

Accessibility is Not Engagement: Exploring Students' Underutilization of Moodle for English Language Development and Self-Regulated Learning

Saleh Al Himali¹, Mohd Haniff Mohd Tahir², Ahmed Al Rahbi³, Anna Mantovani⁴

^{1,2}Universiti Pendidikan Sultan Idris, Malaysia

³University of Nizwa, Oman

⁴University of Padova, Italy

DOI: <https://doi.org/10.47772/IJRISS.2026.100701116>

Received: 09 August 2026; Accepted: 14 August 2026; Published: 22 August 2026

ABSTRACT

This study targets to contribute to the rapidly growing literature on self-regulated learning in technology-mediated educational environments. It aims to investigate Moodle's role in supporting undergraduate students' self-regulation and English language proficiency in Omani higher education, to examine how students' self-regulation, Moodle engagement, and English language proficiency are related, and to identify how AI can be integrated into Moodle to improve students' self-regulation and English language proficiency. This study adopted an embedded mixed-methods case study design. The study used a mix methods data analysis approach, combining quantitative data derived from Moodle learning analytics and students' performance results, and qualitative data obtained from focus group discussions and classroom observations. The sampling technique was purposive, focusing on participants comprising 120 students with 60 students in each class, enrolled in five-month compulsory English language courses at an Omani university. The findings revealed uneven engagement patterns with the Moodle platform, with students largely focusing on completing graded tasks and assignments to pass compulsory English courses while paying inadequate attention to enhancing their overall English language proficiency. Self-regulatory behavioral patterns were characterized by instability and irregularity, revealing notable struggles in managing learning behaviors and sustaining engagement with Moodle-supported learning activities. The findings also demonstrated that students repeatedly used AI tools and the statistical data showed almost half of the students either failed or received D grade due to poor self-regulation. This study indorses the pedagogically guided integration of AI within Moodle platform, yet the development of an AI-enhanced Moodle platform remains a significant challenge for the concerned stakeholders, requiring a combination of pedagogical and technical expertise.

Keywords: self-regulated learning, Moodle, English language learning, higher education, learner autonomy, AI artificial intelligence, Oman.

INTRODUCTION

In technologically mediated learning contexts such as higher education institutions, self-regulation has increasingly received significant importance acting as a critical determinant and crucial factor in students' academic success. Nowadays in this current rapid digital technological integration era, online learning and teaching practices transformation facilitated access to learning resources and permitted online assessments conduction, altering conventional traditional classroom practices.

During COVID-19, the worldwide reliance of educational institutions on digital learning platforms has largely ensured instructional continuity and online learning (Haleem et al., 2022). Since then, the role of educational technologies has consequently played a role of an instructional content delivery system and a supporting medium for shaping and developing individual competences of self-regulatory skills. Thus, educational technologies are no longer considered as merely instructional content delivery systems, but rather a tool for supporting self-

regulatory competences development and shaping learners' behavior and cognition.

In this context, self-regulation is broadly defined as the ability of the learner to maintain conscious management and control over behavioral, emotional, motivational, cognitive, metacognitive and environmental learning aspects in pursuit of academic goals. Strongly self-regulated learners tend to possess capacities for monitoring their learning progress, employing effective time and efforts management strategies, and adapting their learning techniques, strategies and approaches to encounter emerging and changing challenges. Contrarywise, learners who often exhibit lower academic performance, inconsistent engagement and procrastination tend to be associated with limited self-regulatory skills. Learning autonomy has been recently incited by digital learning environments, which also has prompted self-regulation development.

Scholarly attention has been growing in exploring the relationship between self-regulated learning and digital learning environment. For example, Junaščíková (2024) found that research on Massive Open Online Courses (MOOCs) suggests that students, working in online learning courses, can enhance their regulatory learning skills by being able to select the appropriate content, and determining how and when to engage with the learning resources based on their needs.

Similarly, learning environments characterized by more autonomy can promote more significant levels of self-regulation compared with teacher-directed learning contexts as multiple online learning platforms have demonstrated (Makhno et al., 2022). Furthermore, peer scaffolding can be facilitated within technology-mediated collaborative settings where learners interact to their peers' contributions and benefit from online discussions (Nicol, 2009).

Likewise, the Flipped classroom model, as one of technology-enhanced pedagogical approaches, has contributed significantly to students' performance enhancement and engagement improvement (Shyr & Chen, 2017). In theoretical literature, several complementary frameworks can explain the digital technological potentiality in fostering self-regulated learning. For instance, Social Constructivist Theory, specifically the concept of Vygotsky of the Zone of Proximal Development (ZPD), highlights the cruciality of support provided, through interaction, occurring when more competent peer or instructor supports less competent learners to help them move beyond their current competence level (Qiao & Zhao, 2023). Activity Theory, similarly, offers an analytical framework for comprehending learners' interactions within technological environments and their influence on the learning processes and outcomes (Yang & Kyun, 2022). These theoretical perspectives suggest that digital platforms are not only information repositories but rather function as mediational tools for facilitating learner interaction, engagement, and self-regulation.

Recently, the technological-supported learning possibilities were remarkably expanded by the rapid artificial intelligence (AI) evolution. Technologies of artificial intelligence can generate personalized learning experiences and facilitate the creation of intelligent educational environments, yet their impact on learning continues to be disputed (Dou et al., 2025). The AI technologies applications in language instruction have witnessed a noteworthy shift by moving toward more open-ended, interactive and emotionally reactive learning experiences, far beyond the predefined and skill-specific functions (Wang et al., 2026).

AI integration in English language instruction is relatively more widespread than other academic subjects (Crompton et al., 2024). Additionally, unprecedented interest in AI-mediated language education research has been generated since the emergence of generative AI, specifically ChatGPT release in late 2022 (Liu & Zhao, 2026). For example, chatbot, a software application, can engage users into interactive dialogues, interprets their inputs and processes language interaction naturally (Du & Daniel, 2024). There is a rapid conversational AI technologies expansion aligned with theoretical perspectives emphasizing learner autonomy, personalization and interaction (Wang et al., 2026). Moreover, recent studies demonstrated that AI-based speaking assistance may result in foreign language anxiety reduction, students' enjoyment increase and the enhancement of their willingness to communicate (He, 2025).

Concerns about extensive reliance on AI technologies been recently discussed despite promising developments. Critical thinking skills may have been negatively impacted by AI extensive usage (Gerlich, 2025), creating the need to investigate both its anticipated benefits and potential risks. Numerous AI educational utilization require

further investigation remaining underexplored (Akinsemolu & Onyeaka, 2025).

Recent certain research studies reflected a growing interest in AI and educational technologies. The majority of publications on AI-mediated language learning emerged after 2022 (Liu & Zhao, 2026). This research area has adopted methodologically diverse approaches particularly mixed research methods as the most common design (Lee et al., 2026). Geographically, the current research body is concentrated in China, followed by the United State and South Korea (Zhu & Wang, 2025). Remarkably, undergraduate students accounted for more than half of the targeted population of all participants in the existing AI associated empirical research (Liu & Zhao, 2026).

Although digital technologies and artificial intelligence have relatively received considerable attention, their contribution to students' self-regulation development has not obtained similar focus. This gap is particularly significant in the contexts of language learning including engagement sustainability, persistence and efficient time management which are crucial for language development. Furthermore, self-directed learning is enhanced by individual interest as a critical factor influencing students' motivation (Lai et al., 2024), which may also impact the way students benefit from technology-based learning environments.

In response to these gaps, this present investigation intends to explore the role of Moodle platform in supporting undergraduate students' self-regulation in two compulsory English language courses at an Omani university. Precisely, the study focuses on students' engagement with Moodle resources, the patterns of engagement reflecting their self-regulatory practices and the potential role of AI in enhancing the role of the platform. It is worth noting that the initial data were collected in Spring 2024, and a comparable set of Moodle analytics data was collected again in Spring 2026. The findings revealed no significant differences in the observed behavioral patterns across the two periods, indicating that these patterns were persistent and reflected continuous student learning behaviors over time.

