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Teacher support and student motivation to learn with Artificial Intelligence (AI) based chatbot

February 2023 · [Interactive Learning Environments](#)  
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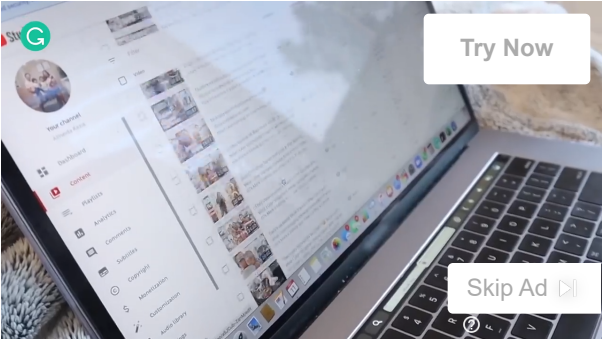
Abstract

As Artificial Intelligence (AI) advances technologically, it will inevitably bring many changes to classroom practices. However, research on AI in education reflects a weak connection to pedagogical perspectives or instructional approaches, particularly in K-12 education. AI technologies may benefit motivated and advanced students. Understanding the teacher's role of student motivation in mediating and supporting learning with AI technologies in the classroom is needed. This study used self-determination theory as the undergirding framework to investigate how teacher support moderates the effects of student expertise on needs satisfactions and intrinsic motivation to learn with AI technologies. This experimental study involved 123 Grade 10 students, and used chatbots as AI-based technologies in the experiment. The analyses revealed that intrinsic motivation and competence to learn with the chatbot depended on both teacher support and student expertise (i.e. self-regulated learning and digital literacy), and the teacher support better satisfied the need for relatedness, and it less satisfied the need for autonomy. The findings refined our understanding about the application of self-determination theory and expand the pedagogical and design considerations of AI application and instructional practices.

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## AI AND STUDENT MOTIVATION

### **Teacher Support and Student Motivation to Learn with Artificial Intelligence (AI) based Chatbot**

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... edagogical approaches. The study by these authors revealed that LLMs can also execute all stages of data analysis with just a few command prompts. This fact underscores the potential for students to manipulate conventional exam questions, highlighting the need to adapt assessment practices. However, in alignment with the findings of Cooper (2023) ; Chiu et. al. (2023) ; Rahman et al. (2023) and Zhai (2023), the authors also expressed optimism regarding the integration of LLMs into the educational landscape. ...

... ivation. Notably, programs grounded in a metacognitive theoretical framework achieve greater success in academic achievement compared to those that focus solely on cognitive aspects. This insight is particularly relevant in the context of AI-driven technologies, such as chatbots, which excel in offering personalized, immediate feedback. Studies by Chiu et. al. (2023) ; Okonkwo and Ade-Ibijola (2021); Yin et al. (2020) have demonstrated the effectiveness of AI technologies in these areas. They argue that such technologies, by providing personalized feedback, can significantly aid in the development of self-regulated learning skills and autonomy. ...

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... ulum content and pedagogical approaches. The study by these authors underscored that LLMs can execute all stages of data analysis with just a few command prompts, presenting the potential for students to manipulate conventional exam questions, and thus emphasizing the need to adapt assessment practices. Aligning with the findings of Cooper (2023) ; Chiu et. al. (2023) ; Rahman et al. (2023), andZhai (2023), the authors remain optimistic about integrating AI into the educational landscape, despite the challenges. Among the foremost advantages of LLMs in education is their ability to provide personalized learning experiences. By analyzing students' responses and learning patterns, LLMs can tailor educat ...

... hieve greater success in academic achievement compared to those that focus solely on cognitive aspects -copying, memorizing, reading, summarizing etc. This insight is particularly relevant in the context of AI educational technologies, such as chatbot-based learning environments, which excel in offering personalized, immediate feedback. Studies by Chiu et. al. (2023) ; Urban et al. (2023) and Yin et al. (2020) have demonstrated the effectiveness of AI technologies in these areas. They argue that such technologies, by providing personalized feedback, can substantially aid students' development. ...

