

Integrating AI into Accelerated Bridge Programs for Out-of-School Learners: *A Greek Pilot*

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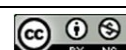
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Abstract

According to UNESCO's latest data, the global education faces challenges, with 250 million children out of school. The COVID-19 pandemic, economic inequalities, regional conflicts, and systemic barriers to education access have exacerbated the crisis. Despite recovery efforts, progress remains uneven, with many families prioritizing immediate needs over education. An innovative educational approach, called Speed schools, has emerged, particularly in Ethiopia, to raise students' academic performance. These schools condense a conventional three-year curriculum into a ten-month program, resulting in significant improvements in literacy and numeracy compared to traditional schooling methods. The 'boost' Speed School students receive from the Speed School instruction does not only bring many of them up to the standard of their peers but also gives them some advantage over the majority, in terms of their persistence and commitment to learn. Empirical research demonstrates that graduates of Speed School programs exhibit increased self-confidence and adaptability within the formal education system, facilitating their integration into state schools following program completion. This paper examines integrating Artificial Intelligence (AI) into a customized Speed School program for school-age out-of-school learners in Greece. The proposed AI integration aims to personalize learning through AI-supported diagnostic assessment, adaptive learning pathways, interactive games, and progress monitoring. A pilot project will evaluate the Speed School model's effectiveness in Greece, focusing on linguistic, cultural, and educational adaptations. Furthermore, the study estimates learning outcome, participation, and teacher attitudes towards AI.

Keywords: *Education, speed schools, AI (Artificial Intelligence), out-of-school, personalized learning, adaptability*



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INTRODUCTION

Introductory Identification of the Problem: The Lost Rhythms of Learning in Education

UNESCO's latest data presents a concerning picture of global education. The number of out-of-school children has surged to 250 million, a six-million increase since 2021 (Global Education Monitoring Report Team, 2023). This alarming trend is largely attributed to the mass exclusion of girls and young women from education in Afghanistan, coupled with a persistent stagnation of educational progress worldwide (UNESCO, 2021). Sub-Saharan Africa bears the brunt of this crisis, accounting for nearly 30% of all out-of-school children. Girls are disproportionately affected, constituting 48% of the total. The report highlights significant disparities across regions, with Central and Southern Asia and North Africa and Western Asia exhibiting particularly high out-of-school rates (Dharamshi et al., 2023; Abulikemu, 2023;

Rongrong, 2024). The COVID-19 pandemic exacerbated existing inequalities, disrupting learning for millions of children and exacerbating the divide (Singh et al., 2024; Valenzuela et al., 2024).

The multifaceted crisis in global education can be influenced by various factors such as economic inequalities, regional conflicts and systemic barriers to access to education, epidemics, wars. The above-mentioned circumstances are anticipated to lead to a significant increase in educational disparities in the wider Mediterranean region, where numerous children and adolescents face complete exclusion from educational procedures, compounding the already existing societal and financial difficulties (Altbach, 2015). While many countries have made efforts to recover lost learning time, the progress has been uneven. Moreover, the global economic downturn has forced many families to prioritize immediate needs over education, leading to increased dropout rates. To meet these goals, countries would need to dramatically accelerate efforts in early childhood education, primary and secondary school enrollment, and teacher training (Vereez, 2013).

Speed School: An Innovative Education Program for Out-of-School Children

The Speed School program is a pioneering intervention in the field of education, aimed at providing educational opportunities to marginalized children who have been excluded from the traditional school system. It consists of a condensed curriculum covering the first three years of school-age learners. The 'boost' Speed School students receive from the Speed School instruction does not only bring many of them up to the standard of their peers but also gives them some advantage over the majority, in terms of their persistence and commitment to learn. Former Speed School students who have been accustomed to active involvement in lessons are more likely to have the confidence to participate in lessons in government schools (Akyeampong et al., 2018).

