Chapter 22
Holistic Curriculum Design:
Embedding STEAM Principles in Education

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ABSTRACT

This chapter begins by exploring the concept of STEAM, its implementation into the curriculum, and ultimately aims to nurture modern individuals effectively for the twenty-first century. In particular, it addresses students' physical, social, emotional, and cognitive development, fostering creativity, critical thinking, and problem-solving abilities. By emphasizing interdisciplinary learning, incorporating hands-on activities, questions, and workable projects can effectively help educators create dynamic environments that enable students to learn and simultaneously solve real-life problems throughout their lifetime. Additionally, the chapter also addresses theoretical frameworks, including constructivist and experiential learning theories, along with diverse STEAM case studies in different contexts of education. As a result, it provides educators, curriculum designers, and policymakers with best practices for cultivating talented STEAM learners who are equipped with the complex skills needed for the globalized world.

INTRODUCTION

STEAM education, which brings together Science, Technology, Arts, Engineering, and Mathematics, is becoming more popular as a means of equipping students to face the challenges of the contemporary world. Yet, much of the research in this

DOI: 10.4018/979-8-3693-7408-5.ch022

area has been limited to short-term studies, making it hard to understand how well its effects last over time or how it influences students' later academic achievements and career paths. For example, earlier studies, like those by Yakman (2008) and Beers (2011), have mostly looked at the immediate outcomes of STEAM education on learning and job readiness. This highlights a need for more in-depth research into how STEAM education shapes key skills, such as critical thinking, problem-solving, and resilience, especially in the long run. Additionally, there is a noticeable gap in research comparing how STEAM is applied in different cultural and social settings. As Margot and Kettler (2019) suggest, it's important to recognize that the approach to teaching STEAM should adapt to fit the needs of each unique educational context.

Moreover, the implementation of a curriculum that integrates STEAM principles can result in the development and production of competitive students. Thus, instead of memorizing information, this approach highlights the holistic development of the person as a whole. Since cognitive, emotional, social, and physical developments are integrated, educators can design purposeful, transformative learning experiences. For this reason, the holistic approach ensures that, in addition to understanding the STEAM subjects, students also possess the passion, emotional intelligence, and skills that will enable them to apply what they have learned during their courses.

Consequently, through this chapter, educators, curriculum developers, and policymakers will be able to develop and incorporate STEAM for enrolled students and foster their social, emotional, cognitive, and physical growth. In addition, it also aims to provide a comprehensive account of shaping students to become lifelong learners and creative problem solvers.

THEORETICAL FOUNDATIONS OF STEAM EDUCATION

This section first explains the shift from STEM to STEAM, in which the arts area has been integrated into STEM to promote creativity. Next, it looks at educational theories and then relates them to holistic education, thereby exploring how STEAM enhances growth at both the individual and academic levels.

HISTORICAL BACKGROUND AND EVOLUTION OF STEAM EDUCATION

STEM education initially laid the foundation for STEAM education, concentrating on science, technologies, engineering, mathematics, and eventually arts. Scientists and academicians discovered that the conventional method of adopting STEM was weak in creativity, especially as the demand for knowledge in these sectors rose in