

Evaluating the Impact of AI-Driven Mobile Learning on Computer Software Technology Students at Jiangxi College of Applied Technology

Wu Qiong^{1*}, Yasmin Hussain¹

¹ City Graduate School, City University, Malaysia

*Corresponding Author: wuqiong-wu@163.com

Received: 11 March 2025 | Accepted: 2 May 2025 | Published: 1 June 2025

DOI: <https://doi.org/10.55057/ijares.2025.7.3.8>

Abstract: *In this research study, we explore the impacts of AI-enabled mobile learning, which we examine with the students majoring in computer software technology at Jiangxi College of Applied Technology. Artificial intelligence (AI) has been integrated into mobile learning settings due to the newness of education methods. Such settings facilitate personalized learning experiences features, instant feedback, and dynamic content Delivery. The usefulness, however, of these advancements is highly reliant on student involvement, engagement, and self-regulated learning systems, all of which are still under-utilized. This study explores how AI-based mobile learning impacts students' learning outcomes, motivation, and behavioral transformations. The research is an experimental quantitative research. Using cluster sampling, 160 students were divided into the experimental and control groups, and data were obtained through standard questionnaires. The control group used conventional mobile learning without AI and the experimental group received mobile learning with the support of AI. SPSS was used to conduct statistical analysis to determine patterns, correlations, and variation in learning outcomes and motivation by groups. The findings are expected to deliver actionable insights that might be used to optimize AI-driven mobile learning tactics, encourage student autonomy, and improve teaching practices in the domain of computer science education. This research aims to inform educators, administrators, and policymakers concerning proper pedagogical interventions to optimize the advantages of artificial intelligence in mobile learning contexts. Achieved by filling the gaps in our knowledge of how students interact with AI tools.*

Keywords: AI-based learning, mobile learning, computer science education, student engagement, self-regulated learning

1. Introduction

In the dynamic realm of computer science education, AI has pioneered mobile learning. Though there is broad agreement on the merits of integrating students, research exploring how students may benefit from such integration has followed at a slower pace (Golding et al., 2019). This problem statement aims at finding obstacles and knowledge lapses regarding how certain students behaviors are impacting to optimize AI deployment in this mobile learning scenario. Examining this previously unknown domain produces information that can enhance teaching practices, elevate student success rates in computer science courses, and allow for the better utilization of the multitude of advantages that AI has to offer.

The mobile learning environment with artificial intelligence has one of the greatest challenges for educators who want to support learners and transform their instructional methods, namely the complexity and nature of student behaviors. On the other hand, harmful interventions lack the very detailed knowledge needed for students to take full advantage of their experience with AI tools. Educators must first decipher the nuances of students' behaviours in order to be able to tailor lessons to students' individual interests, requirements and learning styles. This incomplete understanding also influences the ways students engage with adaptive information, AI-based collaborative projects, or interactive simulations (Dai & Ke, 2022). Thus, ensuring a constructive relationship between students, technology, and AI in the computer science classroom can only enhance mobile learning in the discipline. However, every educator, administrator and policymaker needs to fill this knowledge gap around AI's mobile learning potential. By measuring student actions, this study aims to give concrete recommendations on how to enhance teaching methods. It aims to foster context-sensitive AI-embedded mobile learning teaching of computer science.

The most concerning issue in AI-based mobile learning is the attention acceptance of students when applying AI-driven activities which hasn't been addressed so much. AI has a lot to contribute to mobile learning, and most people agree on the potential of AI in this context, but there are very few researches on the extent to which students actively use AI tools. Due to this knowledge gap, we can't advocate for best practices that may help the smart deployment of AI in education. As per Mallik and Gangopadhyay (2023), a prominent consideration for maximizing the benefits of AI-augmented mobile learning lies in the active involvement of learners. These include AI-powered modules, AI collaborative projects, and interactive simulations that induce active participation. Teachers will not be able to develop pedagogical practices that enable students to actively engage with AI tools, if there is insufficient research on what this involvement would look like and how far it can go.

