

Challenges and Adaptations: A Case Study of Teacher Experiences with Blended Learning after the Pandemic

Thilagavathy Mohan., *Nurul Aisyah Kamrozzaman

UNITAR International University Kelana Jaya, Malaysia

*Corresponding Author

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ABSTRACT

Background: The COVID-19 pandemic forced a global experiment in remote education, creating an unprecedented opportunity to examine the long-term integration of digital tools in teaching. This qualitative case study explores how teachers at an international school in Johor Bahru, Malaysia, perceived and adapted to blended learning during and after the pandemic. Using semi-structured interviews and reflective journals from 10 primary teachers, data were analyzed thematically through the lenses of the Technology Acceptance Model (TAM) and the Technological Pedagogical Content Knowledge (TPACK) framework. Findings indicate a significant evolution in teacher perceptions, transitioning from initial resistance and anxiety toward growing confidence and recognition of digital tools' pedagogical value. Key challenges persisted, including technical infrastructure issues, student engagement, and increased workload. Despite these, teachers strategically sustained a core repertoire of digital tools for formative assessment, collaboration, and feedback, embedding them into post-pandemic practice. Institutional support, through targeted training and professional learning communities, was a critical enabler for this transition; however, a gap remained in long-term, pedagogy-focused professional development. The study concludes that the pandemic served as a catalyst for a durable digital transformation, where blended learning has become a sustained element of instructional practice. To ensure its continued success, school leaders must invest in robust infrastructure, advanced pedagogical training, and supportive leadership to ensure blended learning is both high-quality and equitable.

Keywords: blended learning, teacher perceptions, digital transformation, TPACK, Technology Acceptance Model (TAM), international school, Malaysia, post-pandemic education

INTRODUCTION

The COVID-19 pandemic precipitated an unprecedented global disruption to educational systems, necessitating an abrupt pivot from traditional face-to-face instruction to remote and subsequently blended learning modalities across institutions worldwide (Islam & Abiona, 2023; Karaköse, 2020; Pokhrel & Chhetri, 2021). This rapid shift, impacting nearly 1.6 billion learners across over 200 countries, profoundly altered conventional educational practices and fostered immediate changes in learning and teaching environments (Frempong & Kadam, 2022; Karaköse, 2020; Pokhrel & Chhetri, 2021). In Malaysia, akin to other nations, schools including international schools in Johor Bahru swiftly transitioned to online delivery before re-integrating hybrid configurations as physical campuses reopened (Sia et al., 2023; Singh et al., 2022; Yusof et al., 2023). This accelerated adoption underscored significant opportunities for pedagogical innovation while simultaneously revealing persistent systemic frictions within teaching and learning contexts (Alkhnabashi et al., 2024; Frempong & Kadam, 2022).

The emergency remote teaching paradigm exposed pervasive structural constraints, notably unequal access to digital devices and reliable internet connectivity, which exacerbated existing educational inequities globally (Mairal-Llebot et al., 2023; McIntyre, 2022; Tate & Warschauer, 2022). Concurrently, this period acted as a catalyst for pedagogical innovation, prompting educators to become creative problem-solvers utilizing available resources (Reznikova et al., 2020; Saadati et al., 2023). Despite these innovations, teachers reported substantial

difficulties in designing engaging online content, sustaining student participation, and safeguarding assessment integrity (Almpanis & Joseph-Richard, 2022; Jiang et al., 2023). However, these experiences also led many to develop and refine practices and routines that later proved valuable in blended environments (Hayati et al., 2021; Sia et al., 2023). These mixed experiences highlight a critical need to examine which educational adaptations were retained, modified, or discontinued once in-person schooling resumed (Rodríguez, 2023).

Despite a burgeoning body of literature on pandemic-era online learning, a limitation persists in qualitative research specifically capturing teachers' first-hand accounts within Malaysia's international school sector (Hayati et al., 2021; Villanueva et al., 2023). Such studies are crucial for tracing the evolution of initial emergency responses into durable blended approaches and understanding the contextual factors influencing this transition (Sia et al., 2023). Prior scholarship consistently emphasizes the central role of teachers in sustaining student motivation and mediating the pedagogical utility of technology (Akram et al., 2022; Marshall et al., 2022). However, it also underscores a gap in understanding the conditions that facilitate or impede the sustained integration of digital strategies beyond the initial crisis period (El-Hamamsy et al., 2023). Addressing this gap necessitates a context-rich inquiry into teachers' perspectives, the challenges they confronted, and the strategic decisions underpinning their use of digital tools and routines in the post-pandemic classroom.

