

A STUDY ON THE RELATIONSHIP BETWEEN
COLLEGE STUDENTS' PERCEPTIONS OF AI-
SUPPORTED PERSONALIZED LEARNING
EXPERIENCES AND THEIR LEARNING
MOTIVATION

LI YIJIA

SULTAN IDRIS EDUCATION UNIVERSITY

2026

A STUDY ON THE RELATIONSHIP BETWEEN COLLEGE STUDENTS'
PERCEPTIONS OF AI-SUPPORTED PERSONALIZED LEARNING
EXPERIENCES AND THEIR LEARNING MOTIVATION

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DISSERTATION PRESENTED TO QUALIFY FOR A MASTER'S IN
PEDAGOGY(COURSEWORK MODE)

FACULTY OF HUMAN DEVELOPMENT
SULTAN IDRIS EDUCATION UNIVERSITY

2026



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ACKNOWLEDGEMENT

I would like to express my sincere gratitude to Universiti Pendidikan Sultan Idris (UPSI) for providing an academically stimulating and supportive environment throughout my postgraduate journey. The university's learning culture encouraged critical thinking, academic integrity, and continuous reflection, making this experience both intellectually challenging and personally transformative. I am also deeply grateful to the Faculty of Human Development for its strong academic foundation, well-structured curriculum, and consistent academic and administrative support, which helped me develop a deeper understanding of education from both theoretical and practical perspectives. I would like to sincerely thank all the lecturers and course instructors involved in this programme for their dedication, professional expertise, and thoughtful instruction. Their guidance and constructive feedback greatly enriched my understanding of educational theories, research methods, and practical applications, and contributed significantly to the completion of this project paper. My heartfelt appreciation is extended to my supervisor, Dr. Tang Tsiao Yin, whose guidance, patience, and academic rigor were indispensable throughout this research journey. Her insightful feedback and encouragement challenged me to refine my ideas, strengthen my arguments, and approach research with greater clarity and confidence. Her mentorship has had a lasting influence on my development as a researcher. I am also grateful to my classmates for their companionship, support, and shared academic experiences, which made this journey more meaningful. Finally, I would like to express my deepest gratitude to my family for their unconditional love, patience, and unwavering support. Their belief in me provided the emotional strength and motivation needed to persevere through challenges. This achievement belongs not only to me, but also to them.



ABSTRACT

This study examined the relationship between college students' perceptions of artificial intelligence-supported personalized learning experiences and their learning motivation in the context of higher education in China. The purpose of the study was to explore how students' evaluations of perceived usefulness, perceived ease of use, interactivity, and technical support are related to different types of learning motivation. A quantitative survey design was employed, and data were collected from 365 Chinese university students who had experience using artificial intelligence-related learning tools after data screening. Descriptive statistics, correlation analysis, and multiple regression analysis were conducted. Reliability analysis showed satisfactory internal consistency for all measurement scales with Cronbach alpha values ranging from 0.79 to 0.92. The findings indicated that students generally reported positive perceptions of artificial intelligence-supported personalized learning experiences with mean scores above 3.80 on a five-point Likert scale. Regression results revealed that interactivity was the strongest predictor of learning motivation with $\beta = 0.42$ and $p < .001$, followed by technical support with $\beta = 0.31$ and $p < .001$. Perceived usefulness showed a moderate but significant effect with $\beta = 0.18$ and $p < .01$, while perceived ease of use demonstrated a weak and in some models non-significant effect with $\beta = 0.06$ and $p > .05$. These results suggest that interaction quality and reliable technical support play a more important role in enhancing learning motivation than system usability alone. In conclusion, this study provides empirical evidence that students' perceptions of artificial intelligence-supported personalized learning experiences are closely associated with their learning motivation and offers practical implications for the design and improvement of technology-enhanced learning environments in higher education.