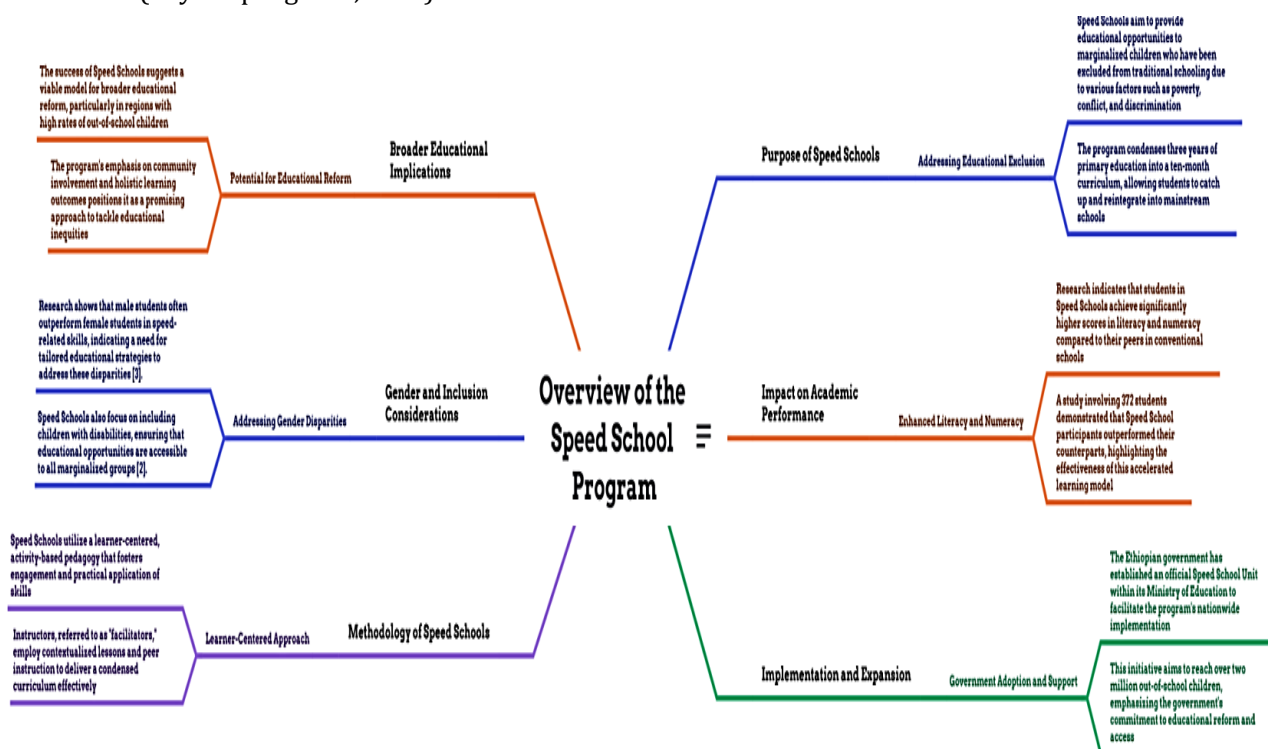


Figure 1. Speed School Overview with essential parts of pedagogical approach
(Source: Author's own elaboration)

Speed schools, particularly in the context of Ethiopia, have emerged as an innovative educational approach aimed at enhancing academic performance among students. These schools condense a conventional three-year curriculum into a ten-month program, resulting in significant improvements in literacy and numeracy compared to traditional schooling methods. A study involving 372 students revealed that those in speed schools achieved statistically higher scores in both literacy and numeracy tests compared to their peers in conventional schools. The speed school model demonstrates effectiveness in rapidly advancing students' academic skills, suggesting a potential model for educational reform (Zerihun et al., 2019). Research on primary school students in Iraq indicates that speed traits can be developed through targeted educational strategies, highlighting the importance of physical and motor skills in early education. The study found that male students generally outperformed females in speed-related skills, emphasizing the need for tailored approaches to address gender differences in physical education (Jabbar & Katea, 2024). The use of integrated dynamic games in school-age learners significantly improved students' speed motor quality while also enhancing interdisciplinary learning outcomes (Macovei & Popescu, 2023). While speed schools show promise in improving academic outcomes, Table 1 highlights the importance of considering the broader implications of accelerated learning for younger students and integrating dynamic learning methods to create a holistic educational experience.

