

RESEARCH ARTICLE

Hybrid Learning and the Changing Dynamics of Student Motivation and Academic Performance

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ABSTRACT

Hybrid learning has shifted from an emergency alternative to a strategic model for organising higher education, yet its effects on student motivation and academic performance remain uneven. This conceptual review examines how the integration of face-to-face and digital learning changes the conditions through which students regulate effort, experience autonomy, interact with lecturers and peers, and translate engagement into academic achievement. The analysis synthesises contemporary and foundational literature on blended learning, self-determination, self-regulated learning, engagement, digital capability, and instructional design. It argues that hybrid learning does not improve outcomes through technology alone. Positive effects emerge when flexibility is balanced with structure, online and classroom activities are pedagogically aligned, feedback is timely, interaction is meaningful, and students possess sufficient digital and self-regulatory capability. Conversely, fragmented course design, weak social presence, unequal digital access, assessment misalignment, and excessive demands for self-management can reduce motivation and widen performance differences. Five analytical mechanisms and five institutional pathways are developed to explain and strengthen these relationships. The review contributes an integrated perspective that positions motivation as a dynamic mechanism connecting hybrid learning design with academic performance and identifies practical priorities for universities seeking sustainable, inclusive, and academically rigorous hybrid education.

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1. INTRODUCTION

Hybrid learning has become a durable feature of university education as institutions combine physical teaching with learning management systems, recorded resources, synchronous online interaction, digital assessment, and flexible study pathways. Hrastinski (2019) describes blended learning as an umbrella concept that covers different combinations of online and face-to-face learning. Nevertheless, the presence of two delivery modes does not automatically create an integrated learning experience. A course may be labelled hybrid even though its online and classroom components operate separately. Purposeful integration can transform university education by connecting different learning environments into a coherent learning experience (Garrison & Kanuka, 2004). For example, online preparation can support classroom problem solving, peer interaction, immediate feedback, and reflective learning. These connections influence motivation and academic attainment because students respond to the quality, clarity, and perceived value of learning activities rather than to the delivery mode alone. Evidence indicates that blended learning can improve achievement and attitudes, although its influence on student engagement varies across learning contexts (Cao, 2023). Purposeful interaction with lecturers and peers can reduce the isolation that may arise when online learning becomes heavily asynchronous or dominated by individual tasks. Effective course design should therefore identify declining participation and intervene before students disengage from either the digital or classroom component. Technology has also become increasingly embedded in university learning behaviour and digital mobility (Yusof et al., 2025).

Student motivation is fundamental to understanding why hybrid learning produces different outcomes across learners and courses. Deci and Ryan (2000) explain that motivation becomes stronger when learning environments support autonomy, competence, and relatedness. Hybrid learning can strengthen autonomy by giving students greater control over their time, pace, location, and access to learning resources. Nevertheless, flexibility also transfers greater responsibility for planning, organisation, and persistence to learners. The importance of competence and social connection in sustaining high-quality motivation was further established by Ryan and Deci (2020). Students may therefore struggle when flexibility is not accompanied by adequate structure, confidence, feedback, or meaningful interaction. Zimmerman (2002) explains that successful learners actively regulate their goals, strategies, progress, and reflection. These capabilities become especially important when learning activities are distributed across physical and digital environments. Motivation and emotional engagement are also connected with academic attainment in blended university learning (Liu et al., 2024). Assessment design is equally important because students allocate effort according to what is rewarded, monitored, and connected with visible academic progress. Poor coordination between learning modes can increase cognitive and organisational burdens. Successful progress can strengthen confidence and effort, while repeated difficulty can reduce persistence. Generation Z students also interpret online information through rapidly changing digital habits that influence their learning behaviour (Zaini et al., 2025).

Academic performance in hybrid learning should be interpreted as the outcome of interacting pedagogical and behavioural mechanisms rather than as a direct consequence of technology use. Means et al. (2013) found that blended approaches can outperform entirely face-to-face instruction under certain conditions. Nevertheless, the advantage often comes from additional learning time, resources, and instructional design rather than the technological medium itself. Students need

activities that connect online preparation with classroom discussion, practice, assessment, and feedback. Positive effects of blended learning on student performance have also been identified across different higher-education settings (Vo et al., 2017). These outcomes are more likely when students understand the purpose of each activity and recognise how it contributes to their academic progress. The effects of blended learning may still differ across national contexts and measures of educational outcomes (Cao, 2023). Therefore, technology alone cannot guarantee stronger academic performance. Motivation should be treated as a dynamic response to learning conditions rather than as a fixed personal characteristic. Recent evidence shows that well-designed blended learning can strengthen academic, behavioural, cognitive, and emotional engagement (Vanslambrouck et al., 2024). Stronger engagement can subsequently support academic attainment by sustaining attention, participation, and effort. Effective learning environments use technology to extend explanation, practice, collaboration, and feedback rather than duplicate classroom content on another platform. The relationship between motivation and performance is reciprocal because progress strengthens confidence, while repeated difficulty can weaken persistence.

Significant tensions remain unresolved despite extensive research on hybrid learning. Rasheed et al. (2020) identify self-regulation, technological competence, and institutional support as persistent challenges within the online component of blended learning. These challenges are not experienced equally because students differ in their confidence, study routines, prior knowledge, and access to appropriate learning environments. Course designs also vary in synchronous intensity, digital workload, assessment strategy, lecturer presence, peer interaction, and the degree of student choice. Boelens et al. (2017) emphasise the difficulty of integrating flexibility, interaction, emotional climate, and learning-process support into a coherent design. Unequal access to devices, connectivity, quiet study space, and digital confidence can further transform flexibility into educational disadvantage. Human-centred work design demonstrates the importance of aligning technological systems with the needs and behaviour of users (Abd Wahab & Yusof, 2020). Similar alignment is necessary in hybrid education to prevent technology from increasing pressure on students. Employability readiness also depends on the development of relevant capabilities rather than access to technology alone (Ghani et al., 2025). Students must be supported in using digital resources strategically, responsibly, and confidently. Technology adoption can influence performance differently according to the surrounding organisational and behavioural conditions (Yusof, 2025). Digital participation also requires learning environments that support sustained engagement and purposeful interaction (Yusof et al., 2025). Academic attainment consequently reflects instructional design, student agency, feedback, social connection, and alignment between online and face-to-face experiences.

The present conceptual review examines how hybrid learning changes the relationship between learner motivation and academic attainment. It also explains why apparently similar learning models can produce different outcomes. The analysis adopts an integrated perspective based on self-determination, self-regulated learning, learner engagement, social presence, and instructional alignment. It first establishes five foundations explaining how flexibility, autonomy, interaction, digital capability, and assessment shape learning behaviour. The analysis then examines five contemporary pressures that can weaken motivation and performance. Five mechanisms explaining why these pressures emerge are subsequently developed. The final part proposes five institutional pathways for improving hybrid learning. The intended contribution is to move beyond the simple

question of whether hybrid learning works. Greater attention is given to the conditions under which hybrid learning supports sustained effort, engagement, and achievement. Universities require learning models that are flexible without becoming fragmented, technology-enabled without becoming impersonal, and accessible without transferring excessive responsibility to learners. The relationship between motivation and performance remains reciprocal because successful progress can strengthen confidence and effort, while repeated difficulty can reduce persistence. Purposeful interaction with lecturers and peers can protect students from the isolation associated with heavily asynchronous learning. Practical and collaborative activities can further connect academic knowledge with meaningful participation. This integrated approach increases the possibility that flexibility, autonomy, interaction, and technology will operate as complementary learning resources rather than competing demands on students' attention.

2.0 FOUNDATIONS OF MOTIVATION AND PERFORMANCE IN HYBRID LEARNING

Hybrid learning changes motivation and academic performance through interacting pedagogical, psychological, social, and technological conditions. Five foundations are particularly important: learner autonomy, self-regulation, social presence, digital capability, and assessment alignment. Together, these foundations explain why flexibility can strengthen student agency or increase learning difficulty. Motivation is not produced by digital access alone, while performance is not simply the result of participating in more learning activities. Students interpret the structure, relevance, support, and social value of their learning environment before regulating their effort. Hybrid learning should therefore be understood as an integrated system in which design decisions shape behaviour across physical and digital spaces. Understanding these relationships establishes the foundation for examining the contemporary pressures that can disrupt motivation, engagement, and academic progress.