KAJIAN MENGENAI HUBUNGAN ANTARA PERSEPSI PELAJAR KOLEJ TENTANG PENGALAMAN PEMBELAJARAN PERIBADI YANG DISOKONG AI DAN MOTIVASI PEMBELAJARAN MEREKA

ABSTRAK

Kajian ini meneliti hubungan antara persepsi pelajar universiti terhadap pengalaman pembelajaran peribadi yang disokong oleh kecerdasan buatan dan motivasi pembelajaran mereka dalam konteks pendidikan tinggi di China. Tujuan kajian ini adalah untuk meneroka hubungan antara persepsi kegunaan persepsi kemudahan penggunaan interaktiviti dan sokongan teknikal dengan pelbagai jenis motivasi pembelajaran. Reka bentuk kajian tinjauan kuantitatif telah digunakan dan data dikumpulkan daripada 365 orang pelajar universiti China yang mempunyai pengalaman menggunakan alat pembelajaran berkaitan kecerdasan buatan selepas proses penapisan data. Statistik deskriptif analisis korelasi dan analisis regresi pelbagai telah dijalankan. Analisis kebolehpercayaan menunjukkan konsistensi dalaman yang memuaskan bagi semua skala dengan nilai pekali Cronbach alpha antara 0.79 hingga 0.92. Dapatan kajian menunjukkan bahawa pelajar secara umum mempunyai persepsi positif terhadap pengalaman pembelajaran peribadi yang disokong oleh kecerdasan buatan dengan nilai min melebihi 3.80 pada skala Likert lima mata. Analisis regresi menunjukkan bahawa interaktiviti merupakan peramal paling kuat terhadap motivasi pembelajaran dengan $\beta = 0.42$ dan $p < .001$ diikuti oleh sokongan teknikal dengan $\beta = 0.31$ dan $p < .001$. Persepsi kegunaan menunjukkan kesan sederhana tetapi signifikan dengan $\beta = 0.18$ dan $p < .01$ manakala persepsi kemudahan penggunaan menunjukkan kesan yang lemah dan dalam beberapa model tidak signifikan dengan $\beta = 0.06$ dan $p > .05$. Dapatan ini menunjukkan bahawa kualiti interaksi dan sokongan teknikal yang boleh dipercayai memainkan peranan yang lebih penting dalam meningkatkan motivasi pembelajaran berbanding kemudahan penggunaan sistem semata mata. Kesimpulannya kajian ini menyediakan bukti empirikal bahawa persepsi pelajar terhadap pengalaman pembelajaran peribadi yang disokong oleh kecerdasan buatan berkait rapat dengan motivasi pembelajaran mereka dan memberikan implikasi praktikal terhadap





penambahbaikan reka bentuk persekitaran pembelajaran berasaskan teknologi dalam pendidikan tinggi.





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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
BPN	Basic Psychological Needs
DV	Dependent Variable
EM	Extrinsic Motivation
IDR	Identity Regulation
IM	Intrinsic Motivation
INT	Interactivity
ITS	Intelligent Tutoring Systems
IV	Independent Variable
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
SDT	Self Determination Theory
TAM	Technology Acceptance Model
TST	Technical Support



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CHAPTER 1

INTRODUCTION



1.1 Introduction

The rapid development of artificial intelligence (AI) is profoundly influencing higher education, particularly in personalized learning systems that can provide content, guidance, and feedback based on students' characteristics. As AI tools are increasingly integrated into university classrooms, understanding how students perceive these AI-supported learning experiences has become an important topic in educational research. Students' perception not only affects their willingness to use AI tools but also directly relates to the formation of learning motivation, which is a key factor in determining learning effectiveness. Although there has been increasing interest in AI in the education field in recent years, empirical studies on students' actual experiences and



motivational responses are still relatively limited, especially in the context of higher education in China. Therefore, this study aims to explore students' perception of the personalized learning experiences supported by AI and further analyze the relationship between this perception and learning motivation. This chapter will introduce the research background, problem statement, research purpose and questions, research significance, conceptual framework, and the definition of key terms in sequence.

1.2 Background of the Study

The rapid development of digital technologies and the increasing emphasis on learner-centered teaching approaches have accelerated the transformation of higher education worldwide. Universities are increasingly adopting digital platforms, learning management systems, and data-driven instructional tools to enhance teaching effectiveness, expand access to learning, and address the diverse needs of students.

