EXAMINING THE OPINIONS OF SCHOOL ADMINISTRATORS AND SCIENCE TEACHERS REGARDING TECHNOLOGY-SUPPORTED SCIENCE EDUCATION

EXAMINANDO AS OPINIÕES DE ADMINISTRADORES ESCOLAR E PROFESSORES DE CIÊNCIAS SOBRE A EDUCAÇÃO CIENTÍFICA APOIADA POR TECNOLOGIA

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Abstract. The main purpose of this research is to examine the perspectives of school administrators and science teachers on technology-supported science education in secondary schools affiliated with the Ministry of National Education in the Turkish Republic of Northern Cyprus and to investigate the impact of this approach on students. The study group consists of one inspector from the Ministry of National Education in the Turkish Republic of Northern Cyprus, along with 18 school administrators and 21 science teachers working in the Lefkoşa, Gazimağusa, Girne, Güzelyurt, and İskele regions. A qualitative research approach was employed, using a case study design. The researcher utilized a semi-structured interview method and developed an interview form with nine semi-structured questions, which was used as the data collection tool. Content analysis was applied for qualitative data analysis. The findings revealed that the use of smart boards in classrooms positively contributes to students' learning processes and that students' attitudes toward technology-supported science education are positive. This approach significantly enhances student motivation; however, there is a lack of the necessary technological infrastructure to fully implement technology-supported science education in schools. Furthermore, teachers need to further develop their skills in this area, and this development should be supported through in-service training. These findings highlight the role of technology in education and underscore the importance of strengthening the technological infrastructure of the education system.

Keywords: Technology-Supported Science Education, Science Teacher, Student Motivation

Resumo. O principal objetivo desta pesquisa é examinar as perspectivas de administradores escolares e professores de ciências sobre educação científica apoiada por tecnologia em escolas secundárias afiliadas ao Ministério da Educação Nacional na República Turca do Chipre do Norte e investigar o impacto dessa abordagem nos alunos. O grupo de estudo consiste em um inspetor do Ministério da Educação Nacional na República Turca do Chipre do Norte, juntamente com 18 administradores escolares e 21 professores de ciências que trabalham nas regiões de Lefkoşa, Gazimağusa, Girne, Güzelyurt e İskele. Uma abordagem de pesquisa qualitativa foi empregada, usando um desenho de estudo de caso. O pesquisador utilizou um método de entrevista semiestruturada e desenvolveu um formulário de entrevista com nove perguntas semiestruturadas, que foi usado como ferramenta de coleta de dados. A análise de conteúdo foi aplicada para análise de dados qualitativos. As descobertas revelaram que o uso de quadros inteligentes em salas de aula contribui positivamente para os processos de aprendizagem dos alunos e que as atitudes dos alunos em relação à educação científica apoiada por tecnologia são positivas. Esta abordagem aumenta significativamente a motivação dos alunos; no entanto, há uma falta de infraestrutura tecnológica necessária para implementar totalmente a educação científica apoiada por tecnologia nas escolas. Além disso, os professores precisam desenvolver ainda mais suas habilidades nessa área, e esse desenvolvimento deve ser apoiado por meio de treinamento em serviço. Essas descobertas destacam o papel da tecnologia na educação e ressaltam a importância de fortalecer a infraestrutura tecnológica do sistema educacional.

Palavras-chave: Educação científica apoiada pela tecnologia, professor de ciências, motivação do aluno

1. INTRODUCTION

Education contributes to creating more just and sustainable societies by fostering individuals' awareness of social responsibility, ethical values, and cultural understanding (Gül, 2019). The role of education is significant not only at the individual level but also at the societal level. The educational attainment of a society influences its contribution to the knowledge economy, technological progress, and social structure. Education drives the development of human capital and supports economic growth, while also promoting the spread of democratic values and strengthening social justice.