2.1 Flexibility Supporting Learner Autonomy Across Hybrid Learning Environments

Flexibility and learner autonomy are critical for explaining the relationship between hybrid learning, motivation, and academic attainment. Ryan and Deci (2020) explain that autonomy can strengthen motivation when learners experience meaningful choice and adequate support. In hybrid environments, autonomy involves control over learning pace, location, sequence, participation, and study time. This flexibility can encourage students to take greater responsibility for their learning. Nevertheless, an increase in choice also expands the number of decisions that learners must make. Students must decide how to prepare, when to participate, which resources to use, and how to divide their attention between online and classroom activities. Flexibility can become difficult when these activities are weakly connected or expectations remain unclear. Designing flexibility therefore requires attention to interaction, support, learning climate, and the organisation of learning activities (Boelens et al., 2017). A student who understands how a digital activity prepares them for a classroom task is more likely to invest purposeful effort. In contrast, the same activity may be viewed as additional workload when its purpose is unclear. Contemporary learning ecosystems also require students to develop capabilities that allow them to respond productively to changing technological conditions (Yusof, 2025). Flexibility is therefore valuable when it gives learners meaningful control without removing the structure, guidance, and feedback required to maintain academic progress.

The importance of autonomy becomes clearer when hybrid learning is designed as a connected sequence rather than a mixture of separate delivery channels. Students need clear signals about

priorities, deadlines, participation requirements, and the relationship between online and classroom activities. Ryan and Deci (2020) indicate that autonomy is most productive when it is supported by competence and relatedness. Universities cannot assume that recorded lectures, online quizzes, discussion boards, or flexible attendance will automatically create motivated learners. Students need opportunities to experience progress and maintain a sense of belonging. Learning activities should therefore provide genuine choices while preserving a clear academic direction. The challenges of designing flexibility demonstrate that productive choice requires careful coordination across learning modes (Boelens et al., 2017). Online resources can support preparation and individual practice, while classroom time can be used for discussion, application, feedback, and complex problem solving. This arrangement allows each mode to perform a clear educational function. Learners also differ in their confidence and ability to use flexibility effectively. Digital capability and previous learning experiences can influence whether students experience autonomy or uncertainty within technology-supported environments (Yusof, 2025). Equity consequently becomes part of educational quality because flexibility cannot support autonomy when devices, connectivity, accessibility, or digital competence restrict participation. Effective design helps students allocate effort intelligently without requiring them to reconstruct the course independently.

2.2 Self-Regulation Strengthening Student Persistence Across Hybrid Learning Environments

Self-regulation and learning persistence are essential for understanding how students convert hybrid flexibility into academic progress. Zimmerman (2002) explains that self-regulated learning involves goal setting, strategic planning, performance monitoring, and reflection. These capabilities become increasingly important when learning is distributed across physical and digital environments. Hybrid learning requires students to make frequent decisions about preparation, attendance, communication, pacing, and resource use. Students with effective routines can use this flexibility to organise learning around their personal circumstances. Other students may postpone online activities, underestimate workloads, or divide their attention across competing tasks. The difference is not simply a matter of personal discipline because course design can either support or obstruct self-regulation. Clear weekly structures, manageable deadlines, progress indicators, and timely reminders can reduce unnecessary organisational demands. Online learners also benefit from strategies involving time management, effort regulation, and consistent engagement with learning materials (Broadbent, 2017). These forms of support allow students to concentrate on learning rather than continually determine what they should complete next. Digital learning ecosystems can further strengthen participation when technology is connected with appropriate capability development and institutional support (Yusof et al., 2025). Hybrid success therefore depends on learners developing disciplined behaviour within an environment that provides sufficient structure, feedback, and opportunities to recover from temporary disengagement.

Persistence becomes more sustainable when self-regulation is supported before students experience serious academic difficulty. Learners may not recognise that they are falling behind when online tasks are distributed across multiple platforms or carry delayed consequences. Zimmerman (2002) demonstrates that monitoring and reflection are essential parts of effective self-regulated learning. Universities can support these processes through weekly plans, completion indicators, formative assessments, learning dashboards, and structured opportunities for reflection. Such tools should help students interpret their progress rather than merely increase surveillance. Lecturers also need to distinguish between an isolated missed activity and an emerging pattern of disengagement. Effective

online learning strategies can improve students' ability to manage time, regulate effort, and maintain persistence across learning tasks (Broadbent, 2017). Early communication can help students identify obstacles and develop realistic recovery plans. Peer support and lecturer interaction are equally valuable because help-seeking is an important self-regulatory behaviour. Students are more likely to persist when they know where assistance is available and feel comfortable requesting it. Digital engagement may also support continuing participation when platforms are used to connect learners with resources, peers, and meaningful academic activities (Yusof et al., 2025). Self-regulation should therefore be developed as an educational capability rather than treated as a personal quality that every university student already possesses.

2.3 Social Presence Strengthening Student Engagement Within Hybrid Learning

Social presence and academic engagement are critical to sustaining motivation across physically separated learning episodes. Garrison and Kanuka (2004) explain that blended learning becomes transformative when online and face-to-face experiences are purposefully integrated. This integration involves more than providing access to digital materials. Students need lecturer visibility, peer interaction, meaningful dialogue, and a sense of belonging across both learning environments. Social presence assures learners that their participation is noticed and valued. It can also make students more willing to ask questions, express uncertainty, and contribute to collaborative activities. Without this connection, asynchronous learning may become an isolated process dominated by individual task completion. Students can gradually disengage even when learning materials remain accessible. Contemporary evidence indicates that academic, behavioural, cognitive, and emotional engagement are important dimensions of successful blended learning (Vanslambrouck et al., 2024). Lecturers can strengthen social presence through regular announcements, responsive feedback, structured discussions, small-group activities, and clear opportunities for consultation. Peer interaction should also serve an academic purpose rather than exist only as a participation requirement. The design of work and learning systems should recognise how human interaction influences confidence and performance (Abd Wahab & Yusof, 2020). Social presence consequently connects participation with motivation by making hybrid learning feel coherent, responsive, and socially meaningful.

The importance of social presence becomes clearer when students move repeatedly between classroom and online learning environments. A connected learning sequence should allow relationships developed in one mode to continue in the other. Garrison and Kanuka (2004) emphasise that effective blended learning depends on the integration of learning experiences rather than the simple addition of technology. Classroom discussions can continue through focused online activities, while digital preparation can provide the foundation for meaningful face-to-face engagement. This continuity helps students maintain their academic identity and understand how each activity contributes to shared learning objectives. Engagement becomes weaker when students post responses that receive no acknowledgement or complete collaborative tasks without meaningful peer exchange. Strong blended-learning designs support interaction across academic, behavioural, cognitive, and emotional dimensions (Vanslambrouck et al., 2024). Lecturers should therefore monitor participation patterns and respond before occasional absence develops into sustained withdrawal. Students also require interaction that respects different communication preferences, accessibility needs, and levels of confidence. Human-centred design can help ensure that technological systems support users rather than create avoidable barriers to participation (Abd

Wahab & Yusof, 2020). Social presence does not require constant synchronous contact. It requires visible teaching, purposeful peer relationships, responsive communication, and a clear sense that learners remain part of an active academic community.

2.4 Digital Capability Strengthening Student Confidence Within Hybrid Learning

Digital capability and learning confidence influence whether technology supports academic performance or creates avoidable friction. Rasheed et al. (2020) identify technological competence as a persistent challenge within the online component of blended learning. Digital capability includes platform navigation, information management, online communication, file handling, cybersecurity awareness, and basic troubleshooting. Students may be highly familiar with social media but still struggle with academic technologies or digital study practices. Difficulty uploading work, locating feedback, joining online sessions, or using unfamiliar software can reduce confidence and consume attention that should be directed towards learning. Course design should therefore minimise unnecessary technical complexity and provide clear instructions for essential tasks. Students also need opportunities to practise using required tools before those tools become part of high-stakes assessment. Digital capability becomes particularly important as technological change reshapes the skills required within contemporary learning and organisational environments (Yusof, 2025). Consistent platform structures, accessible resources, orientation activities, and responsive technical support can reduce uncertainty. Capability development can also strengthen students' readiness to use technology in their future professional roles (Ghani et al., 2025). Technology contributes to performance when learners experience competence and understand how each tool supports a specific learning purpose. Greater technology use alone is not a suitable indicator of educational quality.