Within this context of digital transformation, AI has emerged as a key technological force reshaping higher education. AI technology can analyze learning behaviors in real time, provide timely and context-specific feedback, and adjust teaching content according to the needs of learners (Zawacki-Richter et al., 2019). As a result, AI is increasingly regarded as a promising tool for enhancing learning

efficiency, supporting instructional decision-making, and promoting student engagement in higher education.

One of the most significant educational applications of AI lies in its support for personalized learning. Personalized learning supported by AI refers to an environment where an AI system can dynamically adjust content, feedback, and learning paths based on students' behaviors, preferences, and learning progress (Holmes et al., 2019; Maghsudi et al., 2021). This environment aligns with the constructivist perspective (Vygotsky, 1978), emphasizing active meaning construction and continuous interaction with tools, teachers, and peers. At the same time, the role of teachers shifts from a transmitter of knowledge to a designer of learning experiences, using AI to enhance differentiated teaching and formative assessment (Gou et al., 2024).

At the national level, China has emphasized the integration of artificial intelligence into higher education as part of broader digital transformation and innovation strategies (State Council of China, 2024). However, despite the increasing adoption of artificial intelligence technology by institutions, students' attitudes towards AI-supported learning remain polarized. Some students emphasize its advantages, such as improving learning efficiency and enhancing learning interest; others express concerns about over-reliance on AI, reduced interpersonal interaction, and ethical issues (Rathore & Laghari, 2025). These differences highlight the importance of



understanding students' subjective experiences and cognition in the context of AI-supported learning environments, especially in terms of learning motivation.

1.3 Problem Statement

With the increasing application of AI in higher education, prior studies have mainly emphasized outcome-oriented findings, such as improvements in learning efficiency, personalized feedback, and student engagement (A. Dzhanegezova et al., 2024; Marcos, 2025; Merino-Campos, 2025). However, at present, there is a lack of empirical research that integrates these two theories to analyze the relationship between students' perception of artificial intelligence-assisted learning and their learning motivation. Especially in the personalized learning environment supported by artificial intelligence, the mechanisms by which factors such as perceived utility, immediate feedback, and system support influence learning motivation by meeting psychological needs have not yet been fully explained.

In the context of higher education in China, this research gap becomes particularly prominent. Driven by national strategies for educational modernization, the 2024-2035 master plan on building China into a leading country in education provides a policy foundation for accelerating digital and intelligent transformation in higher education (CPC Central Committee & State Council, 2025). However, Chinese





universities have long been influenced by the tradition of exam-oriented education and the teacher-centered teaching model. When confronted with an artificial intelligence-based learning environment that emphasizes autonomy and individuality, Chinese students may exhibit different motivational responses and cognitive patterns compared to their Western counterparts. These cultural factors may introduce unique complexities to the learning process that Chinese students undertake through artificial intelligence, as well as to their learning motivation mechanisms. However, from an educational perspective, empirical studies that systematically investigate these relationships are still relatively limited.

Therefore, although there has been extensive discussion on the educational value of AI, there is still a lack of systematic empirical evidence explaining how students' subjective perceptions of AI-supported personalized learning experiences relate to different types of learning motivation, particularly in the context of higher education in China. This study aims to fill this gap by integrating the Technology Acceptance Model (TAM) (Davis, 1989) and the Self-Determination Theory (SDT) (Ryan & Deci, 2000) to explore the relationship between students' views on artificial intelligence-supported personalized learning and their learning motivation, thereby providing empirical insights into how artificial intelligence can become a meaningful educational tool.

1.4 Objectives of the Study

This study aims to systematically explore the perception of college students regarding the personalized learning experience supported by AI in the context of higher education in China, as well as the mechanism of its impact on learning motivation.

1. To examine college students' perceptions of AI-supported personalized learning experiences in higher education in China using the Technology Acceptance Model.

2. To assess students' learning motivation in AI-supported learning environments based on Self-Determination Theory.

3. To analyze the relationship between students' perceptions of AI-supported learning experiences and their learning motivation, and to test the predictive roles of perceived usefulness, perceived ease of use, and interactivity in explaining learning motivation.