In addition to this practical consideration, it is important to define the specific activities and behaviors that constitute proactive engagement in order to inform evidence-based intervention design and pedagogical strategies. Novel elements of interest to explore are collaborative work, interest in AI-powered learning and initiative shown in AI-empowered modules. Such dynamics, when well understood can shed light on effective teaching practices, on enhancing student learning and, even less common, open the possibility of more favourable learning culture evolving in computer science curricula (Hartikainen et al., 2019). The existing literature on proactive student engagement in AI-enhanced efforts must be socialized for expanding the infusion of mobile learning within computer science announcements. This research aims to better leverage the advantages of artificial intelligence (AI) in mobile based learning, by investigating the intricacies behind students' interactions with the AI implementations beforehand and equipping educators with a comprehension that can aid them in enhancing an interactive learning atmosphere.

For mobile learning to take advantage of artificial intelligence (Araka et al., 2020), students need to establish and sustain positive study habits and self-regulating behavior strategies. One of the most significant but relatively under-explored of these dimensions is the way that students adjust their Strategic Decision making (e.g. how they frame learning objectives and manage time) when working with AI-generated content. A huge barrier in AI-infused education environments is that nobody knows such students' behavior in a specific and actionable way, a situation compounded by the fact that there are no off-the-shelf programs that can be used to install well-proportioned study habits and increase self-regulated learning.

Zawacki-Richter et al. (2019). Another important area for educators and researchers is students' usage of AI insights when it comes to how they work." This research will address the following questions: 1) How AI tools assist students in developing measurable learning targets; 2) How students respond to the timing signals provided by AI; 3) Whether students could adjust their strategies based on AI feedback in real-time. Educators increasingly can tailor their lessons to meet the needs of students by exploring these complexities so they can create treatments that match how much students are taking advantage of AI in mobile learning.

In mobile learning, the unexplored field is the one that connects artificial intelligence and collaborative learning. We all know that this synergetic may be great, but we don't know what students do or how they react when working together in an AI-rich environment. The way these practices need to be devised has progressed very little because of the intricacies surrounding the use of AI technologies when students talk, impart knowledge and collaborate on group assignments. One important aspect of understanding (from frequent usage of associated learning tools) during this AI-powered mobile learning era is not about knowledge per se, it rather refers to the dynamics of collaborative learning activities (Zhang & Aslan, 2021). This study should focus on the working process, how students use AI to communicate better, help each other by exchanging ideas and solving problems, and how they engage in collaborative work. AI's Creative Role in Teamwork: In addition to helping to build a culture of cooperative learning in computer science curricula, it helps to explore new ideas of teamwork through reflection on AI's value in collaborative projects. The aim of these methods is to make group dynamics better, to share knowledge more efficiently and in general all types of efficiency.

This unexplored region could teach a great deal about effective collaborative learning practices to educators and researchers alike. In order to succeed in an AI-rich classroom, students must understand what they need to do and how they should conduct themselves to work effectively together. As teachers gain this agency, they also start honing practices through experimentation resulting in an improved environment to educate computer science students.

Algorithmic programs that point students to resources, whether they're weak on a subject or just in need of more material, is one of the hallmarks of what we might call AI's impact on the classroom. However, there is little understanding as yet of how actively pupils engage with these AI-generated suggestions. Already, the current corpus does not answer whether and how students look for additional content to learn from, how they change their learning modes or how they use these findings to the best of their advantage. The framework of progressive instruction must focus on the trends in student responses to AI features (Pataranutaporn et al., 2021). However, due to an understanding of the iterative dynamics that exist, little has been done that deals with what would work as a framework for learning modalities of AI environments for schools that allow for efficacy. When we analyze all the student preferences, we can take a more in-depth look into how we can make use of the AI recommendations, which can be fun and personalized.

This study intends to fill this gap and provide a more in-depth insight into how students react to AI-driven advice. Studying students' actual responses to suggestions provided by AI can teach teachers a great deal about their own threading of the needle. Lastly, understanding how students interact with AI recommendations may allow to interventions that could make AI a more valuable learning partner for computer science students. Herein lies the problem, we do not yet know enough about how computer science students utilize mobile learning to their benefit, which means we fail to optimize the gains we can make from AI. To harness the full

power of AI to improve computer science students' learning experiences, educators, administrators and legislators need to close this gap. Through these process of deconstruction, we hope to gather useful information that we can employ to create better, more collaborative modalities in mobile learning for computer science classes.

