Chapter 7
How Do Mathematics Teachers Use ChatGPT in Their Classes?

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ABSTRACT

This chapter presents a study that aims to investigate how mathematics teachers use ChatGPT in their lessons and to reveal their experience. The research was conducted in accordance with case study design. Within the scope of the research, semi-structured interviews were conducted with mathematics teachers using ChatGPT in their mathematics courses. The results show that mathematics teachers use ChatGPT in problem-solving, problem posing, using different strategies in problem-solving, and to make students discover the basic properties of geometric shapes. The participants of the study also mentioned some of the advantages of using ChatGPT in their lessons, the difficulties, the methods to overcome these difficulties, and made recommendations for other teachers. The results of the study uncover the need for more research and guidelines for the use of ChatGPT and similar artificial intelligence tools in mathematics courses. It is recommended to conduct studies on good examples of using ChatGPT in mathematics courses which overcome possible challenges.

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INTRODUCTION

The rise of artificial intelligence is opening new and unexplored avenues in educational contexts. Artificial intelligence (AI) is the technology that enables a machine to mimic and perform human-like behaviors such as learning, decision making, problem solving and prediction (Kennedy & Wanless, 2022). AI in education provides the opportunity to address gaps in content and teacher competence (Busuttil & Calleja, 2025), support teachers and students by providing purposeful learning experiences and intelligent learning systems (Crompton & Song, 2020), and equip students with new skills for an AI-driven world (Slimi, 2023). One of the main reasons for the recent rise of AI is thought to be the development of large language models and the associated increasing potential of chatbots (Lokman & Ameedeen, 2019). Chatbots, also known as conversational agents, enable humans to interact with computers through natural language by applying natural language processing (NLP) technology (Adamopoulou, & Moussiades, 2020). Natural language processing is a system designed to create a representation of human spoken language to perform tasks such as answering questions and making inferences (Bender et al., 2021). The latest evolution of chatbots is important, because it has enabled people to communicate directly with computer systems without the need for any intermediary (Asha et al., 2023). Today's modern chatbots can understand spoken or written commands, fulfill many of them, and answer questions (Adamopoulou, & Moussiades, 2020).

One of the clearest examples of the rise of modern chat bots is ChatGPT. ChatGPT (Chat Generative Pre-Trained Transformer) is an artificial intelligence language model developed by the research company OpenAI (Cooper, 2023). Due to its design using deep learning, ChatGPT is able to generate the kind of text that humans would write and maintain a conversational style that allows for more realistic natural dialog (Tlili et al., 2023). Deep learning methods make it possible for a machine to be fed with raw data and automatically discover the representations needed for detection or classification (LeCun et al., 2015; Lee & Yeo, 2022). Therefore, ChatGPT is continuously improving itself through user feedback (Floridi, 2023). While ChatGPT's primary function is to mimic human speech, its capabilities extend far beyond this. For example, it can generate text such as a poem, a story or a novel, give feedback on such text, or behave in any other way appropriate to the role assigned to it. (Su et al., 2023; Tlili et al., 2023).

The incorporation of artificial intelligence into educational settings is an emerging field due to its potential benefits (Adamopoulou, & Moussiades, 2020; Farrokhnia et al., 2023). Integrating AI into education makes the learning process personalized, flexible, inclusive and fun (Luckin et al., 2016). In parallel, chatbots are thought to provide opportunities in education by engaging students, personalizing learning