

CHALLENGES AND OPPORTUNITIES USING MOBILE COMMUNICATION APPLICATIONS (MCAP) IN AN ONLINE LEARNING ENVIRONMENT

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Abstract: *The unprecedented pivot from traditional face-to-face instruction to digital learning environments in Malaysia, accelerated by global disruptions, has unveiled a constellation of structural, pedagogical, and technological barriers impeding the efficacy of online education. Anchored in the Unified Theory of Acceptance and Use of Technology (UTAUT), this study critically examines the multifaceted inhibitors to online learning adoption, with particular attention to performance expectancy, effort expectancy, facilitating conditions, social influence, trust, and learner satisfaction. Through a comprehensive synthesis of recent literature, findings reveal that Malaysian students grapple with uncertainty regarding the pedagogical effectiveness of digital platforms, compounded by insufficient digital literacy and limited fluency with complex technological tools. Systemic infrastructural inequities, particularly in rural and underserved regions, further marginalize student access, while inconsistent instructional engagement undermines the cultivation of a digitally cohesive learning culture. Additionally, pervasive apprehensions surrounding data privacy, cybersecurity, and academic integrity erode institutional trust, whereas persistent technical glitches detract from user satisfaction and learning continuity. Addressing these challenges necessitates a multi-layered and inclusive approach emphasizing the enhancement of digital competencies, the fortification of infrastructure, and the fostering of digitally resilient pedagogical ecosystems. This review offers timely insights into the dynamics shaping the online learning landscape in Malaysia and provides strategic considerations for educational policymakers, institutional leaders, and*

digital learning practitioners seeking to navigate the evolving contours of higher education in the digital age.

Keywords: *Digital Education, Online Learning, UTAUT, Higher Education, Barriers, Digital Literacy, Trust, Infrastructure, Malaysia*

Introduction

Technological changes are reshaping the mobile communication landscape for global education, especially in the post-pandemic era. In Malaysia, the implementation of online learning is increasingly widespread, resulting in a rapid shift from traditional teaching methods to the use of various digital learning platforms. Among the platforms that are increasingly popular among educators and students are Mobile Communication Applications (MCAP) such as Google Meet, Microsoft Teams, Zoom, Webex Meeting, Telegram, and WhatsApp. These platforms are frequently used and widely used, not only for general communication but also for learning purposes, because they are flexible and user-friendly and support teaching and learning (T&L) activities (Ministry of Education, 2023). However, the use of MCAP in online learning environments also has challenges, such as inconsistent usage practices, technology use, and concerns associated with privacy and security. At the same time, MCAP provides important opportunities to connect and implement two-way communication, increase student engagement, and accustom students to a more responsive learning environment. Therefore, it is an important aspect to study the functions and roles of MCAP to support online P&L more effectively and to identify strategic approaches that can help maximize the potential of this platform

Literature Review

Definition and Context of MCAP

Mobile Communication Applications (MCAP) are digital tools designed to facilitate real-time communication and information exchange via mobile devices. These platforms include widely adopted applications such as Google Meet, Microsoft Teams, Zoom, Webex Meeting, Telegram, and WhatsApp, which support a variety of features including instant messaging, voice and video calling, multimedia sharing, document sending, and group discussions. Their intuitive design and cross-platform compatibility make them highly accessible and user-friendly for a wide range of populations (Nasir et al., 2021).

The need in education, MCAP has emerged as an important communication tool, especially after the sudden shift from face-to-face learning to online learning during and after crises such as the COVID-19 pandemic. While traditional Learning Management Systems, such as Classroom, are designed for formal instructional delivery that offer structured learning modules, the advancement of MCAP online learning makes it a high-impact complement to learning, whether formal or informal, taking place flexibly via system or device. Online learning through MCAP allows for rapid updates, immediate feedback, and continuous engagement between instructors and students.

The flexible nature of MCAP enhances its use in learning pedagogy. On the other hand, its approach and ease of use have made it extremely useful and necessary to sustain teaching and learning activities that overcome resource constraints without boundaries, regardless of place and time. As such, MCAP is a platform that is recognized not only as a communication tool,

but as an important component in the wider online digital learning ecosystem that supports student interaction, motivation, and continuity of instruction.

