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### Integrating Artificial Intelligence into Mathematics Classroom Management: Teachers' and School Administrators' Perspectives

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**Abstract:** The ability to use artificial intelligence applications, particularly in mathematics lessons, for classroom management is becoming increasingly important for educational institutions. Digital developments in mathematics education can change teachers' roles in the classroom, teaching methods and techniques, and, most importantly, learning environments. The integration of artificial intelligence applications into educational fields and processes offers various opportunities for observing students individually and increasing interactions within the classroom. Classroom management applications incorporating artificial intelligence systems can make learning environments more equitable and effective. Furthermore, artificial intelligence applications can alleviate teachers' roles and add innovative dimensions to pedagogical decision-making processes. However, alongside these advantages, artificial intelligence applications can also bring to light debates concerning ethics, privacy, and teacher-student interactions. This research aimed to comprehensively evaluate how 20 participants (5 school administrators and 15 primary school teachers) working in the Turkish Republic of Northern Cyprus (TRNC) used artificial intelligence applications in mathematics classroom management and the effects of this use on classroom management. The phenomenology research design from qualitative research methods was used in the research. A semi-structured interview guide was used to collect data. The data were then examined using descriptive analysis and categorised in terms of the perceived positive and negative contributions of artificial intelligence to classroom management and the conditions of application. As the study was conducted with only 20 participants working in the district of Nicosia, it has limitations in terms of generalisability. In conclusion, it was found that artificial intelligence technologies may have both positive and negative effects on mathematics classroom management, and that schools' equipment is inadequate. It was recommended that teachers and administrators receive in-service training.

**Keywords:** primary school; classroom management; teacher; student; artificial intelligence.

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## 1. Introduction

Technology is advancing and evolving every day, affecting all areas, including education. Thanks to technology, individuals can communicate, learn ways to acquire knowledge, access information, and fulfil many other needs. Today, technology has become an indispensable tool for almost every individual, as well as for teachers, students, and other education stakeholders. With such significant technological advancement, the absence of a technologically advanced environment or technological tools in educational institutions, schools, and classrooms is considered a major shortcoming (Boran et al., 2025). With the frequent use of technology, artificial intelligence (AI) technology has advanced and has now become a technology that attracts considerable interest and is widely used today. With the rise in popularity of artificial intelligence, educational institutions have also been influenced by this technology (İncemen & Öztürk, 2024).

When looking at the definition of artificial intelligence, it is defined as a theory that attempts to replicate the way the human mind works, and it is also the performance by a machine of behaviours that are considered intelligent when performed by humans (Pirim, 2006). According to another definition, artificial intelligence is a type of information technology that exhibits behaviours such as learning, comparing and decision-making by copying the behaviours of individuals. Artificial intelligence systems can acquire new knowledge by analysing previously recorded data, communicate with individuals and automatically perform many different tasks (Bozkurt, 2023).

Instructional leadership is an essential requirement for the processes and procedures necessary to achieve a good level of school success, and is considered the most important responsibility of a school administrator (Yılmaz & Kurşun, 2015). Studies conducted on effective schools for students show that instructional leadership is considered indispensable for an effective school. According to the literature, instructional leadership is known as one of the approaches that focuses on all activities related to the academic calendar and success, the teaching process followed, and the curriculum planning. When examining other definitions, it has been concluded that the main purpose of instructional leadership is to guide teaching. Effective teaching has been shown to lead to more positive results in students' learning (Dolapçı & Uluğ, 2023).

The definition of classroom management, on the other hand, refers to the methods and techniques employed by teachers to establish an effective classroom environment and control student behaviour (Özen & Yıldırım, 2022). Classroom management refers to the existence of a classroom environment that facilitates students' education and learning processes, encompassing harmony, order, and trust. The primary objective of classroom management, which incorporates robust and effective teaching and learning methods, is to ignite students' desire and motivation to learn, creating and maintaining an optimistic classroom environment characterised by harmony and trust. Additionally, one of the aims of classroom management is to develop students into individuals who are aware of their responsibilities. Classroom management has become such an important concept today that it is taught as a subject to teacher candidates at universities (Çelikten, 2022).

With the widespread adoption of artificial intelligence research into its use in education has also increased. The study conducted by Seyrek et al. (2024) aimed to gather information about teachers' perceptions and attitudes towards the use of artificial intelligence. When the findings of the research were examined, it was found that most teachers used artificial intelligence to prepare content, design activities, and track student performance. The study also examined teachers' concerns about artificial intelligence. Teachers' concerns about artificial intelligence included the possibility that it could make students lazy, accustom them to ready-made solutions, undermine their creativity, cause some students to experience difficulties in accessing technology, and thus lead to inequalities (Seyrek et al., 2024).

