Journal of Engineering Science and Technology
Special Issue on ISCoE2024 Vol. 20 No. 3 (2025) 89 - 96

TECHNOLOGICAL APPROACHES TO RESOLVING PEDAGOGICAL CONFLICTS IN PRIMARY SCHOOL STUDENT

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Abstract

This study aims to analyse, develop, and enhance technological approaches for resolving pedagogical conflicts among primary school students. The research employs a comprehensive methodology, integrating theoretical methods such as analytical-synthetic reasoning, comparative analysis, and synthesis; diagnostic methods including surveys, observations, tests, and interviews; and prognostic techniques such as expert evaluations and independent assessments. Through this multi-faceted approach, the study identifies the various forms, types, and manifestations of pedagogical conflicts in primary education and develops effective strategies for their detection and resolution. The research holds both scientific and practical significance by exploring the psychological and pedagogical features of conflict resolution within and beyond the school environment. Furthermore, it contributes to the theoretical foundation of conflict resolution technologies, providing educators with structured, evidence-based approaches to fostering a positive and harmonious learning atmosphere for young students.

Keywords: Educational process, Pedagogical conflicts, Primary school students, Resolving, Technological approach.

1. Introduction

Conflict is an inevitable part of human interaction, often emerging from contradictions, opposing interests, or differences in perspectives [1]. The study of conflicts (known as "conflictology") originates from the Latin term meaning "clash," "contradiction," and "dispute." The Uzbek National Encyclopedia defines conflict as (i) a confrontation between opposing sides, opinions, or forces and (ii) in literature and art, a contradiction that forms the essence of a literary work. In the context of education, conflicts frequently arise in classrooms due to differences in students' interests, academic struggles, teacher-student dynamics, and peer interactions. Managing and resolving these conflicts effectively is critical to fostering a positive and inclusive learning environment in primary schools.

With the advancement of educational technology, modern tools can be leveraged to address and mitigate pedagogical conflicts efficiently [2-7]. Several technologies have been well-known in education, including the Internet of Things (IoT), Augmented Reality (AR), Virtual Reality (VR), Artificial Intelligence (AI), Learning Management Systems (LMS), Gamification, 3D Printing, Blockchain, Cloud Computing, Robotics, Big Data, and machine learning (ML). The use of this technology offers new possibilities for preventing, analysing, and resolving classroom conflicts. Educational institutions worldwide are integrating technological solutions to enhance behavioural monitoring, promote collaborative learning, and implement targeted interventions for conflict resolution.

Based on previous studies [8], the present study aims to analyse and enhance technological approaches to resolving pedagogical conflicts among primary school students. By integrating innovative digital tools into conflict management strategies, this research explores how technology can provide systematic, structured, and scalable solutions to address disputes in the classroom. Technology-based conflict resolution methods have the potential to assist teachers in identifying conflicts early, mediating disputes efficiently, and fostering emotional intelligence among students through interactive and immersive experiences.

The scientific novelty of this research lies in its identification of key aspects of pedagogical conflicts among primary school students, considering age-related, physiological, social, and educational factors. Sources of conflict, including academic difficulties, teacher-student relationships, and self-expression barriers, were analysed based on their pedagogical-psychological characteristics. To address these challenges, an intensive monitoring system was developed, incorporating AI-powered behavioural tracking, sentiment analysis, and digital surveys to detect early signs of conflict. An observational council was established to facilitate collaboration between educators, psychologists, and parents through data-driven decision-making platforms.

Furthermore, an algorithmic roadmap was designed to outline the sequence, interconnections, and consistency of key components in resolving conflicts through technological interventions. A functional model was created, incorporating virtual reality (VR) and gamified simulations to engage students in experiential learning scenarios that promote conflict resolution skills. In addition, pedagogical software tools were developed to facilitate real-time feedback, AI-assisted mediation, and interactive storytelling to help students navigate social interactions and emotional regulation effectively.

By integrating emerging technologies into the pedagogical conflict resolution process, this research seeks to provide scientifically grounded and practically applicable solutions that enhance the ability of educators to manage conflicts proactively. The findings contribute to the theoretical foundations of pedagogical conflictology while offering technology-driven strategies that promote collaborative problem-solving, emotional intelligence, and a harmonious learning environment for primary school students.

2. Literature Review

Figure 1 shows nine technologies for resolving pedagogical conflicts in primary school students, they are: (i) digital communication and collaboration platforms; (ii) AI and chatbots for conflict resolution; (iii) social-emotional learning (SEL) apps; (iv) virtual reality (VR) and augmented reality (AR) for conflict scenarios; (v) gamification and conflict resolution games; (vi) digital mediation and online counselling platforms; (vii) interactive whiteboards and digital storytelling; (viii) behaviour monitoring and positive reinforcement systems; (ix) peer mediation and ai-powered conflict resolution training. Table 1 shows several technologies used in education.