With the changes brought about by the digital age, the adaptability of the education system has become even more critical. Technological advancements, globalization, and the rapidly evolving job market require the education system to be flexible and innovative. Education encourages individuals to adapt to the shifting conditions of the world by promoting not only knowledge acquisition but also lifelong learning (Çelikkaya, 2013).

Science education plays a vital role in sparking interest in science, developing scientific thinking, and preparing students to become future scientists by equipping them with essential knowledge and skills. This profession aims to provide students not only with subject-specific knowledge but also with life skills such as problem-solving, critical thinking, and teamwork. Science teachers bear a significant responsibility in making science appealing to students and encouraging them to pursue science-related careers (Önal, 2017).

The Science and Technology course offers a learning environment that not only avoids rote memorization but also fosters curiosity, inquiry, and solution-oriented thinking. This course helps students understand the power of science and technology and assess their potential for a career in this field, taking a crucial step towards becoming informed and active individuals in their daily and future lives (Devran, Öztay, & Çelikkkıran, 2021).

Educational technologies play a crucial role in modern education systems. When integrated with the right strategies, these technologies can enhance students' learning experiences, offer teachers more opportunities, and enable more effective management of educational institutions. However, for this process to be successful, careful planning, ongoing evaluation, and the ethical and pedagogical alignment of technology use are essential (Ozan & Taşgın, 2017).

1.1. Objective of the Research

The purpose of this study is to evaluate the impact of technology use in science courses on students' learning experiences. Additionally, the study aims to understand how the use of technology in science education is perceived from a managerial perspective by gathering insights from school administrators, inspectors, and science teachers. In this context, the specific objectives of the study are as follows:

1. What are the general views of inspectors, school administrators, and science teachers working in the TRNC Ministry of National Education regarding technology-supported science education during the 2023-2024 academic year?
2. Is technology-supported science education being implemented in schools? If so, what technological tools and methods are being used?
3. What are the views of supervisors, school administrators, and science teachers on how technology-supported science education impacts students' scientific understanding, motivation, and creative thinking skills?
4. What are the observations and experiences of supervisors and school administrators regarding students' attitudes towards technology-supported science education, and what are the reasons behind their willingness or reluctance to engage with it?

5. From the perspective of supervisors and school administrators, what are the differences and advantages of technology-supported science education compared to traditional science education?
6. What do supervisors and school administrators think about the effects of technology use in science education on student motivation?
7. How do supervisors and school administrators assess the risk of students becoming distracted during technology-supported science education? In this context, what suggestions can they offer to guide teachers?
8. What are the views of supervisors and school administrators on teachers' competencies and needs in incorporating new educational technologies into science education?
9. What challenges do supervisors and school administrators face in implementing technology-supported science education practices in their schools? What solutions do they propose to address these challenges?

2. METHODOLOGY

2.1. Research Model

Qualitative research methods were used in this study. In qualitative research, priority is given to the phenomenon being studied and the reality constructed around it. The researcher closely follows facts and events, adopts a participatory stance, and seeks to interpret, describe, and deeply understand various perspectives. Since it occurs within a natural process, qualitative research often leads to theories and experiments (Balcı, 2016). The study employed a case study design, one of the qualitative research methods. In the literature, a case study is also referred to as a "case analysis" or "case method." This method is used to examine a specific situation, event, or group dynamics in detail (Subaşı & Okumuş, 2017).

2.2. Study Group

The study group for this research consists of auditors, school administrators, and science teachers working in state educational institutions in the Nicosia, Famagusta, Kyrenia, Güzelyurt, and Iskele regions of the TRNC Ministry of Education during the spring semester of the 2023-2024 academic year.
Purposive sampling, one of the sampling methods, was used in the research. This method focuses on selecting cases that are rich in information relevant to the research topic. Specifically, snowball sampling, a type of purposive sampling, was chosen. In this method, the research begins with a set of initial participants and expands by identifying additional participants through their suggestions or recommendations (Patton, 2002).