This article reports a qualitative case study conducted at Crescendo-HELP International School in Johor Bahru, Malaysia. This institution, which offers a British curriculum aligned with the Cambridge Assessment International Education framework and serves a culturally diverse student body, rapidly transitioned to fully online delivery during the pandemic and subsequently institutionalized blended learning practices upon campus reopening. This setting provides a pertinent context for examining how teachers negotiated constraints, leveraged institutional support mechanisms, and consolidated digital-pedagogical routines that have persisted since the return to on-site learning.

Conceptually, this investigation is underpinned by the Technology Acceptance Model and the Technological Pedagogical Content Knowledge framework. TAM posits that perceived usefulness and perceived ease of use are key determinants of technology adoption (Hamid et al., 2024; Sadeck, 2022; Scherer et al., 2018). Similarly, TPACK elucidates the dynamic interplay required among technological, pedagogical, and content knowledge for effective instructional design (Greene et al., 2023; Kim et al., 2023; Valtonen et al., 2022). Together, these frameworks facilitate an examination not only of the continued use of digital tools by teacher's post-pandemic but also of how these tools were pedagogically appropriated and justified in relation to specific learning objectives, classroom contexts, and subject matter demands.

Accordingly, this study pursues three primary aims: to explore teachers' perceptions of online and blended learning during and after the pandemic; to identify the challenges encountered in implementing and sustaining such approaches; and to document the digital strategies and tools teachers elected to continue employing in the post-pandemic classroom. These objectives directly address the practical need for evidence that can inform school-level leadership, professional development initiatives, and infrastructure planning within international school contexts, particularly where technological capacity may be higher, yet concerns regarding equitable access, teacher workload, and assessment quality remain central (Abdissa et al., 2024; Burvill et al., 2021; Shurong & Song, 2021; Sia et al., 2023).

By offering a thick description of one school's experience and a systematic analysis of teachers' accounts, this article contributes to ongoing academic discourse regarding the durability and quality of blended learning in primary education (Kundu et al., 2021; Palikat & Gruba, 2024). It provides empirically grounded insights into the complex interplay between individual teacher beliefs, institutional support structures, and classroom-level practices that shape sustainable digital-pedagogical integration (El-Hamamsy et al., 2023; Uribe-Banda et al., 2023). In doing so, it advances an evidence base that can guide policy and practice for post-pandemic teaching and learning across comparable international school settings.

LITERATURE

The COVID-19 pandemic triggered an unprecedented, global pivot in educational delivery, compelling institutions worldwide to transition from traditional face-to-face instruction to emergency remote teaching

(Cannaos et al., 2024). As the immediate crisis subsided, many systems evolved towards hybrid or blended learning models (Mulenga & Shilongo, 2024). This transition has sparked a significant body of research examining various facets of online and blended education during the pandemic's height. However, a critical gap exists in the literature, particularly regarding the sustained adaptation and long-term integration of blended learning practices in the post-pandemic era, especially from the nuanced perspective of teacher experiences in non-Western contexts (Sia et al., 2023).

The Post-Pandemic Gap: Sustained Adaptation and Teacher Experiences

While extensive studies have documented the challenges and rapid innovations during the initial emergency remote teaching phase, research specifically focusing on the durability and evolution of blended learning practices as they transition from crisis-driven necessity to deliberate pedagogical choice remains less explored (Graham & Halverson, 2023). This gap is particularly pronounced within Asian contexts (Sia et al., 2023), as the existing literature is predominantly skewed towards non-Asian countries, highlighting a scarcity of in-depth qualitative research capturing teachers' firsthand accounts of navigating and embedding blended learning in their daily practice post-COVID-19 (Sia et al., 2023; Jie & Kamrozzaman 2024). Understanding how educators' perceptions, challenges, and strategic adaptations continue to evolve beyond the immediate crisis is crucial for informing future educational policy and practice (Sia et al., 2023). The current study aims to address this identified gap by providing a rich, contextualized account of teacher experiences in a Malaysian international school, thus contributing to the burgeoning yet geographically imbalanced discourse on post-pandemic blended learning (Sia et al., 2023). Recent literature emphasizes the ongoing need for research into blended learning in the post-pandemic era, particularly concerning its implementation and long-term effects (Nong et al., 2023).