Digital confidence becomes stronger when technology is integrated into a continuous and predictable learning journey. Students should understand how online preparation connects with classroom engagement, independent practice, feedback, and reflection. Rasheed et al. (2020) show that technological challenges interact with learner, lecturer, and institutional conditions in blended environments. Universities cannot therefore place the full responsibility for digital participation on students. Lecturers require pedagogical support, dependable platforms, usable learning analytics, and realistic workloads to maintain quality across delivery modes. Digital tasks should use tools that are appropriate to the learning objective rather than selected for novelty. Technology can strengthen contemporary capability when learners use it to access evidence, communicate ideas, solve problems, and produce meaningful outcomes (Yusof, 2025). Clear navigation and consistent terminology can further reduce the cognitive burden associated with moving between different systems. Institutions should also recognise that students have unequal access to devices, connectivity, private study spaces, and previous digital experience. Digital readiness contributes to broader capability and employability development when it is supported systematically rather than assumed (Ghani et al., 2025). The long-term objective is not greater dependence on technology. It is stronger learning behaviour, sustained motivation, deeper engagement, and more dependable academic achievement through technology that is accessible, purposeful, and easy to use.

2.5 Assessment Alignment Directing Student Effort Towards Academic Performance

Assessment alignment and performance signals influence how students distribute effort across hybrid learning activities. Cao (2023) demonstrates that blended learning outcomes differ according to context, design, and the type of outcome being assessed. Students naturally prioritise activities

that contribute visibly to grades, feedback, or academic progress. Online discussions, preparation tasks, quizzes, and classroom activities may receive limited attention when their relationship with assessment is unclear. Effective alignment connects learning outcomes, teaching activities, and assessment requirements across both modes. Students should understand why a task is required, what capability it develops, and how it prepares them for later performance. Blended-learning advantages may partly result from additional learning opportunities and instructional resources rather than the delivery medium alone (Means et al., 2013). Assessment should therefore encourage students to use these opportunities purposefully. Formative checks can provide early evidence of progress without creating excessive pressure. Timely feedback can also strengthen competence by showing students what they have achieved and what requires improvement. Learning motivation and emotional engagement become more valuable when they are connected with visible academic attainment (Liu et al., 2024). Assessment alignment consequently serves as a bridge between motivation and performance by directing effort towards activities that support meaningful learning.

Assessment signals become more effective when they provide continuity across online and classroom experiences. Students should not experience digital tasks as an additional layer of work disconnected from the main course. Cao (2023) indicates that the effectiveness of blended learning varies because learning environments differ substantially in design and implementation. An online case analysis might prepare students for a classroom debate, while feedback from that debate could support a later written assignment. Such sequencing makes academic progression visible and gives each activity a clear purpose. Students are more likely to participate consistently when they can recognise these connections. Academic performance in blended learning is strengthened when additional time and resources are accompanied by purposeful instructional design (Means et al., 2013). Workload should also be reviewed across delivery modes because online activities can become excessive when lecturers treat them as additions rather than integrated components. Assessment schedules need to provide challenge without producing avoidable congestion or confusion. Evidence linking motivation and emotional engagement with attainment further supports the value of regular progress signals (Liu et al., 2024). Lecturers require reliable platforms and manageable workloads to provide timely feedback. A coherent assessment system gives students sufficient autonomy while maintaining the structure, accountability, and interpersonal support needed to sustain effort and improve academic performance.

3.0 PRESSURES DISRUPTING STUDENT MOTIVATION WITHIN HYBRID LEARNING ENVIRONMENTS

The potential of hybrid learning is constrained by pressures that emerge when flexibility, technology, and student responsibility are not adequately coordinated. Fragmentation between delivery modes can make learning difficult to navigate. Excessive dependence on self-management may disadvantage students who have not developed strong study routines. Weak social connection can reduce belonging, while digital inequality can restrict participation. Misaligned assessment may also direct effort away from meaningful learning. These pressures are interconnected rather than isolated. A student experiencing unreliable access may participate less, receive limited feedback, feel disconnected, and subsequently lose confidence. Analysing these challenges as interacting conditions explains why apparently flexible learning environments can produce uneven motivational and academic outcomes across different student groups.

3.1 Learning Fragmentation Across Multiple Hybrid Delivery Modes

Learning fragmentation occurs when online and classroom components operate as separate activities rather than parts of a connected learning journey. Hrastinski (2019) explains that blended learning includes various combinations of online and face-to-face learning. This variety creates flexibility, but it can also produce duplicated content, unclear transitions, competing schedules, and inconsistent instructions. Students may struggle to identify which activities are essential and how one task prepares them for another. The number of decisions learners must make also increases as they manage preparation, participation, communication, pacing, and resource use. Flexibility becomes an organisational burden when students must reconstruct the course sequence independently. Designing a coherent hybrid environment requires careful coordination of flexibility, interaction, learning support, and the emotional learning climate (Boelens et al., 2017). A digital activity should prepare students for a later classroom task or extend learning that began during physical instruction. Students are more likely to invest effort when they understand this connection. The outcomes of blended learning vary when course designs differ in the quality of integration and student engagement (Cao, 2023). Technology should therefore extend explanation, practice, collaboration, and feedback rather than duplicate classroom content on another platform. Coherent sequencing helps students recognise the purpose of each learning mode.

The wider consequences of fragmentation extend beyond immediate participation because repeated learning experiences influence confidence, persistence, and expectations of future success. Hrastinski (2019) indicates that blended learning should be understood through the way different delivery modes are combined. Poorly integrated modes can create uncertainty even when each activity appears academically appropriate when considered separately. Students who miss one online milestone may enter the classroom without adequate preparation. Weaker participation can then reduce feedback, understanding, and confidence. Universities should examine whether course structure creates avoidable barriers before interpreting disengagement as a student attitude problem. The challenge of designing flexibility demonstrates why clear sequencing and consistent communication are essential (Boelens et al., 2017). Learning platforms should present priorities, deadlines, resources, and links between activities in a predictable format. Lecturers should also monitor participation patterns and respond before occasional difficulties become sustained disengagement. Variation in blended-learning outcomes further demonstrates that delivery mode alone cannot explain academic success (Cao, 2023). The strategic risk is that students with stronger digital skills and study routines may receive most of the benefits, while less prepared students experience greater confusion. Effective design should reduce this gap by providing clear pathways, timely support, and visible connections across learning modes.

3.2 Excessive Self-Management Demands Weakening Student Learning Persistence

Excessive dependence on student self-management can transform hybrid flexibility into a risk to motivation and academic performance. Zimmerman (2002) explains that self-regulated learning requires goal setting, strategic action, monitoring, and reflection. Not every student enters university with these capabilities fully developed. Hybrid learning increases the number of decisions students must make about preparation, attendance, pacing, communication, and resource use. Students may postpone recorded lectures, overlook online deadlines, or underestimate the time required for independent study. Competing responsibilities such as employment and family commitments can further weaken regular study routines. Online learners rely heavily on time management, effort

regulation, and consistent engagement to maintain progress (Broadbent, 2017). Universities should therefore provide weekly structures, manageable deadlines, progress indicators, and reminders that support planning without removing autonomy. Students also need clear routes for requesting assistance before small difficulties become larger academic problems. Self-regulation and technological competence remain important challenges in the online component of blended learning (Rasheed et al., 2020). Flexibility becomes productive when learners receive sufficient structure to organise their effort and recognise their progress. It becomes harmful when institutional guidance is withdrawn before students are ready to manage the learning process independently.