LITERATURE REVIEW

Self-regulation has been defined as an interconnected process that is demanding and sophisticated which leads to active management of students' learning through multiple behavioral, motivational, emotional and cognitive processes to attain specific learning goals (Nadhif & Rohmatika, 2020.) Described as an iterative and cyclical, self-regulation involves students in ongoing process of planning, monitoring, reflection, evaluation, and adapting learning strategies based on the encountered challenges and received feedbacks (Güven & Babayigit, 2020; Hadwin et al., 2018; Wang et al., 2013). Recursive processes of adjusting behaviors, regulating emotions, maintaining motivation and adopting appropriate strategies enable learners to achieve their academic goals. Self-regulation promotes learners to adapt to emerging challenges and changing learning conditions, in addition to consolidating dimensions such as persistence, autonomy, flexibility and engagement (Inzlicht et al., 2021; Schunk & Greene, 2018).

Learners, at individual levels, continue regulating their behavioral, emotional, and cognitive states to optimize learning outcomes (Mace et al., 2001). Nevertheless, the development of self-regulation does not occur in isolation from other learning factors. Learners' regulatory processes are also shaped by contextual influences and individual characteristics. At external levels, factors including teacher guidance, institutional support, instructional design and peer collaboration, simultaneously have substantial impact on the enhancement and development of self-regulatory behaviors (Pachón-Basallo et al., 2022).

Furthermore, according to Hadwin et al. (2018) socially shared regulation and co-regulation are forms of learning regulation involving learners in collaboratively negotiating goals, monitoring their learning progress and supporting each other's learning. This concept of collaborative regulation coincides with social constructivist perspectives, specifically the Zone of Proximal Development concept, which accentuates the role of interaction between the more knowledgeable peers or instructors and the low performing learners to achieve higher levels of performance (Qiao & Zhao, 2023).

However, self-regulation does not always occur successfully. Certain learners are likely to face difficulties regulating their learning, experiencing under-regulation, mis-regulation and dysregulation which results in poor academic performance, complete dependence on external assistance and ineffective learning behavior

(Baumeister et al., 2007; Pachón-Basallo et al., 2022).

Self-regulation is significantly vital in foreign language learning involving learners in continuous management of complex emotional, cognitive, motivational components to complete demanding linguistic tasks. For learners to achieve successful learning acquisition, they are required to consistently monitor their learning progress, evaluate their communicative performance, learn to overcome emerging language anxiety and adapt their learning strategies to meet the varying and changing communicative situations (Lajoie et al., 2021; Torres & Alieto, 2019). Thus, learners who possess stronger self-regulatory competences tend to exhibit stronger persistence, use more effective communication strategies, and, consequently, can obtain higher language proficiency levels (Khan et al., 2023). In converse way, learners lacking sufficient self-regulatory skills act passively in terms of their learning behaviors, have limited capacities for autonomous learning development and tend to over-rely on their teachers and institutional systems.

Omani learners of foreign languages are particularly encountering these kinds of problems despite long school and university years of exposure to English. Students continue to face psychological, motivational and linguistic barriers including low confidence, communication anxiety, limited vocabulary and inadequate opportunities for authentic English interaction (Al Nofali & Gasim, 2025). These obstacles intensified by a number of constraints such as overcrowded classrooms, teacher-centered instructional time predominance and limited instructional time resulting on substantial teacher's reliance rather than developing independent learning skills and habits (Al-Mahrooqi, 2012; Al-Ruzaiqi & Hussain, 2025). As a result, the importance of fostering self-regulatory capabilities of learners has become increasingly significant to assume greater language learning responsibilities beyond the limitation of the classroom.

English learning opportunities has been increasing along with the recent technological developments that substantially expanded the provision of communication, personalized learning experiences and offered unprecedented access to information (Akhmadov et al., 2023; Raja & Nagasubramani, 2018). Technology has become an integral part of current higher education systems which created digital learning environments to facilitate knowledge construction, to increase learners' interaction, to encourage active participation and to improve educational quality and learning efficiency (Makhno et al., 2022; Shyr & Chen, 2017; Suryavanshi & Mandale, 2022). The role of technology is no longer viewed as mere tool for delivering instructional content but rather a medium for encouraging autonomy, engagement and self-directed learning supporting learner-centered education. Consequently, scholarly growing attention has been gradually attributed to the relationship between technology and self-regulation. Digital learning environments offer continuous learning sources access and offer communication channels to provide opportunities to regulate the location, timing, sequence and pace of learning activities (Junaščíková, 2024).

These technology-mediated environments facilitate goal setting, planning, monitoring, information management, self-reflection and the provision of collaborative learning and social interaction opportunities (Lai et al., 2024). Moreover, online learning platforms allow students to monitor their progress, receive continuous and formative feedback and interact with instructors and peers which consequently strengthens their regulatory behavior throughout their learning process (Nicol, 2009). According to empirical evidence learning environments that encourage learner autonomy and independence are associated with greater self-regulation levels than teachers' support-based environments (Makhno et al., 2022). Likewise, active participation, independent preparation and strategic learning behavior is promoted by flipped classrooms as one example of learning technology-enhanced pedagogical models resulting in significant learner performance improvement (Shyr & Chen, 2017).

The recent expansion and progress of artificial intelligence (AI) enhanced educational potentiality of digital learning environments with the introduction of interactive, personalized and adaptive learning experiences. Despite mixed educational outcomes, AI technology can generate intelligent educational environments that offer personalized learning activities, immediate feedback and tailored instructional support to meet individual needs of different learners (Dou et al., 2025). According to recent reviews, there is a considerable evolvement of AI research in language learning which is shifting applications roles from being defined as task-based to become increasingly open-ended tools offering interactive learning and emotionally responsive experiences (Wang et al., 2026). Indeed, one of the most important fields for AI implementation is English language education where greater attention has been given to AI-supported language learning compared to other instructional subject areas

(Crompton et al., 2024). Since 2023 AI-mediated informal language learning has rapidly emerged in research field, expanding and highlighting the increasing significance and novelty of this research area (Liu & Zhao, 2026).

AI can offer personalized learning pathways, adaptive practices activities, continuous performance monitoring and immediate individualized feedback facilitating and supporting the development of self-regulatory competencies of students (Gerlich, 2025). Foreign language anxiety has been reduced by AI speaking assistance applications increasing students' enjoyment and desire and willingness to participate in conversations, resulting in performance improvement in a supportive, and low-anxiety learning environments (He, 2025; Behforouz et al., 2026). This AI feature of personalized learning and responsiveness aligns with the main features of self-regulation iterative processes which allow learners to monitor and evaluate their progress to identify strengths and weaknesses, and accordingly adjust learning strategies benefiting from the feedback and immediate guidance provided by AI without exclusive reliance on the intervention of teacher.

Nonetheless, there are challenges that emerged from using AI in education regardless of the considerable advantages. Excessive AI tools dependence may have negatively influenced students' abilities to think critically and develop independent cognitive engagement (Gerlich, 2025). Moreover, regardless of the rapid expansion of AI research, further investigations on its long-term pedagogical impact and effectiveness on the learning and the learners are needed (Akinsemolu & Onyeaka, 2025). East Asian educational contexts, including China Taiwan, Hong Kong and South Korea, had predominantly most of the recent AI studies (Zhu & Wang, 2025). Thus, there is an urgent need for empirical investigations in underrepresented educational contexts, such as the Arab Gulf region. En conclusion, technology created adaptive and responsive learning environments that provide learning resources flexibility access, personalized and instant feedback and opportunities for collaborative learning. These features can foster students' self-regulatory skills. However, limited research has been conducted to investigate the role of learning management systems in fostering self-regulation in the Omani context of higher education in EFL learning.

METHODOLOGY

This investigation adopted an embedded mixed-method case study design. It targets to explore how Moodle supports undergraduate university students' self-regulation and English language proficiency. It examines students' learning behavior patterns on the Moodle platform and predicts how a tailored AI-supported design integrated into Moodle could support both self-regulation and English language proficiency development. Ensuring rigorous, valid and meaningful findings relies on having a research design that corresponds with the research objectives. Gamage (2025) highlights the fundamentality of aligning research methodology with the research objectives to enhance research rigor and produce comprehensive insights.