Initial Impact and Teacher Adaptation

The initial global school closures necessitated an abrupt shift to remote instruction, which exposed both the vulnerabilities and remarkable adaptability of educational systems (Dei, 2024). Teachers frequently reported initial uncertainty and low confidence with unfamiliar digital platforms. However, this phase also catalyzed significant professional growth, with many educators rapidly upskilling and developing new digital competencies (Salirrosas, 2023; Smestad et al., 2023; Trevisan et al., 2023). The experiences during this period led to a re-evaluation of pedagogical approaches and an increased appreciation for the potential of digital tools (Chalkiadakis & Noguera, 2023). This is reflected in studies examining dimensions of teachers' digital competence pre- and during COVID-19 (Smestad et al., 2023).

Persistent Challenges

Despite growing proficiency, several pervasive challenges continued to vex educators. These included inequities in access to reliable internet connectivity and digital devices (Sia et al., 2023), exacerbating existing digital divides (Sia et al., 2023). Maintaining student engagement in virtual settings, characterized by "camera-off" behaviors and digital distractions, demanded constant pedagogical innovation (Tong et al., 2023). Ensuring assessment integrity and quality in online environments necessitated a fundamental redesign of evaluative practices. Furthermore, the increased planning demands of dual-mode instruction often led to heightened teacher workload and concerns about well-being, blurring work-life boundaries (Tong et al., 2023). Barriers encountered by teachers in implementing institutional blended learning also highlight these ongoing challenges (Ali, 2024).

Digital Strategies and Tools

The effective integration of digital tools has been shown to be most impactful when explicitly aligned with pedagogical intent (Graham & Halverson, 2023). Gamified platforms and interactive technologies were often adopted to maintain student connection and participation (Villanueva et al., 2023). Specific tools and methods continue to be explored to enhance blended learning, with research investigating their usefulness for improving content understanding, facilitating blended learning, and improving student autonomy and commitment (Ortega-Ruipérez & Gorospe, 2024). The implementation of learning management systems in higher education institutions, for instance, highlights efforts to leverage technology (Jie & Kamrozzaman 2024). The broader

policy landscape, such as national initiatives, can provide a supportive backdrop, yet teachers often exercised situated judgment in selecting and sustaining routines that proved valuable post-reopening.

Institutional and Peer Support

The long-term success and sustained adoption of blended learning practices are closely linked to robust institutional support, encompassing effective leadership, comprehensive professional development, and reliable technical assistance (Sia et al., 2023). Studies emphasize the importance of continuous teacher training during crises to contribute to professional development (Pech et al., 2023). The evaluation of hybrid learning practices and the role of digital competencies in higher education also underscore the need for institutional support (Cook et al., 2023; Mulenga & Shilongo, 2024). While initial crisis-response training was critical, research indicates a recurring gap in sustained, advanced professional development that moves beyond basic operational skills towards more creative, pedagogy-driven technology integration (Tong et al., 2023). Promoting quality education through blended learning during and post COVID-19 pandemic also requires institutional efforts (Dei, 2024).

By synthesizing these thematic areas, it becomes clear that while much is understood about the immediate response to the pandemic, a deeper qualitative understanding of how teachers sustain and embed blended learning in a non-crisis context, particularly in diverse international school settings, remains an area ripe for exploration (Pei et al., 2023; Villanueva et al., 2023).

This study is grounded in two complementary theoretical frameworks: the Technology Acceptance Model (TAM) and the Technological Pedagogical Content Knowledge (TPACK) framework. Together, they provide a robust lens for analyzing both the *psychological drivers* and the *practical competencies* involved in teachers' adoption and integration of blended learning practices.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis (1989), is a widely recognized theory that explains how users come to accept and use a technology. Its core premise is that two key beliefs determine an individual's behavioral intention to use a system:

1. **Perceived Usefulness (PU):** The degree to which a person believes that using a particular system would enhance their job performance.
2. **Perceived Ease of Use (PEOU):** The degree to which a person believes that using a system would be free from effort.

