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Constraints of Platform-Based Learning Among Mobile-Only Students in Regional Higher Education Institutions: A Qualitative Study in the PG-PAUD Study Program

Agus Salim
Universitas PGRI Argopuro Jember, Indonesia
Email: mumunbantman@gmail.com

ABSTRACT

Platform-based digital learning has become commonplace in higher education; however, its implementation often fails to accommodate students who depend on low-end smartphones as their primary learning device (mobile-only learners). This study examines the challenges of platform-based learning experienced by mobile-only students in the PG-PAUD (*Pendidikan Guru Pendidikan Anak Usia Dini*; Early Childhood Teacher Education) program at Universitas PGRI Argopuro Jember, representing a regional higher education context. Using a descriptive qualitative design, the study involved ten purposively selected students. Data were gathered through semi-structured online interviews and light observation of Google Classroom, Moodle/SPADA, and Zoom usage over one semester and were analyzed thematically. The results identify four key challenges: (1) low-end device limitations (restricted RAM/storage, app crashes, and difficulty accessing large files), (2) high internet data demands, particularly during synchronous sessions, (3) unstable network connectivity, and (4) platform navigation that is not mobile-friendly. These barriers are not merely technical; they contribute to an adaptive-passive participation pattern that affects engagement, timely assignment submission, and learning comprehension. The study argues that platform-based learning challenges among *mobile-only* students reflect structural digital inequality, thereby requiring more inclusive digital instructional design (lightweight materials, calibrated asynchronous dominance, and file-size standards) alongside institutionally responsive policies.

Keywords: *digital learning; mobile-only learners; learning platforms; digital divide; regional higher education*

INTRODUCTION

Digital transformation encourages the widespread use of platform-based learning in higher education as an effort to increase flexibility and access to learning (Langseth et al., 2023; Radivojević, 2025; Sangwa et al., 2025; Sharma et al., 2022). Platforms such as Google Classroom, Moodle/SPADA, and Zoom are used for material distribution, academic communication, collaboration, and learning evaluation (Means & Neisler, 2021; Vargo et al., 2021). However, the effectiveness of digital learning is not always evenly distributed. Several studies show that the success of platform-based learning is highly dependent on the readiness of infrastructure, internet network quality, device capacity, and students' digital literacy. The implementation of digital learning that ignores user conditions has the potential to strengthen learning inequality in the form of the digital divide (van Deursen, 2018; Chen et al., 2020; Roberts & Hernandez, 2022).

Digital inequality is becoming increasingly evident in regional universities, where some students come from middle-to-lower socioeconomic backgrounds and live in areas with limited

network infrastructure (Burhan et al., 2025; Nahumury & Antony, 2022; Phetla & Toko, 2022). These conditions impact learning participation, the sustainability of online presence, and the quality of academic interactions (Rahmawati, 2020; Woldeab & Brothen, 2019). In this context, students in the *PG-PAUD* Study Program at PGRI Argopuro University, Jember, show characteristics as mobile-only learners—namely, students who rely on smartphones as their only learning device without the support of laptops or personal computers. The devices used are generally low-spec, with limited RAM, processor, and storage capacity. Full reliance on mobile devices has been shown to limit access to certain learning features, especially when platforms and materials are designed assuming the use of desktop devices (Madge et al., 2019; Gonzales, 2022).

Some learning management systems (LMSs) and online conferencing platforms are still oriented toward the use of laptops or computers, so the interface and navigation are not optimal when accessed through low-spec smartphones. These usability barriers can trigger navigation difficulties, failure to access materials, and a decrease in the quality of learning interactions (Hernández et al., 2020; Bayne, 2015).

Limited devices and internet access also encourage mobile-only students to develop adaptive learning strategies, such as turning off the camera, limiting discussion participation, or avoiding features that drain quota and memory. This strategy has the potential to shift the pattern of learning participation from active to adaptive-passive and affect the quality of the learning experience (Means & Neisler, 2021).

Although many studies have been conducted on online learning and digital inequality, research that specifically examines the constraints of platform-based learning among mobile-only students in regional higher education institutions: a qualitative study in the PG-PAUD study program is still limited. In fact, prospective PAUD teachers need to gain an inclusive digital learning experience as part of strengthening their future pedagogical competence. Therefore, this study aims to identify and analyze the platform-based learning obstacles experienced by mobile-only students in regional universities and examine their implications for engagement and learning quality.

The contribution of this research lies in the interpretation of mobile-only conditions as a form of digital inequality that impacts student learning participation patterns. By combining synchronous and asynchronous cross-context interview and observation data, this study offers implications for a more inclusive platform-based learning design for lecturers and institutions in regional universities, especially for users of low-end devices.

METHOD

Using a descriptive qualitative design, the study involved ten purposively selected students, data were gathered through semi-structured online interviews and light observation of Google Classroom, Moodle/SPADA, and Zoom usage over one semester and were analyzed thematically.