The consequences of excessive self-management demands may extend across an entire semester. Zimmerman (2002) shows that students need to monitor their performance and adjust strategies when progress becomes weak. Students who miss one online activity may become less prepared for the next classroom session. Reduced participation can lead to poorer feedback, lower confidence, and further delay. This cycle may continue even when course content remains accessible. Universities should examine workload, sequencing, communication, and feedback before relying on motivational messages or punitive attendance rules. Effective online learning strategies can help students maintain effort and persistence across different tasks (Broadbent, 2017). Learning dashboards and progress indicators may support this process if they provide clear and constructive information. Lecturers should also use early participation patterns to identify students who may need additional support. Challenges involving institutional support indicate that self-management cannot be treated entirely as an individual responsibility (Rasheed et al., 2020). Students differ in prior knowledge, digital confidence, study routines, employment commitments, and access to reliable learning spaces. Hybrid learning may widen performance differences when students with stronger existing capabilities gain most of the flexibility benefits. Institutional support should therefore develop self-regulation progressively while maintaining clear expectations and accessible assistance.

3.3 Weak Social Connection Reducing Student Academic Belonging

Weak social connection can reduce motivation even when learning content remains accessible. Ryan and Deci (2020) identify relatedness as an important condition for sustaining high-quality motivation. In hybrid learning, relatedness is supported through lecturer visibility, peer interaction, meaningful dialogue, and a sense of belonging. Students may feel disconnected when online activities are largely transactional or completed individually without acknowledgment. Limited interaction can also make learners less willing to ask questions, express uncertainty, or seek assistance. Hybrid learning requires students to move repeatedly between physical and digital environments. Social relationships should continue across these environments rather than disappear when classroom sessions end. Engagement in blended learning includes academic, behavioural, cognitive, and emotional dimensions (Vanslambrouck et al., 2024). Lecturers can strengthen these dimensions through regular communication, responsive feedback, small-group discussions, and collaborative tasks with clear academic purposes. Students should also understand how their contributions support shared learning. Motivation and emotional engagement are connected with academic attainment in blended university learning (Liu et al., 2024). Social connection therefore supports performance by encouraging participation, persistence, and confidence. It should be treated as a central design requirement rather than an optional feature of hybrid education.

The wider effects of weak social connection emerge gradually through changes in participation and academic identity. Ryan and Deci (2020) explain that students are more likely to sustain motivation when they experience meaningful relationships within their learning environment. A student who receives little response may assume that participation is unimportant. Reduced contribution can then limit feedback, understanding, and confidence. Universities should not automatically interpret silence or absence as a lack of interest. Learning conditions may be creating social or communication barriers that discourage involvement. Strong blended-learning environments provide several forms of engagement rather than relying on one communication channel (Vanslambrouck et al., 2024). Some students may participate confidently during classroom discussions, while others may contribute more effectively through structured online activities. Inclusive design should recognise these differences while maintaining meaningful academic expectations. Emotional engagement also influences whether students persist when learning becomes difficult (Liu et al., 2024). Lecturers should monitor participation patterns and intervene before students become isolated from peers and learning activities. Social presence does not require constant synchronous meetings. It requires visible teaching, responsive communication, purposeful peer interaction, and clear evidence that students remain valued members of an active academic community.

3.4 Digital Inequality Creating Uneven Student Learning Readiness

Digital inequality can transform technological flexibility into unequal academic opportunity. Rasheed et al. (2020) identify technological competence and institutional support as continuing challenges in blended learning. Students differ in device quality, internet connectivity, accessibility, digital confidence, and access to suitable study spaces. A student using an unreliable device may take longer to complete the same task as a well-equipped classmate. Connectivity problems can restrict participation in live sessions and access to recorded resources. Limited privacy or quiet study space can also make sustained concentration difficult. These conditions influence motivation because repeated technical difficulties can reduce confidence and perceived control. Digital readiness is increasingly connected with students' broader capabilities and preparation for future employment (Ghani et al., 2025). Universities should therefore assess learning readiness rather than assume that all students possess similar digital resources. Support may include equipment loans, internet assistance, accessible materials, platform orientation, and flexible participation options. Digital engagement can create educational value when students have the capabilities and resources needed to participate effectively (Yusof et al., 2025). The objective is not merely to increase technology use. It is to ensure that technology supports sustained motivation, meaningful engagement, and dependable academic progress across different student groups.

The consequences of digital inequality extend beyond immediate access to learning materials. Rasheed et al. (2020) demonstrate that learner, lecturer, and institutional challenges interact within blended-learning environments. A student facing repeated technical problems may participate less frequently and receive less feedback. Reduced participation can then weaken preparation, classroom confidence, and academic belonging. Universities should examine accessibility and technological conditions before describing disengagement as a personal failure. Digital capability also affects how confidently students navigate information and communicate in academic or professional settings (Ghani et al., 2025). Support should therefore develop practical competence in addition to providing devices and connectivity. Consistent platform structures, clear instructions, and opportunities to practise unfamiliar tools can reduce avoidable digital friction. Technology-supported participation

becomes more sustainable when it is connected with useful resources, collaboration, and meaningful learning activities (Yusof et al., 2025). Lecturers should also provide alternatives when technical requirements are not essential to the learning objective. Hybrid learning may widen academic differences when students with stronger digital resources gain most of the flexibility benefits. Equitable design should ensure that technological conditions do not determine who can participate confidently, receive feedback, and demonstrate academic capability.

3.5 Misaligned Workload and Assessment Practices Weakening Student Academic Motivation

Misaligned workload and assessment practices can direct effort away from meaningful learning. Means et al. (2013) found that positive blended-learning outcomes may reflect additional learning time, resources, and instructional design rather than the delivery medium itself. Additional online tasks do not automatically improve learning. Students may view them as unnecessary workload when they duplicate classroom content or have no visible connection with assessment. Hybrid courses can also become overloaded when lecturers add digital activities without removing or redesigning existing tasks. Students then allocate effort according to deadlines and marks rather than educational importance. The effects of blended learning vary according to context, implementation, and the outcomes being examined (Cao, 2023). Assessment should therefore connect online preparation, classroom participation, formative practice, and final performance. Students need to understand what each activity develops and how it contributes to academic progress. Feedback should be timely enough to guide improvement before the next important task. Contemporary digital education also requires assessment designs that respond to changing learning environments and student needs (Daniel, 2024). Clear grading expectations, realistic workloads, and visible progress signals can strengthen motivation. Misalignment weakens it by making learning appear repetitive, fragmented, or disconnected from achievement.

The consequences of assessment misalignment extend beyond students' immediate decisions about task completion. Means et al. (2013) demonstrate that instructional design influences whether blended learning produces academic benefits. A student who cannot identify the value of an online task may complete it with minimal effort or ignore it entirely. Weak preparation can then reduce classroom participation and later assessment performance. Universities should examine total workload across delivery modes instead of evaluating online and classroom tasks separately. Variability in blended-learning outcomes reinforces the importance of connecting activities with clear educational purposes (Cao, 2023). Formative assessment can provide regular evidence of progress without producing excessive pressure. Feedback should identify strengths, explain weaknesses, and guide the next stage of learning. Assessment practices should also recognise changes in digital participation and the growing diversity of student learning conditions (Daniel, 2024). Lecturers require dependable platforms, usable learning information, and realistic workloads to provide timely support. Students are more likely to sustain effort when tasks are relevant, grading is transparent, and feedback is connected with improvement. A coherent assessment system strengthens continuity across learning modes by directing effort towards activities that contribute meaningfully to academic attainment.

4.0 MECHANISMS LINKING HYBRID LEARNING DESIGN WITH STUDENT OUTCOMES

Understanding hybrid learning requires an explanation of the mechanisms connecting design choices with student outcomes. Autonomy support influences the quality of student motivation. Self-regulation converts flexibility into sustained learning behaviour, while engagement connects social and cognitive participation with achievement. Digital competence determines whether technology supports or obstructs participation. Feedback creates a continuing relationship between academic achievement and subsequent effort. These mechanisms operate simultaneously and can reinforce one another. Effective feedback can strengthen competence, while greater competence can support persistence and improve performance. Conversely, confusing design can weaken perceived control, reduce engagement, and create negative interpretations of academic progress. A mechanism-based perspective therefore provides a stronger explanation of hybrid learning than comparisons based only on delivery mode.

