

## The Effect of Using Technology-Assisted Drama Method in Teaching the Central Nervous System Subject on Academic Achievement and Attitude

### Merkezi Sinir Sistemi Konusunun Öğretiminde Teknoloji Destekli Drama Yöntemi Kullanılmasının Akademik Başarı ve Tutum Üzerine Etkisi

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**ABSTRACT:** The aim of this research is to examine the effects of technology-supported drama method applications on students' academic achievements regarding the central nervous system and their attitudes towards biology. In the research, quasi-experimental design with pre-test post-test control group, one of the quantitative research methods, was used. The sample of the research consists of 50 students studying in two separate classes at a state university and taking biology courses. Within the scope of the research, the subject of the central nervous system was taught with the traditional teaching method in the control group and with the technology-supported drama method in the experimental group. In the research, "Academic Achievement Test" and "Biology Attitude Scale" were used as data collection tools to measure the academic achievements of the students. A statistical package program was used to analyze the data. As a result of the research, it was determined that the course carried out with the technology-supported drama method generally positively affected the academic achievements and attitudes of the students. In future studies, it is recommended that the effects of technology-supported drama method on students' academic achievement and attitudes in biology courses be examined in the long term with larger and more diverse sample groups.

**Keywords:** Drama, technology supported education, biology education, academic achievement, attitude.

**ÖZ:** Bu araştırmanın amacı, teknoloji destekli drama yöntemi uygulamalarının öğrencilerin merkezi sinir sistemi konusuna ilişkin akademik başarılarına ve biyolojiye yönelik tutumlarına etkisini incelemektir. Araştırmada nicel araştırma yöntemlerinden ön-test son-test kontrol gruplu yarı deneysel desen kullanılmıştır. Araştırmanın örneklemini bir devlet üniversitesinde iki ayrı sınıfta öğrenim gören ve biyoloji dersi alan 50 öğrenci oluşturmaktadır. Araştırma kapsamında merkezi sinir sistemi konusu kontrol grubunda geleneksel öğretim yöntemiyle, deney grubunda ise teknoloji destekli drama yöntemi ile işlenmiştir. Araştırmada veri toplama aracı olarak öğrencilerin akademik başarılarını ölçmek amacıyla, "Akademik Başarı Testi" ve "Biyoloji Tutum Ölçeği" kullanılmıştır. Verilerin analizinde bir istatistik paket programı kullanılmıştır. Araştırma sonucunda teknoloji destekli drama yöntemi ile gerçekleştirilen dersin, genel olarak öğrencilerin akademik başarılarını ve tutumlarını olumlu yönde etkilediği tespit edilmiştir. Gelecek araştırmalarda teknoloji destekli drama yönteminin öğrencilerin biyoloji derslerindeki akademik başarılarına ve tutumlarına etkisinin daha geniş ve daha çeşitli örneklem grupları ile uzun vadede incelenmesi önerilmektedir.

**Anahtar kelimeler:** Drama, teknoloji destekli eğitim, biyoloji eğitimi, akademik başarı, tutum.

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Biology education aims to give people the ability to recognize the individual, the environment, society, the development of society, the health of individuals and environmental health. Every individual should receive biology education, even at a basic level (Özkan, 2011). However, since biology contains many foreign terms, words of Latin origin and complex relationships, it becomes more challenging to teach and learn compared to other disciplines. For this reason, one of the most frequently used methods in biology learning is the memorization method. However, this method prevents students from establishing connections between concepts and makes it difficult for them to succeed when they face questions that require analysis, synthesis and evaluation (Köse, 2008).

The progress of a society is closely related to the qualities that the education system creates in individuals. Therefore, the education system should be carefully planned to make individuals thinking, questioning, able to produce innovative solutions to problems, creative and effective (Kılıç & Sağlam, 2004). Today, biology education is constantly being renewed with the advances in educational sciences and technology. Rather than basing biology education on memorized information, teaching methods that will enable students to develop in-depth understanding and the ability to compare and interpret biology subjects are being focused on (Aşılıoğlu & Aytaç, 2002). One of the methods that can develop these skills is creative drama. Many evidences that creative drama contributes to learning are frequently encountered in the literature (Çetinkaya Aydoğdu & Kirpik, 2021; Kırmızı Susar, 2007; Koç & Geçit, 2021; Öztürk & Korkmaz, 2020).

