

*A Comparison of Online Learning Engagement Across Cultural Backgrounds:
A Study of Students at Two International Campuses Sharing the Same Curriculum*

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Abstract

The impact of cultural background on pharmacy students' engagement with online learning activities during remote learning and in the post-pandemic era remains unclear. In this study, we explored whether cultural differences affected students' engagement with online activities designed for active learning and skill development. We conducted a retrospective analysis of learning management system (LMS) engagement data for second-year pharmacy students at Monash University's Malaysia (MA) and Australia (Parkville PA) campuses. The study examined the LMS data from 2,810 students enrolled across eight semesters. The results from various student cohorts and different online learning activities such as readings, video clips, workshop scenarios, self-test quizzes, and preparatory materials were statistically compared using SigmaPlot® software. In the first year of pandemic remote learning, students at the PA campus showed significantly lower engagement with online resources compared to students at the MA campus. In PA however, international students indicated they were more engaged and satisfied with remote online learning resources than local students. The cultural emphasis on academic achievement, adherence to societal norms, and fulfilling responsibilities as signs of respect and commitment are likely to contribute to higher motivation and engagement with learning resources among these students. Online resources with multimodal approach that combine readings with pictures, videos and self-test quizzes enhance engagement in both campuses, compared with pre-recorded lectures or workbooks alone. Educational institutions should use multimodal online resources and tailor engagement strategies to align with students' cultural values and circumstances to enhance engagement.

Keywords: Cultural Differences, Online Learning, Pharmacy

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Introduction

Cultural factors such as interdependence, independence, self-reliance and attitudes towards technology can significantly impact how students perceive and engage with online learning (Katzman & Stanton, 2020). Additionally, the online learning environment, including access to educators, student connectedness, technology and online resources plays an important role in student engagement (Vo & Ho, 2024). Students who had reliable internet access, quiet study spaces, and supportive teachers were more likely to stay engaged. Self-regulated learning (SRL) is thought to be crucial in remote online learning, helping students take control of their education through goal setting, self-monitoring, and self-reflection. SRL promotes effective time management and adaptability to the online environment, leading to better academic outcomes and increased engagement in remote learning contexts (Broadbent & Poon, 2015).

Understanding the factors that influence student engagement with learning activities and resources is essential for designing effective learning environments that address diverse student needs and enhance academic outcomes. The shift to online education during the COVID-19 pandemic highlighted the importance of adaptable and student-centred teaching strategies, yet the long-term impact of this transition on student engagement remains unclear. As blended learning models become the new norm in the post-pandemic era, it is crucial to assess whether online learning engagement has evolved and how it compares across international contexts. This study explores student engagement with online learning activities between 2020 and 2023, focusing on two international campuses in Australia and Malaysia. Findings from this study can inform future pedagogical approaches, ensuring they remain effective, inclusive, and responsive to changing learning preferences (Martin & Bolliger, 2018). The comparison across campuses offers insights into cultural and contextual factors influencing student interaction with online resources (Sato et al., 2022), contributing to a global understanding of effective blended learning design.

Method

We conducted a retrospective analysis of learning management system (LMS) Moodle engagement data for second-year pharmacy students at Monash University's Malaysia (MA) and Australia Parkville (PA) campuses. The study examined the LMS data from 2,810 students enrolled across eight semesters from 2020-2023. The results from various student cohorts and different online learning activities such as readings, video clips, workshop scenarios, self-test quizzes, and preparatory materials were statistically compared using SigmaPlot® software.