1.5 Research Questions

To achieve the objectives of this research and to gain a more systematic understanding of the perceptions and motivational behaviors of college students in an AI-supported personalized learning environment, this study intends to address the following research questions:

1. How do college students perceive the personalized learning experience supported by AI in higher education?

2. What are the levels and characteristics of learning motivation of college students in the AI-supported personalized learning environment?

3. How does the perception of AI learning experience by college students affect their learning motivation?

These research questions collectively form the core exploration direction of this study, guiding the subsequent data collection and analysis process.



1.6 Conceptual Framework

This study proposes a conceptual framework that draws on the TAM and SDT to examine the relationship between students' perceptions of AI-supported personalized learning experiences and their learning motivation in higher education. Consistent with the research title and objectives, this framework clearly defines students' perception of the personalized learning experience supported by artificial intelligence as the independent variable (IV), and learning motivation as the dependent variable (DV). By drawing on TAM and SDT, this framework provides an educational perspective for interpreting how technology-related perceptions of AI-supported learning are associated with different levels of learning motivation.

From the perspective of the TAM, students' perceptions of AI-supported personalized learning experiences can be understood as multidimensional evaluations of the learning system. Specifically, this study conceptualizes students' perceptions of AI-supported personalized learning through four core dimensions: perceived usefulness (PU), perceived ease of use (PEOU), interactivity (INT), and technical support (TST). These dimensions represent different aspects of students' evaluations of the AI-supported learning environment, including its perceived value, usability, INT, and availability of support. When students perceive that an AI-supported personalized learning system is useful, easy to operate, interactive, and adequately supported, they are more likely to hold a more positive overall perception of the learning experience.

In the current study, TAM is used to structure and operationalize students' perceptual evaluations of AI-supported learning experiences, rather than to model behavioral intention or technology usage behavior.

From the perspective of the SDT, learning motivation is understood as a core psychological construct that influences students' engagement and persistence in learning activities. In this study, learning motivation is conceptualized in terms of different types of motivational regulation, including intrinsic motivation (IM), identified regulation (IDR), controlled forms of extrinsic motivation (EM), and basic psychological needs (BPN), within the context of AI-supported learning. SDT emphasizes that the learning environment exhibits characteristics such as support for autonomy, enhancement of abilities, and positive implications for interpersonal relationships to varying degrees, and these cognitions are closely related to students' motivational orientations. In the context of artificial intelligence-assisted learning, features such as timely feedback, personalized support, and meaningful interaction constitute the key characteristics of the learning environment and are associated with changes in students' motivational responses. Importantly, in the current study, SDT is used as a theoretical lens to interpret motivational outcomes rather than as a tested mediating mechanism.

In this study, learning motivation is operationalized at the measurement level using three SDT-based forms of motivational regulation: IM, IDR, and EM. BPN

satisfaction is included as a supplementary construct to facilitate SDT-based interpretation of the findings, rather than being modeled as a mediating variable.

Figure 1.1 presents the conceptual framework of this study. Consistent with the study title and objectives, the framework specifies students' perceptions of AI-supported personalized learning experiences as the independent variable (IV) and learning motivation as the dependent variable (DV).

Drawing on the TAM, the IV is represented by key perception-related constructs reflecting students' evaluations of the AI-supported learning experience, including PU, PEOU, INT, and TST (Davis, 1989).

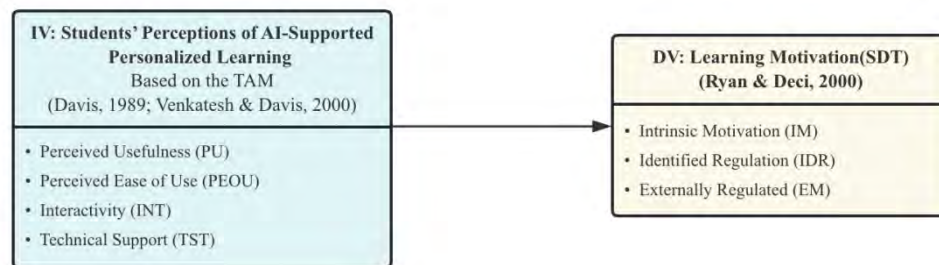
Drawing on SDT, the DV is represented by multiple forms of motivational regulation in AI-supported learning contexts, including IM, IDR, and controlled forms of EM (Ryan & Deci, 2000).

