TutorBot+: Automatic Programming Assistant with Positive Feedback based on LLMs

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Abstract : The purpose of this document is to showcase the preliminary work in developing an EduChatbot-type tool and measuring the effects of its use aimed at providing effective feedback to students in programming courses. This bot, hereinafter referred to as tutorBot+, was constructed based on chatGPT and is tasked with assisting and delivering timely positive feedback to students in the field of computer science at the Universidad Católica de Concepción. The proposed working method consists of four stages: (1) Immersion in the domain of Large Language Models (LLMs), (2) Development of the tutorBot+ prototype and integration, (3) Experiment design, and (4) Intervention. The first stage involves a literature review on the use of artificial intelligence in education and the evaluation of intelligent tutors, as well as research on types of feedback for learning and the domain of chatGPT. The second stage encompasses the development of tutorBot+, and the final stage involves a quasi-experimental study with students from the Programming and Database labs, where the learning outcome involves the development of computational thinking skills, enabling the use and measurement of the tool's effects. The preliminary results of this work are promising, as a functional chatBot prototype has been developed in both conversational and non-conversational versions integrated into an open-source online judge and programming contest platform system. There is also an exploration of the possibility of generating a custom model based on a pre-trained one tailored to the domain of programming. This includes the integration of the created tool and the design of the experiment to measure its utility.

Keywords : assessment, chatGPT, learning strategies, LLMs, timely feedback