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... Course programs and plans can be arranged according to the subjects that students need. While doing all this, ChatGPT can also give an idea about how teaching materials can be used more efficiently (Chiu et al., 2023) . ...

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... Furthermore, AI is employed to construct interactive and cutting-edge digital learning platforms and enhance distance learning by utilizing tools and programs that permit virtual communication and cooperation (Yufei et al., 2020). The importance of balancing the benefits and risks of AI the field of education enhances inclusivity, elevates the standard of learning (Berendt et al., 2020; Chiu et al., 2023; Perrotta & Selwyn, 2020). ...

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... Additionally, the ability to provide effective feedback instantly throughout the process may be one of the reasons for obtaining these results (George & George, 2023; Okonkwo & Ade-Ibijola, 2020; Porter & Grippa, 2020). This situation is emphasised to promote self-regulation (Chiu et al., 2023) and facilitate learning by increasing participation (Karsenti, 2019; Rudolph et al., 2023; Ślapeta, 2023). Similar results were obtained in studies conducted by Kuhail et al. (2023) and Winkler and Söllner (2018) in the context of personalised learning. ...

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The moderating effects of gender and need satisfaction on self-regulated learning through Artificial...

December 2022 · Education and Information Technologies

● Qi Xia · ● Thomas K.F. Chiu · ● Ching Sing Chai

Artificial intelligence (AI) has the potential to support self-regulated learning (SRL) because of its strong anthropomorphic characteristics. However, most studies of AI in education have focused on cognitive outcomes in higher education, and little research has examined how psychological needs affect SRL with AI in the K–12 setting. SRL is a self-directed process driven by psychological factors ... [\[Show full abstract\]](#)

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Investigating the relationship of technology learning support to digital literacy from the perspecti...

May 2022 · Educational Psychology

● Thomas K.F. Chiu · ● Murod Ismailov · Jerry Chih-Yuan Sun

Digital literacy, a prerequisite for online learning, is fostered by active engagement with technology, a concept that is explained by self-determination theory (SDT). This two-study project took the unique opportunity afforded by COVID-19 to explore the effect of technology learning support for SDT-needs satisfaction on digital literacy and the possible mediating effects of needs satisfaction on ... [\[Show full abstract\]](#)

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The mediating effects of needs satisfaction on the relationships between prior knowledge and self-re...

February 2023 · British Journal of Educational Technology

● Qi Xia · ● Thomas K.F. Chiu · ● Ching Sing Chai · ● Kui Xie

The anthropomorphic characteristics of artificial intelligence (AI) can provide a positive environment for self-regulated learning (SRL). The factors affecting adolescents' SRL through AI technologies remain unclear. Limited AI and disciplinary knowledge may affect the students' motivations, as explained by self-determination theory (SDT). In this study, we examine the mediating effects of needs ... [\[Show full abstract\]](#)

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Catering to Inclusion and Diversity With Universal Design for Learning in Asynchronous Online Educat...

February 2022 · Frontiers in Psychology

● Murod Ismailov · ● Thomas K.F. Chiu

The Universal Design for Learning (UDL) guidelines were extensively studied to understand inclusive learning and teaching in higher education. However, to date, there have been few studies that approached UDL-based asynchronous university courses from the needs satisfaction perspective in self-determination theory (SDT). To address this gap, researchers designed and implemented two 15-week ... [\[Show full abstract\]](#)

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Teacher Support and Student Engagement in Digital Learning

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Student engagement is an important aspect of digital learning. It is energized by motivation and explained by three basic needs in Self-determination theory (SDT). Teacher support distinguished in SDT was widely applied in face-to-face settings, but not digital learning, particularly in K12 context. We know very little how to support the needs of the young children in digital learning. Recently, ...

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