Creative drama is a workshop that focuses on the successful achievement of specified goals, is carried out with a group accompanied by a leader and includes the steps of “Warm-up, Revitalization and Evaluation”, and has no age or subject restrictions (Akdemir & Karakuş, 2016). Creative drama is a method that can be used at all levels of education, starting from pre-school education, including university and graduate education, and can be applied in various fields (Akgül, 2018; Köksal Akyol, 2003). This method offers students the chance to act out a situation or event and assume the roles of the relevant characters. Students are given background information about the characters they will portray and then asked to express their perspectives by putting themselves in the shoes of these characters or empathizing with them (Stradling, 2003, p.107, as cited in Altıkulaç & Akhan, 2010). In the process of drama in education, the individual experiences and learns how to communicate in almost every moment of daily life in sample events and situations. In the course taught with drama method, students can develop their speaking, listening, reading comprehension and written communication skills while taking different roles and expressing their feelings, thoughts and wishes through improvisation (Maden & Dinç, 2017). Different concepts that mean drama, such as drama and creative drama, are used in education. In addition, it is noteworthy that concepts such as role playing and improvisation are used instead of drama. However, role playing are techniques involved in the improvisational drama process. The concept of drama is expressed in a wide range as different terms are used in different countries and educational approaches. For example, while it is called “creative drama” in the United States, the term “drama in education” is more common in England and “creative drama” is more common in Turkey. As Çifci and Altınova (2012) state, the general purpose of creative drama is to raise individuals who are

creative in every field, self-sufficient, self-aware, able to communicate with their environment and improve this, and with increased expression power and forms.

Biology course, by its nature, includes subjects suitable for role-playing. For this reason, it can be ensured that students move away from abstract concepts by acting out the events and the lesson becomes more interesting. Compared to other teaching methods, creative drama method is student-centered and encourages active participation, thus creating an interactive social learning environment. Biology course is one of the areas where creative drama method can be used effectively since it is an important course where students take their first steps towards science and technology (Aydın & Bülbül, 2011).

In addition to the creative drama method, another method that has a significant impact on the learning process is technology-assisted instruction. In today's rapidly changing world, educators are now realizing the importance of students learning not only the information they memorize, but also how to creatively develop and use this information in practice. New technologies hold great promise for overcoming traditional barriers to professional development (Wiske et al., 2001). Today, many technologically advanced countries have realized that the real power is no longer physical, but in the educated human brain. At every stage of education, many technologies are used, from blackboards to books, from projectors to computers (Çetin et al., 2004). Advances in technology enable technological tools to be used more widely and spread rapidly in the field of education (Karadüz & Baytak, 2010). The use of technology in educational environments increases the quality of the educational process. This use reduces educational costs, facilitates adaptation to developing technology, and provides students with the knowledge and skills they need in their individual and social lives (Tiryaki & Demir, 2020). Use of technology-supported instruction in lessons positively affects students' interest and learning (Ünal & Yeşilyurt, 2023).

Although there are many studies in the literature on the effectiveness of technology-supported instruction and creative drama methods in different disciplines (Kolovou & Kim, 2020; Shim et al., 2003; Tsaushu et al., 2012; Yağmur, 2010; Yalım, 2003; Yılmaz et al., 2023), the number of applications in which these methods are used together is quite limited (Anderson et al., 2016; Dimililer et al., 2017; Gürbüz & İlğaz, 2021; Öztürk & Korkmaz, 2020; Yağmur, 2010). When the problem is examined in terms of the effectiveness of technology-supported drama method in biology course, there is no research on the effectiveness of technology-supported drama method in biology course.

In addition, considering the aforementioned researches, in learning environments where technology-supported drama method is applied, students are not limited to memorizing the course; they can also become aware of how they learn (Öztürk & Korkmaz, 2020)

Therefore, technology-supported drama method can provide students with a more effective learning experience in the biology course and encourage them to actively assimilate information instead of passively taking it.

In this context, it is predicted that this research will make an important contribution by filling the gaps in the literature. In this context, the aim of the research is to investigate the effects of using technology-supported drama method on students'

academic achievement and attitude towards the central nervous system in biology course.