In their 2024 study, Opesemowo and Ndlovu investigated the positive and negative aspects of using artificial intelligence in mathematics lessons. Looking at the positive aspects of artificial intelligence, it provides students with personalised education tailored to their needs, identifies and addresses students' weaknesses, adjusts the difficulty level of questions in AI-supported assessments based on students' responses according to their potential, increases student participation by

providing a gaming environment, automatically checks students' exams, saves teachers time, and supports them in avoiding unnecessary expenditure of energy. The negative aspects of artificial intelligence used in mathematics lessons include encouraging students to memorise, preventing students from performing mathematical operations logically, hindering emotional intelligence towards mathematics lessons, restricting students' freedom and independence when performing operations, and damaging students' problem-solving and critical thinking skills (Opesemowo & Ndlovu, 2024).

The study conducted by Uyak et al. (2024) evaluated the views of educational administrators and teachers regarding artificial intelligence applications. For the study, semi-structured interviews were conducted with headteachers and teachers working in the Çankaya district of Ankara, and a qualitative research design was employed. A total of 254 teachers and administrators contributed to the study. The data obtained were analysed using special statistical programmes. The findings of the study revealed that the attitudes of teachers and administrators towards artificial intelligence did not differ according to demographic variables (Uyak et al., 2024).

The study conducted by Solak et al. (2025) examined the disadvantages of artificial intelligence applications in classroom settings. It is noted that individuals are concerned about privacy in environments where artificial intelligence is used and that not all segments of society have access to such applications (Solak et al., 2025).

Akdeniz and Özdiñç (2021) reported in their study that artificial intelligence applications can automatically assess students' grades and save teachers time by tracking student progress (Akdeniz & Özdiñç, 2021).

A review of the literature indicates that while there are numerous studies on the relationship between artificial intelligence and mathematics education, no study has simultaneously addressed the relationship between artificial intelligence, mathematics education, and classroom management. This circumstance renders the present study unique and the study aims to address this gap in the literature. Furthermore, the inclusion of both school administrators' and teachers' views in this study has made it more comprehensive in scope. In addition, this study highlights that schools in the TRNC education system are not sufficiently equipped to use artificial intelligence and that teachers and administrators need in-service training. The emphasis on the need to address artificial intelligence in mathematics lessons not only in terms of teaching but also in terms of classroom management has contributed to the originality of the research. To this end, the main problem of this research is the question: "What are the effects of integrating artificial intelligence into mathematics classroom management on the perspectives of teachers and school administrators?". Parallel to this question, answers were sought to the following sub-problems:

1. What is the importance of artificial intelligence in classroom management?
2. What are the positive and negative effects of artificial intelligence applications used by teachers in classroom management during mathematics lessons?
3. What are the suggestions for increasing the effectiveness of artificial intelligence applications in mathematics lesson classroom management?

## **2. Method**

### **2.1. Research Model**

This study examined the views of school administrators and primary school teachers on the use of artificial intelligence in mathematics classroom management. A descriptive phenomenological design was employed to explore the experiences and perceptions of the participants regarding the use of artificial intelligence in mathematics lessons. In order to uncover the essential structures of phenomenon, the data were analysed through systematic coding, categorisation and theme development. Qualitative research involves the researcher observing individuals in their natural environment, evaluating the processes by which situations arise, and describing the findings in an explanatory manner in order to explain the main characteristics of

personal or social events and phenomena experienced by individuals (Aydin, 2023). Phenomenology is a method which focuses on capturing peoples' direct interpretations of the phenomenon based on their own life experience (Yalçın, 2022).

## 2.2. Research Working Group

The research group for this study consisted of 5 school administrators and 15 teachers working in Nicosia, Northern Cyprus, during the 2025-2026 academic year. The study group was determined using criterion sampling, one of the purposive sampling methods. Informed consent was obtained from the teachers and administrators who contributed to this study, and they participated entirely on a voluntary basis. Furthermore, participants were selected from among individuals with experience and expertise in artificial intelligence applications in mathematics lessons.