4.1 Autonomy Support Strengthening Student Motivation Within Hybrid Learning

Autonomy support strengthens motivation by providing students with meaningful choices without removing academic guidance. Deci and Ryan (2000) explain that autonomy is an important psychological requirement for high-quality motivation. In hybrid learning, students make decisions about participation, preparation, pacing, communication, and resource use. These decisions can increase ownership when expectations are transparent and support remains visible. Nevertheless, choice can create uncertainty when online and classroom requirements are weakly connected. Students may also struggle when they lack confidence in managing their learning independently. The quality of course design therefore shapes how learners interpret flexibility. Motivation becomes stronger when students experience autonomy together with competence and relatedness (Ryan & Deci, 2020). A learner who understands how a digital activity prepares them for a later classroom task is more likely to invest purposeful effort. In contrast, the same activity may be perceived as additional workload when its value is unclear. Effective autonomy support also requires appropriate structure, interaction, and emotional support across learning modes (Boelens et al., 2017). A coherent design gives students sufficient control over learning while preserving accountability, guidance, and interpersonal connection. Autonomy should therefore support intelligent choices rather than require students to reconstruct the course independently.

Autonomy support explains why the same hybrid design can produce different motivational and academic outcomes. Deci and Ryan (2000) demonstrate that students' interpretations of control and choice influence the quality of their motivation. Learners continually evaluate whether tasks are manageable, worthwhile, and connected with their academic goals. These evaluations affect attention, persistence, help-seeking behaviour, and willingness to continue after experiencing difficulty. The process is recursive rather than linear. A successful learning experience can strengthen competence and increase later effort. Poorly coordinated tasks can produce confusion, weak performance, and lower motivation. Competence and social connection therefore remain important even when students have considerable freedom (Ryan & Deci, 2020). Technology should also be evaluated according to its influence on learning behaviour rather than its novelty or frequency of use. A digital feature has educational value only when it improves access, interaction, feedback, practice, or reflection. Flexible learning can become demanding when students receive choices without sufficient instructional support (Boelens et al., 2017). Purposeful interaction with lecturers

and peers can further reduce the isolation associated with heavily asynchronous learning. Students are more likely to sustain effort when expectations are clear, feedback is timely, and digital tasks contribute visibly to assessed outcomes.

4.2 Self-Regulation Converting Hybrid Flexibility into Academic Performance

Self-regulation converts access and flexibility into sustained learning activity and academic progress. Zimmerman (2002) describes self-regulation as a process involving planning, strategy use, monitoring, and reflection. These capabilities become especially important when students divide their learning across physical and digital environments. Hybrid learning increases the number of decisions involving preparation, attendance, communication, pacing, and resource use. Students who manage these decisions effectively can use flexibility to support their personal circumstances. Other students may procrastinate, overlook online tasks, or underestimate the time required for independent learning. Time management, effort regulation, and consistent engagement are particularly important for success in online learning environments (Broadbent, 2017). Course design can support these behaviours through predictable schedules, manageable deadlines, progress indicators, and timely reminders. Learners also need clear opportunities to request assistance when their original strategies are ineffective. Motivation and emotional engagement can influence whether students maintain these self-regulatory behaviours and achieve stronger academic outcomes (Liu et al., 2024). Self-regulation should therefore not be treated as a fixed personal quality. It is a capability that can be strengthened through structured practice, useful feedback, and learning environments that balance student responsibility with appropriate institutional support.

Self-regulation also explains why students can experience different outcomes within the same hybrid course. Zimmerman (2002) indicates that learners must continuously monitor progress and adjust their strategies. Students evaluate whether learning activities are manageable, valuable, and connected with visible improvement. These judgements influence persistence and willingness to return after difficulty. A well-designed task may produce early success, strengthen confidence, and encourage greater effort. A confusing task can produce the opposite cycle by weakening competence and increasing avoidance. Students therefore need tools that help them interpret progress without creating unnecessary surveillance. Effective strategies for managing time and regulating effort can support continued participation across online learning tasks (Broadbent, 2017). Lecturers should also identify patterns of missed activities before they develop into sustained disengagement. The relationship between motivation, emotional engagement, and academic attainment demonstrates that self-regulation operates within broader learning conditions (Liu et al., 2024). Technology has educational value when it supports planning, practice, communication, feedback, and reflection. A coherent hybrid environment creates continuity among online preparation, classroom participation, digital practice, and assessment. Academic performance consequently depends on student agency and the quality of the structure surrounding that agency.

4.3 Student Engagement Connecting Social Presence with Academic Achievement

Student engagement connects social presence with academic achievement through behavioural, cognitive, emotional, and interactive participation. Vanslambrouck et al. (2024) identify multiple dimensions of engagement within blended-learning environments. Behavioural engagement involves attendance, participation, and task completion. Cognitive engagement involves sustained attention, strategic thinking, and effortful learning. Emotional engagement develops through interest,

confidence, belonging, and positive relationships. These dimensions help explain why physical or digital presence alone does not guarantee meaningful learning. Students may attend sessions while remaining intellectually or emotionally disconnected. Hybrid course design should therefore create purposeful opportunities for interaction, application, feedback, and collaboration. Evidence indicates that blended learning can support positive outcomes, although its effect on engagement varies across contexts (Cao, 2023). Students are more likely to engage when they understand why activities matter and how participation contributes to academic progress. Purposeful integration between online and classroom experiences can support deeper learning and transform the wider educational experience (Garrison & Kanuka, 2004). Engagement therefore operates as the bridge through which social presence and well-designed activities contribute to stronger understanding, persistence, and academic performance.

Engagement also explains why apparently similar hybrid environments can produce different learning trajectories. Vanslambrouck et al. (2024) demonstrate that engagement includes academic, behavioural, cognitive, and emotional responses. Students continually assess whether learning tasks are manageable, relevant, socially supported, and connected with progress. These evaluations shape attention, persistence, help seeking, and willingness to participate after experiencing difficulty. Early success can strengthen competence and encourage deeper involvement. Poorly coordinated activities can create confusion and gradually reduce participation. The variation found across blended-learning outcomes indicates that engagement depends on implementation rather than delivery mode alone (Cao, 2023). Technology should therefore be assessed according to whether it strengthens interaction, practice, feedback, and reflection. Discussion boards or collaborative platforms provide limited value when participation is superficial or receives no response. The transformative potential of blended learning depends on meaningful integration between physical and digital learning experiences (Garrison & Kanuka, 2004). Lecturers require pedagogical support, reliable systems, and realistic workloads to maintain this integration. Purposeful interaction with lecturers and peers can reduce isolation and strengthen students' academic identity. Engagement becomes more sustainable when learning activities are connected, socially meaningful, and clearly aligned with assessed outcomes.

4.4 Digital Competence Enabling Effective Participation Within Hybrid Learning

Digital competence enables students to participate effectively without allowing technical difficulty to distract from disciplinary learning. Rasheed et al. (2020) identify technological competence as an important challenge within the online component of blended learning. Digital competence includes platform navigation, information literacy, online communication, file management, and basic troubleshooting. Students may use digital technologies frequently in daily life but remain unfamiliar with academic platforms and learning practices. Difficulty locating resources, joining synchronous sessions, submitting work, or accessing feedback can reduce confidence. These problems also consume time and attention that should be directed towards academic tasks. Universities should provide clear platform guidance, orientation activities, and low-risk opportunities to practise essential skills. Technological capability becomes increasingly important as learning and work environments continue to change (Yusof, 2025). Course designers should also minimise unnecessary complexity and use digital tools for clear educational purposes. Digital participation becomes more meaningful when technology supports access, communication, collaboration, and the completion of relevant learning activities (Yusof et al., 2025). The objective is not to maximise technology use. It

is to ensure that learners experience sufficient digital competence to participate confidently and concentrate on meaningful academic work.

Digital competence helps explain why the same technology can support one learner while obstructing another. Rasheed et al. (2020) demonstrate that technological challenges interact with learner, lecturer, and institutional conditions. Students continually judge whether digital tasks are manageable and whether available support is sufficient. Successful participation can strengthen confidence and encourage students to attempt more complex activities. Repeated technical problems can produce frustration, avoidance, and lower motivation. Universities should therefore monitor digital readiness and provide support before difficulties affect academic performance. Contemporary capability development requires students to use technology strategically rather than simply interact with more digital tools (Yusof, 2025). Consistent platform structures, clear terminology, accessible resources, and responsive technical assistance can reduce avoidable friction. Students also differ in access to devices, connectivity, suitable study spaces, and previous digital experience. Digitally connected learning environments can support participation when they provide practical value and inclusive opportunities for engagement (Yusof et al., 2025). Technology should therefore complement autonomy, interaction, and feedback rather than compete for students' attention. The long-term outcome should be stronger learning behaviour, sustained motivation, and dependable academic achievement.