This study merged quantitative and qualitative methods to address the research objectives by attempting to understand measurable students' engagement patterns on Moodle platform and to explore the insights underlying learning processes of self-regulation and language proficiency development. Mixed-methods research integrates evidence derived from qualitative and quantitative data to provide a comprehensive insight of complex educational phenomena (Gamage, 2025). Mixed methods illustrate the "why" behind quantitative findings and, simultaneously, allow researchers to unveil multiple phenomenon dimensions. Yu and Khazanchi (2017) contends that the combination of quantitative and qualitative approaches allows researchers to reveal both the phenomenon components, the interrelationships among those components and the influencing contextual conditions. This study combines both paradigms and integrates them to provide complementary strengths and to reduce each one's individual limitations (Yu & Khazanchi, 2017).

This case study was conducted in the authentic educational context of undergraduate English language courses at an Omani university. Its appropriateness lies in its feature of investigating a real-life contemporary phenomenon by employing multiple sources of evidence (Bell & Warren, 2023, citing Yin, 2017). Case study research is valuable for generating practical recommendations beyond theoretical explanations derived out of profound understanding of educational practices occurring within natural learning contexts (Bell & Warren, 2023). This investigation, accordingly, does not study Moodle platform as an isolated technological case but rather as an integral everyday English language learning and teaching component. This study focuses on

undergraduate students in two compulsory English language courses during the Spring of 2024 semester.

Moodle platform is the primary learning management system at the university that serve students to access to instructional materials, complete assignments, participate in learning tasks and receive instructions and feedback. The study examines the engagement of students with Moodle platform within their regular educational context. The participants are undergraduate student studying in different academic disciplines and are required to complete certain language courses as a part of their university's general education curriculum. They were two classes with about 60 students in each class. Most participants are enrolled in non-English majors, and the study focuses on students within the courses in which they are enrolled rather than on the same participants across all courses. This is a case study methodology investigating a bounded educational system within its natural setting (Bell & Warren, 2023).

In line with the embedded mixed-methods design, the study collected multiple sources of both quantitative and qualitative evidence. Quantitative data included Moodle learning analytics and students' achievement in English Language. Moodle analytics comprised general resource access, utilization patterns (e.g., frequency and timing), other online learning activities such as assignment submissions, task completion (including completion delays), and other online tasks related variables, including the number of attempts and completion duration.

Classroom observation and regular group discussions served as qualitative data sources. Classroom observations focused on students' interaction, participation and engagement with learning tasks as well as observable manifestations of self-regulatory behavior. Group discussions provided insights into students' experiences of using Moodle, their perceptions of its impact on their learning, the difficulties they encountered, the strategies they used to regulate their learning through Moodle, and the other platform features that they perceived as either hindering or facilitating their learning. As Gamage (2025) states, qualitative research addresses the "how" and "why" of learning by exploring participants' viewpoints, experiences, and behaviors, that numerical measures cannot fully capture.

Whereas Moodle learning analytics were used to collect data on students' observable learning behaviors, and classroom observation and group discussion provided insights into students' behavioral, emotional, motivational, and cognitive processes underlying their observable behavior within the digital environment. Additionally, the English performance of students provided another perspective on the relationship between self-regulation, language proficiency, and Moodle platform engagement.

The first objective of this study investigates the extent to which Moodle platform supports students' English language proficiency and self-regulation through the analysis of their engagement patterns in addition to classroom experiences and academic performance. The second objective examines the relationship between English language proficiency, Moodle-supported self-regulation, and students' engagement by the integration of data on academic achievements, Moodle platform learning analytics and students' reflections. The study does not seek to establish causality between the variables but rather to investigate the association among them within an authentic technology-supported learning environment where learning is influenced by a range of interacting factors such as instructional practices, prior knowledge, motivation and individual learning strategies. The third objective explores opportunities for self-regulation learning enhancement through artificial intelligence. Drawing upon analyzed data, this investigation identifies AI-supported design features that could be integrated into the Moodle platform to enhance both language proficiency and self-regulatory skills. This is consistent with Moon et al. (2023), who argue that ensuring educational improvement sustainability necessitate to translate evidence into actionable strategies while learning from the current practices.

Data collection

Data was collected by Moodle analytics, focus group discussions, performance results and classroom observations. Moodle provided analytics data consisting of students' views and posts. Opening assignments, accessing learning materials, checking grades or even page refresh and repeated accesses are automatically counted as views. On the other hand, assignment submissions, database entries, content creation or interaction are considered as posts. Numerous logged events can be recorded by Moodle, for example, if a single student performed different activities even repeatedly savings or revising submissions. These characteristics may

represent a methodological limitation; thus, the interpretation of the statistics is not direct measure of students' participation but rather as overall engagement and activity patterns. Therefore, Moodle analytics are triangulated with classroom observations, academic performance, and students' reflections.

Prior to data collection, the researchers obtained ethical approval and informed consent was obtained from the participants. Throughout the study, voluntary participation, confidentiality, anonymity and the right to withdraw were ensured.

DISCUSSION

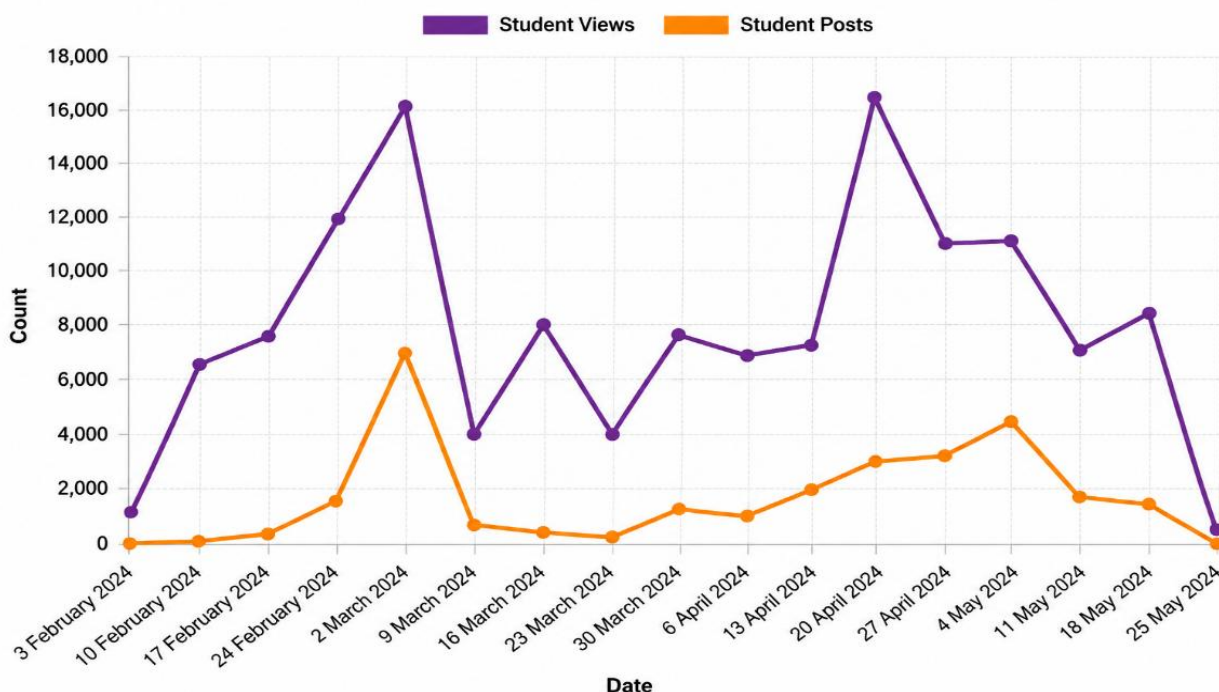
Moodle platform analytics illustrated irregular patterns of students' engagement, assessment-driven behaviors and limited use of supplementary learning resources. While students' learning performance was reflected by behavioral data from the Moodle platform, valuable explanation of these behavioral patterns were provided by the focus group discussions and classroom observations. These integrated findings offered a comprehensive understanding of students' self-regulated learning behaviors and the factors influencing their engagement with the platform.

