, were more successful in letter recognition, spelling and reading.

In terms of the process, the instructors assessed the use of technology in the initial literacy instruction. While they came to the overall conclusion that technology has a good influence on the process, they underlined that it facilitates instruction and saves time. Birgül (2014) found that primary school instructors have favorable attitudes toward the use of computer-assisted instruction in primary literacy education. They concluded that it promotes an effective and productive learning environment by capturing students' attention and providing multi-sensory teaching and concretization chances. It can be observed that the methods used in elementary literacy teaching are confined to problem solving, presentations, demonstrations, and making. Despite this limitation, they argued that it is very important for the teaching process to ensure permanent learning in the student, to keep his interest, curiosity and motivation alive, to have fun while learning and to help him connect what he has learned with life. For this reason, their thoughts on the MakeyMakey kit were also positive. Teachers stated that MakeyMakey applications should be used in primary literacy education as they keep students active, provide effective/permanent learning and allow multimedia applications. Turan and Emir (2018) examined the educators' views on technology, education 4.0 and artificial intelligence in their study, and concluded that they support the education-technology association and that it will positively impact the child's activity in education.

Students generally shared their feelings regarding MakeyMakey in their remarks. Its application in elementary literacy teaching has given pupils sensations of joy, difference, happiness, and boredom. The student who finds it dull attributes his dissatisfaction to the difficulty of the course, not the kit or the technoorganic education applications. When students evaluated the method in terms of the course's difficulty, they largely claimed that it has helped the course. When asked if they wanted to utilize MakeyMakey in additional classes, the majority of students said yes. Can and Turan (2021) stated in their study that technoorganic education applications had beneficial impacts within the context of benefits such as learning via play, facilitating learning, boosting success, and promoting creativity. This explains the excellent feedback about using students in different classes.

The usage of MakeyMakey in the initial literacy instruction was examined in terms of parents' perspectives, learning process, and successes in the parent interviews. While favorable comments indicate that the strategy is advantageous to the process, negative opinions came as a result of their being thought superfluous. When evaluating the learning process and achievements, it is stated that it adds to personal growth and computer literacy. Furthermore, it has been stated that the knowledge is persistent since it encourages learning and gives hands-on learning. Ekici Calın (2019) also mentioned in his study that the facilitation of the first literacy education with teacher and student dimensions and making it more efficient will be possible by including alternative literacy methods and focusing on the practice part of the first literacy education process. It has been observed that students' reactions in technoorganic education applications are typically favorable; they like the studies and add to the lesson's motivation. Maden (2013) noted that strategies that include students in the process of learning

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basic language skills would produce more effective results.

## CONCLUSION

To turn basic literacy instruction into an effective, productive, and quality process, it is vital to pay attention to kids' interests and individual peculiarities. In order for the student to be actively involved in the process, exciting and interesting procedures and strategies should be used. Organic education should be provided to kids so that they may interact with real world, but it should not be divorced from technological support, which is a requirement in this day and age. Technoorganic education and the use of MakeyMakey gain importance at this point. It has been proven by studies that the motivation of the student for the lesson is high, that he is active in the process and that the information he has learned will be permanent when he is given the opportunity to learn as a result of his studies. By offering training on programs/software relevant to their interests, students may be requested to summarize or assess what they have learnt at the end of these trainings with these programs/software. The motivation of the child's interest in lessons can be improved by applying this strategy in other sessions. Furthermore, broadening the reach of academics interested in conducting new studies on the MakeyMakey kit would make a substantial contribution to the discipline. In this regard, a research that includes all letter groups for the first reading and writing lesson can be conducted. If the scope is expanded to include other courses, it is feasible to adjust to bigger samples based on grade level by developing training patterns on a course-by-course basis.

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## Appendixes

### Appendix-1: Images of the Application Process