RESULTS AND DISCUSSION

Summary of Themes Constraints and Their Impacts

Table 1. Themes of Constraints and Their Impact on Learning Participation Mobile-Only Students

Theme Constraints	Typical Indicators/Events	Impact on Learning	Examples of Evidence (citations/observations)
Low-end devices	Apps often close auto-closes, unable to open large documents, full memory when uploading	Falling behind in sync sessions, delays in collecting assignments, barriers to accessing materials	"If the online meeting is too long, the application often closes itself and has to be re-entered." (M2)
High quota load	Quick quota depletion on video conferencing, buffering during material playback	Cameras off, in and out of class, limited discussion participation	"I turn off the camera more often so that the quota doesn't run out quickly." (M5)
Unstable network	Signal loss, sound dropped, failed download/upload	Attendance is discontinuous, academic communication is hampered	Observation: failure to upload assignments in Moodle occurs repeatedly at certain hours
Navigation platform is less mobile-friendly	Excessive scrolling, small menus, unresponsive features	Swollen learning time, frustration, decreased motivation	"Searching for tasks on the platform via cellphone is quite confusing because the menu is small." (M8)

Table 1 summarizes the four main themes of platform-based learning constraints experienced by mobile-only students, along with their impact on participation and quality of learning experience. The findings in this table are the basis for analysis in the next subsection. Empirical evidence was obtained from interviews and observations during the research process.

Limitations of Low-End Devices

The results show that most students use smartphones with a RAM capacity of 2–3 GB as the main learning device. The limitations of this specification cause online conferencing applications to often close automatically (force close), difficulty opening large documents, and obstacles in the task upload process. This condition makes it difficult for students to follow synchronous learning optimally and increases the risk of falling behind material. These findings are in line with Madge et al. (2019) and Sriwahyuningsih (2021) who assert that low-end devices limit access to digital learning features and encourage patterns of learning participation that tend to be defensive.

Internet Quota Burden

The use of video conferencing, especially Zoom, requires relatively high internet quota consumption, making it a financial burden for students. In response, students choose to turn off the camera, go in and out of class, or not participate in a full synchronous session. This strategy reflects a form of adaptation to the structural pressures of internet access. These findings are consistent with Putri (2021) and Means and Neisler (2021) who show that quota load contributes to low synchronous participation and decreases the quality of interaction and learning engagement.

Network Instability

Students who live in rural areas face internet network instability which has an impact on delays in accessing materials, failure to download and upload assignments, and obstacles to academic communication. Connectivity disruptions also affect continuity of attendance and participation in online learning. These results corroborate the findings of Rahmawati (2020) and Woldeab and Brothen (2019) that limited network infrastructure is a major obstacle to digital learning in non-urban areas and contributes to learning experience gaps.

Platform Navigation on Mobile Devices

The suboptimal interface of the learning platform when accessed through low-spec smartphones is another significant obstacle. Limited screen sizes, excessive scrolling needs, and failure to open multimedia files make it difficult for students to navigate academic features. This usability barrier extends task time, decreases comfort, and impacts learning motivation. The findings are in line with Hernández et al. (2020) and Bayne (2015) who stated that desktop-oriented LMSs tend to be less user-friendly to mobile device users.

Synthesis of Findings and Discussion

Overall, the constraints of platform-based learning in mobile-only students are not only technical, but form an adaptive-passive pattern of learning participation, in which students adjust through survival strategies instead of active participation. This pattern has an impact on learning engagement, accuracy of assignment collection, and material comprehension. The research findings show that inequality does not stop at device access, but continues on the quality of learning experiences and participation outcomes. This reinforces the conceptualization of the digital divide as an access–skills–outcomes gap (van Deursen, 2018; Roberts & Hernandez, 2022). Therefore, improvement efforts do not stop at the provision of platforms, but need to be directed towards more inclusive learning design standards, such as file-size governance, measurable asynchronous dominance, and the application of mobile-first principles in the design of materials and assignments.

The results of this study confirm that the digital divide in the context of higher education is not solely related to differences in access to devices and internet connectivity, but also includes inequality in the quality of learning experience and student learning outcomes. Students who rely entirely on mobile devices are in a relatively vulnerable position as most digital learning platforms and designs are still being developed assuming the use of desktop devices. Therefore, digital learning needs to be understood as a pedagogical practice that is influenced by the user's technological context, so that it cannot be considered neutral from the condition of the device owned by students. These findings expand the meaning of the digital divide as a pedagogical and institutional issue, not just a technical one.

From the practical side, this study shows the importance of developing digital learning designs that are more adaptive to the limitations of low-spec smartphones. Educators are advised to suppress the dominance of videoconferencing-based synchronous learning and strengthen asynchronous learning strategies through the provision of lightweight, flexible formats, and easily accessible materials via mobile devices. In addition, higher education institutions need to formulate digital learning policies that take into account the reality of mobile-only students, such as setting learning file size limits, setting the duration and intensity of synchronous sessions, and providing internet access support and supporting facilities. This

approach is expected to increase student involvement and improve the quality of the learning experience at regional universities.

CONCLUSION

This study confirms that mobile-only students in the PG-PAUD Study Program at regional universities face structural platform-based learning obstacles, including low-spec smartphone limitations, high internet quota demands, network instability, and platforms not fully optimized for mobile users. These issues lead to reduced student engagement, delayed assignments, limited material comprehension, and an adaptive-passive participation pattern. To promote inclusivity, digital learning should adopt mobile-first principles, emphasize asynchronous formats, manage material sizes realistically, and implement responsive institutional policies addressing digital inequalities. For future research, longitudinal studies could evaluate the long-term effects of these inclusive interventions on mobile-only students' academic performance and pedagogical competence in teacher training programs.

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