Behavioral Patterns of Moodle Use and Self-Regulated Learning

The analysis of Moodle learning analytics displayed inconstant patterns in students' engagement and self-regulatory behavior. Students utilized Moodle principally as a repository of learning resources rather than as a reciprocal digital setting promoting steadily stable and continuous language learning development. Their engagement was predominantly motivated by assignment concerns rather than sustained self-regulatory practices. This finding was evidently reflected in students limited individual and group participation, where many demonstrated significant language difficulties.

A noticeable behavioral pattern that emerged from the analysis was the substantially higher recurrence of content viewing compared with active participation and task completion. Across both classes, students accessed assignment instructions, lecture materials and supporting documents far more often than interactive activities and discussion forums. This implies a primarily consumption-oriented approach to learning, with Moodle platform functioning mainly as a mere means for meeting course demands. Their inquiries to the instructors were primarily shaped by their overwhelming concerns to complete the required assignments and grades tasks, rather than developing their English proficiency.

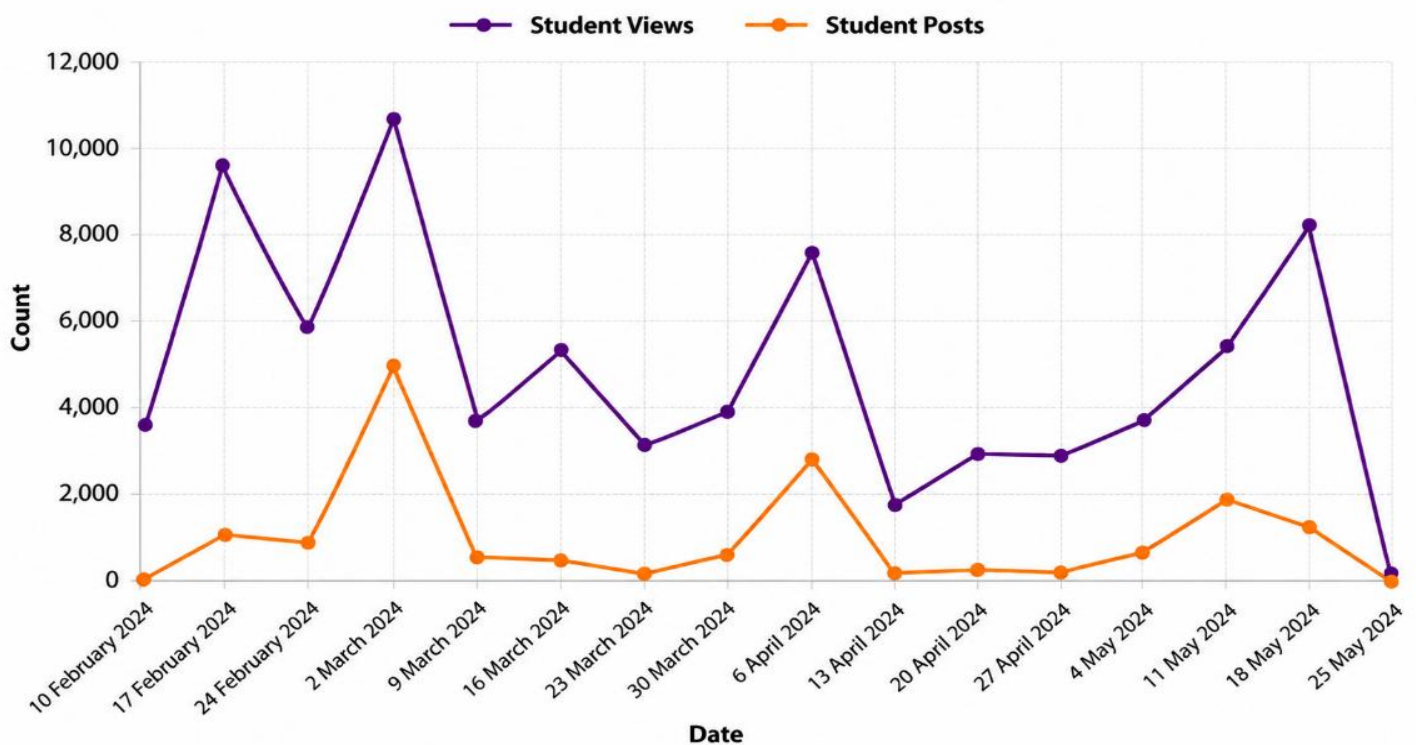
Figure 1. Analysis of Students' Learning Activities on the Moodle Platform (Class 1)



Students' engagement was not evenly distributed throughout the semester, accumulating substantially before examinations and assignment, and sharply decreasing afterward. This pattern suggests assessment-orientated learning behavior characterized by procrastination and reactive engagement with learning resources and online materials in response to inevitable assessment requirements.

The findings further unfold a consistent prioritization of graded tasks and assignments over noncompulsory learning resources intended to develop students' English proficiency. Despite repeatedly echoed encouragement from instructors, students seldom engaged with supplementary materials, often citing excessively heavy academic workloads, commitments to other courses and 'unnamed' life burdens. Conversely, assignment-related resources, such as instructions and writing guides, were accessed relatively more regularly. This choosy sort of engagement reveals that students tended to prioritize immediate assessment exigencies over durable English language development. These tendencies were further reflected by assignments behavior. While a small number of students steadily submitted work well before deadlines, most delayed submissions until the deadline day or beyond. These behavioral patterns reveal discrepancies in time management, planning, persistence, and other features of self-regulated learning. This behavioral pattern was further supported by students' frequent requests for assignments deadlines extension, citing other academic commitments.

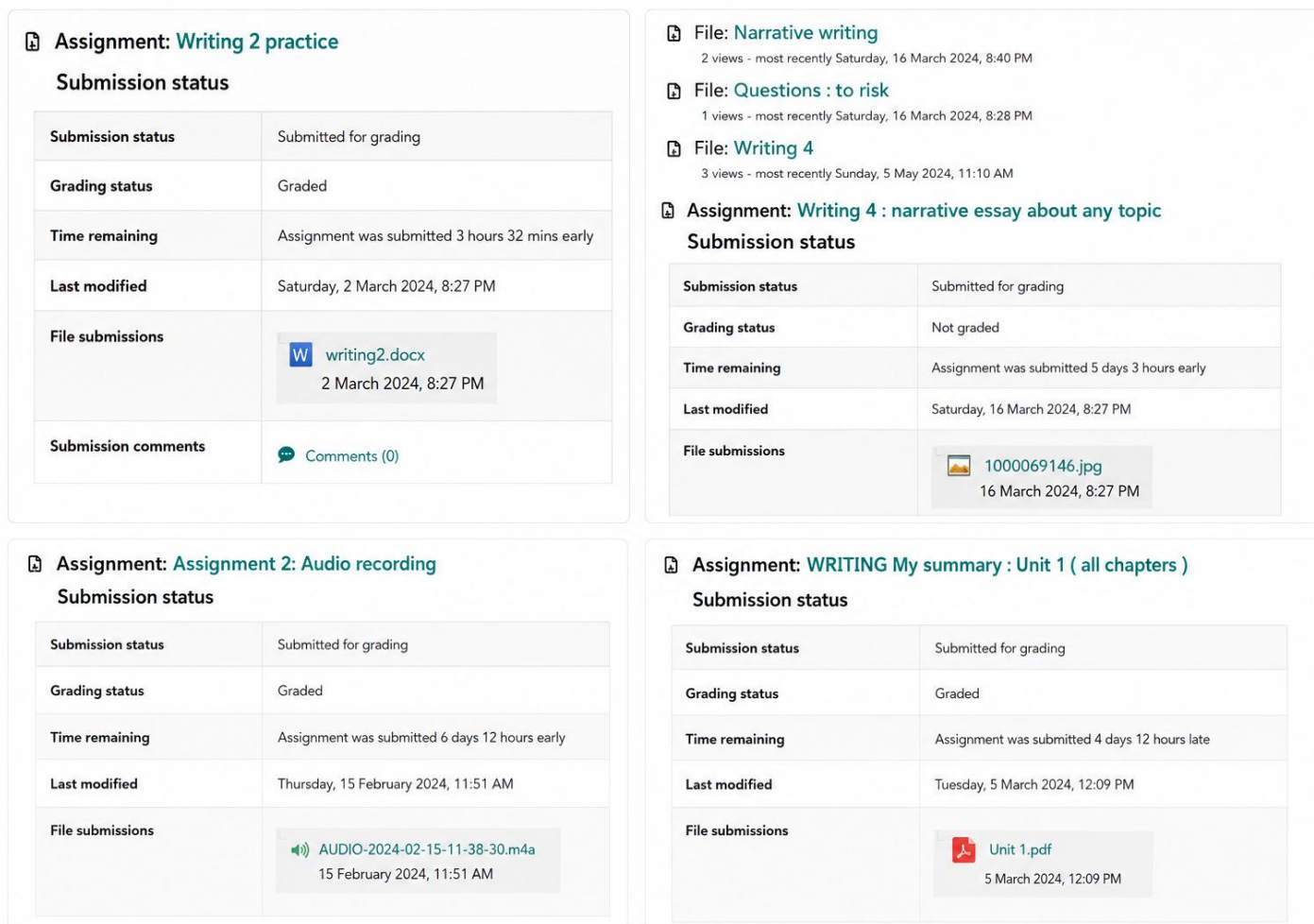
Figure 2. Analysis of Students' Learning Activities on the Moodle Platform (Class 2)