In this direction, the sub-problems of the research are as follows;

1. Is there a statistically significant difference between the experimental group and the control group in terms of academic achievement in terms of pre-test scores before the experimental study?
2. Is there a statistically significant difference between the experimental group and the control group in terms of pre-test attitude scores before the experimental study?
3. Is there a statistically significant difference between the experimental group in which Technology Supported Drama Method was applied and the control group in which traditional teaching method was applied in terms of academic achievement in terms of post test scores?
4. Is there a statistically significant difference between the experimental group in which Technology Supported Drama Method was applied and the control group in which traditional teaching method was applied in terms of post-test attitude scores?

## Method

### Research Design

In this research, a quasi-experimental design with pre-test post-test control group was used among quantitative research methods. Quasi-experimental design is a type of experimental design generally used in educational research. This design is used when it is not possible for researchers to conduct real experiments and control all variables. It especially covers situations where different conditions are examined in existing groups and individuals in schools or classes cannot be randomly selected (Cohen et al., 2000). This design aims to test how different the change in one of the groups is from the change in the other group (Büyüköztürk, 2007). The pretest-posttest control group design is a design in which participants are evaluated both before and after the experimental study with a measurement related to the dependent variable. Participants are divided into two groups as experimental group and control group (Karasar, 2005). The experimental design used in the research is shown in Table 1.

Table 1

*Experimental Design Used in the Research*

Working group	Pre-test	Application	Post-test
Experimental group (EG)	Academic achievement test, biology attitude scale	Technology supported drama method	Academic achievement test, biology attitude scale
Control group (CG)	Academic achievement test, biology attitude scale	Traditional classroom method	Academic achievement test, biology attitude scale

## Participants

The sample of the research consisted of a total of 50 students studying in two separate classes and taking biology course at a state university. One of the classes was accepted as the experimental group and the other as the control group. Analyses were conducted on the total data of these two classes. Since the number of classes taking biology course in the research was limited and only one instructor allowed the application in his/her course, convenience sampling method, one of the non-random sampling methods, was used in sample selection. In this context, a total of two classes were determined. In quasi-experimental studies, since the researcher cannot create groups artificially, such studies involve the unbiased selection of groups. The researcher objectively selects one of the existing groups as the experimental group and uses the other as the control group (Creswell, 2005, cited in Erdoğan & Şengül, 2017). One of the classes was selected as the experimental group in which the Technology Supported Drama Method was applied; the other was selected as the control group in which the traditional classroom method was applied as specified in the curriculum. The gender distribution of the participants in the research is shown in Table 2.

Table 2

### *Distribution of Participants by Gender*

Gender	Experimental group	Control group
Male	15	14
Female	10	11

## Data Collection Tools

In the research, 2 scales were used as data collection tools.

For academic achievement: In the research, “Academic Achievement Test” developed by Akman (2023) was used to measure the academic achievement of the students. The scale consists of a total of 19 items including multiple-choice questions to determine students’ academic achievement on the central nervous system. The KR20 value of the academic achievement test was calculated as .81.

For attitude Biology Attitude Scale, which was developed by Geban et al. (1994) to determine students’ attitudes towards chemistry and modified by Pekel (2005) as biology attitude scale, was used in the research. The scale was prepared in 5-point Likert type and consisted of 15 items in total. The Cronbach’s alpha reliability coefficient of the entire Biology Attitude Scale was .926.

## Data Analysis

A statistics package program was used to analyze the data obtained at this stage. The Kolmogorov-Smirnov test was applied for the academic achievement test and attitude scale in order to evaluate the suitability of the data obtained from the research for normal distribution and the kurtosis-skewness coefficients were examined and it was determined that normality was achieved. In addition, the kurtosis and skewness values of the data were examined and it was tested whether these values were between +1.5 and -1.5 (Tabachnick & Fidell, 2013). As the achievement test and attitude scale data

showed normal distribution in the experimental and control groups, parametric test was used. Arithmetic mean, standard deviation and independent sample t test were used to compare students' academic achievement and attitude scores towards biology course.