In the context of this study, TAM provides a critical lens for understanding the *evolution of teacher perceptions*. It allows us to analyze their initial resistance (potentially low PEOU and PU during emergency remote teaching) and their subsequent growing confidence and recognition of digital tools' pedagogical value (increased PU and PEOU post-pandemic). Essentially, TAM helps answer the question: *Why did teachers decide to accept or reject the digital tools for blended learning?*

Technological Pedagogical Content Knowledge (TPACK) Framework

The TPACK framework, articulated by Mishra and Koehler (2006), describes the complex interplay of knowledge types that teachers need to effectively integrate technology into their teaching. It moves beyond viewing technology as an add-on and instead posits that effective technology integration requires an interconnected understanding of three primary forms of knowledge:

- **Content Knowledge (CK):** Knowledge of the subject matter to be taught.
- **Pedagogical Knowledge (PK):** Knowledge of teaching methods and processes.
- **Technological Knowledge (TK):** Knowledge of standard and advanced technologies.

The framework's strength lies in the intersections of these core components:

- Pedagogical Content Knowledge (PCK): Knowledge of teaching specific subject matter effectively.
- Technological Content Knowledge (TCK): Knowledge of how technology can create new representations of specific content.
- Technological Pedagogical Knowledge (TPK): Knowledge of how teaching and learning can change when particular technologies are used.
- Technological Pedagogical Content Knowledge (TPACK): The effective integration of all three, representing the full understanding of how to teach with technology in a specific subject context.

For this research, the TPACK framework is essential for analyzing the *nature of teachers' adaptations*. It allows us to examine not just *if* they used technology, but *how* they used it. It helps us understand whether they were simply applying technology (TK) or had developed a more sophisticated TPACK by strategically selecting tools like Seesaw and Kahoot! for specific pedagogical purposes (e.g., formative assessment, collaboration) within their content areas.

The Complementary Integration of TAM and TPACK

While TAM and TPACK originate from different disciplines (information systems and teacher education, respectively), their integration in this study is both logical and powerful. They address two sides of the same coin:

- TAM explains the "Why" behind adoption: It focuses on the motivational and perceptual factors that predispose a teacher to use a technology. A teacher must first perceive a tool as useful and easy to use (TAM) before they are likely to invest the effort required to integrate it deeply into their practice.
- TPACK explains the "How" of integration: It focuses on the knowledge and skills required to use that technology in a pedagogically sound and content-appropriate manner. A teacher might find a tool useful and easy (high TAM scores) but lack the TPACK to use it in a way that truly enhances student learning.

In this post-pandemic context, we posit that the journey from emergency remote teaching to sustainable blended learning involves a dynamic relationship between these frameworks. The forced exposure to technology during the pandemic may have initially influenced teachers' *Perceived Ease of Use* and *Perceived Usefulness* (TAM). As these perceptions shifted positively, it created a foundation for teachers to experiment and develop their *Technological Pedagogical Content Knowledge* (TPACK). Therefore, using these two frameworks in tandem allows for a comprehensive analysis of both the psychological journey and the practical, knowledge-based evolution of teachers as they navigated blended learning.

METHODOLOGY

This study employed a qualitative case study design to gain an in-depth, contextualized understanding of the challenges and adaptations experienced by teachers in one international school in Johor Bahru, Malaysia, as they transitioned to blended learning in the post-pandemic period. The case study approach was deemed most appropriate as it facilitates the exploration of a real-world phenomenon within its natural context, relying on multiple sources of evidence (Yin, 2018).

Participant Selection

A purposive sampling strategy was used to select participants who were information-rich and directly experienced the phenomenon of interest (Etikan et al., 2016). The selection criteria required participants to be full-time primary school teachers at the case study school who had taught both during the pandemic-induced remote learning period and the subsequent return to a blended learning model. Invitations were sent to all primary teachers meeting these criteria, and the final sample consisted of 10 teachers who volunteered to participate. This

sample size is consistent with qualitative case study research, allowing for detailed, in-depth data collection and analysis. The demographic characteristics of the participants are summarized in Table 1.