The directional arrow from the IV to the DV indicates the examined relationship between students' perceptions of AI-supported personalized learning experiences and their learning motivation. Specifically, more positive perceptions are expected to be associated with higher levels of learning motivation, while less positive perceptions are associated with lower motivational levels.

Overall, this framework illustrates how TAM and SDT are used as complementary theoretical perspectives to structure the independent and dependent variables of the study, linking technology, elated perceptions to motivational outcomes without assuming a mediating mechanism.

Figure 1.1

The Conceptual Framework



1.7 Operational Definition

To clarify the operational connotations of the core concepts of this study, the following key terms are hereby defined. These definitions, based on previous research and the specific context of this study, are used to determine the scope of the variables and the research direction.

1.7.1 Artificial Intelligence-Supported Personalized Learning

AI-supported personalized learning refers to a teaching process that utilizes AI technology to provide differentiated and dynamic learning resources and feedback for different students. Its core lies in automatically adjusting teaching content and learning paths based on algorithm analysis of students' learning behaviors, progress, and interests, thereby achieving individualized learning support (Chakkaravarthy et al., 2025).

In the context of this study, it specifically refers to a series of learning experiences regarding personalized support formed by university students during their interaction with systems such as intelligent learning platforms or generative AI tools.

This experience is manifested in the matching degree of learning content, the timeliness of system feedback, and the degree of AI support for learning autonomy.

1.7.2 Perception

In the educational context, perception refers to the subjective judgment and emotional response of learners towards the learning environment, teaching tools, or learning experiences. It includes the learners' subjective evaluation of the usefulness, ease of use, interactivity, and support level of the AI-supported learning environment. According to

TAM (Davis, 1989), the key dimensions of perception include PU and PEOU, which jointly influence the learners' willingness to accept and use the technology.

In this study, perception mainly refers to students' overall view of the system functions, teaching feedback, and learning experience in the AI-supported personalized learning environment.

1.7.3 Learning Motivation

Learning motivation is the internal psychological drive that motivates students to engage in and persist in learning activities, thereby influencing their learning outcomes.

According to SDT (Ryan & Deci, 2000), learning motivation can be divided into IM (learning for interest or satisfaction) and EM (learning for grades or external expectations). In an AI-supported learning environment, students' motivation is not only dependent on the learning task itself, but also influenced by system support, autonomy feedback, and the sense of learning control.

In this study, learning motivation is operationally defined as the degree of learning engagement, interest level, autonomous behavior, and learning persistence demonstrated by students in the AI personalized learning experience.

1.7.4 Self-Determination Theory

The Self-Determination Theory is one of the main frameworks for explaining human motivation, suggesting that the initiative and persistence of an individual's behavior depend on three fundamental psychological needs: autonomy, competence, and relatedness (Ryan & Deci, 2020). When the external environment can support the satisfaction of these needs, learners are more likely to stimulate IM and maintain continuous learning engagement.

In this study, this theory was used as the core framework to explain how students' perception of AI learning affects the satisfaction of their psychological needs, thereby leading to changes in learning motivation.

1.7.5 Technology Acceptance Model

The Technology Acceptance Model, proposed by Davis (1989), is used to explain users' acceptance and usage behaviors towards new technologies. The model suggests that an individual's PU and PEOU jointly determine their attitude towards and willingness to use the technology. In the field of education, TAM is often used to analyze learners' acceptance of online learning platforms, AI learning tools, or educational technology systems.

In this study, TAM serves as an important explanatory framework, mainly used to analyze the perceptual basis of college students' perception of the AI learning environment and connect it to the formation process of their learning motivation.

1.8 Significance of the Study

This section elaborates on the significance of this research from both theoretical and practical perspectives. Theoretically, this study combines the TAM and the SDT to explain the relationship between students' cognition of AI-supported personalized learning and their learning motivation in the context of Chinese higher education, thereby contributing to the fields of educational technology and motivation research.