*Table 1. Distribution of School Administrators and Primary School Teachers According to Descriptive Characteristics*

| <b>Characteristics of Participants</b> | <b>Frequency (f)</b> |
|----------------------------------------|----------------------|
| <b>Gender</b>                          |                      |
| Female                                 | 17                   |
| Male                                   | 3                    |
| <b>Age</b>                             |                      |
| Under 30                               | 7                    |
| 31-35 Years                            | 3                    |
| 36-40 Years                            | 4                    |
| 41-50 Years                            | 3                    |
| Above 50                               | 3                    |
| <b>Professional Experience</b>         |                      |
| 0-5 Years                              | 4                    |
| 6-10 Years                             | 4                    |
| 11-15 Years                            | 3                    |
| Above 15 Years                         | 9                    |
| <b>Educational Level</b>               |                      |
| Bachelor's Degree                      | 7                    |
| Master's Degree                        | 13                   |

Table 1 presents the characteristics of the school administrators and teachers who contributed to the study. It was determined that 17 of the participants were female and 3 were male, 7 were under the age of 30, 3 were between the ages of 31 and 35, 4 were between the ages of 36 and 40, 3 were between the ages of 41 and 50, and 3 were 51 years of age or older. It was noted that 4 of the participating teachers had 0-5 years of professional experience, 4 had 6-10 years, 3 had 11-15 years, and another 9 had 15 years or more. Seven of the teachers had completed their undergraduate education, while 13 had also completed their postgraduate education.

## 2.2. Data Collection Tool and Data Collection

In this study, an interview guide containing seven open-ended questions was used to determine the views of five school administrators and 15 teachers working in the Nicosia district of the TRNC during the 2025-2026 academic year. The interview form consisted of two sections. The first section concerned the participants' personal information, while the second section contained questions related to the topic. The form was prepared and organised with input from experts in the field.

In this research, which aims to determine the views of school administrators on instructional leadership and teachers on the use of artificial intelligence in mathematics classroom management,

the interview method, one of the qualitative data collection methods, was selected and a semi-structured interview technique was used.

The individuals who participated in the research did so entirely on a voluntary basis. The researcher conducting the study informed the participants that the data obtained during the interviews would be used solely for the purposes of the research and that none of the personal information provided by the participants would be transferred elsewhere. This was intended to ensure that the voluntary participants responded to the research questions in a more sincere, honest and genuine manner. The average interview duration with each participant was between 35 and 40 minutes. During the interviews, the participants were not pressured or guided towards specific answers. Furthermore, the participants' responses were transcribed verbatim into written records. After expert review, the interview materials were used in the research with the participants' consent.

The questions prepared for the interview form to be asked to school administrators and teachers are provided below:

Questions to be asked to primary school teachers and principals:

1. What are your thoughts on the use of artificial intelligence applications while managing the classroom during mathematics lessons? (Could you elaborate?)
2. Could you explain your thoughts on the positive and negative effects of artificial intelligence applications on classroom management?
3. Could you explain your thoughts on artificial intelligence technologies that negatively affect classroom management during mathematics lessons?
4. What are your thoughts on the most effective artificial intelligence technologies for ensuring classroom management during mathematics lessons? (Could you elaborate?)
5. What are your thoughts on the equipment of classrooms regarding the use of artificial intelligence technologies in mathematics class management? (Could you elaborate?)
6. What are your suggestions for increasing the effectiveness of artificial intelligence technologies in classroom management during mathematics lessons?

### **3. Data Analysis**

The researcher wrote down the answers given by volunteer school administrators to the questions on the forms. The responses regarding the assessment of the impact of artificial intelligence used by teachers in mathematics classroom management were examined in terms of differences and commonalities, and categories were created. Data were analysed using descriptive analysis following established qualitative analysis procedures. It was used to evaluate the data which includes repeated reading of the semi-structured forms, open coding and organisation of codes into themes representing common experiential patterns. For each research question, the responses of the participants who participated voluntarily were analysed in terms of similarities and differences, and codes were created. The process of creating themes and coding the data was carried out systematically by a single researcher. The themes obtained were submitted to expert opinion to support the validity of the study. After that revisions were made by consensus. During the coding stage, the data were reviewed multiple times to ensure consistency. The findings obtained were tabulated. The "QDA Miner Lite" software was also used when tabulating the data. Some of the direct statements expressing the thoughts of school administrators and teachers were presented in quotation marks without any changes. Participants were coded sequentially as T1, T2, T3, T4, and so on.