Results and Discussions

In the first year of remote online learning, we found that 'Discovery book' engagement was significantly lower in PA campus compared with MA campus in both teaching semesters (Figure 1). Discovery book contains readings, video clips and self-test quizzes related to pathophysiology and pharmacotherapeutic and non-pharmacological (including lifestyle) management options of dermatological conditions, pain and wound care in semester 1 and cardiovascular diseases (e.g. hypertension, dyslipidaemia) in semester 2. Similarly, MA students' engagement with lecture recordings (Figure 2) was significantly higher in the first year of remote online learning. These findings indicated that Malaysian students adapted to and accepted remote online learning quicker than their Australian counterparts. This may

reflect different cultural and educational expectations, as Malaysian students might place greater value on reviewing readings and recorded content for theoretical understanding and flexible learning opportunities. In contrast, Australian students may prioritise in-person engagement and face-to-face interactions as central to their learning experience. These variations could stem from differing educational practices, with Malaysian systems often emphasising structured, resource-based learning, while Australian education systems encourage interactive and discussion-based approaches. Understanding these cultural and pedagogical distinctions is essential for designing inclusive and effective learning strategies in international and blended learning contexts (Markey et al., 2023). Nevertheless, no differences in engagement with online discovery book were observed in subsequent years, suggesting that the shift to online learning during the pandemic has become normalised, and students now accept and expect online resources to be an integral part of their learning experience.

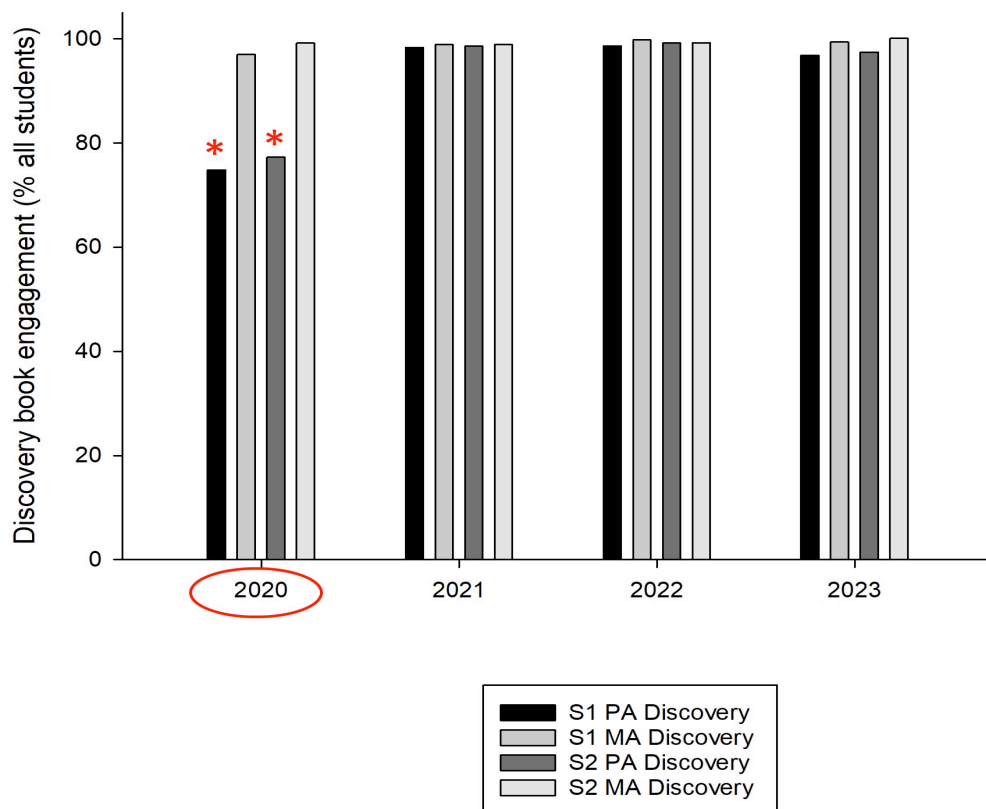


Figure 1: Pharmacy Students (Pa=Australia Campus, Ma=Malaysia Campus) Engagement With Online Discovery Books. Asterisk (*) indicates $P < 0.05$