At the individual level, students demonstrated noticeable diversity in Moodle engagement. Higher-performing students broadly manifested more steady participation, regular access to learning resources, and timely assignment submission, whereas lower-performing students engaged more sporadically, delayed assignment submission and inconsistent participation. Nonetheless, a few students achieved similar academic outcomes despite divergent engagement patterns, illustrating that factors beyond Moodle-recorded behaviors also shape students' performance.

Generally, the observed Moodle behaviors provided signals of students' self-regulation, particularly behavioral regulation. Students who submitted assignments early and regularly appeared to have stronger planning and time-management skills, whereas those who repeatedly delayed assignments submissions depended more predominantly on last-minute completion strategies and frequent extension requests.

Figure 3. Moodle Learning Analytics Showing Students' Assignment Submission Activities.



Assessment-Oriented Learning, Motivation, and Students' Challenges

Findings revealed that students' engagement was driven more by assessment demands than by a genuine desire to enhance their overall English proficiency. During focus group discussions, students admitted relying on more hasty strategies and techniques, including AI tools for translation and assignment completion, to meet course requirements. This behavioral pattern indicates that students' engagement often served as a means of satisfying assessment demands rather than fostering language proficiency development.

Figure 4. Distribution of Students' Final Semester Course Results (Class 1).

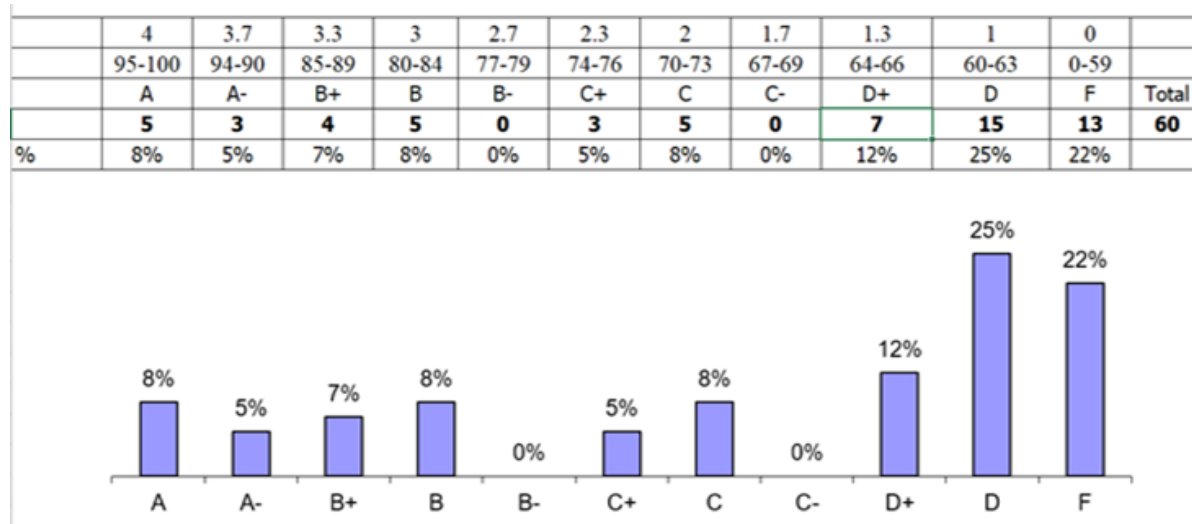
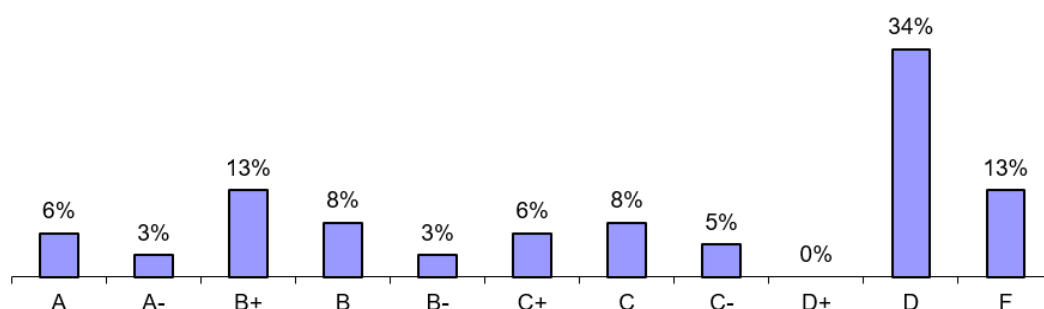


