Factors Affecting the Effectiveness of Generative Artificial Intelligence Apps on University Students' Programming Language Learning in Sri Lanka: A Systematic Literature Review

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Abstract

In today's era, technology has become pervasive worldwide, significantly facilitating access to learning resources. Notably, the emergence of Generative Artificial Intelligence (AI) has garnered rapid attention and interest in a short period with the introduction of ChatGPT. Many individuals have extensively discussed and evaluated this AI-powered language model, from researchers to casual internet users. Importantly, Generative AI applications are increasingly recognized for their potential in educational contexts. In the realm of education, AI has the potential to significantly broaden and improve teaching and learning in higher education. However, while numerous studies have explored the effectiveness of Generative AI applications in programming language learning, an absence of research examining their impact comprehensively exists. Hence, this study aims to identify the factors that affect the successful utilization of Generative AI applications in the context of undergraduate programming language learning, with a particular emphasis on the viewpoints of university students. A systematic literature review was undertaken to obtain the research objectives, adhering to the Prisma 2020 guidelines, which involved selecting and analyzing 47 prior studies. Mainly this study utilized a systematic literature review to comprehend the factors influencing the effective utilization of Generative AI apps by undergraduate students in their programming learning experiences. Furthermore, the study discusses the advantages and challenges university students face when learning programming using generative AI applications.

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