The Impact of AI-Driven Tools on Learning Motivation: A Case Study of ChatGPT Usage Among Thai Undergraduates

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Abstract
This study investigates the impact of ChatGPT on the learning motivation of undergraduate students in Thailand, where the adoption of artificial intelligence in education is rapidly growing, reflecting a broader shift towards integrating AI tools into learning environments. The research employs the Motivated Strategies for Learning Questionnaire (MSLQ) framework, focusing on six motivational dimensions: Test Anxiety, Intrinsic Goal Value, Control Beliefs, Extrinsic Goal Orientation, and Self-Efficacy for Learning and Performance. Given the unique challenges faced by Thai undergraduates in maintaining engagement and motivation in a competitive academic environment, this study highlights the critical role of learning motivation in fostering academic success. Data from Thai university students reveal that the Task Value group demonstrated the highest Orientation, Task usage of ChatGPT (100%), while the Control Beliefs group exhibited the lowest (60%). These findings align with Bandura's self-efficacy theory and studies emphasizing the role of task relevance in motivating technology use. This research underscores ChatGPT's potential to address diverse learner needs and provides actionable insights for educators and institutions to integrate AI tools effectively and ethically, fostering a supportive and dynamic learning environment.

Keywords: ChatGPT, Learning Motivation, Undergraduates, Artificial Intelligence (AI), Educational Technology

Introduction

The future world is undeniably a world of rapidly evolving technology, where human behavior is increasingly influenced by advancements in network technology (Internet), cloud computing, and the Internet of Things (IoT). These technologies have been developed and widely adopted, profoundly altering various aspects of human life. In particular, the development of Artificial Intelligence (AI) has emerged as a significant milestone. AI, a form of artificial intellect created by humans, is designed with the capability to think analytically, create logic, reason, plan, and even learn and develop through various programs and software as instructed by human coders. AI systems, or intelligent machines, are becoming pivotal mechanisms for future applications across numerous domains, including business operations, industrial management, and administrative tasks. Moreover, AI plays a crucial role in enhancing efficiency and effectiveness in work processes, whether through managing big data for better analysis and decision-making or handling complex tasks. Examples include predicting

diseases, analyzing medical images, forecasting, and managing health crises or climate conditions, and developing innovative solutions in economics and business through data-driven decision-making and automated transactions.

Background of ChatGPT

"ChatGPT" began gaining widespread attention in 2022, with various perspectives emerging regarding its potential and implications. On the positive side, ChatGPT is seen as a tool that can support and facilitate numerous tasks across different domains. However, some groups express concerns about the potential risks and negative impacts that might arise from its use. ChatGPT, or Generative Pre-trained Transformer, is a technology developed by OpenAI, a company focused on advancing artificial intelligence and creating highly capable models for simulating human language (Slowik & Kaiser, 2023). ChatGPT is built on the GPT (Generative Pre-trained Transformer) model, known for its ability to generate human-like text. The natural language processing models, such as GPT-3.5 and GPT-4, have garnered significant interest due to their unprecedented ability to mimic human language. This has led to studies and analyses of ChatGPT and GPT-4's capabilities in text generation, essay writing, information retrieval, and academic writing. There are also concerns about the social and legal implications of this technology (Moritz *et al.,* 2023). Research on ChatGPT's general capabilities (GPT-3.5) has shown that it can effectively simulate human conversation, making it a highly capable conversational partner and a powerful tool for answering complex questions. The model's ability to generate responses and information on demand has been continuously improved, and the latest version, GPT-4, has increased accuracy and reliability. Additionally, GPT-4 has enhanced capabilities in image generation and description, and it has shown promising results when applied to examinations and testing (Slowik & Kaiser, 2023). The rapid development of ChatGPT has sparked widespread discussions and debates about its applications, ranging from everyday use to its broader social and legal impacts (Moritz *et al.,* 2023). Despite the ongoing debates, ChatGPT has been widely adopted for educational purposes.

