THE THEORETICAL IMPORTANCE OF THE STEAM PROGRAM IN THE DEVELOPMENT OF THE QUALITY OF EDUCATION

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Abstract. *This article highlights the content, modern trends and international experiences of the theoretical importance of the STEAM program in improving the quality of education. According to the science, technology, engineering, arts, and mathematics (STEAM) program, this experimental research aims to advocate e-content based on augmented reality (AR) technology to enhance retention learning (LR) and reinforce critical thinking in the intermediate stage.*

Key words. *innovation, integration, augmented reality (AR), Virtual Reality(VR), science, technology, engineering, arts, and mathematics (STEAM) program, technology.*

Introduction. In an ever-evolving world, the traditional education system is constantly challenged to adapt and prepare students for the demands of the 21st century. One innovative approach that has gained momentum is the integration of STEAM (Science, Technology, Engineering, Arts, and Mathematics) programs into mainstream education. The information age we live in helps us in applying knowledge in novel ways because it is built on digital technologies. As a result, the digital generations appeared due to the change of learning styles from audio, visual, and kinesthetic (VAK) ones to E-VAK, since we have got computers with huge capacity and multitasking, the integration of mobile and computers into network-based interface devices, and the emergence of endless numbers of interactive application programs

used by the new generations. Because technology is changing so quickly, educational materials must be updated and modified constantly.

Consequently, educators were interested in employing contemporary and virtual technologies to assist learning environments, such as AR, a recent technology that creatively and engagingly supports learning environments by fusing reality with digital interactions. Also, it helps in boosting both practical skills and intellectual concepts. Hence, there is a propensity to combine different technologies to uphold learning goals and maximize their outcomes through the orientation of the learner-centered learning strategy, with examples including visual reality (VR-Virtual Reality), smart learning (AR-Augmented Reality), and Internet of things. AR allows real and virtual objects to interact with one another, which is the only technology that connects physical reality to virtual data regarding that reality. It delivers a direct or indirect picture of the physical world in real-time that is heightened by the addition and overlay of virtual data. Additionally, AR technology can be used directly or indirectly in the teaching and learning environment to assist and sustain learners in dealing with knowledge and interacting with it (visually and auditory) in an easier way to represent, store, and test knowledge.

It is clear that augmented reality technology has the potential to create a knowledge-building environment similar to that described in constructivist theory, which requires the creation of realistic situations and an active learning environment through interaction with learning software. The use of educational AR is also dependent on modern communication theory principles such as self-learning and the learner's ability to obtain knowledge and respond when exposed to stimuli on networks, devices, or electronic tools such as portable smart devices. Education systems are rapidly modified by immersive technologies. Among them, AR has resourcefully shown promise, particularly for STEAM education. The philosophy of STEAM integrated education is to provide creative education, covering cutting-edge technology, to students who are already accustomed to advanced technology, so that they do not lose interest in learning in case of their inability of keeping up with the pace of technology. The future of society's advancement depends on STEAM competencies, which are also anticipated to be the cornerstone of some of the fastest-growing businesses.

What is more, STEAM is defined as a broad field that includes numerous disciplines and epistemological practices. Many requirements must be met in order to activate STEAM education, encompassing the development of integration between different disciplines via the problem-solving method, active learning via learning situations and planned and extracurricular projects, and the creation of technology-rich learning environments to benefit and excite learners while preparing them for the future

practical market. Lower enrollments in STEM courses, which are critical for future economic growth, reflect young people's growing disengagement from STEM. Past studies defend using modern technology to facilitate the learning processes while anchoring this education and training in STEM pedagogy through an interdisciplinary approach. New technologies have emerged in recent decades, allowing a more thorough exploration of appropriate technology to support STEM learning. Immersive technology, such as augmented reality (AR), has gained popularity in recent years, with an increasing number of studies published in educational contexts.

Obtained Results and their Analysis.

The theoretical and practical significance of organizing the educational process of a general education school with the help of STEAM programm is presented in the studies of scientists, such as Alkhabra, Yaser A,Ibrahem, Usama M.,Alkhabra, Saleh A., Sung, Jihyun, Lee, Ji Young, Chun, Hui Young, Potvin, Jacquelyn, Chappell, Kelsi, Amin, Sarah, D. Anvarova, D. Bekpo'latova, G.Saidova, G.Ergasheva, D.Khalilova, I.Ibragimov

In an era where the demands of the workforce are rapidly evolving, the traditional education system is being reimagined to better prepare students for the challenges and opportunities of the 21st century. Enter STEAM programs — an innovative educational approach that integrates Science, Technology, Engineering, Arts, and Mathematics. This article explores how the infusion of STEAM into the education system is not just a change but a revolution, offering a dynamic and effective framework for improving the learning experience.

This interdisciplinary model seeks to break down the traditional silos between subjects, fostering a holistic and creative approach to learning. In this article, we explore the significant impact of STEAM programs on improving education.

Fostering Critical Thinking and Problem-Solving Skills: STEAM education encourages students to think critically and solve real-world problems. By engaging in hands-on activities and projects, students learn to apply their knowledge across various disciplines, enhancing their ability to analyze situations and devise innovative solutions. This approach prepares them for the challenges they will face in a rapidly changing global landscape.

Promoting Collaboration and Teamwork: Collaboration is a cornerstone of STEAM programs. Students work together on projects that require a combination of skills from different disciplines. This collaborative environment mirrors the modern workplace, where professionals with diverse expertise must work together to achieve common goals. Through teamwork, students not only learn to respect diverse perspectives but also develop interpersonal skills essential for success in their future careers.

Integrating Technology in Education: In today's digital age, technology plays a crucial role in almost every aspect of our lives. STEAM programs seamlessly integrate technology into the learning process, enabling students to become familiar with tools and applications relevant to their fields of study. This not only enhances their technological literacy but also prepares them for the tech-driven workforce they will enter upon graduation.

Nurturing Creativity and Innovation: The incorporation of arts into STEM subjects (transforming STEM into STEAM) adds a creative dimension to education. Arts encourage students to think outside the box, fostering creativity and innovation. Whether through designing, composing, or visualizing concepts, students develop a well-rounded skill set that is not only valuable in academic settings but also in entrepreneurial and creative pursuits.

Real-World Relevance and Application: STEAM programs emphasize the real-world application of knowledge. Students are exposed to practical challenges that simulate the complexities they may encounter in their future professions. This application-oriented approach bridges the gap between theoretical learning and practical implementation, making education more relevant and meaningful for students.

Conclusion.

STEAM programs are at the forefront of transforming education, equipping students with the skills and mindset needed to thrive in the 21st century. By fostering critical thinking, collaboration, technological literacy, creativity, and real-world application, STEAM education prepares students to face the challenges and opportunities of a rapidly evolving world. As schools and educators continue to embrace and implement STEAM initiatives, we can expect a positive shift towards a more engaging, relevant, and impactful education system.

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