From a practical standpoint, the research results are expected to provide guidance for university administrators, teachers, and instructional designers, helping them optimize the learning environment supported by AI to enhance students' learning experience, meet their psychological needs, and strengthen their sustained learning motivation.

1.8.1 Theoretical Significance

This study combines the TAM and the SDT as complementary perspectives, contributing to the theoretical development of research on artificial intelligence-

assisted learning. The aim of this study is to explore the relationship between students' views on the personalized learning experience assisted by artificial intelligence and their learning motivation. Unlike focusing solely on technology adoption, this study links key acceptance cognitions (e.g., perceived usefulness, perceived ease of use, and interactivity) with motivational perspectives (e.g., autonomy, competence, and relatedness) to provide a more comprehensive educational explanation of students' learning experiences in the context of artificial intelligence assistance. In this way, the application of TAM is extended to the field of learning motivation, and empirical insights with specific contexts are provided to support the relevance of SDT in technology-enhanced higher education environments.

1.8.2 Practical Significance

At the practical level, this research helps teachers gain a deeper understanding of students' psychological reactions in the AI learning environment, thereby optimizing teaching design and enabling AI tools to truly meet learning needs. The research results can also provide decision-making references for university administrators when introducing or improving AI teaching systems, shifting the integration of technology from function utilization to enhancing learning experience and effectiveness. Moreover, this research reveals the potential value of AI in promoting students' autonomous learning ability and long-term motivation development, providing a basis for

universities to implement core training goals such as learner autonomy, metacognition, and continuous learning.

1.9 Scope of the Study

The scope of this study is mainly focused on exploring the relationship between college students' personalized learning experiences supported by AI and their learning motivation in the context of Chinese higher education. The research subjects are college students from different regions, different majors and grades, who have experience using AI learning tools or platforms. No further distinction is made regarding specific schools or specific majors.

This study focuses on two core variables: one is students' perception of the personalized learning experience supported by AI, including PU, PEOU, INT, and TST; the other is students' learning motivation, including IM, EM, IDR, and BPN. This study adopts a quantitative cross-sectional survey design and collects data from college students in different regions across the country through online questionnaires.

Overall, this study aims to present the AI learning experiences and motivation characteristics of college students at a specific point in time, rather than comparing differences between different schools or conducting long-term tracking.

1.10 Limitations of the Study

The limitations of this study mainly stem from the research design and sampling method. Firstly, this study adopted a cross-sectional questionnaire survey approach, collecting data at a single point in time. Therefore, it was unable to present the changes in students' perception of AI personalized learning experiences at different time periods, nor could it track the long-term changes in their learning motivation. The results of this study can only reflect the experiences and motivation states of the participants at the time of data collection.

Secondly, although this study used TAM and SDT as the main theoretical basis, these two theoretical frameworks cannot cover all the factors that may affect learning motivation. For example, teaching design, teacher support, school policies, or students' previous learning experiences are not within the scope of this study's analysis.

Thirdly, this study used convenience sampling and snowball sampling methods to distribute questionnaires to college students in different regions of China. Although this method improved the efficiency of data collection, the sample has a certain degree of self-selection and regional characteristics, which may affect the representativeness of the research results and limit the external validity of the research findings.



Finally, the data of this study are entirely based on self-reports from online questionnaires. Self-reports may be influenced by social expectation bias, recall bias, or subjective understanding differences of the participants. Therefore, the results of this study should be interpreted with caution in light of its methodological limitations.

1.11 Summary

This chapter provides an overview of the development trend of AI-supported personalized learning in the context of higher education, and emphasizes the crucial role of students' subjective perception in determining their learning engagement and motivation. By integrating TAM and SDT, this chapter constructs the theoretical foundation of the research, clarifies the research questions, research objectives, and their theoretical and practical significance. At the same time, this chapter also points out the research context and methodological limitations. Overall, this chapter provides a systematic theoretical framework for understanding how AI affects students' learning experience and motivation, and lays the direction for the literature review in the next chapter.