2.3. Data Collection Tool

In this research, the semi-structured interview technique was employed as a qualitative data collection tool. In most qualitative studies, interviews are designed to include flexible and open-ended questions. Less structured interviews provide participants with the freedom to describe their perspectives and experiences in their own words. To fully capture participants' viewpoints, researchers often use open-ended questions that encourage them to express themselves freely (Merriam, 2013).
This research aims to determine the perspectives of inspectors affiliated with the TRNC Ministry of National Education, secondary school principals, assistant principals, and science teachers regarding technology-supported science education. A semi-structured interview form, developed based on a literature review and expert opinions, was used to collect data. This form includes nine different items and aims to gain a detailed understanding of the participants'

views on technology-supported science education. The study reached one supervisor, 18 school administrators, and 21 science teachers.

2.4. Analysis of the Data

The results obtained from analyzing the data make it easier to understand the relationships between the events examined or the concepts that form the main theme of the research. These findings reveal the dynamics and patterns of the issue under examination, providing deeper insights (Büyüköztürk, 2011). In this study, the interview technique was used as a data collection tool, and qualitative data analysis was applied to analyze the data. The approaches used in the analysis of qualitative data should be orderly, disciplined, and clearly visible and identifiable (Geray, 2004). The data obtained from the interviews were analyzed using the "content analysis technique." Content analysis is a technique used to organize and understand qualitative data (Kıncal, 2015).

2.5. Validity and Reliability

Reliability is a critical concept for the robustness and repeatability of a qualitative study. The consistency of the data collected by the researcher and the systematic conduct of the research are important factors that enhance reliability. While the methods used to assess reliability in qualitative and quantitative research may differ, reliability in qualitative research depends on the researcher's commitment to impartiality and objectivity (Yıldırım & Şimşek, 2021). Internal validity in qualitative research involves questioning whether the data collected by the researcher and the interpretations made reflect the truth. External validity refers to the generalizability of research findings, testing whether the results of a study are applicable in similar environments and conditions (Merriam, 2013).

3. RESULTS

The findings of the research are listed in this section.

Table 1. Evaluation of the school administrators and teachers in our study group

THEMES	F(n:)	%
Gender		
Female	23	57,5
Male	17	42,5
Position		
Inspector	1	2,5
Manager	4	10
Assistant Manager	14	35
Science Teacher	21	52,5
Years of service		
0-4 Years	8	20
5-9 Years	2	5
10-14 Years	3	7,5
15-19 Years	10	25
20-24 Years	5	12,5
25 years and above	12	30
Total working time in teaching		
0-4 Years	4	10
5-9 Years	5	12,5
10-14 Years	3	7,5
15-19 Years	13	32,5
20-24 Years	10	25
25 years and above	5	12,5
Total working time in management		
0-4 Years	11	27,5
5-9 Years	6	15
10 Years and above	2	5
School of Participants		2,5
Ministry of Education	1	
Polatpaşa High School	10	25
Değirmenlik High School	7	17,5
Meral – Vedat Ertüngü High School	2	5
Bekirpaşa High School	2	5
Lapta Yavuzlar High School	6	15
Türk Maarif College	1	2,5
Oğuz Veli Secondary School	2	5
Anafartalar High School	2	5
Guzelyurt Turkish Maarif College	1	2,5
Bülent Ecevit Anadolu High School	2	5
20 Temmuz High School	2	5
İrsen Küçük Secondary High School	2	5

57.5% of the teachers who contributed to the study are women and 42.5% are men. In addition, 2.5% of the participants are supervisors, 10% are principals, 35% are assistant principals, and 52.5% are science teachers. Years of service of the participants: 20% between 0-4 years, 5% between 5-9 years, 7.5% between 10-14 years, 25% between 15-19 years, 12.5% between 20-24 years, 25% and over It increased to 30%.