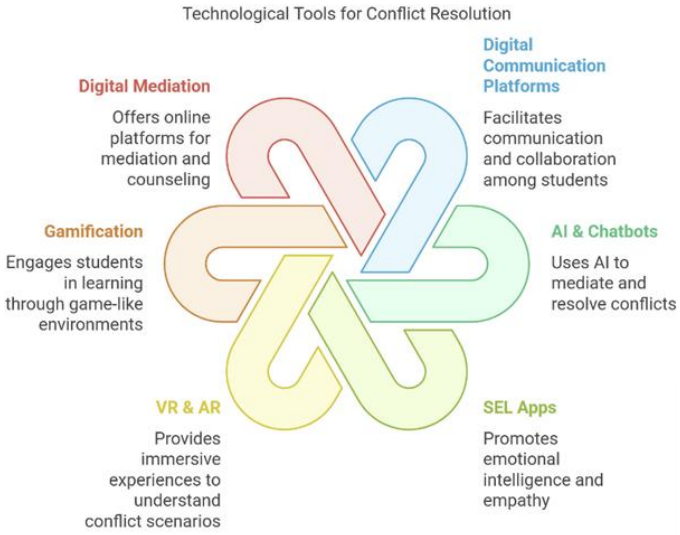

Fig. 1. Technological tools for conflict resolution.

Digital platforms help teachers, students, and parents maintain open communication and address conflicts early. Tools like Google Classroom, Microsoft Teams, and Edmodo facilitate teacher-student and peer interactions, reducing misunderstandings. Seesaw and ClassDojo allow teachers to provide feedback and encourage positive behaviour through a reward-based system. AI-driven tools can help mediate conflicts by providing personalized support to students. AI chatbots like Replika and Woebot for Kids offer emotional support and teach students conflict-resolution techniques. Sentiment analysis tools powered by AI can detect emotional distress in students based on their online communications, allowing educators to intervene proactively [9-10].

Table 1. Technology used in education.

Techno.	Title	Ref.
AI	A review of artificial intelligence in security and privacy: Research advances, applications, opportunities, and challenges.	[11]
AI	Embedded design and implementation of mobile robot for surveillance applications.	[12]
AR	Development of augmented reality application for exercise to promote health among elderly.	[13]
ML	Prediction and classification of low-birth-weight data using machine learning techniques.	[14]
VR	The use of virtual reality as a substitute for the pre-school students' field trip activity during the learning from home period.	[15]
AI	Combining chatbot and social media: Enhancing personal learning environment (PLE) in language learning.	[16]
IOT	Greening the Internet of Things: A comprehensive review of sustainable IoT solutions from an educational perspective.	[17]
AI	Chatbots as digital language tutors: revolutionizing education through AI	[18]
ML	Evaluating the performance of supervised machine learning algorithms in breast cancer datasets.	[19]
ML	A neural network aided real-time hospital recommendation system.	[20]
AI	Trends in the use of artificial intelligence (AI) technology in increasing physical activity.	[21]
ML	Handwritten digit recognition using machine learning algorithms.	[22]
LMS	Determinants of learning management system (LMS) adoption by university students for distance learning.	[23]

Social-emotional learning-based technology helps students develop empathy, emotional regulation, and problem-solving skills. Platforms like Peekapak teach kids how to resolve conflicts through interactive storytelling, while Breathe, Think, Do by Sesame Street helps young children develop problem-solving and emotional regulation skills. VR and AR can immerse students in role-playing scenarios where they learn how to handle conflicts effectively. ClassVR offers VR experiences that simulate real-life conflicts and guide students toward resolution. Empathy VR, developed by Stanford's Virtual Human Interaction Lab, allows students to experience different perspectives, enhancing empathy and understanding [24].

Some platforms offer digital tools for training students in peer mediation. mediators beyond borders (MBBI Digital Resources) provides virtual training for peer mediation, equipping students with the skills needed to resolve conflicts independently. AI-driven mediation simulations allow students to practice de-escalating conflicts in a controlled, simulated environment. The key is to use interactive, engaging, and adaptive technologies to teach children emotional intelligence, empathy, and effective communication.

3. Method

This study employed a systematic, technology-driven approach to analyse and enhance conflict resolution strategies in primary education. Four key methodologies were used:

(i). Theoretical Methods-Analytical-synthetic reasoning, comparative analysis, and synthesis were applied to examine conflict resolution theories and technology integration in education.