Unlike more formal and structured Learning Management Systems (LMS), MCAP can be used both formally and informally. It has proven effective in ensuring continuity of communication in learning, especially after the COVID-19 pandemic situation (Khan, 2021)

Relevant Theoretical Frameworks

The use of MCAP can be analysed through several theoretical lenses, including:

- **Technology Acceptance Model (TAM)** by Davis, (1980, 1989), which emphasizes *perceived usefulness* and *perceived ease of use* as predictors of user acceptance of technology.
- **Unified Theory of Acceptance and Use of Technology (UTAUT)** by Venkatesh et al., (2012, 2016), which integrates four key constructs: *performance expectancy*, *effort expectancy*, *social influence*, and *facilitating conditions*.
- **Theory of transactional distance** by Moore, (1989, 1997) which outlines three key types of interaction in online learning: learner-content, learner-instructor, and learner-learner interaction.

Findings from Previous Studies

Previous studies have shown that Mobile Communication Applications (MCAP) hold significant potential in supporting various aspects of online learning. For instance, MCAP have been found to enhance student engagement by providing accessible and familiar spaces for interaction (Prasetya et al., 2023). They also encourage both self-directed and collaborative learning, allowing students to manage their learning pace while actively engaging in peer-to-peer exchanges (Okyere et al., 2023; Rouf et al., 2024). Additionally, these platforms facilitate real-time communication between students and instructors, thereby supporting immediate feedback and clarifying instructional content in a timely manner (Lee et al., 2023).

Despite these benefits, the literature also highlights several challenges associated with MCAP use. Among the most frequently cited issues are digital fatigue resulting from prolonged screen time, limited data access in low-connectivity areas, privacy concerns related to personal information and boundaries, and communication overload due to continuous notifications beyond formal academic hours (Salleh & Hamid, 2020). These challenges underscore the importance of developing strategies to manage the use of MCAP effectively within online learning environments.

Table 1: Findings from Previous Studies on the Use of Mobile Communication

Study & Year	Sample	Key Findings
(Lee et al., 2023) (Malaysia, private university)	244 students	Students rated WhatsApp highly in terms of usability and collaborative effectiveness. It contributed positively to academic performance but had limited group cohesion.
(Zainol & Mohd Samingin, 2022) (Perak, Form 4 students)	210 respondents	WhatsApp engagement showed a negative correlation with academic achievement; more usage was linked to lower performance.
(Hasbullah et al., 2022)	N/A	The use of Google Meet has had both positive and negative effects on student acceptance during the pandemic.
(Tang & Hew, 2022) (Global, quasi-experimental)	N/A	MCAP, such as WhatsApp, increased behavioural, cognitive, and emotional engagement compared to traditional asynchronous discussions.
(Roslan & Halim, 2021) (Mix Method study)	178 respondents (Questionnaire) 10 respondents (In Depth Interview)	Barrier in access, which is 22.5% student-owned devices, 21.9% did not have a device, and 11.2% did not receive mobile coverage to access WhatsApp, Telegram, and YouTube
(Musa & Abdillah, 2021)	80 respondents	The findings show that Google Meet is easy to use and can help Sultan Zainal Abidin Polytechnic students learn.

Applications (MCAP)

The following table summarizes selected quantitative findings from prior research studies that examine the impact and usage of Mobile Communication Applications (MCAP) in online learning environments. These studies highlight both the benefits and challenges associated with MCAP.

Methodology

This paper is structured as an analytical literature review focusing on current issues related to the use of Mobile Communication Applications (MCAP) in online learning. The study does not involve primary data collection but instead synthesizes and critically analyzes existing scholarly work to uncover prevailing trends, challenges, and opportunities. Sources for this review were selected from peer-reviewed journal articles, empirical research reports, policy documents, and academic publications published between 2020 and 2024. The materials were retrieved from reputable academic databases such as Scopus, ERIC, Google Scholar, and institutional repositories.