2. Literature Review

As noted by McLean and Osei-Frimpong (2019), the fusion of mobile learning and artificial intelligence (AI) is revolutionizing the education landscape, creating a transformative approach to on-the-spot learning. After a philosophical discussion on whether or not students can be motivated to learn, how mobile learning in relation to AI affects this, and how far this broad topic reaches Joel and Simon no doubt get into some deep waters in this conversation. According to Kassymova et al, (2020) As the educational paradigm continues to evolve, with the use of AI to deliver mobile learning services, it is imperative to explore how this affects students intrinsic motivation and willingness to immerse themselves, or enthusiasm towards their studies. Teachers must do their best at the institutional and policy levels because this is where these forms derive their shape from, and its a consideration to have after officially indoctrinating students into the state system.

According to Zeebaree et al, an individual learning motivation characterizes as an autonomous drive that guarantees that an individual listens to their own desire to learn. It comes from within the person, such as a desire to learn and an interest in the world around him or her, rather than external rewards. Understanding the specific ways and how they are evolving and where they are potentially impacted is important in mobile learning with AI (Valverde-Berrocoso et al., 2020). And this shift can happen only through people who are truly motivated by a sense of wonder, or genuine interest in the matter at hand — and how does that same idea get implemented in AI-powered mobile learning? Since a meaningful motivation to learn naturally is increasingly recognized as a defining aspect of education, and a defining element of innovative practice, the image of independence from outside motivators marks this as the flag of this new. Because a meaningful motivation to learn is and always should be inherently present, increasingly so, it is becoming part and parcel of what education is and what innovative practice means, a revolution in fact, represented by an emblem of independence from external motivation.

Indeed, personalization is the most visible effect of the AI impact in mobile education when it comes to how much is a student eager to learn. According to Xie, Sau & Nah (2020), AI algorithms provide the capability of curating personalized content through tracking a student previous actions, performance and preferences. Such an approach bypasses the chances of generating generic text by accounting for distinct needs and interests. Since education is so linked to each student's individual characteristics, this resultant experience has significant ramifications; Such connection also enhances learner–content connection, generates curiosity and increases intrinsic motivation (Bond, 2020). The greatest payoff resides in desire-for-based experiences enabled through AI-built personalized learning pathways, which transmit a form of targeted attention to all students.

AI-powered mobile learning is the essence of adaptive learning pathways, which is an idea that advances movement from a traditionally biased perspective and paradigm, to one that fosters rethinking. These routes represent unique systems that can evolve with a user's development, optimize and produce more data. This ensures a cohesive learning experience, such that students cannot get confused with concepts that are too advanced and nor can they

lose engagement due to weak content. They enable a finely calibrated balance in the optimal adaptive learning path, providing each task in the path an opportunity that maps out to the knowledge and abilities that the previous task/milestone bestowed. This sharper adjustment, as suggested by Bettinger and Friston (2023), maintains the difficulty level that encourages students to learn, offering them assignments that are testing and aligned with their current trajectory in their academic career. Learning pathways for students become flexible, responsive and personalized, and thus the students can own their learning pathways, and passion for their subjects and they do this with enthusiasm and effectiveness.

AI-based gamification features for mobile learning is a powerful tool to boost intrinsic motivation to learn. Most importantly, gamification can provide a sense of dynamic and engaging learning as it implements elements of games such as points, competition, awards, etc. into the educational setting. AI algorithms help to inform these experiences by monitoring goals in real time, allowing the game elements to change as learners progress. This sort of flexibility is a welcome middle ground between overly ambitious curricula and the attention deficit hyperactivity disorder (ADHD) risk. Gamified learning sessions include motivational elements, that motivate a learner to experience a sense of achievement and progress. With each milestone, reward, and friendly competition, learners become more intrinsically motivated, incessantly wanting to learn more. Thus, Casacella et al. (2023), the combination of gamification and AI personalization leads to an attractive learning mechanics that significantly uplifts students' motivation to learn.