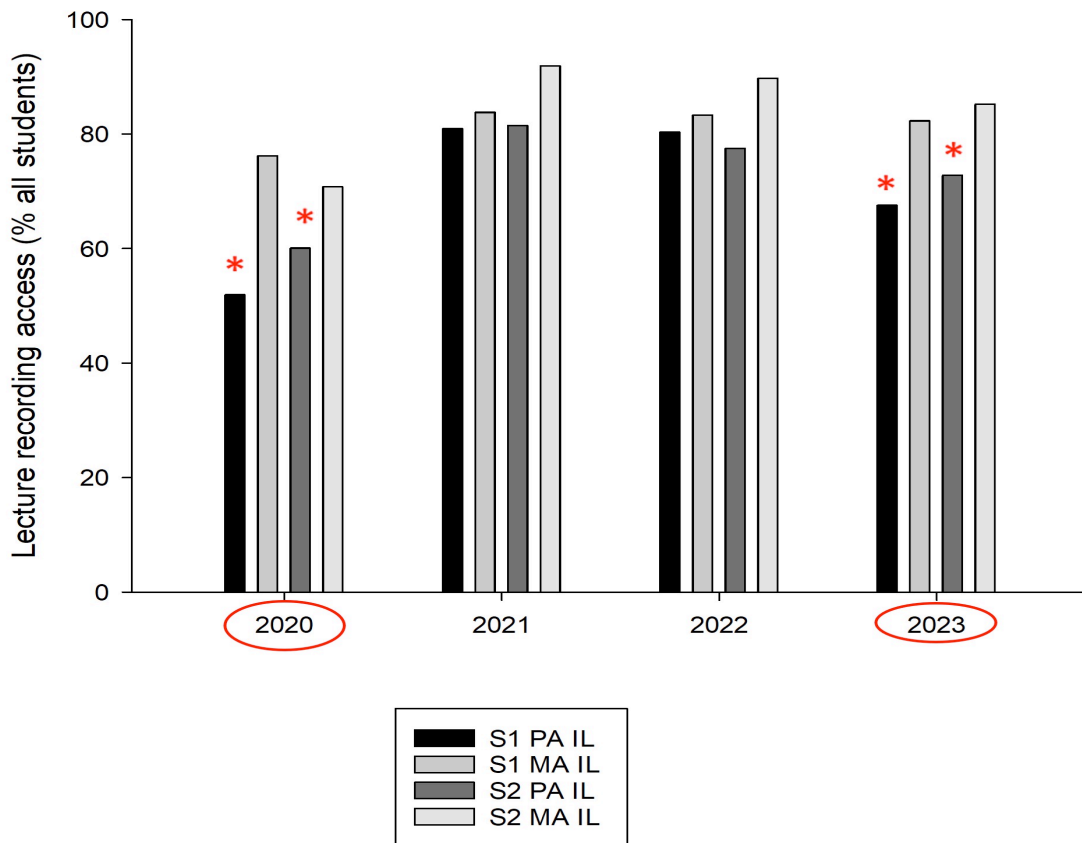


Figure 2: Pharmacy Students (Pa=Australia Campus, Ma=Malaysia Campus) Engagement With Interactive Lecture Recordings. Asterisk (*) indicates $P < 0.05$

Interestingly, following the resumption of on-campus classes in 2023, review of lecture recordings declined among students in the PA campus (Figure 2) but that remained consistent in the MA campus. This observation highlights potential differences in learning preferences between the two campuses. PA students may favour interactive learning environments, reflecting a preference for collaborative and experiential learning that aligns with Western educational paradigms. On the contrary, MA students may continue to value recorded content for its flexibility and utility in reinforcing theoretical concepts. This attitude aligns with educational practices common in Asian contexts that emphasise resource-based and self-paced study, further emphasising the role of cultural and systemic factors in shaping learning behaviour. Understanding these dynamics is critical for tailoring educational resources and support to meet the diverse needs of international student cohorts.