### **4. Findings**

The findings related to the first sub-problem of the research, titled 'What is the importance of artificial intelligence in classroom management?', indicate that teachers and administrators are uncertain about the use of artificial intelligence, and that it can have either positive or negative contributions. Therefore, the themes of uncertainty, positive contribution, and negative contribution

were established. The majority of stakeholders provided answers related to the positive contribution theme. For example:

T1: 'Artificial intelligence creates a personalised learning environment for students. This increases student interest by responding to each student's needs. Students with increased interest in the lesson may exhibit more desirable behaviours and fewer undesirable behaviours. This contributes positively to classroom management.'

T3: 'It provides extra assistance to the teacher in producing in-class content. Furthermore, the content is effective in drawing attention and maintaining focus in classroom management. Thanks to the games that can be created using artificial intelligence, classroom management can be made more effective and efficient.'

Following the findings gathered in the context of the first sub-problem, the study examined participants' views on the positive and negative effects of artificial intelligence. The themes related to the positive effects of using artificial intelligence while managing the classroom during mathematics lessons were as follows: 'Time saving, effective learning, multifaceted positive impact, facilitating management, and none.' The majority of participants contributing to the research commented on the theme that artificial intelligence can have a multifaceted positive impact. The views of teachers and administrators were as follows.

T3: "Artificial intelligence technologies can facilitate time management. It contributes to student-centred learning. Additionally, it can increase student participation in class by reducing behavioural problems."

T1: "Artificial intelligence applications offer students the opportunity for personalised education. By providing education tailored to students' levels, ages, and needs, it can increase student motivation. I believe this can positively influence classroom management."

T10: 'I believe artificial intelligence applications add diversity to education. Furthermore, by preparing different questions and visuals with these applications, they keep the focus on the lesson within the classroom, thereby facilitating classroom management.'

Regarding classroom management during mathematics lessons, the negative effects associated with the use of artificial intelligence were identified as 'breach of privacy, dependency, reduced interaction, time loss and absence'. The majority of participants responded with 'dependency'. The views of teachers and administrators are presented below.

T2: "It may have negative effects as it could lead to the loss of student privacy."

T18: "Excessive use of artificial intelligence applications may increase students' risk of technology addiction and negatively affect their critical thinking skills."

T5: "Artificial intelligence technologies used to manage the classroom during mathematics lessons may accustom students to dependence. This situation may subsequently make it difficult to conduct lessons without artificial intelligence."

Other findings related to the second sub-problem of the study concern the schools' equipment for using artificial intelligence while teachers and administrators manage the classroom during mathematics lessons. Half of the participants responded that the equipment was 'insufficient'.

T2: 'I do not think that classroom equipment is in any way sufficient for the use of artificial intelligence technologies today. Classrooms lack not only artificial intelligence equipment but also many other types of equipment.'

T6: "The school where I currently work only has technology that teachers can use. I believe that schools across the TRNC are inadequate in this regard."

T9: "The hardware available in classrooms is definitely not sufficient for using artificial intelligence applications."

The final sub-question of the study was: 'What are your suggestions for improving the effectiveness of classroom management in mathematics lessons through artificial intelligence applications?' Based on the views of teachers and administrators, the themes of 'in-service training,

hardware development, and multiple suggestions' were identified. More than half of the participants provided responses related to the 'multiple suggestions' theme.

T19: "In-service training can be provided to teachers on the subject. A list of simple educational applications to be used can be communicated to teachers."

T11: "Activities can be prepared in the form of games that will attract more children's interest. By preparing activities within limits, children's learning can be made more enjoyable and effective."

T18: 'It is very important to provide in-service training to teachers on this subject, to strengthen the technological infrastructure of classrooms, and to adapt the applications to the age level of the children. Furthermore, artificial intelligence should be used as a support for the teacher, not as the centre of the lesson.'

## 5. Discussion

This study highlights the importance of artificial intelligence applications used for classroom management in mathematics lessons. When the information in the literature and the comments of the educators participating in the study are examined, it is observed that artificial intelligence applications have both positive and negative effects on classroom management in mathematics lessons.

Akdeniz and Özdiñç (2021) reported in their study that artificial intelligence applications can automatically evaluate students' grades and save teachers time by tracking student progress. In this study, based on the participants' comments, a minority stated that artificial intelligence applications saved time when used in classroom management. However, an equal number of participants stated that the use of artificial intelligence applications in the classroom could cause teachers to lose time, both in terms of covering the curriculum and in terms of the poor planning of time when using artificial intelligence applications. In this sense, the two studies have both similarities and differences.