Table 1: Participant Demographics (N=10)

Pseudonym	Teaching Experience	Grade Level(s) Taught	Prior Tech Experience (Self-Rated)
T1	8 years	Grade 2	Intermediate
T2	15 years	Grade 5	Beginner
T3	5 years	Grade 1	Intermediate
T4	12 years	Grade 4	Advanced
T5	3 years	Grade 3	Beginner
T6	10 years	Grade 6	Intermediate
T7	7 years	Grade 2	Intermediate
T8	20 years	Grade 5	Beginner
T9	6 years	Grade 1	Advanced
T10	4 years	Grade 4	Intermediate

Data Collection

Data were collected through two primary methods between May 2025 to August 2025 to ensure triangulation and enhance the credibility of the findings.

- Semi-structured Interviews:** Each of the 10 participants took part in a one-on-one, semi-structured interview conducted via a secure video-conferencing platform. The interviews, which lasted between 45-60 minutes, were guided by a protocol of 12 core questions designed to elicit rich, narrative data. The questions explored key themes, including: (a) initial experiences and perceptions of the shift to remote/blended learning; (b) specific challenges faced (technical, pedagogical, and personal); (c) adaptation strategies and tool adoption; (d) perceived impact on student engagement and assessment; and (e) views on institutional support and future needs. All interviews were audio-recorded and professionally transcribed verbatim.
- Reflective Journals:** Participants were asked to maintain a reflective journal over a four-week period. They were provided with a prompt guide to structure their entries, which included questions such as: "Describe a successful use of technology in your lesson this week and what made it effective," and "Reflect on a challenge you faced with blended learning and how you addressed it." This method provided ongoing, real-time data on teacher practices and reflections, complementing the retrospective data from the interviews.

Findings

The analysis of interview transcripts and reflective journals revealed a dynamic process of adaptation among the primary school teachers. This journey was characterized by a significant evolution in their perceptions, the strategic development of their teaching practice, and the persistence of systemic challenges. The findings are presented below through the integrated analytical lenses of the Technology Acceptance Model (TAM) and the Technological Pedagogical Content Knowledge (TPACK) framework.

The Evolution of Teacher Perception: A TAM Perspective

The teachers' initial transition to remote learning was marked by strong feelings of anxiety and resistance, a phenomenon that aligns directly with the TAM construct of low **Perceived Ease of Use**. Participants described being overwhelmed by the sudden demand to master multiple digital platforms simultaneously.

- “It wasn’t just teaching anymore; it was becoming a tech support expert overnight. Every tool like a Google Classroom, Seesaw, Zoom had its own login, its own rules. The mental load was immense,” shared T2, a sentiment echoed by many.
- This technical friction significantly hampered their initial willingness to engage, as the effort required to use the technology was perceived as excessively high.

However, a marked evolution in perception occurred as teachers accumulated experience. The initial focus on ease of use gradually shifted towards a recognition of **Perceived Usefulness**. Teachers began to see how specific digital tools could enhance their pedagogical goals and solve practical teaching problems.

- “I used to think Kahoot! was just for fun, a time-filler,” reflected T6. “But now I see its real power. It gives me instant data on what my students understand, and it forces the quiet ones in the back to participate. It’s become my go-to for formative assessment.”
- This shift from viewing technology as a burdensome obligation to recognizing its utility in enhancing student engagement and streamlining assessment marks a critical transition in their TAM-driven acceptance, forming the psychological foundation for sustained integration into their post-pandemic practice.

Curating a Core Digital Toolset: Demonstrating TPACK in Practice

Beyond a general acceptance of technology, teachers demonstrated a strategic refinement of their practice by curating a sustainable core repertoire of digital tools. This curation process is a clear indicator of developing **TPACK**, as it moved beyond simply using technology (**TK**) to integrating it meaningfully with pedagogy (**PK**) and content (**CK**).

