

Theories of Evaluating Learner's Motivation and Learning Outcomes by AI-Powered Tools

*Do Thi Kieu Lan**

* M.A. Department of Business English, Foreign Languages Faculty National Economics University

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Abstract: This article explores the potential impacts of AI-powered tools on student motivation and learning outcomes within the framework of Self-Determination Theory. It examines how AI tools can influence students' sense of autonomy, competence, and relatedness, potentially fostering intrinsic motivation and internalized extrinsic motivation, leading to improved academic performance. The article also discusses the need for empirical research to investigate these complex relationships further.

Keywords: Pronunciation, /ʒ/ and /dʒ/, supplementary activities, drilling, minimal pairs, teaching.

Introduction

Artificial Intelligence (AI) has evolved significantly since its inception in the 1950s, progressing from simple task-oriented machines to complex systems capable of learning, adapting, and acting like humans (Popenici & Kerr, 2017; Purdy & Daugherty, 2016). Machine learning, a subset of AI, enables systems to recognize patterns and make predictions based on data (Popenici & Kerr, 2017). In education, AI has transformed teaching and learning processes at all levels, offering personalized learning, automating administrative tasks, and providing predictive analytics (Popenici & Kerr, 2017). The future of higher education is intertwined with the continuous development of AI, presenting both opportunities and challenges (Popenici & Kerr, 2017).

There are certain specific examples of AI-powered tools which are being applied in education settings to assist personalized learning. For example, adaptive learning platforms (ALPs) use algorithms to analyze student performance data and tailor learning content and activities to individual needs and progress. Examples include Dreambox Learning specializing in Mathematics or *Linguaskill* which is an online, multi-level test is designed to help organisations assess groups of candidates. It offers a complete picture of your candidates' English abilities, with fast and accurate testing of all four language skills: reading, listening, writing, and speaking. *Linguaskill* has now been introduced into universities in Vietnam as well.

Particularly, AI tools are best designed to support intelligent content creation. It means that AI can generate educational content, such as quizzes, summaries, or even entire lessons, based on specific

learning objectives. Examples include PrepAI and ContentBot. Furthermore, virtual reality (VR) and augmented reality (AR) experiences are improved thanks to AI tools because AI can be used to create immersive VR and AR experiences, leading to enhanced learning and engagement, such as Labster (virtual science labs) and 3DBear (AR creation tool). Therefore, AI-powered tools like virtual tutors can offer 24/7 assistance, addressing students' questions and concerns outside of traditional classroom hours (Chen et al., 2021).

Another function of AI-powered tools that must be mentioned is to administrate tasks by creating chatbots for students. AI chatbots can answer students' questions, provide information about courses, and help them navigate administrative processes, saving much time. Examples include ChatGPT and Gemini which have been overwhelmingly welcomed by Vietnamese university students since the first appearance. By providing grammatically correct sentences, ChatGPT can aid learners in producing well-structured texts. Additionally, its ability to comprehend and respond to human queries makes it a valuable resource for language learners (Huang & Tan, 2023).

At universities, students are required to complete mini assignments or final assignments in which questions are given, requiring students to read and conduct comprehensive investigation to produce written reports for submission. In detail, at National Economics University (NEU), Vietnam first year students in several departments and programs such as Advanced Educational Program (AEP) or International Bachelor's Degree (IBD) study Eng100 or Project which expects students to complete the

final assignment by writing 3000-word literature, reviewing a given topic. When finishing the coursework, many students tend to find AI-powered tools to do the task, gain the decent grades and reduce the time spent doing the final test. Though AI chatbots serves as a time-saving tool, some students find it easy to complete the coursework assignment and get good marks and gradually lose efforts in learning. Other students, however, think chatbots are useful tools assisting the academic work and motivate them when studying. Despite the benefits of AI-powered tools, questions concerned about ethics, usefulness and the effect on students' study results as well as learning motivation have been raised.

In conclusion, while AI technologies have shown potential benefits in education, there is a need for research to understand their specific impacts on student motivation and learning outcomes. Questions arise regarding the effectiveness of AI tools in fostering engagement, supporting diverse learning needs, and ultimately improving educational.

Theories of evaluating learner's motivation and learning outcomes

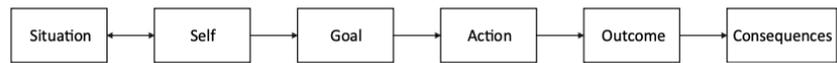
This part explores theoretical frameworks that underpin the relationship between AI and students' motivation and learning outcomes.

Motivation, a central concept in educational psychology, is frequently defined as a process that initiates and sustains goal-directed actions (Schunk et al., 2014). In academic settings, the study of motivation seeks to understand the reasons behind student behaviors and how these behaviors influence learning and achievement (Schunk et al., 2014).

Several major theories have emerged in educational motivation research to describe, explain, and predict various aspects of learning behaviors, such as their direction, initiation, intensity, and persistence (Linnenbrink-Garcia & Patall, 2016). However, each theory uses its own unique terminology and concepts, which can make the field somewhat inaccessible. Furthermore, motivation researchers often create new terms, modify existing concepts, and expand on established theories, blurring the lines between different models (Murphy & Alexander, 2000; Schunk, 2000).

In this section, the foundational motivational model is presented. This model is based on the general model of motivation proposed by Heckhausen and Heckhausen (2018, p.4) and aims to explain the

fundamental traits of motivated human behavior.



Source: Heckhausen and Heckhausen (2018)

This model provides a simplified representation of the complex process of motivation. It highlights the key factors that contribute to motivated behavior and the dynamic interplay between them. It emphasizes the ongoing cycle where a situation influences a person's self-perception, leading to goals, actions, and consequences. These consequences then affect the initial situation, creating a continuous loop of motivated behavior.