Considering the participants' total working time in teaching, 10% between 0-4 years, 12.5% between 5-9 years, 7.5% between 10-14 years, 32.5% between 15-19 years, 32.5% between 20-24 years. 25%, 25 and above increased to 12.5%. The total working period of the participants in management was 27.5% between 0-4 years, 15% between 5-9 years, and 5% between 10 years and above. According to the places where the participants work, 2.5% is

Ministry of National Education, 25% is Polatpaşa High School, 17.5% is Değirmenlik High School, 15% is Lapta Yavuzlar High School, 5% is Meral-Vedat Ertüngü High School, % 5 Bekirpaşa High School, 5% Oğuz Veli Secondary School, 5% Anafartalar High School, 5% Bülent Ecevit Anatolian High School, 5% 20 July Science High School, 5% İrsen Küçük Secondary School, 2.5% Turkish Maarif College, 2.5% of them work at Güzelyurt Turkish Maarif College.

Table 2. Evaluation of Participants' Opinions on Technology-Assisted Science Education

THEMES	n	%
It increases students' motivation.	7	17,5
It is very important for new generations.	13	32,5
It increases students' desire and curiosity for learning.	3	7,5
It offers students the opportunity to learn by doing and experiencing.	9	22,5
It is necessary in the century we live in.	6	15
Interest is increasing day by day.	4	10
It should be laboratory and technology supported.	3	7,5
It offers students a safe learning environment.	3	7,5
Learning can turn into more permanent learning.	3	7,5
Technological and physical infrastructure is not at the required level.	4	10
It positively affects the learning and teaching process.	6	15

As seen in Table 2, the majority of the interviewees stated that it is very important for new generations and that it offers students the opportunity to learn by doing and experiencing. When we look at the table, 32.5% of the participants say that technology is of great importance for new generations, 22.5% say that it provides the opportunity to learn by doing and living, 17.5% say that it increases motivation, 15% say that it is the technology of the century we live in. It is a must and it is inevitable not to use technology, 10% say that the technological and physical infrastructure in our schools is not at the required level, 15% say that it shapes the learning process in a positive way and enables students to acquire knowledge more effectively and efficiently, 7.5% say that 7.5% stated that it increases students' enthusiasm for learning, 7.5% stated that science courses should be taught with laboratory and technology support, and 7.5% stated that it ensures that the information has a permanent trace and is remembered in the long term.

Table 3. Evaluation of Participants' Opinions on the Use of Tools, Equipment and Methods on the Implementation of Technology-Assisted Science Education in Schools

THEMES	n	%
Applications are being carried out.	36	90
Applications should happily be carried out in a laboratory environment.	3	7,5
Projection is used via smart boards and computers.	36	90
Java applications, simulation, experiment kits and computer-aided experiment kits are used.	13	32,5
Use of laboratory instruments (Microscope, pH meter, thermometer…)	20	50
Applications are not at the required level.	4	10
Learning takes place by doing experiments in the laboratory.	6	15

As seen in Table 3, the vast majority of participants use technology in science classes at school. During the use of technology, smart boards are used in many schools. In schools where there is no smart board, the computer is connected to a projection device and the images on the computer screen are projected onto the projection screen with the help of projection. They also stated that the use of technological laboratory equipment is widely used in many schools. Looking at the table, 90% of the participants stated that they used technology while teaching science lessons at school, 90% stated that they used smart boards or projections at this stage,

and 50% stated that they used laboratory equipment. Laboratory tools include technology. For example, the microscope offers students the opportunity to explore the world invisible to the eye. A pH meter is a laboratory instrument used to measure whether solutions are acidic, basic or neutral, digitally displaying measurement results and often used via a display or display panel. 32.5% of the participants use Java applications, simulations, experiment kits and computer-aided experiment kits in education. 15% of the participants stated that they learned by doing and experiencing the experiments carried out in the laboratory, 10% stated that such applications were not carried out at the required level, and 7.5% stated that the applications should definitely take place in the laboratory environment.

