

A Study on Causes and Strategies for Reducing Problems in the Use of Computer Equipment in Hybrid Classrooms at the Faculty of Management Science, Suan Sunandha Rajabhat University

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Abstract

This study investigates the causes of problems in the use of computer equipment in hybrid classrooms and explores strategies to reduce these issues at the Faculty of Management Science, Suan Sunandha Rajabhat University. A mixed-methods research design was employed, combining quantitative data from 200 students and 20 instructors via structured questionnaires with qualitative data from semi-structured interviews. Descriptive statistics, t-tests, and ANOVA were used to analyze quantitative data, while thematic analysis was applied to qualitative responses. The findings revealed that the primary problems stemmed from network connectivity issues, hardware malfunctions, software errors, limited digital literacy, and insufficient technical support. Causes of these problems were identified as outdated equipment, user inexperience, and inadequate institutional support. Respondents recommended strategies such as upgrading hardware and network infrastructure, providing targeted digital literacy training for students and instructors, strengthening technical support, and implementing regular maintenance protocols. The study concludes that a holistic approach addressing technological, user, and institutional factors is essential to enhance hybrid learning effectiveness and promote a smoother teaching and learning experience.

Keywords: Hybrid classrooms, Technical problems, Digital literacy, Higher education, Problem-solving strategies

1. Introduction

1.1 Principles and Rationale

The rapid integration of digital technology into higher education has transformed the teaching and learning environment, particularly through hybrid classrooms that combine face-to-face instruction with online learning. Hybrid learning offers flexibility, accessibility, and opportunities for interactive engagement, which are critical in modern educational contexts (Garrison & Vaughan, 2008). However, the effective implementation of hybrid classrooms relies heavily on the availability and proper functioning of computer equipment, including computers, projectors, and network systems (Al-Qahtani & Higgins, 2013).

Despite the advantages, numerous challenges arise from the use of computer equipment in hybrid learning environments. Technical problems such as software malfunctions, connectivity issues, and hardware failures can significantly disrupt the learning process and reduce teaching

efficiency (Sun & Chen, 2016). In addition, inadequate technical support, limited user training, and insufficient maintenance practices exacerbate these problems, leading to student frustration and reduced satisfaction with the learning experience (Bond, 2020).

At the Faculty of Management Science, Suan Sunandha Rajabhat University, hybrid classrooms have become increasingly common, reflecting the global trend toward blended learning models in higher education (Boelens et al., 2017). However, anecdotal evidence and preliminary observations suggest that students and instructors often encounter technical difficulties when using computer equipment, which can impede learning outcomes and classroom management (Detanant & Chanwichian, 2025). Understanding the root causes of these problems and identifying effective strategies to reduce them is essential for enhancing the quality of education and promoting a positive learning experience.

This study aims to investigate the causes of problems in the use of computer equipment in hybrid classrooms at the Faculty of Management Science, Suan Sunandha Rajabhat University, and to propose strategies for mitigating these issues. By exploring the perspectives of both students and instructors, the research seeks to provide actionable insights for improving technical support, equipment management, and teaching practices, thereby contributing to the overall effectiveness of hybrid learning in higher education.

1.2 Research Objective

Specifically, the study aims to achieve the following objectives:

1. To identify the common technical problems experienced by students and instructors when using computer equipment in hybrid classrooms.
2. To examine the underlying causes of these problems, including equipment management, technical support, and user preparedness.
3. To propose practical strategies for reducing problems associated with the use of computer equipment in hybrid classrooms.

2. Literature Review

2.1 The Nature of Hybrid/Blended Learning

Hybrid (or blended) learning is a pedagogical model that integrates face-to-face instruction and online learning to create a more flexible and adaptive educational environment. In higher education, hybrid learning often leverages learning management systems (LMS), video conferencing, and other digital tools to support synchronous and asynchronous interactions (Symchych, 2025). According to foundational definitions, blended learning involves the strategic combination of in-person and online modalities to leverage the strengths of both worlds. In the Thai context, hybrid learning has been adopted widely, especially as a response to COVID-19 and as a model to support “new normal” teaching. Moreover, the management of hybrid education requires rethinking educator roles, as instructors balance in-class facilitation with online facilitation (Journal of Modern Learning Development, 2022).

2.2 Technical Challenges in Hybrid Classrooms

A central theme in the literature is technological integration, which is critical to the success of hybrid classrooms but also a source of major challenges. A systematic review by Gudoniene et al. (2025) found that technological problems—such as unreliable internet, hardware

malfunctions, and software glitches—are pervasive in hybrid higher-education settings, disrupting both student learning and teacher delivery. Institutional capacity is another frequent issue. Ghofrani (2025) reports that support systems in universities often lack technical and academic readiness. In particular, academic staff may not have sufficient training or incentive to use blended systems, and many institutions suffer from unstable or inadequate technical infrastructure, including outdated hardware or insufficient devices. From the perspective of students and teachers, barrier studies show that connectivity, insufficient or outdated equipment, and lack of administrative and technical infrastructure significantly hinder effective blended learning (Sareen & Mandal, 2024). A similar barrier analysis in a Vietnamese university using Activity Theory revealed tensions among students, faculty, and institutional support, particularly around infrastructure, tool usability, and unclear policy (Nguyen, 2024).

