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METHODOLOGY OF USING DIGITAL TECHNOLOGIES IN TEACHING COMPUTER SCIENCE

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ABSTRACT

Digital technologies have revolutionized computer science education, offering new opportunities to enhance learning experiences and develop computational thinking skills. This scientific article presents a comprehensive methodology for the effective integration of digital technologies in the teaching of computer science. The methodology includes core components such as curriculum design, instructional strategies, assessment practices, and professional development to support teachers in using digital tools and platforms. By using this methodology, teachers can create an engaging and interactive learning environment that prepares students for the challenges of the digital age.

Keywords: Digital technologies, platforms, methodology, coding platforms, visualization, interactive lectures.

INTRODUCTION

The advent of digital technologies has transformed the field of computer science education, requiring innovative approaches to teaching and learning. This article presents a methodology that provides educators with a systematic framework for effectively integrating digital technologies into computer science education. By using a variety of tools and platforms, educators can improve learning outcomes, develop computational thinking, and prepare students for a dynamic and technology-driven world. The design of educational programs plays a decisive role in the methodology of using digital technologies in the teaching of computer science. This includes careful consideration of educational goals, learning objectives, and the integration of digital tools and resources to enhance the learning experience.

Curriculum design:

The methodology begins with paying close attention to the creation of the curriculum. Teachers are encouraged to align their educational goals and learning objectives with the principles of computer science education and the specific needs of students. They learn the basic concepts, programming languages, algorithms, data structures, and problem solving techniques that are important in computer science education. In addition, educators will consider how digital technologies can be integrated to facilitate hands-on learning experiences and encourage active participation.

Learning strategies:

The methodology includes a range of educational strategies that use digital technologies to improve teaching and learning. Teachers explore methods such as blended learning, flipped classrooms, project-based learning, and collaborative problem solving. They use digital tools and platforms to deliver interactive lectures, facilitate online discussions, provide realistic

simulations and visualizations, and engage students in coding exercises and programming challenges. These strategies promote active learning, critical thinking, creativity, and collaboration.

Digital tools and platforms:

The methodology emphasizes the study and use of digital tools and platforms that support computer science education. Teachers will be introduced to programming environments, integrated development environments (IDEs), online coding platforms, data visualization tools, virtual and augmented reality applications, and simulation programs. They learn to select and integrate appropriate tools based on learning objectives and the needs of their students. These tools allow students to practice, experiment, and learn complex concepts.

Assessment Practice:

The methodology supports the use of a variety of assessment practices appropriate to the nature of computer science education and the integration of digital technologies. Teachers include formative assessment strategies such as coding exercises, debugging activities, peer review, and self-assessment to provide continuous feedback and monitor student progress. They also develop summative assessments that include coding projects, algorithm design problems, and computational thinking tasks to assess students' mastery of key concepts and their ability to apply them to real-world scenarios.

Professional development:

Recognizing the dynamic nature of digital technologies, the methodology emphasizes the continuous professional development of teachers. It encourages participation in workshops, webinars, conferences, and online courses that provide opportunities to learn about emerging technologies, innovative learning strategies, and best practices in computer science education. Faculty participate in communities of practice to share experiences, collaborate, and stay abreast of the latest trends and research in the field.

Ethical Considerations and Digital Citizenship:

The methodology focuses on developing ethical reasoning and digital citizenship skills. Teachers guide students in the responsible and ethical use of digital technology, including issues related to privacy, security, intellectual property, and online behavior. They contribute to discussions about the impact of computer science on society, ethical decision-making in technology development, and the importance of diversity and inclusion in the field.

SUMMARY

The methodology presented in this article provides a comprehensive framework for effectively integrating digital technologies into computer science education. By focusing on curriculum design, instructional strategies, assessment practices, and professional development, educators can create engaging and interactive learning environments that foster computational thinking skills and prepare students for the rapidly evolving digital landscape.

Adopting this methodology will help develop a new generation of computer scientists equipped with the knowledge, skills and attitudes needed to thrive in the digital age.

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