Table 4. Evaluation of Participants' Opinions on the Effect of Technology-Assisted Science Education on Students' Learning Process and Achievement

THEMES	n	%
It contributes to the learning process of students.	34	85
Students' success increases because they learn by doing and experiencing.	23	57,5
It creates technology addiction in students.	3	7,5
It does not contribute to the learning process and success of students.	2	5
It increases students' motivation, interest and success.	14	35
It gives students the opportunity to use time more effectively and efficiently.	5	12,5
Persistent trace learning occurs through experiments, videos and animations.	11	12,5
It concretizes abstract concepts.	5	27,5

As seen in Table 4, the majority of participants think that technology-supported science education makes positive contributions to the students' learning process. Participants stated that permanent learning occurs by seeing and experiencing, and that technology offers opportunities to support this type of learning with tools such as videos, animations and experiments. In this context, it has been observed that students' motivation, interest and success in the course increased. It has been stated that especially in a field such as science education, where abstract concepts are intense, technology makes it easier for students to visualize these concepts by concretizing them and provides the opportunity to use time more effectively and efficiently in the learning process. However, a minority of people think that technology-supported science education does not contribute to the learning process and success. Participants who held this view stated that technology could be distracting in some situations and lead to technology addiction. Despite this, the general consensus is that the positive effects of technology in education far outweigh the possible negatives.

When we look at the table, 85% say that it contributes to the learning process of the students, 57.5% say that the success of the students increases because they learn by doing and experiencing, 35% say that it increases the students' motivation, interest and success in the course, 27.5% say that it increases the students' permanent learning. It is realized through experiments, videos and animations, 12.5% allows students to use time more effectively and efficiently, 12.5% concretizes abstract concepts, 7.5% creates technology addiction in students, 5% states that students They stated that it did not contribute to the learning process and success.

Table 5. Evaluation of Students' Attitudes Towards Technology-Assisted Science Education According to Participants' Opinions

THEMES	n	%
Students' approaches, attitudes and wishes are positive.	35	87,5
The traditional education model negatively affects students' motivation.	3	7,5
Students' positive perspective on technology positively affects the process.	17	42,5
Visual and auditory activities in students lead to more permanent trace learning.	6	15
Students' curiosity and interest in the course increases success.	6	15

As seen in Table 5, the majority of participants stated that students' approaches, attitudes and wishes regarding technology-supported science education were extremely positive. Participants stated that in this process, the visual and auditory activities provided by technology provided permanent learning and that students' interest in the course increased significantly. It has been emphasized that technology-supported educational materials help students understand the subjects better and participate more actively in lessons.
Looking at the table, 87.5% of the participants stated that students' approaches, attitudes and wishes towards technology-supported science education were positive, 42.5% stated that students' positive perspective on technology positively affected the learning-teaching process, and 15% stated that students had visual and auditory skills. 15% stated that the activities provided more permanent learning, 15% stated that students' interest and curiosity in the course increased their success, and 7.5% stated that the traditional education model negatively affected students' motivation.

Table 6. Evaluation of the Differences between Technology-Assisted Science Education and Traditional Science Education, According to the Opinions of the Participants

THEMES	n	%
T.S.S.E. It matches the students' learning skills and styles.	8	20
T.S.S.E. It has more gains and advantages from the student perspective.	14	35
T.S.S.E. The curriculum is conveyed to students more quickly and actively.	7	17,5
T.S.S.E. Permanent learning occurs with visual and auditory stimuli.	14	35
T.S.S.E gives students the opportunity to learn by doing and use their time effectively.	18	45
It is thought that students find traditional science education inefficient and boring.	14	35
T.S.S.E. It increases students' interest and motivation.	11	27,5