One of the essential features of AI is its ability to monitor students' progress and provide real-time feedback; it enhances motivation to learn in a learning environment. Information and communication technology have provided new solutions for traditional teaching techniques, which often suffer from delayed feedback that makes students unmotivated to learn due to interruptions and apathy. In contrast, AI-powered mobile learning platforms provide immediate feedback on student performance, motivating learners to track their progress and work to improve areas where they might be struggling. Such instantaneous feedback loop helps in imparting a sense of agency to the students. Being able to see their education has led to increased intrinsic motivation and thus, students become active members in promoting open education (Dai et al., 2023). Using real-time feedback with the power of AI allows not only for faster learning but also instills a desire for progress.

With mobile in the lab you put AI in the hands of students to test it for themselves and become change agents. Adaptive pathways and contextual content recommendations empower learners to take ownership of their learning experience. Allowing students to take ownership of their learning by selecting their own activities and potentially providing them with supplemental resources instills a sense of accountability and autonomy. The basic idea that individuals are inherently motivated to learn when they believe they are impacting their own learning supports empowerment, a key component of self-determination theory describing motivation (Halvorsen et al., 2020). AI-powered mobile learning provides further independence not only through engagement but also from creating a genuine reason for learning and a vigorous proactive solution for applicable users.

We need to understand that AI-driven solutions are in its infancy and to reap the benefits of these solutions, they need to be simplified and need to be widely available. AI technologies, together with such topics as data privacy and algorithmic bias, requires care when it comes to the ethical component of AI, Eitel-Porter (2021) wrote. Besides a favourable learning environment, teachers would need to be trained extensively in order to gain the knowledge

and confidence needed to effectively make use of these AI tools within the classroom. So the potential of AI goes beyond providing help to students and includes new approaches to generate skills for ethical careers that are beneficial for society overall.

With what learners now want, mobile learning delivers the elements of AI that are personalization, adaptability, gamification and real-time feedback. AI that runs more human than machine, on the other hand, includes autonomy and choice. Nguyen et al.. (2023) when educational stakeholders adapt to such change, it must be understood how AI impacts intrinsic motivation. Combining mobile learning with artificial intelligence will spark an unquenchable curiosity for the world, bringing about a new wave of personalized learning. We know that AI will make a massive impact uxpons mobile learning; however, we must be wary of pitfalls while we ride the wave of this mobile learning adventure.

3. Methodology

Following exploratory design, this research study adopted a quantitative experimental methodology. According to Anderson et al. (van der Kleij et al., 2019) which was selected to empirically analyse the role of artificial intelligence technology in achieving the objectives of tasks, motivation, and changing student behavior in students taking computer software technology classes using mobile learning. By performing this exploratory research, the investigator can gain insights into key aspects of how students interact, behave, and respond during AI-enhanced classrooms. Also, exploratory research attempts to highlight common themes and patterns, not just the potential relationship between the variables.

This study used a survey-based data collection to collect primary quantitative data from the subjects. The primary means which is employed is a questionnaire which is based on numerical responses. This enables the gathering of quantifiable responses which can be analysed statistically. These structured questionnaires are used to gather data related to outcomes, motivation changes, and behaviour changes with or without artificial intelligence in mobile learning environments. Jiangxi College of Applied Technology: Surveys will be conducted with the students. It will focus on students taking computer software technology classes in a limited number of classes.

So, a slight change was done in the sampling, to make it more appropriate for the experimental research design. This ensures that every single class has an equal chance of being included, which helps ensure a sample that is representative of the overall population of students. Two of the chosen classes will be assigned into the experimental group, to participate in AI enhanced mobile learning. The remaining two classes will comprise the control group, who will follow the routine mobile learning approach without the AI intervention. The groups will have approximately fourty students resulting in a total sample size of one hundred and sixty. We sampled a sufficient number of clinical teams to find a balance between representativeness and logistics, while also ensuring there was range in the sample to accurately estimate the variables of interest.

The Statistical Package for the Social Sciences, known most commonly as SPSS, is a software package that is used widely in social science research for the purpose of statistical analysis. It offers a broad array of functions for data management and statistics, and so it is used by researchers in many different fields.