ChatGPT and Learning

Given the aforementioned points, there has been an exploration and compilation of AI tools designed to support educational processes, focusing on AI's ability to adapt to learning activities, create dynamic content, provide real-time feedback, and design instruction that aligns with curriculum structure. These features enhance teaching strategies and help students achieve their learning goals, facilitating natural and engaging communication (Ruiz-Rojas *et al.,* 2023). ChatGPT can deliver various types of information, such as text, audio, and images, which contribute to creating challenging and enriching learning experiences for students (Sohail *et al.,* 2023).

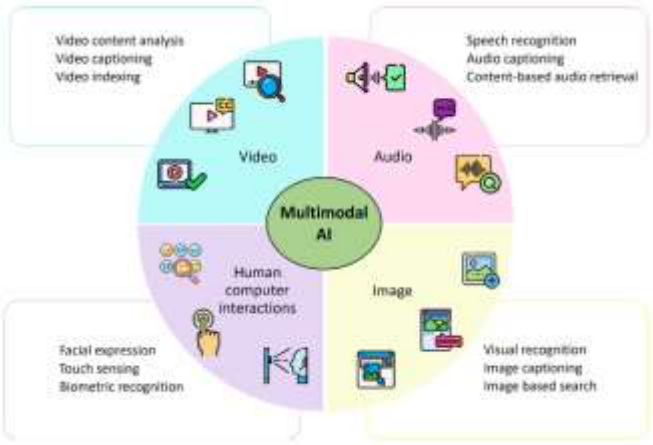

Figure 1: Various technological integration for building multimodal AI

ChatGPT and the Future World

The future of learning may not stop with ChatGPT alone. The continuous discovery of new inventions is an ongoing process, and the development of learning approaches is not solely dependent on technology, tools, or methods that evolve with the times. Understanding the content and context of knowledge is crucial for achieving effective learning. This is evident from the evolution of prompts, which originated as computer commands and have since been refined into conversational prompts in ChatGPT. These prompts can now be formulated in natural language, with specific details added to generate complete responses in a short time, saving costs and time otherwise spent searching for answers. This benefits both learners and educators in various contexts. However, caution must be exercised when using ChatGPT's responses, as they need to be analyzed, synthesized, and applied in a manner that aligns with the user's context for maximum effectiveness. Therefore, the author strongly believes that the development of ChatGPT and its impact on the future world will continue to evolve indefinitely. As AI systems gain experience from the vast array of questions posed to them and learn new response patterns from all corners of the globe, coupled with the diverse information accessible to them, and with the foundation of Artificial General Intelligence (AGI), it is anticipated that ChatGPT could become one of the greatest repositories of knowledge and the smartest tool in the world in the future.

Using Prompts in ChatGPT

The use of "ChatGPT" in education has sparked widespread debate regarding its application from both the learners' and educators' perspectives. Some view ChatGPT as a learning tool that fosters creativity by encouraging users to ask questions, while others are concerned about issues of plagiarism. Another perspective considers ChatGPT as a tool for straightforward question-and-answer sessions, which may lead to incomplete responses due to a lack of critical thinking and question formulation. This presents a challenge in designing learning activities: how to ensure that ChatGPT serves merely as a tool rather than the final, complete answer. Examples of using ChatGPT in education include systems for information retrieval and libraries, language learning, vocabulary expansion, ambiguity analysis, assessment, and examinations (Sohail *et al.*, 2023). Moreover, a critical mechanism that enhances the

accuracy of ChatGPT's responses is the use of "prompts." A prompt refers to a statement or question that initiates the AI system's operation, acting as a command or starting point for generating content or providing information. The system attempts to respond or create content relevant to the initial input in an appropriate manner. From an educator's perspective, ChatGPT and prompts can be used to design learning activities. Andrew Herft, for instance, presented A Teacher's Prompt Guide to ChatGPT Aligned with 'What Works Best' as a guideline for designing learning activities. He emphasized the importance of refining prompts by stating, “Don’t forget to ask additional questions to continuously refine the results. Sometimes, when you’re close to getting exactly what you want, starting a new conversation with a clearly refined prompt can be beneficial” (Herft, 2023).