RESEARCH METHOD

Proposed utilization of AI technologies for the enhancement of learning in Speed School's innovative educational program

In the modern educational environment, AI emerges as a catalytic factor in the transformation of the educational process, offering multi-level support to both teaching staff and student potential. Integrating AI in education redefines traditional paradigms by enabling personalized learning experiences through adaptive learning systems and AI-enhanced teaching tools. These technologies tailor educational experiences to individual student needs, significantly transforming how students learn and educators teach. (Ray & Sikdar, 2023; Bushuyev et al., 2024; Buşu, 2024; Souza et al., 2024).

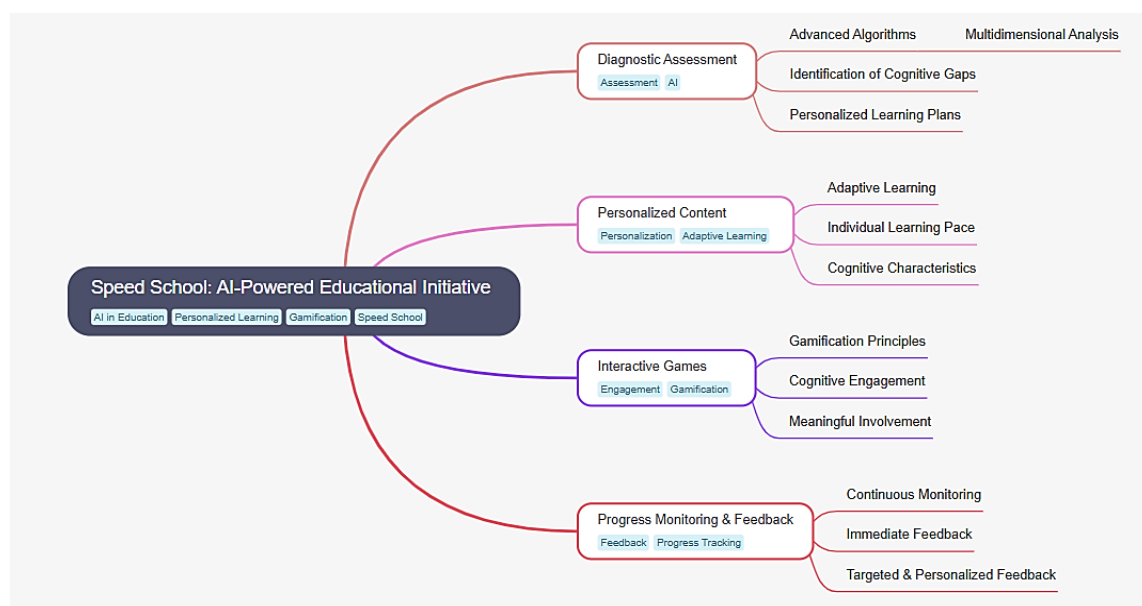


Figure 2. Speed School's AI: student and teacher benefits (Source: Author's own elaboration)

Table 2 presents the context of modern educational technology in which the innovative initiative “Speed School” is proposed as a comprehensive and advanced learning support system that leverages AI through a multi-level and cohesive framework. The system integrates four critical methodological components. First, diagnostic assessment, supported by advanced algorithms, enables a comprehensive and multidimensional analysis of learners’ needs, ensuring precise identification of individual cognitive gaps. Second, the system offers dynamic and flexible personalization of educational content, adapting with high accuracy to students’ unique learning characteristics, cognitive profiles, and individual learning pace. Third, the incorporation of interactive games serves as an innovative pedagogical mechanism that applies contemporary gamification principles to stimulate, cognitively engage, and meaningfully involve students in the learning process. Finally, through systematic and continuous monitoring of learning progress, the system provides immediate, targeted, and personalized feedback that functions as a dynamic tool for guidance and support throughout the educational process.

In addition, the proposed methodological approach could contribute significantly to freeing educational staff from time-consuming administrative and management obligations, allowing them to focus distractedly on the cultivation and development of higher-level cognitive skills of students, including critical thinking, analytical ability and creative expression. The capability to process and analyze data in real time is a potent instrument that facilitates the prompt and precise adaptation of educational interventions and teaching practices, thereby ensuring optimal support and enhancement of the learning process. In light of the above, the synergy developed between AI and the innovative Speed School program constitutes a pioneering approach in the field of education, which optimally utilizes modern technological developments and innovations, aiming at the qualitative upgrade of the learning experience and the maximization of educational effectiveness, as demonstrated in detail in table 1.