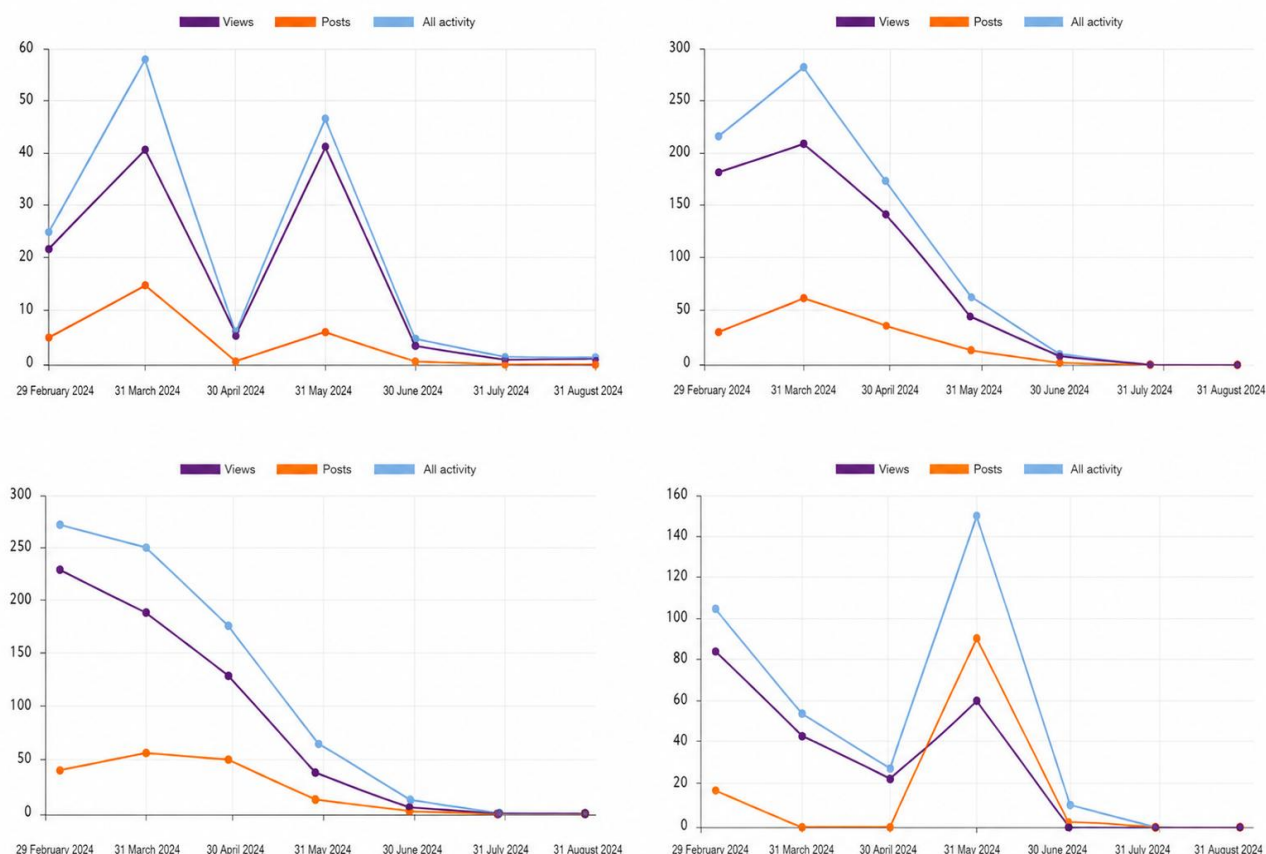
Figure 5. Distribution of Students' Final Semester Course Results (Class 2)

	4	3.7	3.3	3	2.7	2.3	2	1.7	1.3	1	0	
	95-100	94-90	85-89	80-84	77-79	74-76	70-73	67-69	64-66	60-63	0-59	
	A	A-	B+	B	B-	C+	C	C-	D+	D	F	Total
	4	2	8	5	2	4	5	3	0	21	8	62
%	6%	3%	13%	8%	3%	6%	8%	5%	0%	34%	13%	



Another crucial finding was the inconsistency between students' declared desire to improve their English proficiency and their bustling learning behaviors, as reflected in Moodle analytics, classroom participation, and academic outcomes. As Figures 4 and 5 illustrate, approximately 50% of students in both classes obtained either a grade D or failed the course, reflecting overall low academic performance and weak regulatory skills. Although many students articulated strong motivation and desire to pass the course, particularly repeat students, this claimed motivation did not always translate into concrete actions and more effective learning strategies. This implies that expressing motivation alone may not be sufficient to alter profoundly established learning habits and self-regulatory behaviors. Students frequently referred to insufficient time to complete Moodle activities, heavy workloads and competing academic demands. While some students requested deadline extensions, a small number reported that Moodle had facilitated acquiring better organizational and time-management skills.

Figure 6. Examples of Moodle Activity Analytics for Randomly Selected Students



Students' Perceptions and Self-Regulation Challenges

Focus group discussions revealed considerable obstacles that students experienced in their learning. Students highlighted challenges in self-regulating their learning and management of English language learning cognitive demands. Limited vocabulary, weak writing ability, and difficulty of the reading texts were identified and accentuated as major challenges. The most frequently expressed concerns mentioned by students include: "My English is not good," "I can't write in English, and I need to translate to understand," "The course is difficult, and we don't know how to learn new vocabulary," and "The texts in the book are complex and contain a lot of new vocabulary." Some students also questioned the rational for studying these compulsory English courses, expressing doubts about their relevance to their academic majors such as Nursing, Arabic language and Fine Arts. Their comments included: "We just want to pass this course. It's a big headache," and "Why must we study these courses of English?" These comments may reflect how actually students approached learning English in these two courses as solely as sort of compulsory requirement, limiting intrinsic motivation for language and weakening their self-regulatory behaviors.

Moodle analytics findings indicated issues with students' abilities to manage their time effectively. This finding was confirmed by their statements revealed during focus group discussions such as "We have other courses in our major which require a lot of time," "There are so many tasks to do in a week," "The time is too short to complete all the assignments and tasks," and "There is not enough time to do all the assignments and tasks on Moodle."

Furthermore, some students even requested extensions, as previously mentioned, for assignment deadlines to be delayed, presenting various excuses such as "Can you please delay the deadlines because we are busy now," and "We need more time to finish the assignments because we are busy." However, a small number of students acknowledged that Moodle had helped them improve their time-management skills, stating, "We learnt how to organize our time better."

This finding may indicate potentiality of Moodle platform to enhance students' self-regulatory skills, but students require more careful guidance to help them plan, prioritize and monitor their learning activities and tasks.

One of the most significant findings reported by students was their extensive use of artificial intelligence as a compensatory strategy to overcome English language learning difficulties that were not adequately addressed by the current Moodle design. Students reported using AI tools such as ChatGPT in various ways, stating: "ChatGPT is useful to understand the questions and the vocabulary," "AI helps me understand the English text because my English is weak," "I use ChatGPT to check my writing and answer questions," "AI can be used in different ways, and it helps because we do not have time," and "AI explains to me how to do the tasks."

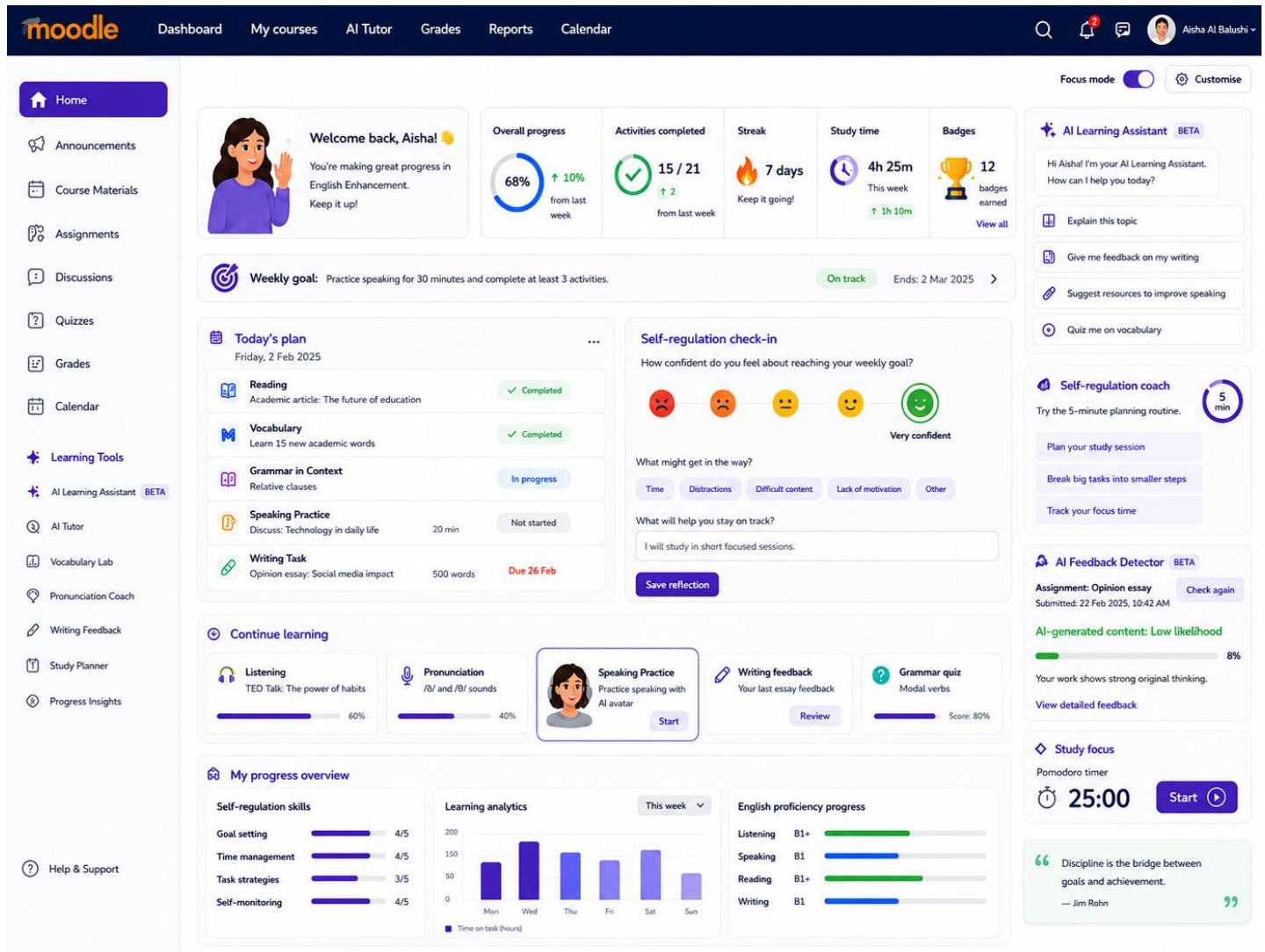
These statements suggest that students may use AI for generating answers but also for clarifying instructions and understanding vocabulary. This reflects a positive sign of some awareness of AI usage for improving learning which requires to be developed through guided support to achieve and promote more effective language learning and to enhance students' self-regulatory skills in an a carefully designed learning environment.