### **Implementation Process**

A pretest was administered to the experimental and control groups to determine their level of knowledge about the central nervous system. Both groups were allocated 6-hour lessons separately and a total of 3 weeks for the explanation of the central nervous system. The pretest and posttest applications were excluded from these 3 weeks. Before starting the drama practices, in the first week, detailed information about the technology-supported drama method was presented to the students, and the roles of the students in the process of dramatizing the central nervous system were determined by distributing the roles. In the second week, during the implementation phase, all students in the class participated effectively in the drama activities, the students both processed the subject with creative drama technique and an interactive learning environment was created by utilizing technological tools. It was ensured that students used technological tools effectively in drama practices. Various technological tools such as projectors, tablet computers, CDs, voice recorders and stethoscopes were introduced to the students. These tools were used to dramatize the topic of the central nervous system and to help students determine their roles. Students shared visual materials with projectors, accessed interactive content with tablet computers, provided effective voice-over with voice recorders, and made dramatized situations more realistic with stethoscopes. In this way, technology enriched the learning experience by enabling students to actively and effectively participate in drama activities. Students covered the course topic with a combination of creative drama technique and technological tools. In the last week, the students were divided into groups and evaluated the applied method and discussed the parts of the Central Nervous System.

Prepared creative drama plans should be examined by at least one expert before implementation and any deficiencies should be corrected (Yağmur, 2010). The drama activity implemented in the course was examined and approved by two experts in the field of biology education and creative drama. In this process, first of all, expert opinions were received and ideas were shared about drama activities that could be used in biology course content. Experts have determined which topics are suitable for drama activities, how student participation can be ensured, and how the activities can be evaluated. Then, the central nervous system topic was chosen in line with expert opinions and consensus of researchers. Drama activity was created by researchers. Experts examined and revised the deficiencies and faulty parts of the creative drama activity and suggested arrangements. In line with these suggestions, the activity was finalized and implemented. The drama activity prepared for the central nervous system subject is as follows;

Mrs. Hatice sits and watches television. Her son Selçuk comes in, takes the remote control and changes the channel. To his mother:

Selçuk: what did you cook?

Mrs. Hatice: Leek meal.

Selçuk: What a leek! I don't like leeks. Make me another meal!

Mrs. Hatice: I wish you would get married as soon as possible!

*Mrs. Hatice talks to herself internally:*

Mrs. Hatice: I urgently need to get my son married. I wonder who I should find to marry him off. Hanife's daughter is very beautiful, she is very hardworking. Let me tell her to my son.

Mrs. Hatice: I went to Hanife's house the other day and her daughter has grown so big and beautiful. And she's so hardworking.

*Selçuk understands his mother's intentions:*

Selçuk: I understand your intentions, but don't tire yourself. I won't marry the girl you found. What age are we living in?

*Selçuk leaves the room complaining:*

Mrs. Hatice: I need to marry my son urgently. Let his wife suffer a little bit, I have suffered until this age.

Brain: *(the previously recorded voice comes on the computer as an external voice)*: Okay, let's say you got your son married, but what about the wedding expenses, there is the gold, the engagement, the henna, the wedding.

Mrs. Hatice: You thought very right, brain, but what about these expenses?

Brain: In my opinion, the shortest thing to do is to have a family engagement and then a wedding. *(Computer recording as an external voice)*

Mrs. Hatice: Will the girl and her family accept this?? Enough is enough, I'm getting sick thinking about it *(Mrs. Hatice faints and is taken to the hospital by the people around her)*. *(Mrs. When Hatice wakes up, she is in the hospital)*.

Doctor: Hello Mrs. Hatice, you scared us but you are fine, right?

Mrs. Hatice: Well, doctor, there are endless noises in my brain.

Doctor: Hmm. Well, if you want, let's examine your organs. Let's even look at them and talk to your brain and other organs that make up your central nervous system *(first the tablet and then the computer is used)*

Yes, doctor.

Doctor: Yes, we are now seeing the brain, cerebellum, spinal cord and spinal bulb. *(Everyone tries to speak at the same time, buzzing)*. *(Brain raises his voice)*:

Brain: Hey can everyone be quiet? I'm telling you, listen to me! I am your center, remember that.