Table 1. AI and Speed School benefits summary

Advantage/Possibilities	Description	Impacts/Benefits
<i>Liberation of Educational Staff</i>	Automation of administrative and management tasks.	• More time for teachers to focus on developing higher-level cognitive skills of students (critical thinking, analysis, creativity). • Improved quality of teaching and interaction with students.
<i>Real-time Data Processing and Analysis</i>	Immediate processing and analysis of learning data.	• Rapid and accurate adaptation of educational interventions and teaching practices. • Optimization of support and enhancement of the learning process. • Personalized approach to learning.
<i>Synergy of AI and Speed School</i>	Combination of AI technology with an innovative educational program.	• Pioneering approach in education. • Optimal use of modern technological developments and innovations. • Qualitative upgrade of the learning experience. • Maximization of educational effectiveness.
<i>Development of Higher Cognitive Skills</i>	Focus on cultivating critical thinking, analytical ability, and creative expression.	• Providing students with skills necessary for success in the 21st century • Creating thinking and creative citizens.

The efficacy of the Speed School model in combating school dropout in Greece: A case study in School-age learners

Education is considered a fundamental human right worldwide and a key tool for social development. However, in many countries, including Greece, a significant number of students drop out of school in the early grades, particularly those from vulnerable social groups. Educational marginalization in the Greek educational system is a complex social and educational phenomenon that requires special attention. According to recent data from the Bureau of Investigation and Evaluation of Educational Work of the Institute of Educational Policy (IEP), a significant percentage of school-age children remain outside the school-age learners system, around 5% - 7%, with the phenomenon being particularly pronounced in specific social groups (M.E.R.R.A. & I.E.P., 2019). The research focused on the 2015-2016 school year with a sample of 4,304 public primary schools, including the full range of educational typologies: Intercultural Education, European Education, Minority Education, All-day and Experimental Schools. Economic factors, family support, health issues, and a lack of interest in learning are among the primary causes of early school leaving. Economic instability often forces students to prioritize work over education, leading to early school leaving (Szverle, 2020). While these factors are critical to understanding early school leaving, it is also important to consider that some students may leave due to personal choices or alternative paths they deem more beneficial. This demonstrates the complexity of this issue.

To adapt the Speed School concept to Greek educational realities, an interdisciplinary approach is required, as well as meticulous planning. However, using this approach provides a unique opportunity for the development of innovative educational techniques and the construction of a tailored learning environment. Adopting the model can assist educators in addressing key difficulties in the modern educational system, such as boosting teaching efficacy, increasing student participation, and preparing students for modern society. Focusing on linguistic, cultural, and educational dimensions should be the key axes around which the process of adapting the Speed School model to Greek Education should revolve. This is necessary in order to meet the requirements and features of the educational environment in Greece (Table 2).

Table 2. Speed School in Greece: adaptation's core elements

Dimension	Criteria	Objectives
Linguistic	All content (instructions, exercises, examples, explanations) should be in Greek.	Ensure student understanding and engagement.
	Use simple and clear language, adapted to the age and knowledge of the students.	Avoid difficulties in comprehension.
Cultural	Draw examples and exercises from Greek history, culture, and daily life.	Relevance and interest for students.
	Integrate the multiculturalism of Greece.	Promote tolerance and respect for diversity.
Educational	Compatibility with the New Curriculum.	Coverage of basic learning objectives and skills.
	Interdisciplinary approach to lessons.	Development of critical thinking, creativity, and connection of knowledge.
	Integration of Information and Communication Technologies (ICT).	Creation of interactive lessons and development of digital skills.

Proposed pilot project to adapt Speed School to Greek Education: Process and Methodology

This pilot research evaluates the efficiency and applicability of the Speed School instructional concept in Greece's educational system. The project will collect and evaluate data on the model's implementation, impact on students and teachers, and the difficulties and possibilities that arise. Through this systematic procedure, the study will help to draw findings and make recommendations for improving and adapting the model to the demands of Greek education. To ensure the results are representative, school-age learners schools should be selected from all regions of the country, considering the geographical distribution and characteristics of the school units (e.g., urban, rural, multicultural). This variety will allow the assessment of the model's applicability in different educational environments.