Between 2021 and 2023, we found that a higher percentage of students from both campuses engaged with discovery books that integrated text, images, animations, videos and quizzes, compared with traditional recorded lectures. The multimodal approach to presenting SRL materials leverages diverse learning modalities - visual, auditory and kinaesthetic, stimulates greater engagement, and enhances comprehension by catering to individual learning preferences. By combining interactive elements with accessible formats, discovery books can make complex concepts more digestible, fostering deeper engagement, understanding and retention. Additionally, integrating multimedia elements has been shown to improve cognitive load management and facilitate meaningful learning by bridging abstract concepts with tangible visuals (Mayer, 2009). Nevertheless, the effectiveness of such resources

compared to recorded lectures may depend on contextual factors, including the subject matter and students' prior familiarity with online learning tools. While recorded lectures are beneficial for revisiting detailed content, discovery books provide a more interactive and flexible learning experience, potentially addressing the varying needs of a diverse student cohort. Future research could explore how integrating these multimodal resources across disciplines impacts long-term learning outcomes and student satisfaction.

As part of the online learning module, self-test quizzes with instant feedback were embedded in discovery books to foster SRL and develop pharmacy professional skills such as problem-solving, critical thinking, and decision-making. The present study found that a significantly higher proportion of MA students engaged with online quizzes during the first year of the pandemic compared to PA students (Figure 3). While quiz usage increased across both campuses in subsequent years, MA students consistently demonstrated higher engagement. This suggests that MA students are more proactive in utilising available resources and valuing the flexibility to review materials at their own pace.