According to the participants' opinions, technology-supported science education provides positive contributions to students' learning processes in several ways. Notable advantages of this educational model include visual and auditory stimuli, the opportunity to learn by doing and experiencing, increased interest in the subject matter, and greater motivation compared to traditional education models. Participants agree that technology-supported science education makes students' learning processes more effective and efficient.
It has been emphasized that the visual and auditory supports offered by technology help students better understand science subjects and retain this information long-term. The importance of learning by doing and experiencing is regarded as another critical element in technology-supported science education. This approach enables students to grasp scientific concepts more deeply by ensuring their active participation and experiential learning.
In contrast, the perception that traditional science education can be boring for some students often leads to reduced motivation. This creates a significant disparity when compared to the benefits of technology-supported science education. The use of technology in education not only attracts and motivates students but also encourages them to participate more actively in lessons, making the learning process more enjoyable.
In conclusion, participants believe that technology-supported science education is a vital tool for enhancing students' academic success and learning motivation. It is recommended that educators fully utilize the advantages provided by this educational approach to enrich students' learning experiences. They emphasized that the opportunities offered by technology can improve academic success by helping students better understand scientific concepts and retain this information over the long term.
Looking at Table 6, 45% of the participants say that technology-supported science education offers the opportunity to learn by doing and experiencing and use time effectively, 35% say

that it has more gains and advantages from the student perspective, 35% say that it provides permanent learning with visual and auditory stimuli. 35% of students find traditional science education inefficient and boring, 27.5% say that using technology increases students' interest and motivation, 20% say that technology use matches students' learning skills and styles, and 17.5% say technology-supported science education. They expressed their opinions that science education conveys the curriculum to the students in a faster and more active way.

Table 7. Evaluation of Participants' Opinions on the Differences Regarding the Effect of Technology Use in Technology-Assisted Science Education on Student Motivation

THEMES	n	%
The effect of technology use on student motivation is positive.	36	90
The learning-by-doing environment provided by the use of technology tools is effective.	9	22,5
The use of technology increases the student's attention, interest and curiosity.	12	30
The use of technology increases student success	7	17,5

Looking at the table, it can be seen that the majority of the participants think that the use of technology in science lessons increases student motivation. According to the participants' opinions, technology-supported science education significantly increases students' interest and curiosity in lessons. This increased curiosity and interest enables students to participate more actively in lessons and strengthens their commitment to the learning process.

Participants also state that technology-supported science education offers the opportunity to learn by doing and experiencing. Thanks to the visual and interactive materials offered by technology, students learn science subjects not only theoretically but also practically and experientially. This way of learning allows students to better understand the subjects and memorize their knowledge permanently. In this context, participants state that learning by doing and experiencing enables students to have a more in-depth and meaningful learning experience during the education process.

In addition, according to the participants' opinions, technology-supported science education positively affects students' academic success. Various tools and resources offered by technology increase students' performance in science courses and help them learn subjects faster and more effectively. This is also reflected in students' exam results and overall academic success.

As a result, in line with the table data and participant opinions, it can be said that there is a strong opinion that the use of technology in science lessons increases student motivation, triggers students' curiosity, provides the opportunity to learn by doing and experiencing, and increases academic success. The majority of participants agree that technology-supported science education makes important and positive contributions to students' educational processes.

When we look at the table, 90% of the participants think that the use of technology in science lessons has a positive effect on student motivation, 30% say that the use of technology increases the student's attention, interest and curiosity, and 22.5% say that the learning by doing environment provided by the use of technology tools is positive. 17.5% stated that it is effective and 17.5% stated that using technology increases students' success.

Table 8. Evaluation of Participants' Opinions on Distraction of Students and Guidance to be Provided to Teachers in Technology-Assisted Science Education

THEMES	n	%
T.S.S.E. Student-centered education should be included during	4	10
The time used in technology should be limited and it should be interactive.	9	22,5
Since students are actively involved in the learning process, their attention is not distracted.	22	55
Teachers need to receive in-service training on technology use and teaching methods.	7	17,5
Teachers' selection of materials should be appropriate to the course and content.	18	45

Care should be taken not to overuse images and content.	6	15
T.S.S.E. Courses and seminars should be organized for teachers and students for this purpose.	3	7,5
T.S.S.E. There may also be distraction.	7	17,5

As seen in Table 8, students stated that they were able to maintain their attention better when they took an active part during the lesson. Participants pointed out that teachers should be supported with continuous training and said that the most important factor to consider when choosing materials is suitability for the content of the course. They also stated that excessive use of visuals and content may distract students' attention and cause them to move away from the main subject.