AI-Enhanced Moodle for Supporting Self-Regulated Learning

The proposed AI-enhanced Moodle dashboard is designed to support both English language proficiency development and self-regulated learning. The platform combines language-learning resources with tools that guide students in planning, monitoring, reflecting on, and evaluating their learning. The dashboard displays learning progress, study time, course completion rates, weekly goals, and achievement badges to encourage motivation and goal setting. It also helps students organize speaking, writing, vocabulary, reading, and grammar activities through progress indicators and deadlines. Self-regulation check-in tools encourage learners to identify challenges, evaluate progress, and implement improvement strategies. An AI Learning Assistant and Self-Regulation Coach provide personalized feedback, study recommendations, time-management support, and adaptive learning activities. The AI Feedback Detector extends beyond formative feedback by encouraging reflection and revision. Integrated learning analytics allow students to monitor both language development and self-regulatory growth. To maintain pedagogical relevance and avoid potential emotional or personal issues, AI-

supported speaking practice is restricted to curriculum-based topics aligned with course objectives. In this context, Creely and Carabott (2025) proposed the Integrated AI-Oriented Pedagogy Model, which advocates combining human experience with the agency of artificial intelligence. It consists of three dimensions: positionality, which helps the teacher to shift from central authority to a facilitator and co-learner; relationality, which emphasizes collaborative knowledge generation by students, teachers, and AI; and functionality, which defines how the transformation occurs by describing personalized feedback, novel forms of creativity, and differentiated instruction.

Figure 7. Proposed Conceptual Design of an AI-Enhanced Moodle Platform.



Limitations of the Study

Despite the contributions of this study, there are some limitations, such as the fact that Moodle analytics may not fully reflect, in depth, students' learning behavior. Moodle records function as indicators of engagement and online participation, yet these findings need to be interpreted cautiously. Additionally, due to the limited scale of the study, cultural, learning, and institutional factors were not examined sufficiently in terms of identifying self-regulation patterns. Another limitation was the need for further theoretical examination of persistent students' engagement issues with Moodle across the two-year period, as the study identified. Finally, the study provided a proposal to integrate AI into Moodle but did not support it with a detailed pedagogical model, which requires future research to examine it in depth.

RECOMMENDATIONS

To gain an in-depth understanding of students' regulatory behaviors, future research should combine Moodle

activity data with more observations, interviews, and student diaries. Students' attitudes toward learning English, teaching methods, and others need to be examined through further analysis of influencing cultural and institutional factors. Studying other higher education institutions in Oman and other Gulf countries would help establish a generalized picture of the investigated issue.

CONCLUSION

To conclude, educators and decision makers in higher education are required to reconsider the role of digital learning platforms in this rapidly growing era of technology to support learning process. Their current function, and particularly their design, urge reassessment in response to non-stop technological development and to be reshaped to address evolving learning needs and emerging educational challenges.

Digital tools are learning facilitators and offer adaptive learning opportunities, enhancing students' autonomy and self-regulation, yet their role depends on a number of factors such as ethical considerations, tool quality, characteristics of users (Stalmach et al., 2025). Students' interaction with modern technology became a fundamental necessity in contemporary education and an essential factor in foreign languages learning. For example, using Grammarly for providing students with automated corrective feedback on their writing productions resulted in improving both self-regulation skills and EFL learners' writing accuracy (Zhai, 2026). The need for continuous adaptation requires learning platforms to keep pace with a rapidly changing world and function not merely as repositories for course materials and assignments, but as pedagogically designed environment that plays a crucial role in shaping and supporting learning.

However, the effective transformation of these platform necessities to be supported by appropriately designed and implemented pedagogical practices. Increasing the weighting of continuous assessment from the current 10 - 20% to approximately 40-50% of the total assessment score may encourage students to engage more consistently. The integration of AI into the learning platform in a carefully controlled and guided manner can provide students with more personalized support through instant intelligent feedback, adaptive reading assistance, automated study plans, reflective prompts, learning recommendations and tools for supporting self-monitoring and evaluation, thereby fostering the development of self-regulatory competences. AI has the potential to function as pedagogical scaffolding tool embedded within Moodle, helping students to enhance their English language learning and developing more autonomy skills as their self-regulatory competences improves simultaneously.

REFERENCES

1. Akhmadov, A., Mutsurova, Z., & Beterbieva, A. (2023). Innovative technologies in the educational process: Trends and prospects for development. SHS Web of Conferences, 172, 01013. <https://doi.org/10.1051/shsconf/202317201013>
2. Akinsemolu, A. A., & Onyeaka, H. N. (2025). The role of artificial intelligence in transforming language learning: Opportunities and ethical considerations. *Journal of Language and Education*, 11(1), 148–152. <https://doi.org/10.17323/jle.2025.22118>
3. Al-Issa, S. M. A. (2020). The language planning situation in the Sultanate of Oman. *Current Issues in Language Planning*, 21(4), 347–414.
4. Al-Mahrooqi, R., & Denman, C. J. (2020). Assessing students' critical thinking skills in the humanities and sciences colleges of a Middle Eastern university. *International Journal of Instruction*, 13(1), 783–796.
5. Bell, R., & Warren, V. (2023). Illuminating a methodological pathway for doctor of business administration researchers: Utilizing case studies and mixed methods for applied research. *Social Sciences & Humanities Open*, 7(1), Article 100391. <https://doi.org/10.1016/j.ssaho.2022.100391>
6. Chen, H. (2023). Innovative educational technologies and virtual research tools: Trends and perspectives on future developments. SHS Web of Conferences, 172, 01013. <https://doi.org/10.1051/shsconf/202317201013>
7. Creely, E., & Carabott, K. (2025). Teaching and learning with AI: An integrated AI-oriented pedagogical model. *The Australian Educational Researcher*, 52, 4633–4654. <https://doi.org/10.1007/s13384-025->