4.5 Feedback Loops Reinforcing Student Motivation Through Academic Performance

Feedback loops connect academic performance with subsequent motivation, confidence, and effort. Liu et al. (2024) demonstrate that learning motivation and emotional engagement are connected with academic attainment in blended university learning. Students interpret assessment results, lecturer comments, peer responses, and progress indicators as signals about their competence. Positive progress can strengthen confidence and encourage continued effort. Repeated difficulty can reduce persistence when learners interpret poor performance as evidence that improvement is unlikely. Feedback should therefore explain both current performance and the actions needed for improvement. Timeliness is particularly important because delayed comments may arrive after students have completed similar tasks. Digital learning environments create opportunities for more frequent progress signals, but excessive automated feedback may lack personal relevance. Contemporary assessment practices should respond to changing learning environments while maintaining clarity and educational purpose (Daniel, 2024). Students need to understand what is assessed, how performance is judged, and how feedback connects with later tasks. Competence-supporting feedback can strengthen motivation when it is delivered within an environment that also supports autonomy and relatedness (Ryan & Deci, 2020). Effective feedback is therefore developmental rather than merely corrective.

Feedback loops explain why motivation and performance should not be treated as a one-directional relationship. Liu et al. (2024) indicate that stronger motivation and emotional engagement can support academic attainment. Academic results subsequently influence how students interpret their ability and future prospects. A successful experience can strengthen competence, while stronger competence can encourage greater effort in the next task. Poorly coordinated assessment may create the opposite cycle through confusion, disappointing performance, and withdrawal. Feedback needs to identify manageable next steps so that difficulty becomes a basis for improvement rather than

disengagement. Digital assessment can provide rapid progress information when it is designed around meaningful learning objectives (Daniel, 2024). Lecturers should also combine automated information with personalised guidance when students face complex problems. Motivation is strengthened when learners experience progress without losing autonomy or social connection (Ryan & Deci, 2020). Course teams should monitor participation and performance patterns to identify negative cycles at an early stage. Students are more likely to sustain effort when expectations are clear, feedback is timely, and online tasks contribute visibly to academic progress. A strong feedback system therefore transforms assessment into a continuing mechanism for confidence, reflection, improvement, and renewed motivation.

5.0 INSTITUTIONAL PATHWAYS STRENGTHENING SUSTAINABLE HYBRID LEARNING PRACTICES

Sustainable hybrid learning requires institutional pathways that translate evidence about motivation and performance into course design, student support, and academic decision making. Universities need coherent learning journeys, structured support for self-regulation, strong human presence, inclusive digital capability, and assessment systems that provide timely information about student progress. These pathways should not be treated as optional improvements because they determine whether flexibility becomes academically productive. Implementation requires coordination among lecturers, programme leaders, learning designers, student support services, and technology teams. The strategic objective is to create an environment in which students can exercise autonomy without losing structure, use technology without unnecessary difficulty, remain socially connected, and receive feedback early enough to improve their learning behaviour.

5.1 Designing Coherent Learning Journeys Across Hybrid Delivery Modes

Universities should design hybrid learning as one coherent learning journey rather than two parallel streams of online and classroom content. Hrastinski (2019) explains that blended learning includes various combinations of physical and digital learning activities. The educational value of these combinations depends on how clearly activities are sequenced and connected. Students should understand where preparation occurs, how one task supports another, and why a particular delivery mode is used. Poor transitions can create confusion, duplicated content, competing schedules, and unnecessary workload. Effective design should also address flexibility, interaction, learner support, and the emotional climate of the learning environment (Boelens et al., 2017). Online activities can prepare students for classroom discussion, application, and problem solving. Classroom sessions can subsequently generate questions or feedback that guide further digital practice. This continuity allows each mode to perform a specific educational function. Purposeful integration can also transform learning by combining the strengths of face-to-face interaction and online access (Garrison & Kanuka, 2004). Universities should therefore map the complete learning sequence before selecting technologies. The strongest learning environments use technology to extend explanation, practice, collaboration, and feedback rather than duplicate existing classroom content.

Implementing a coherent learning journey requires coordinated academic design rather than isolated technological changes. Hrastinski (2019) indicates that the concept of blended learning covers diverse arrangements that require clear educational purposes. Programme teams should map preparation, participation, interaction, assessment, and feedback across the teaching period. This process can reveal duplicated tasks, unclear deadlines, workload peaks, and activities that are

disconnected from learning outcomes. Minimum expectations should also be established for digital accessibility, lecturer response, workload balance, and online participation. Designing flexibility remains challenging because students require both meaningful choice and adequate structure (Boelens et al., 2017). Staff development should therefore extend beyond basic platform operation. Lecturers need support in pedagogy, communication, inclusion, assessment, and the responsible use of learning data. Students should also receive guidance on studying effectively across hybrid environments. The integration of physical and digital experiences is central to the transformative potential of blended learning (Garrison & Kanuka, 2004). Clear sequencing and visible connections help students recognise what matters and allocate effort appropriately. These conditions establish hybrid learning as a pedagogical system rather than a scheduling arrangement.

5.2 Scaffolding Self-Regulation Through Structured Student Learning Routines

Universities should scaffold self-regulation through learning routines that gradually develop students' capacity for independent study. Zimmerman (2002) explains that self-regulated learning involves planning, strategic action, progress monitoring, and reflection. Hybrid learning places greater responsibility on students to manage preparation, pacing, attendance, communication, and resource use. This responsibility can strengthen ownership when students have clear expectations and suitable support. It can become a burden when learners lack established routines or receive limited guidance. Weekly milestones, study plans, progress indicators, and timely reminders can provide useful structure. Online learning success also depends on strategies involving time management, effort regulation, and consistent engagement (Broadbent, 2017). These routines should support independence rather than create excessive monitoring. Students also need clear opportunities to seek help when their initial strategies are ineffective. Learner self-regulation and institutional support remain important challenges within blended-learning environments (Rasheed et al., 2020). Predictable structures can reduce uncertainty while allowing students to manage their learning according to personal circumstances. The objective is to develop independent capability gradually rather than assume that every student already knows how to organise flexible learning effectively.

Effective scaffolding requires early intervention and coordination across the student learning journey. Zimmerman (2002) demonstrates that learners need to monitor their progress and adjust strategies when performance becomes weak. Universities can support this process through orientation, planning tools, formative assessment, and reflective activities. Lecturers should identify patterns of missed tasks before they develop into serious disengagement. Students who fall behind need realistic recovery plans rather than only warnings about attendance or deadlines. Effective online learning strategies can strengthen persistence when learners understand how to organise time and regulate effort (Broadbent, 2017). Support should also recognise that students have different levels of digital confidence, prior knowledge, and external commitments. Institutional structures are necessary because blended-learning challenges cannot be addressed entirely through individual responsibility (Rasheed et al., 2020). Technology can support progress monitoring, but learning data should be used constructively and ethically. Capability development can also strengthen students' adaptation to digitally mediated learning and work environments (Yusof et al., 2025). Structured routines therefore provide a foundation from which students can progressively develop greater autonomy, persistence, and responsibility.

5.3 Strengthening Human Presence Through Inclusive Learning Communities

Universities should strengthen human presence by creating deliberate opportunities for academic and social connection across learning modes. Engagement in blended learning includes behavioural, cognitive, emotional, and social dimensions (Vanslambrouck et al., 2024). Lecturer visibility can be strengthened through regular announcements, responsive feedback, consultation opportunities, and active participation in important online discussions. Peer connection can be developed through small-group activities, mentoring, collaborative problem solving, and structured dialogue. These interactions should have clear academic purposes rather than function as superficial participation requirements. Relatedness is also important for sustaining high-quality learner motivation (Ryan & Deci, 2020). Students are more likely to ask questions, seek help, and persist through difficulty when they feel recognised as members of an academic community. Hybrid flexibility should therefore be balanced with opportunities for meaningful interaction. Human-centred design further demonstrates that systems should support user confidence, participation, and performance (Abd Wahab & Yusof, 2020). Universities should not assume that access to communication technology automatically produces connection. Human presence requires visible teaching, purposeful peer relationships, responsive communication, and inclusive opportunities for participation.