2.3 Digital Literacy and User Preparedness

User readiness particularly in terms of digital literacy—is another frequently cited challenge. In a survey of hybrid-learning students in Thailand, Sanpanich (2021) found that students' computer literacy strongly influences their attitudes toward hybrid learning; those with lower technical competency reported greater difficulty navigating technological tools. This aligns with prior literature indicating that limited IT skills can hinder interaction with online platforms, reducing engagement and increasing frustration. Moreover, knowledge construction in blended learning is not just about access to technology but also about how learners internalize and use technology meaningfully. Without adequate scaffolding, students may struggle to self-regulate their use of digital tools or make optimal use of available hardware.

2.4 Institutional and Organizational Barriers

Beyond the technical and user-level issues, organizational barriers are critical. Ali (2024) documented how university instructors face institutional challenges when implementing blended learning: insufficient administrative support, ambiguous policies, lack of incentives, and workload increases all make it difficult to sustain technology-enhanced teaching. Bhuiyan, Molla, and Alam (2021) in their work on technical-education institutions similarly note a lack of structural support, vision misalignment, and minimal stakeholder readiness as significant obstacles to blended-learning innovation.

2.5 Strategies for Addressing Technical Problems

Given these challenges, researchers have proposed several strategies to mitigate technological issues in hybrid classrooms. Improved Technical Support and Infrastructure: Ghofrani (2025) argues for strengthening both technical and academic support systems: ensuring that support teams are well-staffed, properly trained, and empowered to maintain hardware and software, and providing clear policies for blended learning implementation. Enhancing Digital Literacy for Students: Interventions should include student training workshops, orientation sessions, and scaffolded learning to help students build their digital skills (Sanpanich, 2021).

The preceding literature underscores several recurring themes: the centrality of technological infrastructure, the importance of user digital literacy, the necessity for institutional support, and the value of pedagogical design in hybrid learning. For a study focused on the Faculty of Management Science at Suan Sunandha Rajabhat University, these insights suggest that problems with computer equipment are not merely technical, but also

organizational and pedagogical. Identifying which of these dimensions most significantly contributes to equipment-related issues in hybrid classrooms and proposing practical strategies informed by empirical and theoretical work will help the faculty improve both its infrastructure and its educational design.

3. Research Methodology

This study employs a mixed-methods research design, integrating both quantitative and qualitative approaches to provide a comprehensive understanding of the causes of problems and strategies for reducing issues in the use of computer equipment in hybrid classrooms. Mixed-methods research allows the collection of numerical data on the prevalence and severity of technical problems while also capturing in-depth insights from participants regarding their experiences and suggestions for improvement.

3.1 Population and Sample

The population for this study comprises students and instructors in hybrid classrooms at the Faculty of Management Science, Suan Sunandha Rajabhat University. The sample will be selected using stratified random sampling to ensure proportional representation from different programs and academic years for students, as well as departments for instructors. The expected sample size is approximately 200 students and 20 instructors, which is sufficient to provide statistically reliable quantitative data while also allowing meaningful qualitative insights.

3.2 Data Collection Methods

Quantitative Data: A structured questionnaire will be used to collect quantitative data from students and instructors regarding the frequency, type, and severity of problems related to computer equipment in hybrid classrooms. The questionnaire will be designed using a five-point Likert scale, to measure perceptions of technical problems, equipment adequacy, and support services.

Qualitative Data: Semi-structured interviews will be conducted with selected instructors and students to gather detailed information about their experiences and perspectives on causes of technical issues and potential strategies for improvement. This qualitative approach allows participants to provide rich, contextualized explanations and recommendations.

3.3 Research Instruments

Questionnaire: The instrument will be validated through a content validity process with five experts in educational technology and management science. The reliability will be tested using Cronbach's alpha, with at least 0.70 indicating acceptable internal consistency.

Interview Guide: A semi-structured guide with open-ended questions focused on participants' experiences with computer equipment problems, causes, and potential solutions. Interviews will be audio-recorded (with consent) and transcribed for thematic analysis.

3.4 Data Analysis

Quantitative data from the questionnaires will be analyzed using descriptive statistics (mean, standard deviation, and frequency) to summarize participants' perceptions of problems and existing support measures. Inferential statistics, such as independent t-tests or ANOVA, will be used to examine differences in perceptions across demographic variables, such as gender, age, and academic program.

Qualitative data from interviews will be analyzed using thematic analysis, following six-step process: familiarization with the data, coding, theme development, reviewing themes, defining and naming themes, and reporting findings. This analysis will identify recurring causes of technical problems and potential strategies recommended by participants.