Based on these considerations, the researcher found that the effective use of ChatGPT involves formulating questions, providing detailed context, and using prompts to communicate with the AI. A prompt serves as an initial command or question that guides the AI in generating more targeted and relevant responses to the user's input. The process of using ChatGPT can be illustrated with a flowchart as follows:

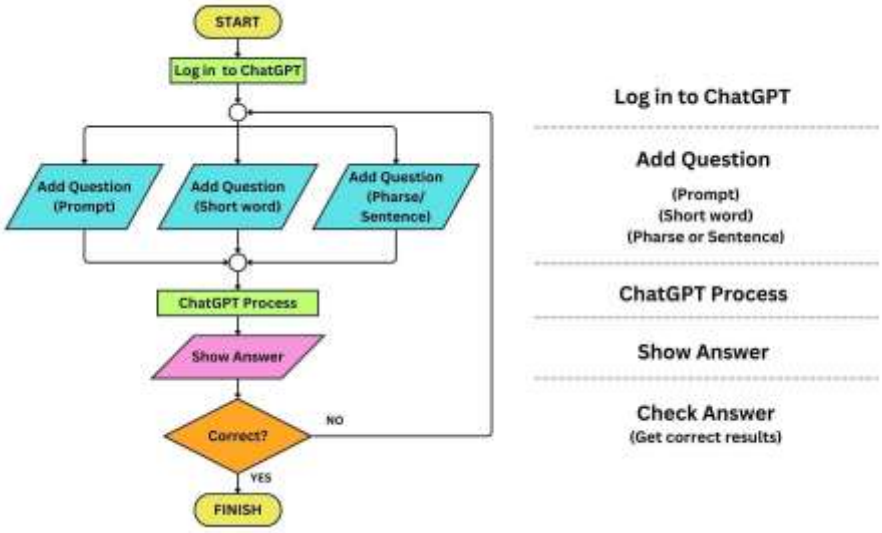

Figure 2: Process of ChatGPT

Furthermore, the use of ChatGPT plays a significant role in enhancing students' motivation to pursue knowledge, commit to learning, and engage in self-development. This aligns with Moritz et al. (2023), who highlighted ChatGPT's crucial role in fostering learning motivation. ChatGPT can stimulate students' dedication to continuous learning and self-improvement, serving as a tool for research, understanding complex content, and practicing essential skills that effectively boost their motivation to learn.

Motivation

Motivation acts as the driving force behind learning, sparking interest through intrinsic motivators such as curiosity and challenge, which draw students toward knowledge acquisition. It also serves as an external driving force, such as rewards and recognition, that encourages students to invest effort, persist, and stay committed to their studies. In this context, educators must promote and adopt appropriate learning strategies that serve as motivators, helping students to better absorb, retain, and

understand the material, ultimately leading to improved self-regulation and academic performance. This is consistent with the research of McKeachie *et al.* (1986), who introduced the Motivated Strategies for Learning Questionnaire (MSLQ). This instrument, comprising 31 items, categorizes students' motivation into six key areas: 1) Intrinsic Goal Orientation, which refers to the learner's recognition and engagement in their learning goals; 2) Extrinsic Goal Orientation, which involves external goals that complement the primary objectives, such as grades, rewards, evaluations by others, and competition; 3) Task Value, which assesses how interesting, important, and useful the learner perceives the task to be; 4) Control of Learning Beliefs, which reflects the learner's belief that their efforts will lead to positive outcomes; 5) Self-Efficacy for Learning and Performance, which relates to the learner's confidence in their ability to learn and perform well; and 6) Test Anxiety which captures the level of anxiety students experience in testing situations, which can impact performance.

The motivation that students develop will significantly impact their success and outcomes. Therefore, promoting motivation that aligns with students' needs will enhance their academic achievement. Using ChatGPT for answering questions demonstrates its potential to improve learning and enrich the learning experience by providing appropriate responses and recommendations, offering immediate learning support, tailoring content to individual students, fostering engagement, collecting and analyzing data, and providing emotional support, all of which position it as a valuable learning assistant (Miller, 2019). By analyzing six motivational dimensions, it highlights differences in ChatGPT usage among groups and offers insights into student motivation within educational contexts.

Research Objective:

1) To study the challenges and usage of ChatGPT in relation to learning motivation among undergraduate students.
2) To examine the impact of ChatGPT usage on the learning motivation of undergraduate students.

