Three Years of Adaptive Learning: Faculty and Student Perspectives

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Abstract: *Adaptive learning technologies have gained increasing attention in higher education for their potential to support personalised learning. Despite growing adoption, limited research has examined how adaptive learning is implemented and experienced over time by both student and faculty, particularly in the adult learning contexts. This paper reports student and faculty perceptions of a three-year adaptive learning implementation across three undergraduate courses at a university. Using a mixed-methods approach, data were collected from the Adaptive Learning System (AdLeS®), student questionnaires, and focus group interviews with faculty and students. AdLeS® was embedded within the course modules and designed with adaptive learning models aligned to course pedagogy and learning outcomes. The system provided diagnostic assessments, personalised learning pathways and real-time feedback to support student learning. Findings indicated that students reported higher satisfaction with AdLeS® and identified several features useful for learning. Faculty perceived positive effects on student learning and more efficient use of teaching time for student-centred practices. Both students and faculty also identified challenges and limitations associated with adaptive learning. This paper highlights three key implications for adaptive learning implementation: the importance of pedagogically driven design principles, the need for iterative and supported delivery and implementation processes, and the central role of faculty professional development support.*

Keywords: adaptive learning, adaptive course design, faculty and student perspectives, higher education, adult learners

1. Introduction

Adaptive learning has gained increasing attention in higher education in recent years, driven in part by advances in artificial intelligence (AI) and the rapid digital transformation accelerated by the COVID-19 pandemic. As online and hybrid learning expanded, institutes of higher learning (IHLs) faced persistent challenges of learner diversity, engagement and scalability, which increased interest in technology-enabled approaches that can better support personalised learning. Adaptive learning systems use learning analytics and personalisation techniques to adjust content, pacing and feedback to address diverse learner needs (Tyton Partners, 2016). This approach is particularly relevant for IHLs serving growing populations of adult learners, who often demonstrate diversity in prior knowledge, learning goals and external commitments (Chong et al., 2015). Despite this promise, gaps remain in literature. Prior research on adaptive learning has often focused on student academic performance, with fewer studies examining implementation over time. In addition, while student perceptions have received some attention, faculty perspectives remain comparatively under-explored (du Plooy et al., 2024; Martin et al., 2020. Student perspectives are critical, as perceptions of usability, usefulness and challenges influence satisfaction and engagement (Lim et al., 2022), while faculty perspectives shape adaptive course design, interpretation of learning analytics and instructional decisions (Simon & Zeng, 2024). Examining adaptive learning through both student and faculty lenses therefore provides essential insights into its pedagogical value and sustainability in higher education and adult learning contexts. To address this gap, this study examines a three-year implementation of adaptive learning in a higher education adult learning context. The study addresses the following research questions:

RQ1: How do students perceive adaptive learning in terms of satisfaction, usefulness and challenges?

RQ2: How do faculty perceive adaptive learning in terms of course design process, usefulness and challenges?

RQ3: What changes are observed in adaptive learning completion rates over time?

2. Adaptive Learning System (AdLeS®)

The Adaptive Learning System (AdLeS®) used in this study is developed in-house for students at the university to support a diverse adult learner population. AdLeS® personalises learning pathways by integrating four key adaptive elements: adaptive diagnostic, content, sequence and assessment. The system also incorporates four learning models (i.e., Bridging, Flipped Learning, Revision and Summative Assessment), selected based on course requirements and pedagogical considerations. Personalisation is driven by psychometrically robust Rasch measurement model and machine learning techniques such as collaborative filtering to adapt content and assessment based on students' demonstrated understanding. AdLeS® also generates learning analytics and reports based on Zone of Proximal Development (ZPD) (Vygotsky, 1978), providing both students and faculty with insights into learning progress. Faculty are supported through targeted professional development workshops related to adaptive learning.

3. Methods

This study examined the implementation of AdLeS® in three undergraduate courses between 2023 and 2025. The sample comprised 2,547 undergraduate students who were predominantly adult learners, and 15 faculty members involved in adaptive learning implementation. A mixed-methods approach integrated three data sources: AdLeS® completion data, student questionnaire responses collected through the Learner Satisfaction Questionnaire (Lim et al., 2022), and student and faculty focus group interviews. Completion data were used to examine progress patterns over time, questionnaire data captured student perceptions and satisfaction and focus group interviews provided in-depth insights into implementation experiences. Student focus group participants (n=15) were recruited through stratified purposive sampling based on course results to represent high-, average-, and low-progress groups. Questionnaire data were analysed using descriptive statistics (percentages), while the focus group data were analysed thematically using an inductive approach (Creswell, 2022). Coding procedures, consistency checks and an audit trail were used in the analysis of the focus group data. Findings from the completion rate, questionnaire and focus group were compared and integrated at the interpretation stage to develop a fuller understanding of the results.