The analysis followed a thematic approach, where recurring themes related to the use, impact, and perception of MCAP in higher education settings were identified, categorized, and interpreted. The review particularly focuses on literature relevant to the Malaysian context, while also drawing comparative insights from international studies. Thematic elements were

categorized under two main domains: (i) challenges in MCAP implementation, and (ii) pedagogical opportunities offered by MCAP.

This methodology is suitable for offering a conceptual understanding and synthesis of the current state of research, enabling the formulation of strategic recommendations for educators, policymakers, and institutional leaders.

Findings and Discussion

Challenges in Using MCAP

The integration of Mobile Communication Applications (MCAP) in online learning, while beneficial in many respects, presents several practical and pedagogical challenges that limit their full potential:

Dependence on Devices and Internet Connectivity

Students in rural or underserved areas frequently face barriers related to unstable internet access and a lack of appropriate devices. This digital divide creates unequal learning experiences and hinders consistent participation in MCAP-based learning interactions (Unicef, 2023).

Digital Fatigue and Information Overload

Continuous notifications, fragmented discussions, and the simultaneous use of multiple platforms can lead to digital fatigue. Both instructors and students report feeling overwhelmed by excessive messages, many of which are unrelated to the course content, thus diluting focus and reducing motivation (OECD, 2020, 2024).

Privacy and Professional Boundaries

The use of personal mobile numbers for academic communication blurs the line between professional and private spaces. This raises concerns about data privacy, unregulated access, and the potential for inappropriate timing or tone in communication (OECD, 2020, 2024).

Lack of Formal Institutional Guidelines

In many educational institutions, the use of MCAP is ad hoc and informal, with little oversight or structured integration into pedagogical planning. The absence of clear policies leads to inconsistent practices, variable expectations, and potential misuse of the platform (Kowal, 2024).

Opportunities in Using MCAP

Despite the challenges, MCAP offer a range of opportunities that can enhance the quality and reach of online teaching and learning if used effectively:

Flexibility and Responsiveness

One of the most significant affordances of Mobile Communication Applications (MCAP) is their ability to facilitate immediate, asynchronous, and location-independent communication between instructors and learners. Unlike conventional classroom settings or even structured Learning Management Systems (LMS), MCAP allow users to engage in discussions, pose questions, and receive feedback at any time without being restricted by institutional timetables or geographical constraints. This high degree of flexibility is particularly beneficial for students who are balancing academic responsibilities with personal or professional commitments, as it enables learning to occur at a self-determined pace and time.

Moreover, the responsiveness facilitated by MCAP significantly enhances the learner's perception of being supported. When students can receive rapid clarification on concepts or instructions, they are more likely to remain engaged and confident in the learning process. This immediacy contributes to a stronger sense of instructor presence, which is a key factor in reducing transactional distance in online learning environments (Moore, 1989, 1997; Ustati et al., 2013; Zawacki-Richter & Jung, 2023). In turn, this perceived accessibility can foster a more trusting and interactive learning climate, encouraging students to take initiative in their studies and to participate more actively in academic discourse. In sum, the flexibility and responsiveness offered by MCAP not only accommodate diverse learner needs but also strengthen relational and cognitive dimensions of online learning, making the platforms a valuable supplement to more formal digital learning systems (Parsons, n.d.).

Improved Student Engagement

Mobile Communication Applications (MCAP) such as Google Meet, Microsoft Teams, Zoom, Webex Meeting, Telegram and WhatsApp have been shown to significantly enhance student engagement in online learning environments, particularly due to the informal and familiar nature of their interfaces. Unlike formal platforms such as Learning Management Systems (LMS), which may feel rigid or hierarchical, MCAP promotes a more relaxed and approachable communication space. This informality lowers the psychological barriers that often prevent students from actively participating in discussions or seeking clarification during synchronous online sessions (Otto & Kruikemeier, 2023; Rouf et al., 2024).

