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Implementation of Technical Education in Early Primary School: Analysis Based on Empirical Research

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Abstract

This article presents an analysis of key aspects of technical education in grades 1–3 of primary school in Poland, based on a study conducted among teachers and students in early primary education. The findings indicate that although children generally enjoy technical classes, such lessons are often held infrequently. The results also show that teachers attempt to meet the requirements of the core curriculum, yet they encounter obstacles arising from insufficient preparation, limited resources, or inadequate facilities. The article is based on the master's thesis: Kołodziejczyk (2024). The implementation of technical education in grades 1–3 of primary school in the light of own research University of Rzeszów.

Keywords: technical education, early childhood education, teacher preparation, student engagement, core curriculum, primary school

Introduction

The modern world is developing at a rapid pace, and many changes that seemed unattainable only a decade ago have become part of everyday life. Artificial intelligence, once associated exclusively with theoretical considerations and science fiction, is now widely applied in fields such as medicine, design, special effects, and data analysis (Patrzyk, Woźniacka, 2022).

The appearance of the 21st-century world is largely shaped by technological development. This era is characterized by dynamic progress, which creates the need for individuals to learn about technology from an early age – beginning in preschool and early school education. Teachers at these stages are obligated to implement the core curriculum, which requires them to teach technology using

methods appropriate to children's developmental needs. Although the idea is correct, practical experience suggests that it is not always implemented effectively, which motivated the present research.

In 2024, I conducted a study subjected to both quantitative and qualitative analysis. Its aim was to examine what technical education looks like in practice in grades 1–3 of primary school. Research tools were designed to obtain the most precise data. The procedures, results, and conclusions are presented in this article.

Subject of Research

The subject of the study was the implementation of technical education in grades 1–3 of primary school. The theoretical and cognitive aim was to determine how teachers apply the core curriculum and whether their training equips them with the skills necessary to conduct classes adapted to students' needs and the rapidly changing world. The practical aim was to examine the actual state of technical education in early primary grades and identify methods of supporting teachers (Palka, 2010).

Methodology and Study Group Characteristics

The research used the diagnostic survey method and a questionnaire (Sztumski, 2005). A total of 108 female teachers from various regions of Poland participated. They differed in workplace location, professional experience, and grade level taught.

Research was also conducted among primary school students. Diagnostic surveys and observations were applied. Student participation across research stages is shown in Table 1. The participants were pupils from several schools in the Podkarpacie region.

Table 1. Summary of the number of students participating in each stage

	Grade	Number of children	Total
Interview	1	5	20
	2	7	
	3	8	
Drawing	1	2	15
	2	6	
	3	8	
Observation	1	5	19
	2	6	
	3	8	

Analysis of Survey Results

The teacher questionnaire consisted of 13 closed and semi-open questions addressing: 1) implementation of the core curriculum in grades 1–3; 2) teachers'

preparation for teaching technical education; 3) obstacles encountered during instruction; and 4) sources of ideas for technical classes.

Analysis showed considerable variation in curriculum implementation. Most teachers conduct at least one hour of technical classes per week, using methods suited to their students. However, 68.5% reported obstacles – most commonly safety concerns during practical activities.

A discrepancy appeared in responses regarding teacher preparation: some believed that university studies did not prepare them for technical education, while others stated the opposite. Many develop their skills through online courses and webinars, though a significant number do not. This raises concerns about burnout or systemic issues. Pedagogy requires continuous learning because curricula and teaching methods evolve constantly.

Teachers face challenges such as time-consuming preparation, insufficient facilities, and limited materials. Most obtain ideas for classes from the Internet, which facilitates planning but may reduce creativity and blur the boundary between art and technology. Technical classes should emphasize solving practical, technical problems rather than artistic tasks.

Students' Perceptions of Technical Education

Interviews revealed that students enjoy technical classes and remember the projects they created.

Examples of responses:

Table 2. Examples of answers to question 1 of the interview:
What are technology classes like, what do you do during them?

Child's response	Child's name	Grade
"My teacher has many great ideas. Recently, we made hovercraft models. It was easy. We inflated a balloon, attached it to a bottle cap, and then to a board. The teacher prepared everything in advance."	Martyna	3
"In technology class, we do experiments. Recently, we mixed water and salt in a jar, tied a string to a pencil, and now we have to wait a week."	Kalina	2

1. Martyna (Grade 3): "My teacher has many great ideas. Recently, we made hovercraft models. It was easy. We inflated a balloon, attached it to a bottle cap, and then to a board. The teacher prepared everything in advance."
2. Kalina (Grade 2): "In technology class, we do experiments. Recently, we mixed water and salt in a jar, tied a string to a pencil, and now we have to wait a week."

Students appreciated their teacher's creativity and clearly distinguished technical classes from other types of lessons. Drawings and descriptions of their favorite projects were also collected.