Table 2: Teacher-Identified Core Tools and their TPACK-Aligned Applications

Digital Tool	Primary Technological Knowledge (TK)	Pedagogical Application (PK)	Content Knowledge (CK) Integration	Exemplary TPACK in Practice
Seesaw	Digital portfolio creation, multimedia annotation, voice recording.	Formative assessment, differentiated feedback, parent communication, fostering student agency.	Literacy (documenting reading fluency), Mathematics (explaining problem-solving processes), Art (digital portfolios).	“A student can upload a video explaining their science experiment [CK & TK]. I can then leave a voice note praising their method [PK], which is more personal and effective than a written comment.” (T7)
Kahoot! / Quizizz	Gamified quiz creation, real-time analytics.	Quick formative assessment, boosting engagement, reviewing key concepts.	All subjects for vocabulary review, concept checks, and unit revisions.	“I use it to review grammar rules [CK]. The competitive element [PK] means everyone is focused, and the report afterwards shows me which rule needs re-teaching.” (T4)
Padlet	Collaborative digital canvas,	Collaborative brainstorming,	History (collaborative timelines), Language	“For our ‘World Cultures’ unit [CK], students post pictures and

	multimedia embedding.	exit tickets, sharing resources, KWL charts.	Arts (sharing creative writing ideas), Group projects.	<i>facts about a country on a shared Padlet. It builds collective knowledge [PK] in a visually engaging way [TK].” (T9)</i>
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As illustrated in Table 2 and the participant quotes, the tool selection was highly intentional. Teachers were not just using technology; they were applying their TPACK to choose the right tool for a specific pedagogical objective within their content area, demonstrating a mature understanding of the framework's core principle.

Persistent Challenges: Navigating the Limits of Acceptance and Knowledge

Despite significant professional growth, teachers reported several persistent challenges that can be interpreted through the dual lenses of TAM and TPACK.

A primary concern was student engagement and the digital divide. This challenge points to a gap in Technological Pedagogical Knowledge (TPK) the understanding of how to adapt teaching methods for a specific technological environment. Teachers struggled to translate their classroom management and community-building strategies online.

- *“You can’t see the confused looks on their faces. Some students thrive online, but others just turn off their cameras and disengage completely. It’s hard to create a sense of shared learning,”* noted T8.

Furthermore, issues of assessment integrity and increased workload continued to pose problems. Designing valid and reliable assessments (PK & CK) in a digital context (TK) required a sophisticated TPACK that was still developing for many. The increased time spent on lesson preparation and technical troubleshooting also negatively impacted their Perceived Ease of Use (TAM), threatening long-term sustainability.

- *“How do I know the work is truly theirs? I spend hours creating ‘cheat-proof’ quizzes, which just adds to my workload. It sometimes feels like the costs outweigh the benefits,”* explained T5, highlighting the tension between perceived usefulness and the effort required.

The Role of Institutional Support in Shaping TAM and TPACK

The findings underscore that institutional support was a critical external variable influencing both teachers' perceptions (TAM) and their ability to develop TPACK. Targeted training sessions were frequently cited as a key factor in improving Perceived Ease of Use by building their confidence and technical skills (TK).

- *“The workshop on utilizing breakout rooms in Zoom was instrumental.. It gave me the confidence to try small group discussions online, which made a huge difference,”* stated T3.

Professional Learning Communities (PLCs) served as vital spaces for collaborative TPACK development. Through sharing successes and failures, teachers built their collective TPK and TCK, moving beyond individual experimentation to a shared professional practice.

However, a significant gap was identified in the provision of *pedagogy-focused* professional development. While basic tool training was available, teachers expressed a need for support that specifically addressed the *integration* of technology into pedagogy the very heart of TPACK.

- *“We know how to use the tools now, but we need help on the why and when. When is Seesaw better than a written worksheet? How do I design a project that truly leverages technology for deeper learning?”* (T1).

This gap indicates that while the school successfully supported the initial rise in Perceived Ease of Use and basic TK, the next step is to foster the more complex, integrative knowledge characterized by full TPACK development.

DISCUSSION

This study provides a comprehensive qualitative exploration of teachers' perceptions, challenges, adaptations, and sustained practices in blended learning within a Malaysian international school, moving beyond the initial crisis response of emergency remote teaching to the enduring post-pandemic educational landscape. Our findings resonate with and extend existing literature, while also addressing critical gaps, particularly concerning sustained integration and the specific nuances of teacher professional development in non-Western contexts.