00913-6

8. Crompton, H., Edmett, A., Ichaporia, N., & Burke, D. (2024). AI and English language teaching: Affordances and challenges. *British Journal of Educational Technology*, 55(6), 2503–2529. <https://doi.org/10.1111/bjet.13460>
9. Davison, R. M., Martinsons, M. G., & Malaurent, J. (2021). Improving action research by integrating methods. *Journal of the Association for Information Systems*, 22(3), 851–873.
10. Dou, A., Xu, W., Li, X., Zhang, S., & Zhang, J. (2025). Artificial intelligence in language learning: Bridging gaps, revealing patterns, and charting the future. *International Journal of Distance Education Technologies*, 23(1). <https://doi.org/10.4018/IJDET.385045>
11. Du, J., & Daniel, B. K. (2024). Transforming language education: A systematic review of AI-powered chatbots for English as a foreign language speaking practice. *Computers and Education: Artificial Intelligence*, 6, Article 100230. <https://doi.org/10.1016/j.caeai.2024.100230>
12. Gamage, A. N. K. K. (2025). A comparative analysis of qualitative and mixed methods research: Strengths, limitations, and practical applications. *World Journal of Advanced Research and Reviews*, 25(3), 2040–2046. <https://doi.org/10.30574/wjarr.2025.25.3.0947>
13. Gerlich, M. (2025). AI tools in society: Impacts on cognitive offloading and the future of critical thinking. *Societies*, 15(1), 6. <https://doi.org/10.3390/soc15010006>
14. Guven, M., & Babayigit, B. B. (2020). Self-regulated learning skills of undergraduate students and the role of higher education in promoting self-regulation. *Eurasian Journal of Educational Research*, 20(89), 47–70.
15. Hadwin, A., Järvelä, S., & Miller, M. (2018). Self-regulation, co-regulation, and socially shared regulation in collaborative learning environments. In D. H. Schunk & J. A. Greene (Eds.), *Handbook of self-regulation of learning and performance* (pp. 83–106). Routledge.
16. Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, 3, 275–285. <https://doi.org/10.1016/j.susoc.2022.05.004>
17. He, M. (2025). AI-speaking assistants' impact on EFL students' enjoyment, anxiety, and willingness to communicate. *Humanities & Social Sciences Communications*. <https://doi.org/10.1057/s41599-025-05817-5>
18. Hoyle, R. H., & Dent, A. L. (2018). Developmental trajectories of skills and abilities relevant for self-regulation of learning and performance. In D. H. Schunk & J. A. Greene (Eds.), *Handbook of self-regulation of learning and performance* (pp. 49–63). Routledge.
19. Inzlicht, M., Werner, K. M., Briskin, J. L., & Roberts, B. W. (2021). Integrating models of self-regulation. *Annual Review of Psychology*, 72, 319–345.
20. Junaščíková, J. (2024). Self-regulation of learning and modern technology in higher education: A review. *Interactive Technology and Smart Education*, 21(2), 270–291. <https://doi.org/10.1108/ITSE-02-2023-0030>
21. Lai, C., Chen, Q., Wang, Y., & Qi, X. (2024). Individual interest, self-regulation, and self-directed language learning with technology beyond the classroom. *British Journal of Educational Technology*, 55, 379–397. <https://doi.org/10.1111/bjet.13366>
22. Lajoie, S. P., Zheng, J., Li, S., Jarrell, A., & Gube, M. (2021). Examining the interplay of affect and self-regulation in the context of clinical reasoning. *Learning and Instruction*, 72, 101219.
23. Lee, S., Choe, H., Zou, D., & Jeon, J. (2026). A systematic review of generative AI in classroom-based language learning: Focus on L2 or FL learners' experiences. *Interactive Learning Environments*, 34(1), 335–359. <https://doi.org/10.1080/10494820.2025.2498537>
24. Liu, G. L., & Zhao, X. (2026). A scoping review of AI-mediated informal language learning: Mapping out the terrain and identifying future directions. *ReCALL*, 38(1), 111–130. <https://doi.org/10.1017/S0958344025100359>
25. Makhno, K., Kireeva, N., & Shurygin, V. (2022). The impact of online learning technology on self-regulation and student success. *Research in Learning Technology*, 30. <https://doi.org/10.25304/rlt.v30.2762>
26. Molla, S. (n.d.). Mixed methods designs. Department of Education, St. Xavier's College.
27. Moon, S. E. J., Hogden, A., Eljiz, K., & Siddiqui, N. (2023). Looking back, looking forward: A study protocol for a mixed-methods multiple-case study to examine improvement sustainability of large-scale

- initiatives in tertiary hospitals. *Healthcare*, 11(15), Article 2175. <https://doi.org/10.3390/healthcare11152175>
28. Nadhif, A., & Rohmatika, I. (2020). The role of self-regulated learning on students' English achievement. *Cendekia: Jurnal Kependidikan Dan Kemasyarakatan*, 18(2), 249–266.
29. Nicol, D. (2009). Assessment for learner self-regulation: Enhancing achievement in the first year using learning technologies. *Assessment & Evaluation in Higher Education*, 34(3), 335–352. <https://doi.org/10.1080/02602930802255139>
30. Pachón-Basallo, M., de la Fuente, J., González-Torres, M. C., Martínez-Vicente, J. M., Peralta-Sánchez, F. J., & Vera-Martínez, M. M. (2022). Effects of factors of self-regulation versus external regulation of learning in self-regulated study. *Frontiers in Psychology*, 13, 968733.
31. Qiao, H., & Zhao, A. (2023). Artificial intelligence-based language learning: Illuminating the impact on speaking skills and self-regulation in Chinese EFL context. *Frontiers in Psychology*, 14, Article 1255594. <https://doi.org/10.3389/fpsyg.2023.1255594>
32. Raja, R., & Nagasubramani, P. C. (2018). Impact of modern technology in education. *Journal of Applied and Advanced Research*, 3(Suppl. 1), S33–S35. <https://doi.org/10.21839/jaar.2018.v3S1.165>
33. Schunk, D. H., & Greene, J. A. (2018). Historical, contemporary, and future perspectives on self-regulated learning and performance. In D. H. Schunk & J. A. Greene (Eds.), *Handbook of self-regulation of learning and performance* (pp. 1–15). Routledge.
34. Shyr, W.-J., & Chen, C.-H. (2017). Designing a technology-enhanced flipped learning system to facilitate students' self-regulation and performance. *Journal of Computer Assisted Learning*, 33(3), 221–230. <https://doi.org/10.1111/jcal.12213>
35. Stalmach, A., Reinck, C., D'Elia, P., Di Sano, S., & Casale, G. (2025). A conceptual impact model of digital support for student self-regulation and emotion regulation grounded in Self-Determination Theory. *Discover Education*, 4(1), Article 383. <https://doi.org/10.1007/s44217-025-00825-8>
36. Suryavanshi, S. S., & Mandale, S. S. (2022). A research paper on use of technology in education. *International Journal of Multidisciplinary Research Transactions*, 4(7), 25–32.
37. Usher, E. L., & Schunk, D. H. (2018). Social cognitive theoretical perspective of self-regulation. In D. H. Schunk & J. A. Greene (Eds.), *Handbook of self-regulation of learning and performance* (pp. 19–35). Routledge.
38. Wang, C., Bong, M., & Ahn, H. S. (2013). Korean college students' self-regulated learning strategies and self-efficacy beliefs in learning English as a foreign language. *Asian EFL Journal*, 15(3), 81–112.
39. Wang, Y., Zhang, Z. J., & Zhou, H. (2026). Artificial intelligence in language learning: A twenty-year scoping review of applications, research methods, and outcomes. *Research Synthesis in Applied Linguistics*. <https://doi.org/10.1080/29984475.2026.2647961>
40. Yang, H., & Kyun, S. (2022). The current research trend of artificial intelligence in language learning: A systematic empirical literature review from an activity theory perspective. *Australasian Journal of Educational Technology*, 38(5), 180–210. <https://doi.org/10.14742/ajet.7492>
41. Yu, X., & Khazanchi, D. (2019). Using embedded mixed methods in studying IS phenomenon: Risks and practical remedies with an illustration. *Communications of the Association for Information Systems*, 34, 555–595.
42. Zhai, Y. (2026). Automated written corrective feedback: Fostering writing accuracy, self-regulation, and motivational dynamics in EFL learners. *BMC Psychology*, 14, Article 46. <https://doi.org/10.1186/s40359-025-03765-y>
43. Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M.
44. Zhu, M., & Wang, C. (2025). A systematic review of research on AI in language education: Current status and future implications. *Language Learning & Technology*, 29(1), 1–29. <https://hdl.handle.net/10125/73606>