Looking at the table, 55% of the participants stated that with technology-supported science education, students are not distracted because they are actively involved in the learning process, 45% stated that care should be taken not to overuse visuals and content, and 22.5% stated that the time spent using technology should be limited and interactive. 17.5% think that teachers should receive in-service training on technology use and teaching methods, 17.5% think that teachers' material selection should be appropriate to the course and content, 17.5% think that there is distraction in technology-supported science education. 15% stated that courses and seminars should be organized for teachers and students for technology-supported science education, and 10% stated that student-centered education should be included during technology-supported science education.

Table 9. Evaluation of Teacher Competencies and Needs in Technology-Assisted Science Education According to Participants' Opinions

THEMES	**n**	**%**
Teachers are at the required level in terms of using technology.	13	32,5
Teachers are not at the required level in terms of preparing course material.	4	10
There is a need for teachers to receive quality in-service training.	25	62,5
Teachers are not at the required level in terms of using technology.	11	27,5
The technological infrastructure in schools is not at the required level.	34	15
Teachers' knowledge is renewed through in-service training.	10	7,5

As seen in Table 9, some of the participants think that teachers should receive good in-service training in order to effectively implement technology-supported science education. These participants emphasize that it is important for teachers to receive continuous training so that they can use technology effectively in the classroom. Some participants think that teachers are not at a sufficient level in terms of using technology. On the other hand, some participants think that teachers are at a sufficient level in using technology. Some participants think that teachers can use technology, but they do not have sufficient equipment to find and prepare course materials. Participants also state that the infrastructure in schools is inadequate and this reduces the effectiveness of technology-supported science education. At the same time, there are participants who say that the current curriculum is not very conducive to technology integration. On the other hand, there are a few people who think that teachers' knowledge is renewed through in-service training.

Looking at the table, 62.5% of the participants think that teachers need to receive quality in-service training, 32.5% say that teachers are at the required level in using technology, 27.5% say that teachers are not at the required level in using technology, and 15% say that teachers are not at the required level in using technology. I stated that the technological infrastructure in schools is not at the required level, 10% stated that teachers are not at the required level in terms of preparing course materials, 10% stated that teaching programs should be regulated, and 7.5% stated that teachers' knowledge is renewed through in-service training.

Table 10. Evaluation of Participants' Opinions on Potential Challenges and Challenges towards Technology-Assisted Science Education

THEMES	n	%
Teachers should be developed through in-service training.	17	42,5
The lack of physical infrastructure and technological equipment in schools must be eliminated.	36	90
Teacher transfers	4	10
Financial support should be provided to schools for physical infrastructure and technological equipment.	10	25
A structure or IT personnel support should be provided to provide technical support to schools.	9	22,5
Student profile and class numbers	7	17,5
Courses and seminars on technology use should be organized for students.	2	5

As seen in Table 10, almost all of the participants stated that the lack of technological infrastructure in schools should be eliminated. Some of them stated that personnel should be provided to provide support to solve the technical problems encountered in schools. Additionally, it was stated that courses and seminars on the use of technology should be organized for students.

Looking at the table, 90% of the participants say that the lack of physical infrastructure and technological equipment in schools should be eliminated, 42.5% say that teachers should be developed through in-service training, 25% say that financial support should be provided to schools for physical infrastructure and technological equipment, % 22.5% of them believe that structures or IT personnel support should be provided to provide technical support to schools, 17.5% think that student profiles and class numbers should be regulated, 10% think that teacher transfers should be done on time, 5% think that technology use should be made for students. They expressed their opinions that courses and seminars should be organized for this purpose.