Cerebellum: So what if you are our center. Without me you would be off balance, remember that I am the BALANCE! Without me, your arms and legs would be out of balance *(laughs)*.

Brain: Okay, you are the center of balance, but I am the MANAGER! I am the manager; you are all employees *(laughs)*. Learning, memory, hunger, thirst, sleep, wakefulness, blood pressure, body temperature, speech, writing, senses, hormones. oooo you see I have it all.

*(Spinal cord interjects)*

Spinal cord: You're making a big fuss! I also provide the connection between the organs and the central nervous system. So only you have important tasks? Reflexes occur under my control (e.g., pupil dilates or shrinks according to the intensity of the light (role-play), the foot lifts up when the kneecap is tapped (role-play). Pulling the hand away when touching a hot object (simulated). The sucking movement of a newborn baby. Also, without me, there would be no learned reflexes. You would not be able to ride a bicycle, swim or knit. Look how everyone's mouth is watering when they see this lemon *(shows lemons to those sitting)*.

*(The spinal bulb can't take it anymore)*

Spinal bulb: Please calm down. We all have important tasks. For example, I control the internal organs. This is how the digestive, respiratory, excretory and circulatory systems work properly. Swallowing, chewing, coughing (cough sound), sneezing (sneeze sound), vomiting (grimace) is also under my control. Also remember that I am an intermediary. The neural transmission between the spinal cord and the brain is mediated by me. We are a team, remember.

And why are we at odds with each other like this? Obviously, there is a problem.

Brain: Yes. Mrs. Hatice gets stressed about her son, so of course we have the right to respond. And when she gets overwhelmed with thoughts, we fall out with each other like this. Could you take this CD? (*Hands a CD to the doctor*). If it were up to us, this bet would not end until the morning. The best thing is for you to watch and see what we do. Oh, and please don't stress yourself and put us in this situation. Ahh Ahh, I want to see this world before I die. I'm asking for too much! (*CD is opened and a video about the central nervous system is shown*)

Doctor: Yes Mrs. Hatice, your central nervous system organs are very troubled. We should find solutions to the problems without stressing ourselves so that our organs are not damaged.

Figure 1

*Central Nervous System Technology-Supported Drama Activity*



The lessons in the control group were taught with traditional teaching methods. Within the framework of this method, the teacher explained the lessons and presented them with direct explanation and question-answer techniques. Lessons were held on time and with the active participation of the teacher, previous lessons were repeated at the beginning of each lesson, and questions were asked to the students to get feedback at the end of each lesson. After the interventions, a post-test was administered to the experimental and control groups to assess their level of knowledge about the central nervous system.

### **Ethical Procedures**

The legal obligation to comply with ethical rules has been approved by the decision of Kafkas University Social and Human Sciences Scientific Research and Publication Ethics Board dated 24.11.2023 and numbered 29.



## Results

In this section, the data obtained from the research on each sub-problem are tabulated and presented.

### Findings Related to the First Sub-Problem

Before the application, independent samples t test was applied to determine whether there was a difference between the academic achievement of the students in the experimental and control groups on the central nervous system. The results of the analysis of the pretest scores of the experimental and control groups are presented in Table 3.

Table 3

*Mean, Standard Deviation and T-Test Results of the Pretest Scores of the Experimental and Control Groups*

Groups	<i>n</i>	$\bar{X}$	<i>ss</i>	<i>sd</i>	<i>t</i>	<i>p</i>
Experimental group	25	40.41	12.03	48	.256	.799
Control group	25	39.55	11.78			

\* $p > .05$

According to Table 3, the mean score of the experimental group ( $\bar{X}=40.41$ ) and the mean score of the control group ( $\bar{X}=39.55$ ) were close to each other. According to the results of the independent samples t-test analysis, there is no statistically significant difference between the experimental and control groups [ $t(48)=.256, p > .05$ ]. Therefore, it can be said that there is equivalence between both groups in terms of academic achievement.

### Findings Related to the Second Sub-Problem

In order to determine the effect of Technology Supported Drama Method applications on academic achievement, independent samples t test was applied to determine whether there was a difference between the experimental and control groups. The results of the analysis of the post-test scores of the experimental and control groups are presented in Table 4.