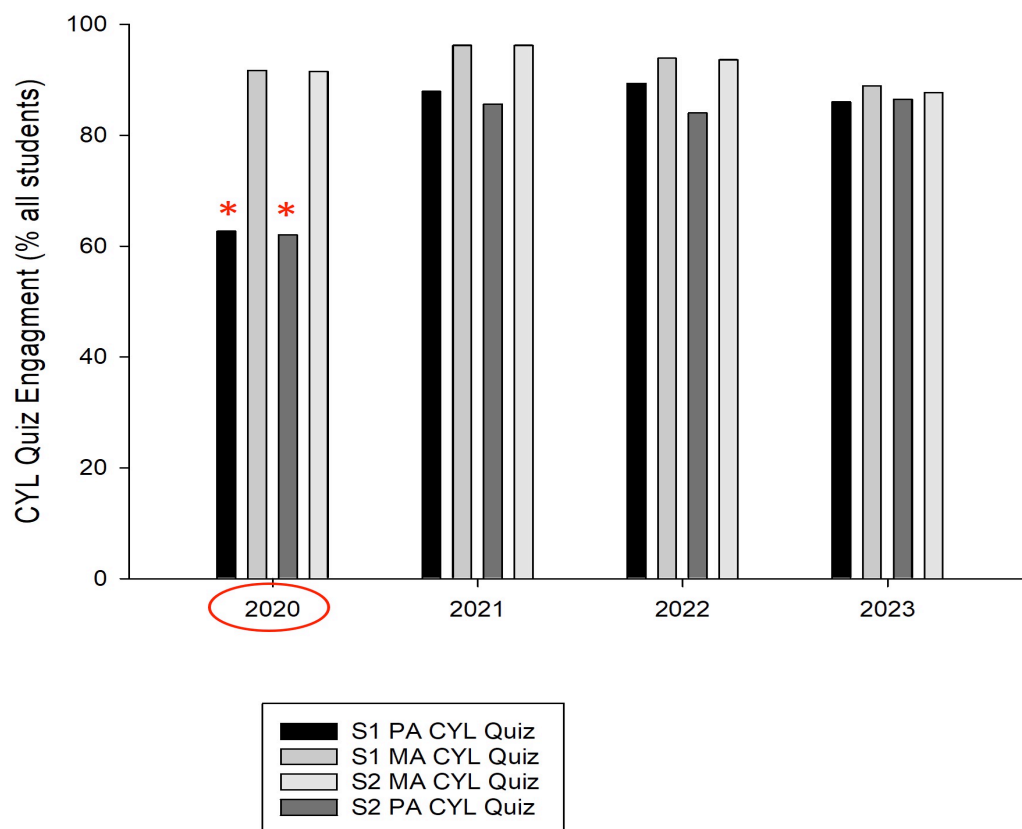


Figure 3: Pharmacy Students (Pa=Australia Campus, Ma=Malaysia Campus) Engagement With Check Your Learning (Cyl), Self-Test Quizzes. Asterisk (*) indicates P<0.05

Self-test quizzes with feedback are particularly beneficial as they provide immediate reinforcement of learning, help identify strengths and weaknesses and enable students to adjust their study strategies effectively. By promoting active recall, metacognitive skills, and personalised learning, such quizzes enhance knowledge retention and academic performance (Nicol & Macfarlane-Dick, 2006). In many Asian cultures where education is highly emphasised, students often strive to excel academically, which may explain MA students'

greater engagement with self-assessment tools (Van der Linden et al., 2021). These findings highlight the value of culturally adaptive learning resources to support diverse learner needs.

Online learning workshop books are provided for students to complete preparatory tasks before attending the small group problem- and scenario-based learning workshops (4-5 students per team), conducted virtually via zoom videoconferencing facility during the pandemic in 2020 and 2021, and in-person when on campus classes resumed in 2022 and 2023. Each pre-workshop book typically contains a clinical case scenario with patient information including current medication list, medical conditions, pathology results and lifestyle considerations for students to identify and solve medication-related problems, e.g. side effects, interactions, contraindications, and adherence issues. During workshops, students worked with team members to solve these problems and propose an individualised care plan including pharmacological and non-pharmacological management options, e.g. smoking cessation, healthy eating, exercise, etc. We found that online workshop workbooks with knowledge-based questions and quizzes engaged more students (>90%) compared with those without (<70%) for both PA and MA cohorts. This indicates the need for assessment-related components to be incorporated in online learning resources to foster students' accountability for effective participation in team tasks.

Conclusion

The findings of our study highlight the importance of tailoring educational strategies to meet the diverse needs of both local and international students in online learning environments. Enhancing engagement may require integrating more interactive elements such as live discussions, collaborative projects, and peer-to-peer learning opportunities as these approaches can foster a sense of connection and active participation, addressing potential preferences for in-person engagement. In contrast, the preference for recorded lectures and asynchronous learning formats among many Asian international students underscores the value of flexibility and accessibility in course design. These students may benefit from didactic components, such as structured content delivery, which can be reviewed multiple times at their own pace to reinforce understanding and mastery of theoretical knowledge. Institutions should prioritise the development of blended learning models that offer both synchronous and asynchronous online learning and in-person classroom options to support the diverse learning needs of their student populations.

The main limitation of the study is the lack of qualitative data which can be referred to explain observations of the Moodle engagement data. Qualitative data include students' comments of their learning experience, e.g. the specific teaching and learning activity or approach which has worked well for them or needs improvement and the reason for change, as well as learning obstacles and expectations throughout the entire study period. These data may provide insights on the distinctive differences between PA and MA students in terms of their engagement on specific online learning activities, during the pandemic and post-pandemic. The information, will subsequently, guide educators in the design of student-centred learning content, taking into account factors such as cultural differences. This limitation is an area of future studies.

Future research should explore how cultural and contextual factors influence engagement with various learning tools and formats. Longitudinal studies could assess the impact of tailored strategies on academic performance, satisfaction, and retention rates across diverse cohorts. Research could also evaluate the role of emerging technologies, such as artificial

intelligence-driven adaptive learning platforms and feedback systems, in enhancing personalised learning experiences for global student populations.

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