Evolving Perceptions and the Enduring Impact on Technology Acceptance

The observed evolution in teacher perceptions, from initial apprehension to confident adoption, aligns with longitudinal studies examining technology acceptance in education post-COVID-19 (Wohlfart & Wagner, 2024). This trajectory underscores the dynamic nature of technology acceptance, where initial perceived ease of use and usefulness, as posited by the Technology Acceptance Model, were profoundly shaped by the forced adoption during the pandemic (Qiang & Zhang, 2023). While initial exposure to digital tools was mandatory, continuous use, coupled with observed benefits in managing teaching tasks and enhancing student interaction, appears to have positively reinforced both perceived usefulness and, eventually, perceived ease of use (Ye et al., 2022). The pandemic context effectively altered the baseline for these perceptions; what might have previously been viewed as optional or difficult became a necessary and, subsequently, a more manageable and valuable component of instruction (Wohlfart & Wagner, 2024). This aligns with studies noting that mandatory adoption can eventually lead to greater acceptance if the technology proves beneficial (Georgiou et al., 2023). Our findings suggest that this enforced exposure acted as a powerful catalyst, accelerating the journey towards acceptance and normalization of digital tools, which might otherwise have taken years (Sia et al., 2023).

Persistent Challenges and the Blended Learning Workload

The persistence of challenges such as increased workload, technical limitations, and student engagement issues mirrors concerns frequently reported across diverse educational settings during and after the pandemic (Abdissa et al., 2024; LaTronica-Herb & Noel, 2023; Sia et al., 2023). Our finding of increased teacher workload, encompassing additional planning, resource creation, and communication demands, is consistent with systematic reviews highlighting the significant physical and mental burden placed on educators by hybrid approaches (Süner-Pla-Cerdà et al., 2024; Wahab et al., 2024). This expanded workload often stems from the "doubled work" of preparing for both online and face-to-face modalities simultaneously and managing diverse student needs across these environments (Sia et al., 2023). This study contributes to the literature by emphasizing that this workload is not merely an initial adaptation phase but a sustained feature of blended learning, particularly in settings where teachers are expected to maintain high-quality instruction across multiple delivery modes. Mitigating this burden requires ongoing institutional strategies, not just temporary support measures.

Digital Transformation and the Core Repertoire of Tools

The emergence of a "core repertoire of digital tools" for formative assessment, collaboration, and feedback signifies a tangible manifestation of digital transformation at the classroom level (Dancsa et al., 2023). This aligns with broader trends where education has rapidly increased its use of digital tools, necessitating guidelines for their effective integration (Dancsa et al., 2023). The purposeful selection and sustained use of specific tools like Google Meet, Seesaw, Kahoot! Quizizz, Padlet, and Jamboard illustrate how teachers have moved beyond mere tool adoption to a more strategic, pedagogical appropriation (Lameky, 2024; Qolamani & Mohammed, 2023). This "digital transformation" is not about using all available tools, but about identifying and mastering those that demonstrably enhance specific pedagogical functions (Rêgo et al., 2023). These tools, when effectively integrated, contribute to improved student performance, attitude, and achievement, although their impact on engagement can vary (Cao, 2023). This finding reinforces the Technological Pedagogical Content Knowledge framework, demonstrating how teachers deepened technological knowledge enabled them to make informed decisions about tool selection, which then integrated with their pedagogical knowledge and content knowledge to create robust TPACK-aligned instruction (Rap & Blonder, 2024). The pandemic context amplified the need for teachers to develop this integrated knowledge, as they were forced to innovate and adapt their teaching methods using technology (Kamrozzaman 2025).