Table 3 outlines the preparatory and implementation process for the model. Before implementation, teachers from the selected schools will complete a specialized training program designed to familiarize them with the Speed School model, key tools, and effective instructional planning. The training will combine theoretical input, practical activities, case studies, and discussions on challenges and opportunities related to the approach. The model will then be implemented over eight months, during which teachers will integrate it into classroom practice, carry out planned tasks, and monitor student progress. Ongoing technical support and regular reflection meetings will be provided. The pilot study will evaluate the model's effectiveness on student learning, teacher attitudes, and factors influencing successful implementation. A mixed-methods design will be used, incorporating questionnaires for students, teachers, and parents, classroom observations, and analysis of learning outcomes.

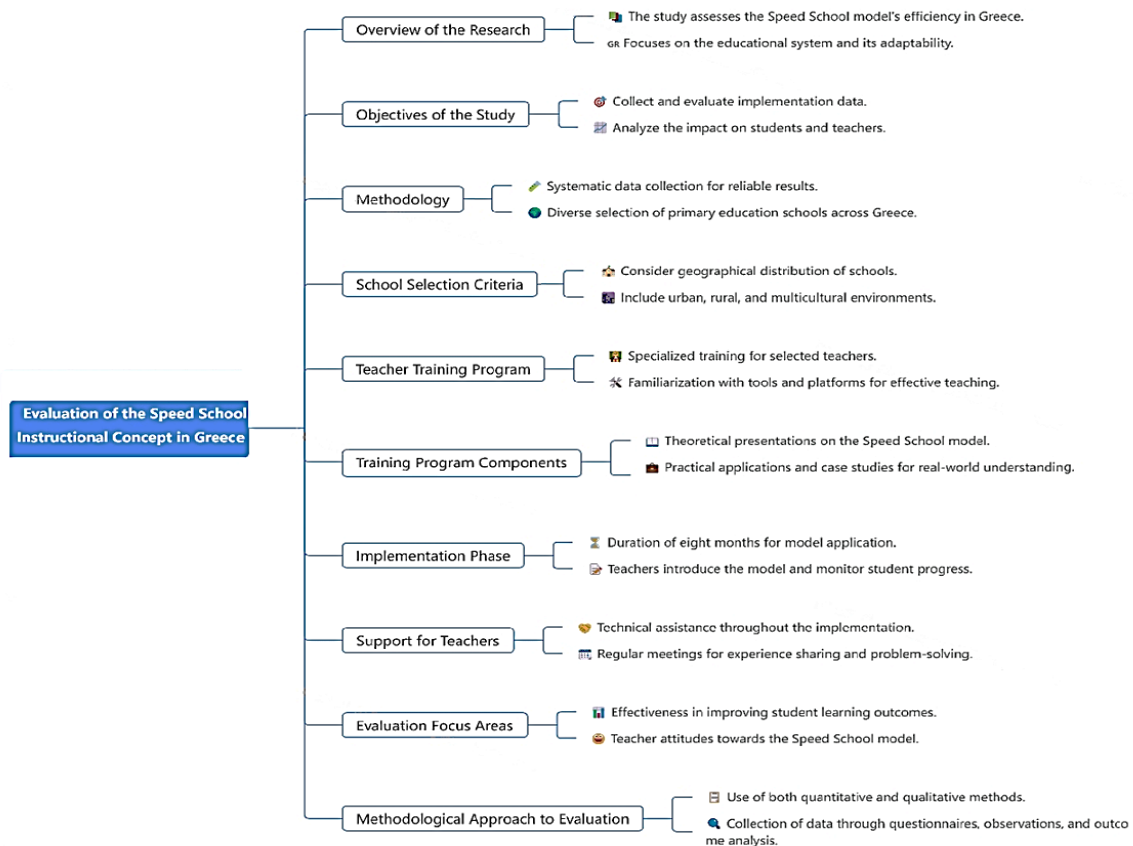


Figure 3. Speed School pilot study in Greek education system (Source: Author's own elaboration)

Overall, the proposed pilot study constitutes an important step toward evaluating and further developing the Speed School model in the Greek educational environment. It is also an important step towards improving the quality of education and promoting innovative approaches in the Greek educational system.