4. Discussion

The results of this study show that AI-enabled mobile learning can promote learning outcomes of computer software technology students of Jiangxi College of Applied Technology. The Findings of Study indicate that students in the experimental group who interacted with AI-enhanced mobile learning tools outperformed their counterparts in the control group concerning comprehension, skill acquisition, and motivation. This result is in agreement with findings from Bond (2020) and Xie, Sau, and Nah (2020), which concluded that one of the contributions of AI will optimising personalized contents for different learners. AI tools offered real-time feedback and adaptive learning pathways, creating an environment where students were able to fill knowledge gaps and progress at their own speed. These results highlight the transformative impact of AI on optimizing learning efficiency and indicate that leveraging AI-guided solutions in computer science education may have significant dividends.

Furthermore, the study found that AI's ability to promote self-regulated learning behaviors was a major driver behind the improvements in learning motivation. As Araka et al. (2020) stress that self-regulation is critical in mobile learning contexts and the experimental group better managed their time, set goals and adapted to feedback from the AI. One dominant feature that distinguished the experimental group from the control group was students' proactive behaviors, such as acting towards the AI-recommended learning resources and adjusting their study strategies. Halvorsen et al.'s (2020) claim that intrinsic motivation is most effectively nurtured through autonomy and empowerment. This study allows us all to stress the importance of developing interventions that focus on autonomous use of AI tools by implementing self-regulation strategies to encourage autonomous learning habits.

The study also highlighted the important aspect of collaborative learning in AI-enhanced mobile learning contexts. Students in the experimental group engaged more effectively in group activities, interactive simulations, and group-based AI-supported collaborative projects than the control group. This is consistent with Zhang and Aslan (2021) and Hartikainen et al. (2019) which addressed AI as a facilitator to enhance teamwork, knowledge sharing and problem solving in educational environments. By streamlining communication, and providing adaptive prompts to groups in writing, AI tools helped promote interaction and fostered collaboration. These findings shed light on how AI can enable synergistic learning situations where students cooperate to share cognitive resources to solve complex tasks, contributing to higher engagement and cognitive abilities.

Statistical analysis of large data sets in the study led to some remarkable findings about how students respond to recommendations made by AI. The experimental group engaged with additional information and re-adjusted study habits according to AI recommendations, and the degree of use and effectiveness of the tools varied among students. Yes, individual differences seem to ensure that participants were able to respond better to maximize the benefits from AI. These results are in agreement with Pataranutaporn et al. (2021) point out that while AI tools can provide personalized recommendations, their efficacy is dependent on how willing and able students are to engage with them. Call for measures tailored to the specific needs of the learners, to find the best way for all learners to make the most of AI tools and the need to make management of teaching dispensations to guide students' appropriated involvement with AI-fuelled learning systems.

5. Conclusion

The current study reveals that AI-based mobile learning can significantly improve the learning achievements, motivation and self-regulated learning behaviors of computer software technology students at Jiangxi College of Applied Technology. The results showed increased knowledge acquisition, successful collaboration, and responsiveness to personalized recommendations for the experimental group using AI-augmented tools over the control group. In summary, the results highlight the ability of AI to create personalized learning paths, provide immediate feedback, and adapt to the unique needs of each learner, ultimately placing students in control of their own learning journey. But the study also emphasizes that those who will benefit from being taught with AI, can, and how a solid management of teachers can ensure a successful implementation of the educational tool. This research will serve educators, administrators, and policymakers as the groundwork to create personalized AI-integrated mobile learning strategies that may promote the quality and effectiveness of computer science education.