Implementing inclusive learning communities requires continuity between classroom relationships and online interaction. Vanslambrouck et al. (2024) demonstrate that stronger engagement emerges when academic, behavioural, cognitive, and emotional dimensions are supported. Classroom discussions can continue through focused online activities, while digital preparation can support more meaningful face-to-face collaboration. Students should receive acknowledgment when they contribute ideas, ask questions, or complete collaborative work. Silence from lecturers or peers can make digital activities appear unimportant. Motivation also becomes stronger when students experience meaningful social connection and competence within the learning environment (Ryan & Deci, 2020). Programme teams should therefore establish reasonable expectations for lecturer presence, response times, and peer interaction. Flexible participation formats can accommodate students who differ in confidence, accessibility needs, employment commitments, and communication preferences. Human-centred systems should also reduce avoidable barriers that make participation difficult or uncomfortable (Abd Wahab & Yusof, 2020). Universities need to monitor whether particular groups remain excluded from discussions or collaborative activities. Strong learning communities protect students from isolation and reinforce the belief that their participation contributes meaningfully to shared academic progress.

5.4 Building Inclusive Digital Capability Through Equitable Learning Access

Institutions should reduce digital participation barriers before evaluating students' academic performance. Rasheed et al. (2020) identify technological competence and institutional support as persistent challenges in blended learning. Students differ in their access to suitable devices, reliable connectivity, accessible software, technical assistance, and appropriate study environments. These differences influence whether flexibility becomes an educational opportunity or an additional disadvantage. Universities should assess digital readiness and provide targeted support where necessary. Equipment loans, internet assistance, accessible resources, platform orientation, and responsive technical support can reduce avoidable barriers. Digital capability is also increasingly important within contemporary learning and professional environments (Yusof, 2025). Support should therefore develop information literacy, digital communication, file management, platform

navigation, and basic troubleshooting. Students' wider capability and employability readiness can also be strengthened through confident and purposeful technology use (Ghani et al., 2025). Digital tools should be selected according to educational needs rather than novelty. The objective is to ensure that students can focus on disciplinary learning without being disadvantaged by unnecessary technical difficulty.

Building inclusive digital capability requires coordination among academic, technical, and student support teams. Rasheed et al. (2020) demonstrate that learner difficulties interact with lecturer practices and institutional conditions. Universities should map the technological requirements that students encounter throughout a teaching period. This process can identify unnecessary platform changes, accessibility problems, duplicated systems, and periods of excessive digital workload. Students should be given opportunities to practise essential tools before using them in high-stakes assessment. Capability development should also help learners use technology strategically rather than simply increase the number of digital activities (Yusof, 2025). Alternative participation methods should be available when a particular technology is not essential to the learning outcome. Digital readiness also contributes to students' confidence and preparation for technology-supported employment (Ghani et al., 2025). Earlier capability research connects information technology with the coordination of knowledge and performance processes (Yusof et al., 2020). Inclusive access therefore involves infrastructure, capability development, accessible design, and continuing support. Equity becomes part of academic quality because students cannot benefit equally from flexibility when their technological conditions differ substantially.

5.5 Aligning Assessment Feedback with Responsive Learning Analytics Practices

Assessment, feedback, and learning analytics should guide student effort and support timely academic intervention. Cao (2023) demonstrates that blended-learning outcomes vary according to context, implementation, and the type of educational outcome assessed. Students naturally prioritise activities that contribute visibly to grades, feedback, or progress. Online tasks may receive limited attention when they appear disconnected from classroom learning or formal assessment. Alignment should therefore connect learning outcomes, activities, feedback, and assessment across both delivery modes. Motivation and emotional engagement are also associated with academic attainment in blended university learning (Liu et al., 2024). Formative assessment can provide early progress signals and help students identify areas requiring improvement. Learning analytics can support this process by revealing patterns of missed work, declining participation, or repeated difficulty. Contemporary digital assessment requires responsive practices that maintain educational clarity and relevance (Daniel, 2024). Analytics should inform professional judgement rather than automatically label students as disengaged. The central objective is to provide useful information early enough for students and lecturers to take appropriate action.

Implementation requires clear standards for feedback timing, workload balance, data use, and academic intervention. Cao (2023) indicates that the effectiveness of blended learning depends significantly on design and implementation. Programme teams should map assessment demands across online and classroom environments to identify duplication, congestion, and unclear relationships between tasks. Students need to understand what is assessed, how performance is evaluated, and how feedback should guide the next activity. The connection between motivation, emotional engagement, and attainment supports the use of regular and constructive progress signals

(Liu et al., 2024). Lecturers also need reliable platforms, usable analytics, and realistic workloads to provide timely support. Digital systems should maintain privacy, security, integration, and accessibility while supporting informed decisions. Technology implementation requires attention to system maintenance and user capability in addition to technical functionality (Yusof et al., 2025). Assessment and analytics should therefore strengthen human decision making rather than replace it. A responsive system helps students recognise progress, recover from difficulty, and sustain effort across the hybrid learning journey.

6.0 CONCLUSION

Hybrid learning has changed the way students experience university education by combining flexibility, digital access, independent learning, and face-to-face interaction within a single learning environment. Its effectiveness, however, depends less on the amount of online or classroom learning and more on how these elements are organised into a coherent academic experience. Flexibility can strengthen student autonomy, but excessive independence without sufficient structure may create confusion, weak engagement, and inconsistent learning behaviour. Similarly, technology can expand access and support communication, yet its educational value remains limited when students experience fragmented activities, unclear expectations, or insufficient interaction. Effective hybrid learning therefore requires a careful balance between autonomy and guidance, flexibility and structure, as well as digital engagement and meaningful human interaction. Student motivation should consequently be understood as something that develops through the learning environment rather than as a fixed personal characteristic. When students understand what is expected, receive timely feedback, maintain meaningful academic connections, and can manage their learning responsibilities effectively, hybrid learning is more likely to support sustained engagement and stronger academic performance.

For universities, the findings emphasise the importance of designing hybrid learning around the complete student learning journey rather than simply dividing teaching activities between physical and online environments. Learning outcomes, instructional activities, interaction, assessment, and feedback should be deliberately connected so that each learning mode performs a clear and complementary function. Students also require appropriate support for time management, independent learning, digital participation, help seeking, and effective use of feedback. At the same time, lecturers need suitable pedagogical preparation, reliable digital infrastructure, manageable workloads, and institutional support to maintain meaningful academic presence across different learning modes. Accessibility must remain an important consideration because differences in devices, internet connectivity, study environments, and digital readiness can influence students' ability to participate effectively. Sustainable hybrid learning therefore requires coordinated institutional responsibility rather than depending solely on individual lecturers. A well-designed environment should provide sufficient flexibility while maintaining clear routines, regular communication, accessible academic support, and opportunities for students to interact meaningfully with lecturers and peers.

Future development of hybrid learning should focus on improving the quality of learning design rather than increasing technological complexity. Universities need to understand how different combinations of physical and digital learning influence motivation, engagement, self-regulation, and academic performance across disciplines and student groups. Greater attention should also be given

to how student experiences change throughout a semester, particularly when difficulties involving workload, feedback, social connection, or independent learning begin to emerge. Future research can strengthen this understanding by examining specific hybrid learning designs, differences in student readiness, assessment practices, accessibility, and patterns of participation over time. Learning analytics may provide useful information, but student behaviour should always be interpreted alongside motivation, belonging, learning circumstances, and academic support. Ultimately, hybrid learning becomes educationally valuable when technology serves pedagogy rather than determines it. Its long-term success depends on creating a connected learning environment where flexibility, autonomy, interaction, assessment, feedback, and institutional support work together to help students participate purposefully, regulate their learning effectively, and achieve sustainable academic performance.

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2. Conflict of Interest

The authors declare that they have no financial, professional, personal, or institutional interests that could have influenced the development, interpretation, or presentation of this article. No competing interests or relationships exist that could reasonably be perceived as affecting the objectivity, academic integrity, or scholarly independence of the work.

3. Author Contribution Statement

Ahzilah Wahid: Conceptualization, development of the conceptual direction, literature synthesis, analysis of hybrid learning, student motivation, and academic performance, preparation of the original manuscript, and manuscript revision.