Methodology

Population and Sample

The target population of are undergraduate students from Prince of Songkla University, Pattani Campus. A sample of 120 students was selected to provide a focused exploration of how ChatGPT usage impacts learning motivation. The sampling process ensured representation across various academic programs and motivational profiles.

Research Variables

The independent variable in this study is the usage of ChatGPT, which is assessed based on the frequency of use and the types of tasks completed with the tool. The dependent variable is the learning motivation of undergraduate students, evaluated using the Motivated Strategies for Learning Questionnaire (MSLQ) motivational framework.

Research Procedure

The methodology is divided into two main phases to ensure a comprehensive understanding of ChatGPT usage and its impact on learning motivation.

Phase 1: Identifying Challenges and Needs

1) Review existing literature and theories related to ChatGPT usage, learning motivation, and the behavioral characteristics of Thai undergraduate students.
2) Develop and distribute a Motivated Strategies for Learning Questionnaire (MSLQ), which includes 31 items across 7 scales (Test Anxiety, Intrinsic Goal Orientation, Task Value, Control Beliefs, Extrinsic Goal Orientation, Self-Efficacy for Learning and Performance, and others).
3) Collect data from the 120 selected students, focusing on their ChatGPT usage patterns, challenges faced, and perceptions regarding its influence on learning motivation.

Phase 2: Examining the Impact and Developing a Framework

1) Design an intervention model based on insights from Phase 1 to incorporate ChatGPT into students' learning processes effectively.
2) Implement the intervention with the sample group of 120 students, detailing specific steps such as:

    2.1) Training students on how to use ChatGPT to address specific motivational challenges.

    2.2) Demonstrating features like goal-setting, real-time feedback, and problem-solving support.

3) Collect feedback from participants to assess the efficacy of the proposed approach.
4) Analyze the results to determine changes in learning motivation and identify factors that enhance or hinder the effectiveness of ChatGPT usage.
5) Summarize the findings and develop a structured framework for educators, outlining practical guidelines for integrating ChatGPT to enhance learning motivation among students.

Results and Discussion

Data were collected from 120 students and categorized into six groups based on the Motivated Strategies for Learning Questionnaire (MSLQ) framework. These groups represent various motivational dimensions: Test Anxiety, Intrinsic Goal Orientation, Task Value, Control Beliefs, Extrinsic Goal Orientation, and Self-Efficacy for Learning and Performance. The ChatGPT usage of students in each group was measured and compared to explore the relationship between learning motivation and ChatGPT usage. The results are illustrated in Figure 3, which highlights the average usage levels by learning motivation group.