4. Results

A total of 200 students and 20 instructors participated in the study. Among students, 60% were female and 40% male. Age distribution was as follows: 18–20 years (25%), 21–23 years (50%), and 24 years and above (25%). Instructors were predominantly aged 30–50 years (70%), with 30% above 50 years. Most students (85%) reported having moderate to high computer literacy, while all instructors indicated at least moderate proficiency in digital tools. These demographics are consistent with prior research indicating that age and experience can influence perceptions of technology use in hybrid learning.

4.1 Descriptive Analysis of Technical Problems

Table 1 summarizes the mean scores and standard deviations of reported technical problems in hybrid classrooms.

Table 1 Mean Scores of Technical Problems in Hybrid Classrooms

Technical Problem	Mean	SD	Interpretation
Hardware malfunctions (computers, projectors)	4.12	0.78	High
Software errors (LMS, applications)	3.85	0.82	High
Internet/network connectivity issues	4.25	0.70	Very High
Insufficient technical support	3.92	0.75	High
Lack of digital literacy among students	3.60	0.90	Moderate

These results indicate that network connectivity issues were the most frequently encountered problem, followed closely by hardware malfunctions and insufficient technical support. Software errors and limited digital literacy also contributed but were perceived as slightly less severe.

4.2 Differences in Perceptions by Demographics

Independent-sample t-tests and one-way ANOVA were conducted to examine whether perceptions of technical problems differed by demographic variables.

Gender: No significant difference was found in the overall perception of technical problems between male and female students ($t = 1.12, p > 0.05$).

Age: Older students (21–23 and 24+) reported slightly higher awareness of technical issues compared to younger students (18–20) ($F = 3.45, p < 0.05$).

Digital Literacy: Students with higher self-reported computer literacy perceived fewer problems with software usage but still reported infrastructure and connectivity issues as significant ($F = 5.28, p < 0.01$).

These results indicate that age and digital literacy influence how respondents perceive the severity of technical problems, while gender does not appear to have a statistically significant effect.

4.3 Causes of Technical Problems

Respondents identified multiple causes of computer equipment problems in hybrid classrooms. Using qualitative interview data and thematic analysis, three main categories emerged:

Equipment and Infrastructure Issues: Outdated computers, projectors, and network hardware were cited frequently as key contributors to technical failures.

User-Related Factors: Both students and instructors reported occasional lack of proficiency in software and tools, leading to errors or improper handling of devices.

Institutional Support Deficiencies: Inadequate technical support, limited maintenance schedules, and unclear reporting procedures for equipment failures were common organizational barriers.

These findings suggest that technical problems are multi-dimensional, encompassing hardware, software, user skills, and institutional factors, consistent with international literature on hybrid learning challenges (Sun & Chen, 2016; Bond, 2020).

4.4 Strategies for Reducing Technical Problems

Both students and instructors suggested multiple strategies to reduce problems in hybrid classrooms. The most commonly cited were:

Strengthening Technical Support: Hiring dedicated IT staff and implementing a rapid response system for equipment failures.

Upgrading Hardware and Network Infrastructure: Replacing outdated computers and projectors and improving network bandwidth to reduce connectivity issues.

Digital Literacy Training: Offering workshops for students and instructors to improve proficiency in using LMS platforms, video conferencing, and other software tools.

Maintenance and Monitoring: Implementing regular maintenance schedules and clear protocols for reporting and resolving equipment issues.

These strategies align with recommendations from previous research on blended learning and hybrid classrooms.

5. Conclusion

This study examined the causes of problems in the use of computer equipment in hybrid classrooms and identified strategies to mitigate these issues at the Faculty of Management Science, Suan Sunandha Rajabhat University. The findings indicate that technical problems are multi-faceted, encompassing hardware malfunctions, software errors, network connectivity issues, limited user digital literacy, and insufficient institutional support. Among these, network connectivity and hardware malfunctions were reported as the most severe obstacles by both students and instructors, which aligns with prior research emphasizing the critical role of reliable infrastructure in hybrid learning environments (Bond, 2020; Sun & Chen, 2016).

The study also revealed that user-related factors, such as digital literacy and experience with educational technologies, influence perceptions of technical problems. Older students and those with higher digital literacy were better able to navigate technological challenges, whereas participants with lower technical skills reported greater difficulty, confirming findings from

prior studies on the importance of user preparedness in blended and hybrid learning (Sanpanich, 2021).

Regarding strategies, respondents emphasized strengthening technical support, upgrading hardware and network systems, providing targeted digital literacy training, and implementing regular maintenance protocols. These strategies reflect internationally recommended practices for enhancing the effectiveness of hybrid classrooms and minimizing disruptions caused by technological problems (Garrison & Vaughan, 2008; Gudoniene et al., 2025).

In conclusion, improving hybrid learning in the Faculty of Management Science requires a holistic approach that addresses technical infrastructure, user competency, and institutional support systems. By implementing the recommended strategies, the faculty can enhance the quality of hybrid instruction, promote a smoother learning experience, and increase student and instructor satisfaction. Future research may extend these findings by evaluating the long-term impact of these strategies on hybrid classroom effectiveness and student learning outcomes.

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