The familiarity of MCAP, already widely used in students' daily social lives, creates a seamless transition between social interaction and academic engagement. As a result, students are more likely to ask questions, voice opinions, and share relevant resources without the apprehension typically associated with formal academic settings. This active communication fosters a dynamic learning environment where ideas can be exchanged fluidly and inclusively.

Furthermore, the constant availability and real-time interaction offered by MCAP contribute to the development of a strong sense of classroom community. This sense of connectedness enhances social presence, which is a key element in the Community of Inquiry framework (Garrison, 2011). When students feel socially and emotionally connected to their peers and instructors, they are more likely to remain motivated, engaged, and committed to their learning goals. In essence, MCAP serves as catalysts for active and meaningful participation in online learning, supporting both cognitive engagement and socio-emotional well-being. Their role in creating accessible and inclusive spaces can be especially impactful in diverse and multicultural educational contexts, such as those found in Malaysian higher education institutions

Support for Collaborative Learning

Mobile Communication Applications (MCAP) provide a conducive environment for promoting collaborative learning, particularly through features such as group chats, file sharing, voice notes, and real-time feedback. These functionalities allow students to co-construct knowledge beyond the constraints of scheduled classroom sessions, enabling seamless collaboration on academic tasks such as assignments, projects, and group presentations (Eom, 2023; Md Yusof & Abdullah, 2025).

The accessibility and ease of use of platforms like Google Meet, Microsoft Teams, Zoom, Webex Meeting, Telegram and WhatsApp encourage students to engage in continuous dialogue, where they can brainstorm ideas, clarify instructions, and divide responsibilities among group members. This process cultivates essential teamwork competencies, including communication, negotiation, and coordination skills that are crucial not only in academic settings but also in professional environments.

Moreover, peer-to-peer learning is naturally reinforced in these digital collaborative spaces. Students often find it easier to learn from their peers who may explain concepts in relatable terms or offer practical tips based on shared learning experiences. Such peer support mechanisms enhance understanding, retention, and confidence among group members, particularly for those who may be hesitant to seek help directly from instructors. Importantly, the asynchronous nature of MCAP allows for flexible collaboration, accommodating diverse schedules and learning paces. Students can contribute to discussions at their convenience, fostering inclusivity for those with part-time jobs, family responsibilities, or limited access to stable internet during specific hours. This flexibility nurtures a more equitable learning experience while encouraging a sense of ownership and responsibility toward collective academic outcomes.

In summary, MCAP serves not only as communication tools but as dynamic collaborative platforms that support interactive, student-centered learning. Their capacity to facilitate cooperative engagement, foster mutual accountability, and build strong learning communities makes them a valuable addition to the digital learning ecosystem.

Cost-Effectiveness and High Accessibility

One of the significant advantages of Mobile Communication Applications (MCAP) lies in their accessibility, which can foster online student engagement even in resource-limited environments. Unlike conventional Learning Management Systems (LMS) that often require high-speed internet, larger storage capacity and high-spec devices, MCAP are generally lightweight applications that require minimal internet data and function effectively like a smartphone as a mobile communication device. This low barrier to entry is crucial in addressing the digital divide, especially in rural or economically disadvantaged areas where infrastructure and technology resources may be limited. By leveraging the tools, they use in their daily lives to make their lives easier by implementing Mobile Communication Applications platforms such as Google Meet, Microsoft Teams, Zoom, Webex Meeting, Telegram and WhatsApp, it can reduce the financial burden associated with online learning, and can also eliminate the need for additional software downloads, subscription fees or specialized hardware. Furthermore, MCAP are usually designed with a user-friendly interface that requires little or no formal training, thus reducing the learning and teaching burden for both students and instructors. Their ease of access anywhere and their rapid adoption reduce resistance to technological change and enable a smoother transition to a digital learning environment during periods of disruption, such as during and after the COVID-19 pandemic.