Table 4

*Mean, Standard Deviation and T-Test Results for the Academic Achievement Post-Test Scores of The Experimental and Control Groups*

Groups	<i>n</i>	$\bar{X}$	<i>ss</i>	<i>sd</i>	<i>t</i>	<i>p</i>
Experimental group	25	66.73	11.54	48	2.557	.014
Control group	25	57.04	15.01			

\* $p < .05$

When Table 4 is examined, it is observed that the mean score of the experimental group ( $\bar{X}=66.73$ ) is higher than the mean score of the control group ( $\bar{X}=57.04$ ). According to the results of the independent sample t-test, there is a statistically significant difference between the experimental and control groups in terms of academic achievement posttest scores [ $t(48)=2.557, p<.05$ ]. These findings show that the experimental group has a higher performance than the control group.

### Findings Related to the Third Sub-Problem

Before the application, an independent samples t-test was applied to determine whether there was a difference between the attitudes of the students in the experimental and control groups towards biology. The results of the analysis of the pretest scores of the experimental and control groups are presented in Table 5.

Table 5

*Mean, Standard Deviation and T-Test Results According to the Attitude Scale Pre-Test Scores of The Experimental and Control Groups*

Groups	<i>n</i>	$\bar{X}$	<i>ss</i>	<i>sd</i>	<i>t</i>	<i>p</i>
Experimental group	25	3.06	.58070	48	-.706	.484
Control group	25	3.07	.48338			

\* $p>.05$

According to Table 5, the mean score of the experimental group ( $\bar{X}=3.06$ ) and the mean score of the control group ( $\bar{X}=3.07$ ) for attitude towards biology were close to each other. According to the results of the independent samples t-test analysis, there was no statistically significant difference between the experimental and control groups [ $t(48)=-.706, p>.05$ ]. Therefore, it can be said that there is equivalence between the experimental and control groups in terms of attitude.

### Findings Related to the Fourth Sub-Problem

In order to determine whether there is a difference between the experimental and control groups in order to determine the attitude of Technology Supported Drama Method applications towards biology course, independent samples t test was applied. The results of the analysis of the post-test scores of the experimental and control groups are presented in Table 6.

Table 6

*Mean, Standard Deviation and T-Test Results According to the Attitude Scale Post-Test Scores of The Experimental and Control Groups*

Groups	<i>n</i>	$\bar{X}$	<i>ss</i>	<i>sd</i>	<i>t</i>	<i>p</i>
Experimental group	25	3.44	.40070	39.089	2.143	.038
Control group	25	3.11	.67377			

\* $p<.05$

When Table 6 is examined, it is observed that the mean score of the experimental group ( $\bar{X}=3.44$ ) is higher than the mean score of the control group ( $\bar{X}=3.11$ ). According to the independent sample t-test results, there is a statistically significant difference between the experimental and control groups in terms of attitude post-test scores [ $t(39,089)=2.143$ ,  $p<.05$ ]. These findings reveal that the experimental group has a higher attitude than the control group.

### Discussion and Conclusion

In this research, it was aimed to determine the effect of technology-supported drama method applications on students' academic achievement related to the central nervous system and attitude towards biology. When the literature is examined, there are studies on the contribution of drama to biology education (Abrahams & Braund, 2012; Aydın & Bülbül, 2011; De Beer et al., 2018). Similarly, there are studies on the contribution of technology-supported instruction to biology education (Taşçı et al., 2010; Van Rooy, 2012; Yang et al., 2015). However, there is no research in which both drama and technology-supported instruction are used together in biology course. One of the main reasons why students fail in science courses is that the subjects are abstract and complex and the curricula present these subjects in an abstract (Doğan et al., 2004). Biology courses are generally perceived by students as a course that requires memorization and therefore are not given enough importance (Özatlı & Bahar, 2010). In learning environments where drama and technology-supported teaching are applied, students can have the opportunity to understand what and how they learn more deeply instead of just memorizing the Biology course. These approaches offer a significant potential to provide students with meaningful learning experiences and enable them to comprehend information more effectively.