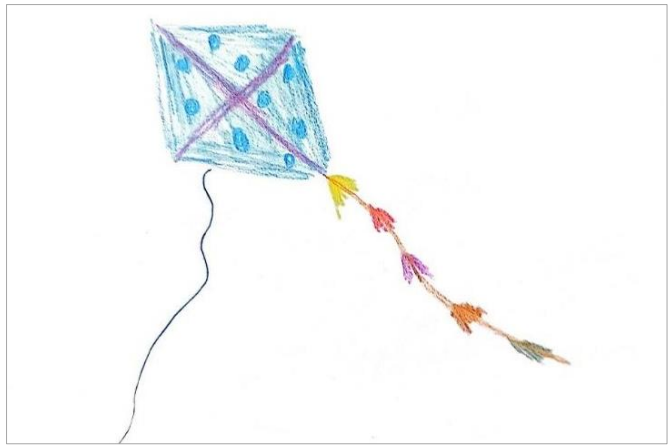

Figure 1. A kite made during class by Edyta (grade 3)

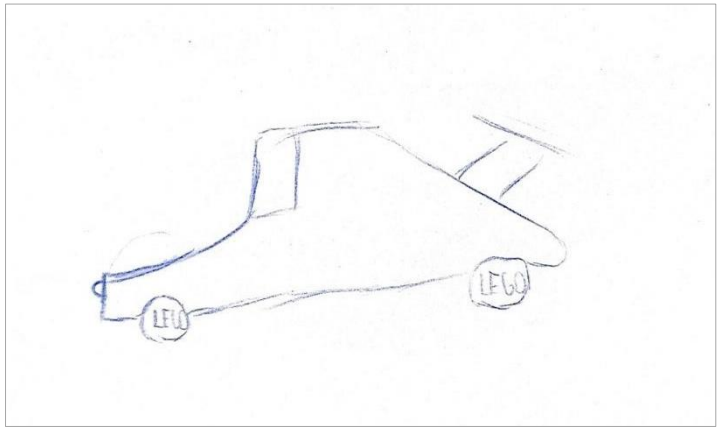

Figure 2. Formula I. Lego model design by Igor (grade 3)

However, the unfortunate reality is that many students rarely participate in such classes, and some do not have access to them at all. This issue became evident during the student interviews. Consequently, the quality of children's education deteriorates, and teachers are unable to adequately fulfill their professional responsibilities. Further large-scale research would be valuable in order to gain a more comprehensive understanding of this problem.

Observation Results

In the final stage, students folded a paper airplane according to instructions. The observation categories included workspace preparation, task initiation, adherence to steps, problem-solving, pace, and emotions.

Half prepared their workspace. Most began confidently. Eight completed the task without mistakes; others made errors but completed the work. Two needed teacher support due to low self-confidence.

Work pace varied, and emotions ranged from enthusiasm to frustration. All students, however, completed their airplanes and expressed satisfaction when testing them.

Technical activities proved highly motivating, even for initially reluctant participants.

Conclusions

The study examined the implementation of technical education in grades 1–3. Although teachers are required to provide at least one hour of technical education per week, only slightly more than half fulfill this obligation. Many students were unfamiliar with technical classes, indicating irregular implementation.

Those who did participate expressed strong interest, recalling their projects enthusiastically. Practical activities proved especially engaging.

Teachers encounter barriers such as insufficient resources, inadequate facilities, and safety concerns. Many lack essential materials and must rely on personal funds or parental support. Effective technical education requires proper resources, clear and developmentally appropriate instructions, and teacher preparation aligned with contemporary educational demands.

Technology plays a key role in the 21st century across medicine, education, and everyday life. Strengthening technical education from the earliest stages is crucial for Poland's continued development.

References

Kołodziejczyk, K. (2024). *Realizacja edukacji technicznej w klasach 1–3 szkoły podstawowej w świetle badań własnych*. Praca magisterska. Uniwersytet Rzeszowski.

Lib, W., Walat, W., Warchoł, T. (eds.) (2025). *Edukacja techniczna w przedszkolu i klasach I–III szkoły podstawowej*. Part 1: *Podstawy techniki: podręcznik dla studentów i nauczycieli*. Rzeszów: Wydawnictwo Uniwersytetu Rzeszowskiego.

Lib, W., Walat, W., Warchoł, T. (eds.) (2025). *Edukacja techniczna w przedszkolu i klasach I–III szkoły podstawowej*. Part 2: *Metodyka edukacji technicznej. Podręcznik dla studentów i nauczycieli*. Rzeszów: Wydawnictwo Uniwersytetu Rzeszowskiego.

Palka, S. (2010). *Podstawy metodologii badań w pedagogice*. Gdańsk: GWP.

Patrzyk, S., Woźniacka, A. (2022). *Sztuczna inteligencja w medycynie.* Łódź: WUM w Łodzi.

Sztumski, J. (2005). Wstęp *do metod i technik badań społecznych*. Katowice: Wydawnictwo Naukowe Śląsk.