4. DISCUSSION AND CONCLUSION

Technology is an effective tool in increasing student motivation. Interactive whiteboards, simulations and courseware make lessons more engaging and interactive. For example, through animations and simulations, students can better understand abstract scientific concepts and maintain their interest in them. These tools provide students with more active learning opportunities compared to traditional lecturing methods (Ministry of National Education, 2024).

Technology-supported teaching plays an important role in increasing students' interest in science subjects and their academic success. Therefore, the use of technology should be increased while teaching science lessons. As the duration of technology used in lessons increases, students' interest in science lessons will also increase (Öztürk, 2023)

The integration of technology in education is of great importance in the modern world. However, the lack of technological infrastructure in most of the schools in Türkiye and the Turkish Republic of Northern Cyprus makes this integration difficult. This situation prevents both teachers and students from using technology effectively.

With the rapid development of technology in recent years, the use of technology in education has also increased. However, it is clear that this increase brings with it some difficulties. There are many factors that prevent teachers from using technology effectively. These include insufficient technical infrastructure, suitability of educational materials, teachers not receiving sufficient training to use technology, and negative attitudes towards technology. In addition, it was determined in the aforementioned research that there are not enough technological tools in schools and that the existing tools are not up-to-date. This situation makes it difficult for teachers to use technology effectively in lessons. Teachers have difficulty in preparing digital

course materials due to the lack of technological devices. Sometimes, the programs they want to use are not available on the school computer, which prevents the effective use of technology in education. These difficulties prevent technology from fully realizing its potential in education and make it difficult for teachers to integrate technology effectively (Kolburan Geçer & Çörez, 2020).
The results of the research show that the majority of chemistry teachers do not have technical equipment in their schools and do not know how to use this equipment adequately because their maintenance is neglected. Participating teachers realized that smart boards make learning more permanent and increase student success. However, many teachers do not consider themselves competent enough in the use of technology and emphasize that they need additional training to progress in this field. They also stated that the curriculum does not support technology integration and the budget allocated to educational technologies is insufficient (Kaya & Tarkın Çelikkıran, 2020).

4.1. RECOMMENDATIONS

Efforts should be made to strengthen the existing physical infrastructure of schools.
Studies should be carried out to strengthen the technological infrastructure and internet infrastructure of schools.
Laboratory equipment should be constantly updated and enriched in diversity. In addition, regular maintenance should be done.
Regular and comprehensive in-service training should be organized to improve teachers' technology use skills. These trainings should ensure that teachers gain the necessary knowledge and skills to use technology effectively.
The content of in-service training should be changed and organized to provide participating teachers with not only theoretical knowledge transfer but also the opportunity to practice. In this way, teachers can have the opportunity to reinforce their theoretical knowledge with practical experiences and improve their ability to effectively apply it in science education.
The curriculum should be updated in line with the needs of today's world in terms of technology-supported science education.
Up-to-date e-content (educational materials) that teachers can easily access and use should be prepared.
Considering the fact that classes are overcrowded in some schools, the number of classes should be made suitable for technology-supported science education.
Science teachers should be encouraged to use technology in their lessons.
The results and findings obtained by examining the same or similar research topics in a larger sample of participants using quantitative and mixed research methods can be compared with the findings determined in this study..
A different and comprehensive study can be conducted under the same study title by adding students' opinions or measuring students' attitudes towards technology-supported science education.
A research can be conducted on whether in-service training on technology-supported science education contributes to teachers effectively integrating technology into classroom environments and transferring it to students more effectively.
In order to evaluate the effects of technology-supported education from a broader perspective, a comprehensive study on technology-supported education can be conducted not only for science education but also for all branches.
Under the same research title, instead of working only with schools affiliated with the Ministry of Education, a comparative study can be conducted in private schools by adding them to the study group.

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