The Speed School Pilot Study: Analyzing the Expected Results

The Speed School pilot project in Greece will be a comprehensive research effort to evaluate an innovative educational model designed to support and empower marginalized students. The program will adopt a condensed curriculum methodology and utilize modern interactive teaching methods, with the ultimate goal of significantly improving learning performance in a shorter period compared to traditional educational approaches. The study sets a multidimensional framework of objectives that focuses primarily on enhancing the learning performance of participants (Figure 4). The program achieves this by comparing the performance of students on standardized assessment tests, which cover basic skills like reading, writing, and mathematics, before and after the implementation of the program. The research also includes monitoring qualitative indicators, such as levels of participation, learning interest, and self-esteem of students. A second axis of the study focuses on promoting and assessing student participation in educational activities at the higher cognitive level. In addition to enhancing students' self-confidence and active participation in demanding learning processes, the program incorporates activities that require and cultivate critical thinking and problem-solving skills. Last but not least, the study will explore the effect of the program on teachers' perceptions toward AI and the integration of technological tools in the educational process. This dimension of the research aims to understand and evaluate the change in teachers' perceptions and practices regarding the utilization of modern technological tools in teaching (Table 3).

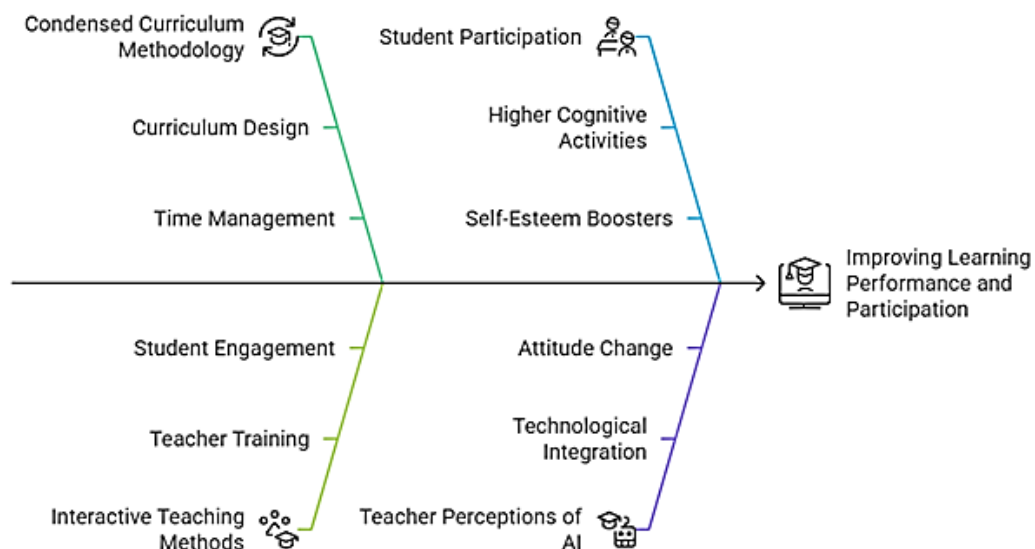


Figure 4. The Speed School project and empowering marginalized students (Source: Author's own elaboration)

Table 3. Objectives and indicators for measuring student performance

Objective	Measurement Indicators	Data Collection Methods
Improve learning performance.	Standardized achievement tests: • Reading (speed, comprehension, vocabulary). • Writing (spelling, grammar, syntax, expression of ideas). • Mathematics (arithmetic operations, geometry, measurement, problem solving).	Standardized tests before and after the program.
Increase participation in higher-level activities.	Participation and interest indicators: • Class attendance rate. • Participation in class activities. • Completion of assignments. • Demonstration of interest in learning.	Classroom observation, attendance records, student questionnaires.
	Self-esteem indicators: • Student self-esteem questionnaires. • Interviews with students. • Observation of participation in group work, discussions, critical thinking activities.	Questionnaires, interviews. Classroom observation, analysis of group work products.
Positive attitude of teachers towards AI.	Questionnaires about their views on the use of technology in education.	Teacher questionnaires.
	Observation of the use of technological tools in the classroom.	Classroom observation