In the study conducted by Solak et al. (2025), the disadvantages of artificial intelligence applications in classroom settings were examined. It is reported that individuals are concerned about privacy in environments where artificial intelligence is used and that not all segments of society have access to such applications. Similarly, findings obtained from participants in this study indicate that artificial intelligence applications compromise privacy. It is also noted that modern or urban schools are suitable for such applications, but rural schools are not.

In their 2024 study, Opesemowo and Ndlovu investigated the positive and negative aspects of using artificial intelligence in mathematics lessons. Looking at the positive aspects of artificial intelligence, it provides students with personalised education tailored to their needs, identifies and addresses students' weaknesses, adjusts the difficulty level of questions in AI-supported assessments based on students' responses according to their potential, increases student participation by providing a gaming environment, automatically checks students' exams, saves teachers time, and supports them in avoiding unnecessary expenditure of energy. This study reached partially similar conclusions to the work conducted by Opesemowo and Ndlovu in 2024. Educators who contributed to this research stated that the use of artificial intelligence in mathematics lessons offers students personalised education, can be designed according to students' levels and interests, and enables students to participate more actively in lessons. Opesemowo and Ndlovu's research also highlighted that while artificial intelligence has positive aspects, it also has negative aspects. The negative aspects of artificial intelligence used in mathematics lessons include directing students towards rote learning, preventing students from performing mathematical operations using logic, hindering emotional intelligence towards mathematics lessons, restricting students' freedom and independence when performing operations, and damaging students' problem-solving and critical thinking skills. This study, however, reached slightly different negative conclusions. This study stated that artificial intelligence distracts students. It was noted that distracted students negatively affect classroom

management. At the same time, this study also stated that artificial intelligence can damage the emotional bond between students and teachers.

## **6. Limitations**

This study was limited to the autumn term of the 2025-2026 academic year. The research was limited to only three schools located in the city of Nicosia in the Turkish Republic of Northern Cyprus. In addition, the study was limited to information provided by school administrators and primary school teachers. Another limitation is that the research was conducted with 5 school administrators and 15 primary school teachers working in TRNC primary schools.

## **7. Conclusions and Recommendations**

### **7.1. Conclusion**

According to the findings of the study, participating teachers and administrators stated that artificial intelligence applications used to support classroom management during mathematics lessons can have both positive and negative effects. It was observed that the majority of teachers and administrators responded that artificial intelligence can have a positive effect. The positive effects of artificial intelligence were reported to include saving time for teachers and administrators, facilitating classroom management, and supporting effective learning among students. The vast majority of participants emphasised that artificial intelligence applications create not just a single positive effect but multiple positive outcomes in classroom management. In addition to the positive effects, teachers and administrators mentioned negative effects such as the violation of privacy, a decrease in interaction between teachers and students, and the development of dependency in students.

When examining the findings related to the sub-objective '*What are the suggestions for increasing the effectiveness of artificial intelligence applications in mathematics classroom management?*', teachers and administrators suggested the need for in-service training for educational stakeholders, the improvement of classroom and school equipment to support the use of these technologies, and the clear determination of the purposes for which artificial intelligence is used.

### **7.2. Recommendations**

#### **Recommendations for the Ministry of Education:**

1. It is recommended that more in-service training be organised to develop the skills of teachers, administrators and educators in using artificial intelligence.
2. It is recommended that such in-service training on the use of artificial intelligence be organised for teachers, administrators and educators at least twice a year.
3. It is recommended that a specific budget be allocated to upgrade classroom equipment for the use of artificial intelligence.
4. It is recommended that textbooks and educational programmes be revised to enable the use of artificial intelligence in the classroom.
5. It is recommended that the Ministry of Education conduct pilot studies on the use of artificial intelligence in schools.

#### **Recommendations for teachers:**

1. It is recommended that teachers participate in seminars, conferences, and similar academic platforms organised domestically or abroad.
2. It is recommended that teachers remain open to new and emerging technologies and develop themselves in relation to the subject.
3. It may be recommended that teachers manage artificial intelligence themselves rather than being managed by it.

### Recommendations for administrators:

1. It is advisable for administrators to encourage teachers to participate in training related to artificial intelligence.
2. It is advisable to ensure appropriate supervision of teachers regarding the use of artificial intelligence.

### Recommendations for researchers:

1. This study examined the relationship between mathematics lessons, classroom management and artificial intelligence. Researchers may be advised to explore the relationship between artificial intelligence and other areas of education.
2. This study consulted the views of school administrators and teachers. It may be advisable to also seek the views of experts working in the Ministry of Education.

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