(ii). Diagnostic Methods-Surveys, observations, tests, and interviews were conducted using traditional and AI-assisted sentiment analysis to assess the nature of pedagogical conflicts.

(iii). Prognostic Methods- Expert evaluations and predictive analytics were used to assess the effectiveness of digital mediation tools and AI-powered interventions.

(iv). Pedagogical Experiments- The study tested gamified conflict resolution training, AI-driven behaviour tracking, and digital mediation platforms, with statistical data processing and graphical analysis validating their impact.

4. Results and Discussion

The research was conducted in two stages. In the preparatory stage, test questions were developed, and discussions with students and teachers were held to refine the research approach. In the experimental stage, the study was carried out, results were analysed, and findings were discussed with participants. A total of 510 primary school students (grades 1-4) from six schools in Tashkent, Jizzakh, and Navoiy regions participated in the study, divided into two groups. The experimental group was assessed using a questionnaire to evaluate their awareness of pedagogical conflicts, obstacles to learning, and behavioural tendencies. The control group consisted of students who demonstrated a strong understanding of pedagogical conflicts.

The findings revealed several key insights. Teachers demonstrated a strong interest in conflict resolution, highlighting the necessity for structured training and methodological recommendations to assist them in handling conflicts effectively. The study also confirmed that pedagogical conflicts remain a significant challenge in primary education, requiring systematic scientific research to develop effective intervention strategies. Furthermore, the results underscored the need for practical recommendations, including the integration of digital tools and structured strategies to enhance conflict resolution. The role of technology in conflict management was particularly significant, as AI-driven behaviour analysis, interactive mediation tools, and digital learning platforms proved to be effective in fostering a positive learning environment [25-27].

Figure 2 describes a system for resolving pedagogical conflicts among primary school students. We conducted the experimental research using this structured system, demonstrating its practical effectiveness. The well-organized approach was successfully implemented for studying and resolving pedagogical conflicts among primary school students. The results confirmed that this method is effective in identifying, managing, and addressing conflicts, providing a strong foundation for enhancing teaching practices and conflict resolution strategies in primary education.

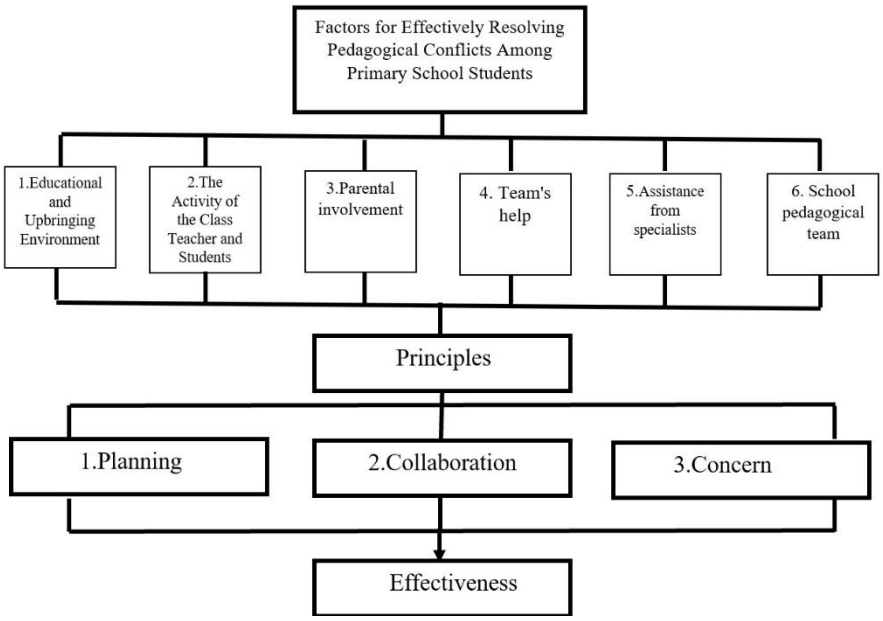

Fig. 2. A systematic model for conducting the experimental research.

5. Conclusions

This study examined technology-driven approaches for resolving pedagogical conflicts among primary school students. The findings confirmed that AI-assisted behaviour tracking, digital mediation platforms, and interactive learning tools enhance early conflict detection and resolution. The experimental study with 510 students highlighted the importance of structured interventions and teacher training in adopting these technologies. A collaborative approach involving teachers, parents, and specialists proved essential in conflict management. By applying planning, collaboration, and concern, technology-based solutions foster a harmonious learning environment. Future research should focus on AI-powered adaptive systems and virtual simulation training to further improve conflict resolution strategies in primary education.

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