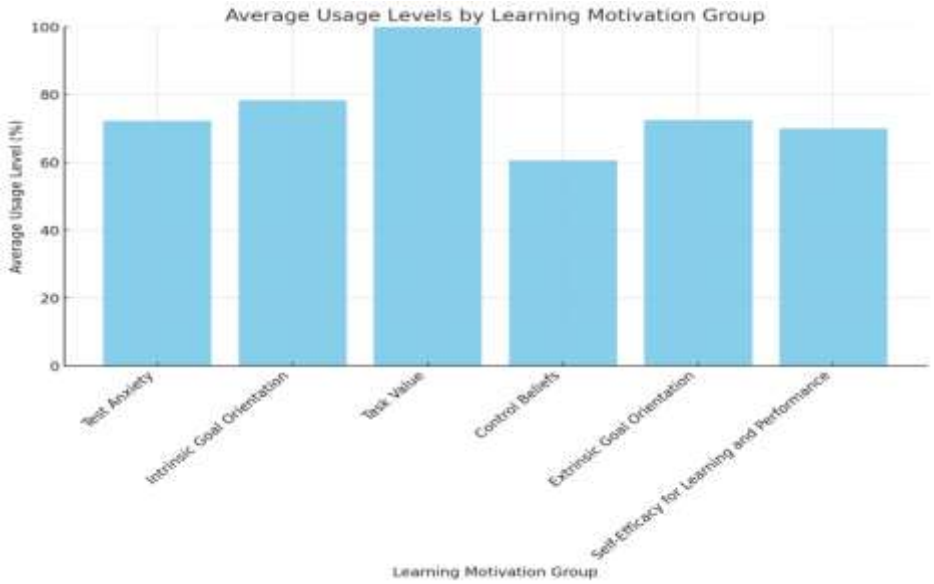

Figure 3: Average Usage Levels by Learning Motivation Group

ChatGPT Usage Across Motivational Groups

The analysis revealed differences in ChatGPT usage across the six motivational groups, illustrating how diverse motivational profiles influence the adoption and effectiveness of AI tools in education. The Task Value group exhibited the highest usage at 100%, reflecting their focus on achieving specific academic goals. This is consistent with the study by Johnson *et al.* (2020), which found that students with high motivation in their tasks are more likely to use technology to support their learning. ChatGPT's features, such as goal-setting tools and personalized Q&A, align well with this group's motivational tendencies, making it a highly effective learning aid. Conversely, the Control Beliefs group displayed the lowest usage at 60%, consistent with their high self-efficacy and belief in their ability to learn independently without external tools. This finding aligns with Bandura's (1997) Self-Efficacy Theory, which suggests that individuals with high self-efficacy tend to rely less on external resources. The Intrinsic Goal Orientation group demonstrated high usage at 78%, consistent with research by Miller and Jones (2018), which highlights a positive correlation between intrinsic motivation and technology adoption. These findings suggest that ChatGPT is particularly effective for task-oriented and intrinsically motivated students, whereas those with high self-reliance may be less inclined to adopt such tools.

Building on these insights, future research should explore how these motivational differences manifest across a broader range of educational contexts and student demographics. Examining variations in ChatGPT usage across research-intensive universities and teaching-focused colleges could uncover how institutional priorities and resources shape adoption patterns. Similarly, investigating cultural and socioeconomic diversity would provide insights into how cultural attitudes toward technology and socioeconomic status influence ChatGPT's perceived value in learning. These efforts could also extend to disciplinary differences, revealing how ChatGPT meets the unique needs and preferences of students in STEM, humanities, and social sciences. By expanding the scope of research, future studies can provide

a richer understanding of the interplay between motivation, context, and technology adoption, offering more targeted and actionable recommendations for implementation.

These findings also contribute to theoretical and practical discussions on the role of AI tools in education. The study affirms Bandura's Self-Efficacy Theory, extending its application to the adoption of AI tools like ChatGPT. It highlights the importance of tailoring ChatGPT's features to meet the specific motivational needs of students, such as incorporating goal-setting tools for task-oriented learners or research support for intrinsically motivated students. Moreover, the results emphasize the potential of ChatGPT to enhance independent learning by supplementing self-directed efforts without undermining self-reliance. To maximize these benefits, institutions must promote ethical and strategic usage through awareness campaigns and targeted training, ensuring that students engage with ChatGPT responsibly and effectively in their academic pursuits. By addressing both the disparities identified in current ChatGPT usage and the broader contextual factors that influence its adoption, this discussion underscores the need for a multifaceted approach. Aligning support strategies with motivational profiles while broadening research to diverse contexts and populations will help integrate ChatGPT more effectively into the educational landscape, ensuring its benefits are accessible to all students.

This study, which was conducted at a single university, may limit the extent to which its findings can be generalized. Future research should address this limitation by expanding the sample to include students from diverse institutions, regions, and academic settings, providing a broader perspective on ChatGPT usage. Investigating how cultural norms, academic disciplines, socioeconomic backgrounds, and digital literacy levels shape perceptions and usage of ChatGPT could further illuminate its role in supporting learning motivation. Combining quantitative data, such as usage rates, with qualitative insights from student interviews through mixed-method research designs would enhance understanding of the lived experiences of ChatGPT users. These efforts could lead to nuanced and actionable recommendations for integrating ChatGPT effectively into diverse educational contexts.

Conclusion

In conclusion, this study reveals a relationship between ChatGPT usage and learning motivation among undergraduate students, with the Task Value group exhibiting the highest usage at 100%, while the Control Beliefs group showed the lowest at 60%. These findings highlight the importance of tailoring educational technology to meet diverse student needs and emphasize the necessity for institutional support to foster effective learning environments in the digital age. Furthermore, this research aims to develop a model for effectively using ChatGPT to enhance learning motivation and provide guidelines for educators to integrate this technology into their teaching methodologies, ultimately improving student engagement and motivation.

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