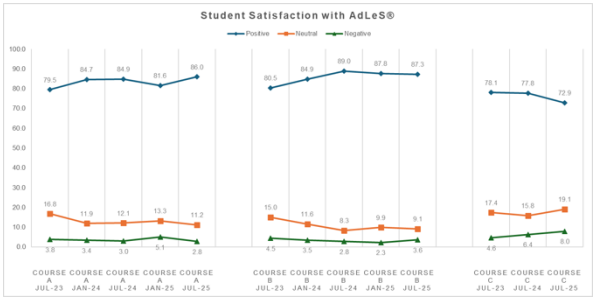
4. Results

4.1. Student Perspectives on Adaptive Learning

As shown in Figure 1, across the three years of implementation period, students reported generally positive and high levels of satisfaction with AdLeS® for all the three courses in terms of its usability, content quality and learning support functions. Students perceived AdLeS® as easy to use and operationally stable, allowing them to navigate the platform and locate the required learning materials efficiently. The content provided was perceived as sufficient and useful, with focus

Figure 1

Student Satisfaction with AdLeS®



group participants indicating that it aligned well with their learning needs. Students also valued the system's support for self-directed learning and personalised learning, including the flexibility to control their learning pace, its scaffolding structure that provided hints and feedback, the presentation of manageable learning concepts, adaptive pathways and the ZPD reports that highlighted areas for improvement.

In the focus group interviews, students identified several challenges, including difficulty interpreting dashboard reports and delays in receiving reports due to the time required for the ZPD analysis. They also noted limited use of

visuals and multimedia, as well as system functionality constraints, such as restriction on downloading learning materials or using copy-and-paste functions, which were intentionally restricted by AdLeS® design.

4.2. Faculty Perspectives on Adaptive Learning

Faculty reported generally positive perceptions of adaptive learning, particularly with respect to the adaptive course design process and its pedagogical value. They described the design process as purposeful, supported by curriculum mapping aligned with course learning outcomes and the intentional design of learning materials and assessment questions to scaffold student learning. They also valued feedback on the quality of items they developed. Faculty perceived positive impact on student learning and noted that adaptive learning enabled more efficient allocation of their teaching time towards student-centred practices. At the same time, they identified several challenges and limitations. Developing high quality adaptive items and feedback was time intensive. They also reported difficulties in interpreting learning analytics and managing student expectations. These challenges diminished over time as they gained experience with adaptive learning. Thus, professional development was viewed as essential, with faculty emphasising the need for ongoing support.

4.3. Overall Student Completion Rate

Across the three courses, adaptive learning activities contributed 15% or less to the course grade and were used mainly for concept bridging (i.e., Bridging Learning Model), preparatory learning prior to class sessions (i.e., Flipped Learning Model) and the consolidation of previously learnt concepts (i.e., Revision Learning Model). Table 1 shows that completion rates were moderate in the initial year, with some students engaging selectively with adaptive learning activities and others failing to achieve mastery, resulting in incomplete tasks. Completion rates increased across all three courses in subsequent years, with a slight 1% decline in the January 2025 semester for Courses A and B. The overall upward trend likely reflects multiple influences, including increased grade weighting, refinements in adaptive course design and platform features, improved faculty understanding of adaptive learning, and the use of reminder nudges.

Table 1.

AdLeS® Completion Rate for Courses A, B and C.

Course	Adaptive Learning Model	Weighted Percentage of AdLeS® (%)	AdLeS® Completion Rate (%)				
			Jul 23	Jan 24	Jul 24	Jan 25	Jul 25
Course A*	Revision	5-10	66.9	73.0	78.7	77.7	82.6
Course B**	Flipped Learning	5-15	46.5	52.6	62.8	61.4	69.7
Course C	Bridging	10	78.9	NA	89.2	NA	96.9

**5% in 2023 and 10% from 2024 onwards; **5% in 2023, 10% in January 2024 and 15% from July 2024 onwards*

5. Discussion and Conclusion

5.1. Pedagogical Design Principles for Adaptive Learning

The findings suggest that the value of adaptive learning depends on its pedagogical design; however, the observed increases in completion rates and satisfaction may also reflect confounding factors, particularly increased grade weighting, rather than pedagogical effectiveness of the system alone. Against this backdrop, students and faculty still identified several pedagogical design features as useful. Alignment with course learning outcomes, content granularity, adaptive pathways and assessment tasks appeared to support coherent implementation. Initial diagnostic assessments helped direct students to suitable content, while smaller, conceptually coherent topics, immediate hints and ZPD reports were perceived as helpful in guiding learning and instructional decisions.

5.2. Iterative and Supported Delivery and Implementation of Adaptive Learning

The delivery and implementation of adaptive learning introduced both opportunities and challenges. Faculty reported that adaptive learning enabled more efficient use of synchronous teaching time for discussion, feedback and application, while promoting personalised and self-directed learning through structured scaffolding and adaptive mechanisms. However, effective implementation required careful orchestration and evolved over time through cycles of enactment,

reflection, and refinement, including having adaptive learning activities contribute to the course grade to enhance student engagement. As faculty gained more experience with adaptive learning, the initial challenges related to adaptive course design, interpretation of learning analytics, and management of student expectations diminished. These findings suggest that adaptive learning should be conceptualised as a developmental instructional process that benefits from flexibility, reflective practice and continuous improvement, rather than a one-time technological rollout.

5.3. Faculty Professional Development Support

This study emphasises the central role of faculty professional development in enabling meaningful use of adaptive learning technologies. Prior to the development of adaptive courses, the AdLeS® team worked closely with faculty to introduce the AdLeS® approach, review learning models and explain key steps in adaptive course design. The design process was streamlined with the use of AdLeS®-provided templates in which faculty developed a curriculum map aligned with course learning outcomes, learning materials and assessment tasks. Following course launch, ongoing support was provided to faculty through analysis of item quality and adaptive pathways for continuous course improvement, identification of areas of concern in student learning, and targeted professional development workshops focusing on adaptive learning. For students, they received assistance for technical issues, and they were provided with reports that highlighted their areas of strengths and weaknesses.

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