The combination of low cost, minimal technical requirements, and widespread usability makes MCAP an inclusive solution for maintaining educational continuity. This is particularly relevant in the Malaysian context, where income disparities and geographical constraints continue to affect access to formal digital learning platforms. By integrating MCAP strategically, institutions can democratize access to education and ensure that no

student is left behind due to technological limitations. The cost-effectiveness and high accessibility of MCAP position them as practical and equitable tools in the broader framework of digital education, particularly in supporting universal access to learning opportunities

Conclusion

Mobile Communication Applications (MCAP) have emerged as critical enablers of online teaching and learning, especially in contexts where flexibility, immediacy, and accessibility are essential. Their widespread use in Malaysia and comparable developing countries highlights their value in bridging communication gaps between educators and students-particularly during periods of educational disruption, such as the COVID-19 pandemic. Platforms like Google Meet, Microsoft Teams, Zoom, Webex Meeting, Telegram, and WhatsApp have enabled institutions to maintain learning continuity by offering real-time messaging, asynchronous discussions, and multimedia resource sharing. These features have proven effective in fostering ongoing interaction, reducing learner isolation, and maintaining a basic level of instructional presence in remote education settings.

Nevertheless, the integration of MCAP into formal educational practices presents several limitations. Persistent issues such as digital fatigue, inequitable access to devices and internet connectivity, blurred professional boundaries, and the lack of structured institutional policies pose substantial obstacles. Without deliberate planning and oversight, the use of these platforms' risks becoming unsystematic and unsustainable, potentially undermining the quality of the learning experience. Moreover, over-reliance on MCAP without pedagogical alignment can lead to inconsistent learning outcomes and learner disengagement.

Despite these concerns, the evidence indicates that MCAP, when embedded strategically within a digital education framework, holds considerable potential to enrich teaching and learning. When supported by clear guidelines, digital literacy training, and purposeful pedagogical design, MCAP can serve as effective supplements to Learning Management Systems (LMS), adding flexibility and immediacy to more structured digital learning environments. They also encourage inclusive practices by offering accessible avenues for students in underserved regions to participate in academic discourse.

This review, therefore, underscores the need for a more nuanced and intentional understanding of MCAP not merely as tools for communication but as integral components of a holistic digital pedagogy. Recognizing their strengths and addressing their limitations can enable institutions to harness their full potential in creating student-centered, engaging, and resilient online learning ecosystems.

Recommendations

Drawing from the thematic synthesis of recent literature, several strategic recommendations are proposed to optimize the use of Mobile Communication Applications (MCAP) in online learning environments:

Firstly, educational institutions should develop comprehensive institutional policies and guidelines that govern the use of MCAP for academic purposes. These policies should clearly delineate the scope, limitations, and ethical parameters for platform usage, including specifications on appropriate working hours, the nature of acceptable communication, and preferred platform choices aligned with institutional objectives.

Secondly, there is a need to enhance digital literacy and professional development among both lecturers and students. Targeted training should be provided to build competencies in digital communication etiquette, data privacy management, and the effective pedagogical use of mobile tools. Such initiatives can empower users to leverage the benefits of MCAP while minimizing risks of misuse, miscommunication, or digital fatigue.

Thirdly, it is recommended that institutions promote the separation of professional and personal communication channels. The use of institutional phone numbers designated professional accounts, or moderated communication groups can help preserve boundaries between academic and personal life. This separation not only safeguards user privacy but also upholds professionalism and prevents encroachment into personal time.

Fourth, MCAP should be strategically integrated with broader digital education frameworks, rather than used in isolation. Their use should complement existing Learning Management Systems (LMS) and be aligned with course planning, instructional design, and assessment strategies. A synergistic approach can foster student engagement while maintaining instructional coherence and pedagogical rigor.

Finally, the study recommends supporting further research and ongoing evaluation of MCAP usage in education. Longitudinal studies should be conducted to assess the sustained impact of MCAP on student learning outcomes, motivation, and satisfaction. Additionally, comparative research across disciplines and institutions can help identify context-sensitive best practices and inform scalable implementation models. Collectively, these recommendations emphasize the importance of intentionally integrating MCAP in higher education through policy-driven and pedagogically sound approaches, ensuring its responsible and effective use in the evolving digital learning landscape.

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