FINDING AND DISCUSSION

The Speed School project is a groundbreaking initiative that has demonstrated significant success in numerous countries, presenting a viable solution to the worldwide challenge of school dropouts. This project employs modern, accelerated learning techniques alongside advanced technological tools in order to deliver quality education to children who have been marginalized by the conventional education system. The fundamental philosophy of the Speed School program is based on the need for rapid and effective integration of children into the school environment. Through focused materials and interactive teaching methods, the program facilitates the swift educational rehabilitation of students and optimally prepares them for reintegration into formal schooling. Technology can be an important part of the process because it can personalize the teaching and adapt it to the needs of each student, making the most of the learning experience. Additionally, the Speed School program promotes the acquisition of fundamental skills like reading, writing, and math that are at the core of the School-age learners curriculum. Through active participation in different learning experiences, the program helps students

build their cognitive capabilities and self-esteem, adequately focusing on reintegration into the formal school environment.

As a result of adapting Speed School to the specific conditions of Greek educational reality, the program represents not only a significant challenge but also a unique opportunity for the Greek educational system. The implementation of a pilot application of this program will provide the necessary platform for evaluating its effectiveness in addressing school dropout, as well as in promoting equality of educational opportunities among students. Through the use of accelerated learning methods and technology, Speed School has proven to be effective in many countries worldwide. However, adapting this program to the Greek educational system requires taking into account the specificities of the national context, such as language, culture, and prevailing socioeconomic conditions.

The pilot implementation's main purpose will be to evaluate the impact of the program on school dropout. School dropout rates will be analyzed before and during the implementation of the program, as well as additional qualitative data through interviews with students, teachers, and parents. Additionally, the pilot implementation will enable the evaluation of the program's effectiveness in promoting equal educational opportunities. This objective can be achieved through analyzing students' access to educational resources and learning opportunities, as well as through examining the impact of the program on students' academic performance and self-confidence. The adaptation and implementation of the Speed School program in the Greek educational reality constitutes an innovative strategy, which, under rational implementation, can offer significant advantages to the educational system, while strengthening the existing paradigm of educational inclusion and ensuring access to education for all children. Through the pilot implementation, it will be possible to evaluate the effectiveness of the program and identify any improvements required for its full integration into the national educational framework.

CONCLUSION

In this study, AI was incorporated into a customized Speed School program for school-age learners in Greece, with the aim of addressing the global challenge of out-of-school children and educational disparities. The proposed pilot project seeks to evaluate the effectiveness of this innovative approach in the Greek context, focusing on linguistic, cultural, and educational adaptations. The program aims to accelerate learning and enhance student outcomes by leveraging AI for personalized learning, diagnostic assessment, and interactive engagement. A positive shift in teacher attitudes toward AI in education is expected as well as improved student performance and increased student participation. As a result of rigorous evaluations and data analysis, this study will provide valuable insights into the feasibility and impact of implementing Speed School with AI integration in Greece, ultimately advancing inclusive and equitable education.

RECOMMENDATIONS

The integration of Artificial Intelligence (AI) into the Speed School program for primary school students in Greece presents a unique opportunity to upgrade the educational experience, especially for students who have found themselves outside the typical school system. For successful implementation, it is recommended to prioritize personalized learning through AI diagnostic tools that will assess the needs of each student, adapt content and learning pace to individual abilities. The use of interactive games with embedded AI will enhance participation and make learning more engaging. At the same time, it is crucial to empower educators through targeted training in the use of AI tools and the utilization of data for drawing conclusions and adapting teaching practices. The automation of administrative tasks with the help of AI will free up time for educators, allowing them to focus on the development of higher cognitive

skills in students. The linguistic and cultural adaptation of the program, with the integration of the Greek language and elements of Greek culture, is essential for creating a familiar and effective learning environment. Conducting a pilot study to evaluate the effectiveness of the program and collecting data for its improvement is also fundamental. Ensuring equal access to technology for all students, especially students from marginalized groups, and collaboration with educational institutions and the community will contribute to the sustainability and success of the program. Finally, long-term monitoring of the impact of the program on the academic trajectory of students will provide valuable information for the continuous improvement and expansion of the program.

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