In this motivational model, the self or "I-self," the thinking and acting individual, is the initiator of motivated actions, enabling goal selection, behavior initiation, and goal persistence (Baumeister, 2010; McCombs & Marzano, 1990; Osborne & Jones, 2011). This "I-self" actively translates an individual's psychological needs, motives, emotions, values, and beliefs into deliberate actions (McCombs, 1991; Roeser & Peck, 2009).

Goals encompass the cognitive anticipation of an action's rewards and outcomes. They serve as the foundation for all motivated behavior, as suggested by Elliot and Fryer (2008). This aligns with Schunk et al. (2014)'s definition of motivation as a process that initiates and sustains goal-directed behavior. Cognitive theories on motivation emphasize the significance of goals in shaping human behavior (Elliot & Hulleman, 2017).

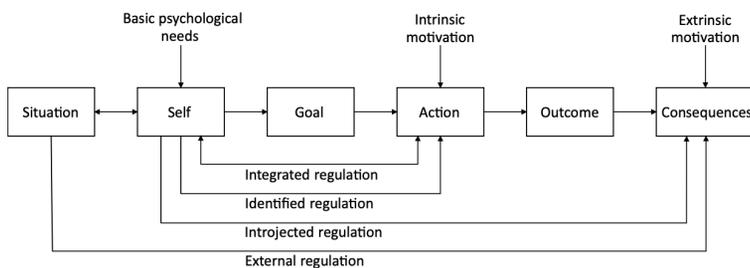
Actions are driven by the anticipation of either achieving a desired goal or avoiding an undesirable one (Beckmann & Heckhausen, 2018). Motivated behavior, therefore, involves pursuing positive outcomes or averting negative ones (Elliot & Covington, 2001). These actions can vary in duration, from brief to extended periods. However, if a goal is perceived as unattainable, its value diminishes, and individuals shift their efforts toward more achievable objectives (Heckhausen & Heckhausen, 2018).

The outcome of an individual's behavior can manifest in physical, emotional, or social changes. This outcome serves as a crucial indicator of whether a standard of excellence has been achieved (Heckhausen, 1991). It often triggers intrinsic feelings like self-worth, self-actualization, or a sense of accomplishment (Mitchell & Albright, 1972).

The consequences of an action extend beyond the

immediate outcome. Vroom's (1964) instrumentality theory posits that the outcome is a means to an end, leading to subsequent consequences. For instance, the significance of school grades for students is influenced by various factors: how they, their peers, and parents perceive the grades, the associated rewards or punishments, the emotions tied to the grades, and whether they contribute to long-term goals like grade promotion. These consequences often carry extrinsic valences like authority, prestige, security, or recognition (Mitchell & Albright, 1972). In conclusion, the situation encompasses the entire context for the sequence of actions, intricately intertwined with the individual's self. Motivation arises from the dynamic interplay between the situation and the individual's self-perception (Roeser & Peck, 2009).

The motivational model should be considered with Self-Determination Theory (SDT), proposed by Ryan and Deci (2000),



Source: Integrating self-determination theory into the basic motivational model

The diagram explores human motivation and personality. SDT posits that individuals have three innate psychological needs: autonomy (the desire to feel in control of one's actions), competence (the need to feel effective and capable), and relatedness (the need to feel connected to others). The satisfaction of these needs is essential for fostering intrinsic motivation, where behaviors are performed for their inherent enjoyment or satisfaction. The framework highlights the dynamic interplay between the situation, the individual's self, their goals, actions, outcomes, and consequences. It suggests that the situation can influence an individual's sense of self and their goals. These goals, in turn, shape their actions, leading to certain outcomes and consequences, which can further impact the situation and the individual's sense of self. The types of regulation, ranging from external to integrated, influence this process at different points.

SDT emphasizes that supporting individuals' basic

psychological needs fosters greater internalization of motivation, leading to more autonomous and self-determined behavior. This has implications across various domains, including education, work, and healthcare, where fostering intrinsic motivation and autonomous behavior can enhance well-being and performance.

SDT provides a valuable lens for examining the impacts on students' motivation and learning outcomes because of two following reasons. **As for Motivation**, AI tools can potentially influence students' motivation by affecting their sense of autonomy, competence, and relatedness. For example, if AI tools provide students with choices and control over their learning process, it could enhance their autonomy and intrinsic motivation.

With respect to Learning Outcomes, SDT suggests that intrinsic motivation and internalized forms of extrinsic motivation are associated with better learning outcomes. Your research could investigate whether AI tools promote these types of motivation, leading to improved academic performance.

Conclusion

AI technologies hold significant potential for enhancing educational practices, but it is crucial to have theoretical frameworks to understand their impact on student motivation and learning outcomes. The motivational model, combined with Self-Determination Theory, provides a lens for examining how AI tools can influence different types of motivation and their subsequent effects on learning outcomes. Future research should delve deeper into these areas to harness the full potential of AI in education while ensuring its ethical and effective implementation.

REFERENCES

1. Chen, X., Chen, Y., & Liu, X. (2021). The impact of artificial intelligence on students' self-regulated learning. *Computers in Human Behavior*, 119, 106724. <https://doi.org/10.1016/j.chb.2021.106724>.
2. Huang, J., & Tan, M. (2023). The role of ChatGPT in scientific communication: Writing better scientific review articles. *American Journal of Cancer Research*, 13, 1148-1154.
3. Linnenbrink-Garcia, L., & Patall, E. A. (2016). Motivation. In L. Corno & E. M. Anderman (Eds.), *Handbook of educational psychology* (3rd ed., pp. 91-103). Routledge.