As a result of the analysis, no statistically significant difference was observed between the experimental group and the control group in terms of pre-test academic achievement before the experimental study. This result shows that the students' initial knowledge about the central nervous system is at a similar level. However, when the post-test scores were examined, it was determined that there was a significant difference between the post-test academic achievement scores of the experimental group and control group students participating in the research in favor of the experimental group. This finding points to the effectiveness of the course taught with the technology-supported drama method. This finding, which emphasizes the effectiveness of the course in which technology-supported drama method is applied, is similar to the results of a small number of studies in the existing literature (Anderson et al., 2016; Dimililer et al., 2017; Gürbüz & İlgaz, 2021; Öztürk & Korkmaz, 2020; Yağmur, 2010). Therefore, this result obtained from the current research is consistent with the results of previous studies and strongly supports the potential of technology-supported drama method to increase student achievement. In addition, many studies have been conducted on the effect of drama method and technology-supported instruction on student achievement. The general results of these studies conducted at different levels reveal that both methods positively affect students' achievement levels (Akgül, 2018; Akgün et al., 2014; Campbell, 2013; Kaf & Yılmaz, 2017; Karadüz & Baytak, 2010; Kavan, 2021; Maden & Dinç, 2017; Yağmur, 2010; Yalım, 2003; Yılmaz et al., 2023).

Another result obtained from the research shows that the application of technology-supported drama method positively affects students' attitudes towards the course. If the methods and techniques used in the course are varied and create an interesting structure for students, this may contribute to the development of positive attitudes towards the course (Öztürk & Korkmaz, 2020). Therefore, it can be said that the reason for this situation is that teaching the lesson with this method provides students with a fun experience and they have a pleasant time in the lesson. In support of this situation, Öztürk and Korkmaz (2020) stated in their research that social studies teaching with technology-supported creative drama activities made a greater contribution to students' attitudes and problem-solving skills compared to traditional methods. In addition, there are many studies on the effects of drama approach associated with technology-supported drama method and technology-supported teaching on attitudes. For example; Ong et al. (2020) concluded that creative drama was effective on science students' career interests and attitudes towards science. Campbell (2013) stated in his research that drama supports motivation, self-efficacy and attitudes. In their research, Zengin and Ulaş (2021) stated that teaching social studies course with drama activities was effective on students' attitudes. Akkale and Özalp (2023) stated in their research that classroom teachers have a very high level of attitude towards the use of creative drama method. Yılmaz (2005) examined the effect of the use of technology in education on student achievement and attitude and found that technological tools had a positive effect on achievement and attitude. Yavuz and Coşkun (2008) examined the attitudes of classroom teaching students towards educational technologies and technological tools and the results of the attitude scale revealed a positive development in students' attitudes towards technology.

In conclusion, a general overview of the results of the research shows that the course conducted with the technology-supported drama method generally increased the academic achievement and attitudes of the students positively.

Technology-supported drama activities encouraged students' active participation and provided them with the opportunity to develop their ability to reconcile abstract concepts with concrete experiences and to understand them in depth. Students learned basic concepts about the central nervous system thanks to technology-supported drama activities.

The recommendations developed based on the research results are as follows:

- In order to evaluate the effect of the technology-supported drama method on biology subjects, studies with larger, more diverse sample groups and longer periods of time can be conducted, so that a more comprehensive understanding of the effect of the method on students' attitudes and academic success levels can be possible.
- In this research, the effects of technology-supported drama method applications on students' academic achievements and attitudes towards biology on the central nervous system were examined. In future studies, variables such as motivation and problem solving can be examined in relation to this issue.
- Similar applications can be made in different subjects that are thought to be difficult for students in the biology course.

- By using different teaching methods, the effects of the methods used can be evaluated.
- Educators can increase the effectiveness of the method by constantly conducting research and development studies on the technology-supported drama method.
- Educators can use the technology-supported drama method not only in biology classes but also by integrating it with other disciplines.
- Educators can provide students with collaborative learning environments by using the technology-supported drama method. Group projects and teamwork allow students to learn by working together and develop social skills.

### Statement of Responsibility

All parts of the article were co-written by the authors. All sections such as Introduction, Method, Results, comment, discussion, and conclusion were written together. All expenses related to the article were made by the authors.

### Conflicts of Interest

The authors have no competing interests to declare that are relevant to the content of this article.

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