Hamidah Razali: Conceptual refinement, theoretical interpretation, validation of the scholarly arguments, critical review, academic input, and manuscript editing.

Both authors contributed substantially to the intellectual development of the article, critically reviewed the manuscript for conceptual coherence and scholarly quality, and approved the final version for publication.

4. Ethics Statement

This article is a conceptual review based exclusively on published scholarly literature and secondary academic sources. It did not involve human participants, surveys, interviews, experiments, interventions, or the collection of personal, confidential, or identifiable data. Accordingly, institutional ethical approval and informed consent were not required. The review was conducted in accordance with established principles of academic integrity and responsible scholarship. All intellectual contributions and published sources used in developing the analysis were appropriately acknowledged, and the authors accept responsibility for the integrity, accuracy, and scholarly presentation of the work.

REFERENCES

- Abd Wahab, N. S., & Yusof, M. S. (2020). Ergonomic work design and its influence on healthcare professionals' well-being and performance. *The Asian Journal of Professional & Business Studies*, 1(2), 90–107. <https://doi.org/10.61688/ajpbs.v1i2.298>
- Boelens, R., De Wever, B., & Voet, M. (2017). Four key challenges to the design of blended learning: A systematic literature review. *Educational Research Review*, 22, 1–18. <https://doi.org/10.1016/j.edurev.2017.06.001>
- Broadbent, J. (2017). Comparing online and blended learner's self-regulated learning strategies and academic performance. *The Internet and Higher Education*, 33, 24–32. <https://doi.org/10.1016/j.iheduc.2017.01.004>
- Cao, W. (2023). A meta-analysis of effects of blended learning on performance, attitude, achievement, and engagement across different countries. *Frontiers in Psychology*, 14, 1212056. <https://doi.org/10.3389/fpsyg.2023.1212056>
- Daniel, K. (2024). Motivate students for better academic achievement: A systematic review of blended innovative teaching and its impact on learning. *Computer Applications in Engineering Education*, 32(4), e22733. <https://doi.org/10.1002/cae.22733>
- Deci, E. L., & Ryan, R. M. (2000). The what and why of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01
- Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education*, 7(2), 95–105. <https://doi.org/10.1016/j.iheduc.2004.02.001>
- Ghani, M. Z., Radzuan, M. F., Uyob, S., Yusof, M. S., & Azlina, A. (2025). Employability of early childhood education graduates in Malaysia: Employer perspectives and market readiness. *The Asian Journal of Professional & Business Studies*, 6(2), 1–13. <https://doi.org/10.61688/ajpbs.v6i2.412>
- Hrastinski, S. (2019). What do we mean by blended learning? *TechTrends*, 63, 564–569. <https://doi.org/10.1007/s11528-019-00375-5>
- Kamarudin, M. A. I., Jaaffar, A. R., Yusof, M. S., Nawi, M. N. M., Sidek, S., Nuh, R., & Yusof, M. S. (2025). Entrepreneurship as a career path among university students: An action research on hands-on learning and follow-up approach in business through the Introduction to Entrepreneurship course. *Journal of Cultural Analysis and Social Change*, 10(2), 3284–3300. <https://doi.org/10.64753/jcasc.v10i2.2096>
- Liu, Y., Ma, S., & Chen, Y. (2024). The impacts of learning motivation, emotional engagement and psychological capital on academic performance in a blended learning university course. *Frontiers in Psychology*, 15, 1357936. <https://doi.org/10.3389/fpsyg.2024.1357936>
- Means, B., Toyama, Y., Murphy, R., & Baki, M. (2013). The effectiveness of online and blended learning: A meta-analysis of the empirical literature. *Teachers College Record*, 115(3), 1–47. <https://doi.org/10.1177/016146811311500307>

- Rasheed, R. A., Kamsin, A., & Abdullah, N. A. (2020). Challenges in the online component of blended learning: A systematic review. *Computers & Education*, 144, 103701. <https://doi.org/10.1016/j.compedu.2019.103701>
- Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, 61, 101860. <https://doi.org/10.1016/j.cedpsych.2020.101860>
- Vanslambrouck, S., Zhu, C., Pynoo, B., Lombaerts, K., Tondeur, J., & Scherer, R. (2024). Effective student engagement with blended learning: A systematic review. *Heliyon*, 10, e39497.
- Vo, H. M., Zhu, C., & Diep, N. A. (2017). The effect of blended learning on student performance at course-level in higher education: A meta-analysis. *Studies in Educational Evaluation*, 53, 17–28. <https://doi.org/10.1016/j.stueduc.2017.01.002>
- Yusof, M. S. (2025). Technology adoption in small and medium enterprises and its impact on business growth, innovation, and digital sustainability. *International Journal of Advanced Research in Economics and Finance*, 7(3), 84–100. <https://doi.org/10.55057/ijaref.2025.7.3.7>
- Yusof, M. S. (2026). Integrating digital and entrepreneurial leadership: A framework for SME performance in emerging economies. *Jurnal Evolusi*, 7(1), 62–77. <https://doi.org/10.61688/jev.v7i1.568>
- Yusof, M. S. B., Razak, N. A., & Fauzi, N. (2025). Empowering small and medium enterprises in Terengganu through technological learning and innovation for economic growth. *Veredas do Direito*, 22(7), e224108.
- Yusof, M. S., & Abd Wahab, N. S. (2021). Balancing technology and ethics in the transformation of modern hospital healthcare. *The Asian Journal of Professional & Business Studies*, 2(1), 16–34. <https://doi.org/10.61688/ajpbs.v2i1.146>
- Yusof, M. S., Abdul Razak, N., Jamaludin, A., Abdulloh, N. N., Ahmad, A., & Mat Zin, Z. (2025). Integrating smart technologies in warehouse management to overcome system maintenance and security issues. *International Journal of Environmental Sciences*, 11(20s), 533–543.
- Yusof, M. S., Abdul Razak, N., Mat Zin, Z., & Abdulloh, N. N. (2025). Challenges and opportunities in TikTok Shop for advancing social commerce and consumer engagement strategies. *International Journal of Business and Technology Management*, 7(2), 60–71. <https://doi.org/10.55057/ijbtm.2025.7.2.7>
- Yusof, M. S., Abdul Razak, N., Misnan, N., & Abdul Malik, H. K. (2026). Corporate governance and ethical accountability in sustainable organizational development. *Jurnal Evolusi*, 7(1), 14–31. <https://doi.org/10.61688/jev.v7i1.564>
- Yusof, M. S., Kamarudin, M. A. I., Osman, M. F., & Syed A Rahman, S. N. M. (2025). Unleashing sustainable growth in Malaysian SMEs through the development and application of entrepreneurial competencies. *International Journal of Advanced Research in Economics and Finance*, 7(3), 127–144. <https://doi.org/10.55057/ijaref.2025.7.3.10>

- Yusof, M. S., Kamarudin, M. A. I., Wahid, A., & Osman, M. F. (2025). The impact of digital transformation: An empirical analysis on the stability of agro-food SMEs. *International Journal of Business and Technology Management*, 7(6), 287–301. <https://doi.org/10.55057/ijbtm.2025.7.6.24>
- Yusof, M. S., Othman, N., Zaini, A. F. A., Abdul Manan, D. I., & Jali, M. N. (2025). Digital mobility and learning behavior within the humanities education perspective among university students using Grab e-hailing services. *Veredas do Direito*, 22, e224040. <https://doi.org/10.18623/rvd.v22.n6.4040>
- Yusof, M. S., Razak, N. A., Jamaludin, A., Jali, M. N., & Seman, S. A. (2025). Empowering women entrepreneurs in Malaysia through digital participation and innovation. *TPM–Testing, Psychometrics, Methodology in Applied Psychology*, 32(S8), 325–335.
- Yusof, M. S., Salleh, M. N., & Zahari, F. M. (2020). The relationship between information technology capability and new product development success: A conceptual framework. *International Journal of Business and Technology Management*, 2(1), 98–112.
- Zaini, A. F. B. A., Yusof, M. S. B., Jamaludin, A., Yunus, M. H. S. M., & Hashim, F. (2026). Consumer review perception and its impact on Generation Z online spending behaviour in modern digital commerce. *Veredas do Direito*, 23(1), e234304.
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice*, 41(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2