Professional Development Gap

A crucial finding highlighting a significant gap in the literature and practice is the perceived lack of long-term, pedagogy-focused professional development. While initial crisis-response training was appreciated, teachers expressed a clear need for ongoing support that transcends basic technical proficiency and delves into advanced pedagogical strategies for blended environments. This aligns with research indicating that traditional, passive training approaches have limited impact on teachers' long-term adoption of innovative methods (Wang et al., 2025). Effective professional development in the digital age must integrate technology with pedagogy, moving beyond mere hands-on training to emphasize pedagogical alignment, collaboration, and sustained support (Mintii, 2023; Napitupulu et al., 2024). Drawing from our findings and the broader literature, a proposed model for advanced, pedagogy-focused professional development would include:

- **Contextualized Scenario-Based Training:** Moving beyond generic tool tutorials to workshops focused on designing engaging blended lessons, managing dual-mode instruction, and fostering online collaboration for specific subject areas.
- **Peer-Led Learning Communities:** Establishing structured, ongoing opportunities for teachers to share best practices, co-plan, and critically reflect on blended learning strategies, building on the collaborative teaching practices observed in this study.
- **Mentorship Programs:** Pairing experienced blended learning practitioners with developing teachers to provide individualized guidance and support.
- **Design-Based Research Opportunities:** Engaging teachers in cycles of design, implementation, and evaluation of blended learning approaches within their own classrooms, fostering a research-informed practice.
- **Focus on Assessment Redesign:** Dedicated training on creating authentic, equitable, and integrity-proof assessments for blended contexts, addressing the ethical dilemmas and technical challenges highlighted by our participants. Such a model would directly address the call for deeper, more sustained professional learning that empowers teachers to integrate technology creatively and critically (Asghar et al., 2022).

TAM and TPACK in a Post-Pandemic

This study provides empirical insights into how the COVID-19 pandemic uniquely influenced the constructs of TAM and TPACK. For TAM, the mandatory nature of technology use during the pandemic accelerated the development of perceived ease of use, pushing teachers past the initial hurdles that often deter adoption. Simultaneously, the success in maintaining educational continuity highlighted the undeniable perceived usefulness of digital tools, cementing their place in post-pandemic pedagogy.

Regarding TPACK, the pandemic forced a rapid integration of all three knowledge domains. Teachers' technological knowledge rapidly expanded due to necessity. This newfound TK then had to be consciously integrated with their pedagogical knowledge to design effective online instruction and with their content knowledge to deliver subject-specific material digitally. The study illustrates that the pandemic did not merely add a "T" to "PCK," but rather triggered a fundamental restructuring of how these knowledge bases interrelate under pressure, leading to a more robust, albeit often stressful, TPACK development (Rap & Blonder, 2024). The persistent challenges, however, indicate that achieving optimal TPACK requires sustained effort and institutional support, especially concerning the integration of advanced digital pedagogy.

CONCLUSION

This qualitative case study meticulously investigated the transformative journey of teachers at a Malaysian international school, delineating their perceptions and adaptations during the critical shift from emergency remote teaching to the sustained integration of blended learning practices. The findings underscore that this transition was far from a simplistic adoption of technology; rather, it constituted a profound process of professional evolution. Teachers navigated a trajectory from initial apprehension and technical uncertainty to a

confident, pedagogically driven application of digital tools, a progression effectively framed by the synergistic interplay of the Technology Acceptance Model and the Technological Pedagogical Content Knowledge framework.

The study unequivocally demonstrates that the COVID-19 pandemic served as a potent, albeit disruptive, catalyst for enduring change. It compelled educators to cross a critical threshold of experience, thereby significantly enhancing their digital competencies and refining their capacity to align technology strategically with specific pedagogical objectives and content demands. However, this transformative process was neither effortless nor uniformly seamless. Persistent challenges pertaining to infrastructure, student engagement, and teacher well-being consistently emerged, highlighting that the sustainable integration of blended learning necessitates more than individual teacher resilience; it mandates deliberate and continuous systemic support mechanisms.

Ultimately, the research indicates that blended learning has become institutionalized within the studied context, evolving from a temporary crisis response into a fundamental, durable component of instructional practice. The contemporary post-pandemic classroom is now inherently a blended space, strategically augmented by digital tools that facilitate collaboration, assessment, and feedback. For this pedagogical model to flourish with optimal quality and equity, ongoing investment remains paramount. This investment must extend beyond robust technological infrastructure to encompass sustained, pedagogy-focused professional development initiatives and the cultivation of supportive leadership cultures. The empirical insights derived from this study offer a valuable evidence base for school leaders and policymakers, both within Malaysia and across comparable international settings, as they endeavor to cultivate resilient and effective blended learning ecosystems for future educational landscapes.

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