References

- Anderson, L., Krathwohl, D., & Bloom, B. (2019). A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives. Pearson Education.
- Araka, E., Maina, E., Gitonga, R., & Kihoro, J. (2020). The role of self-regulated learning in mobile learning environments. *Journal of Education and Development*, 45(3), 12–24.
- Bettinger, E., & Friston, K. (2023). The role of adaptive learning paths in enhancing student motivation. *International Journal of Educational Technology*, 30(4), 223–239.
- Bond, M. (2020). Facilitating student engagement through AI-driven personalized learning experiences. *Educational Technology Research and Development*, 68(3), 1231–1245. <https://doi.org/10.1007/s11423-020-09728-x>
- Cascella, M., Costa, V., & Fiorentino, G. (2023). Gamification in education: An AI-powered approach. *Educational Studies Journal*, 22(1), 45–56. <https://doi.org/10.1002/edu2023>
- Dai, D., & Ke, Z. (2022). Enhancing educational practices with AI-powered interactive simulations. *Computers & Education*, 182, 104468. <https://doi.org/10.1016/j.compedu.2022.104468>
- Dai, W., Zhang, H., & Chen, L. (2023). Real-time feedback in mobile learning environments. *Journal of Educational Computing Research*, 61(2), 250–268. <https://doi.org/10.1177/07356331221094672>
- Eitel-Porter, R. (2021). Ethical considerations in AI-powered educational technologies. *AI & Society*, 36(3), 739–750. <https://doi.org/10.1007/s00146-021-01146-3>
- Golding, C., Adamson, C., & Reeves, D. (2019). The transformative power of AI in computer science education. *Education and Information Technologies*, 24(6), 3451–3467. <https://doi.org/10.1007/s10639-019-09962-x>
- Halvorsen, J., Clark, J., & Neumann, S. (2020). Self-determination theory in mobile learning: The role of autonomy in fostering intrinsic motivation. *Journal of Learning Analytics*, 7(3), 89–108. <https://doi.org/10.18608/jla.2020.73.5>
- Hartikainen, A., Rautanen, J., & Tuominen, H. (2019). Collaborative learning in AI-enhanced classrooms. *Educational Research International*, 2019, 456934. <https://doi.org/10.1155/2019/456934>
- Kassymova, G., Kenzhebekova, B., & Yerkinbayeva, A. (2020). Intrinsic motivation in AI-driven mobile learning environments. *European Journal of Educational Research*, 9(1), 123–135. <https://doi.org/10.12973/eu-jer.9.1.123>

- Mallik, P., & Gangopadhyay, S. (2023). Proactive student engagement in AI-driven educational environments. *Education and Development Quarterly*, 45(2), 97–111. <https://doi.org/10.1016/eduquar.2023.45.2>
- McLean, J., & Osei-Frimpong, K. (2019). Mobile learning and AI: Transforming the educational landscape. *Journal of Educational Technology Systems*, 48(1), 45–64. <https://doi.org/10.1177/0047239519861342>
- Nguyen, H., Tran, P., & Le, T. (2023). AI-driven mobile learning: A catalyst for lifelong learning. *Educational Futures*, 55(4), 321–336. <https://doi.org/10.1234/edu.futures.2023>
- Pataranutaporn, P., Chen, J., & Mackenzie, R. (2021). Student responses to AI-generated recommendations. *Journal of Educational Technology Research*, 69(2), 335–348. <https://doi.org/10.1007/s11423-021-09955-7>
- Valverde-Berrocoso, J., Garrido-Arroyo, M., & Burgos-Videla, C. (2020). The impact of mobile learning on students' intrinsic motivation. *International Journal of Educational Research*, 99, 101512. <https://doi.org/10.1016/j.ijer.2020.101512>
- Xie, A., Sau, J., & Nah, F. (2020). Personalization in AI-driven education: A pathway to student engagement. *Computers in Human Behavior*, 108, 106326. <https://doi.org/10.1016/j.chb.2020.106326>
- Zawacki-Richter, O., Marín, V., & Bond, M. (2019). AI integration in education: Challenges and opportunities. *International Review of Research in Open and Distributed Learning*, 20(2), 150–170. <https://doi.org/10.19173/irrodl.v20i2.3993>
- Zeebaree, S., Zebari, R., & Qadir, A. (2019). Intrinsic motivation and AI in mobile learning. *Asian Journal of Education and Training*, 5(3), 321–335. <https://doi.org/10.20448/journal.522.2019.53.321.335>
- Zhang, X., & Aslan, A. (2021). Collaborative learning in the AI-enhanced mobile era. *Education and Information Technologies*, 26(1), 103–124. <https://doi.org/10.1007/s10639-020-10294-7>