



Assessing Blended Learning Outcomes: An Empirical Study of Learning, Behaviour, and Performance

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ABSTRACT

Blended learning has become a widely adopted instructional approach that integrates face-to-face and online learning to enhance both teaching quality and learning outcomes. Yet, despite its growing use, the elements that make blended learning truly effective are not always well understood. This study examines the effectiveness of blended learning by evaluating learner reactions, knowledge acquisition, behavioural changes, and perceived outcomes, drawing on the experiences of 150 students from Universiti Teknologi MARA, Negeri Sembilan. Data were collected through surveys and performance assessments across various academic settings. The findings highlight that several factors play a decisive role in shaping positive blended learning experiences: learner engagement, the quality of instructional design, access to reliable technology, and strong institutional support. Students generally reported meaningful learning gains and the ability to apply what they learned, suggesting that blended learning can strengthen both cognitive and skill development. However, their immediate satisfaction and perceptions of long-term benefits were slightly more mixed, indicating room for improvement in enhancing students' overall experience and confidence in the lasting value of blended learning. Overall, this study contributes empirical evidence showing that blended learning is an effective approach in higher education, especially in supporting knowledge development and behavioural application. At the same time, the results underscore the need for institutions to focus more intentionally on improving engagement strategies, strengthening pedagogical design, and making the long-term value of blended learning more visible to students. These insights can guide educators and administrators as they refine future blended learning practices and strengthen the learning experience.

Keywords: Blended Learning; instructional design, pedagogical

INTRODUCTION

Digital technologies are reshaping higher education, enabling more flexible, integrated learning spaces that blend in-person interaction with online engagement. In this context, blended learning (BL) has moved from an experimental option to a practical "new normal," combining the social strengths of classroom teaching with the active, technology-enabled learning afforded by online learning. BL supports both synchronous and asynchronous modes, giving students greater control over when, where, and how fast they learn, an alignment that many governments and institutions, including in the European Union and Saudi Arabia, see as essential to future workforce readiness. Importantly, BL should not be treated as an add-on to existing curricula. It functions best as an integral design principle that promotes student-led, active learning experiences and re-centres learning on participation, autonomy, and higher-order thinking. Yet adoption remains uneven.

Definitions of BL differ across contexts, leading to inconsistent practice and expectations. Common barriers include underdeveloped technological infrastructure, limited pedagogical training for instructors, and unclear institutional policies. Many educators also face increased workloads and harbor skepticism about whether online components genuinely enhance learning challenges that can dampen momentum for sustained implementation. Research on BL has often focused on narrow outcomes (e.g., student satisfaction or grades)



and single perspectives (students or instructors), making it difficult for institutions to judge what truly works at scale. Without a comprehensive evaluation lens that captures immediate experiences, learning gains, behavioural transfer, and broader results, decision-makers risk equating technology presence with impact. This study responds to that need by clarifying the critical success factors for BL's adoption and effectiveness in higher education, with attention to both pedagogy and organizational supports.

Problem Statement

Higher education is undergoing rapid digital transformation, with institutions increasingly integrating technology into teaching and learning. However, despite the rise of digital tools and flexible virtual learning spaces, universities still struggle to fully harness the potential of blended learning (BL). Although BL is widely promoted as a model that effectively merges face-to-face interaction with online engagement, its implementation remains inconsistent, uneven, and poorly understood across many academic contexts. One of the fundamental challenges is the lack of a clear and universally accepted definition of blended learning. Institutions, faculties, and even individual educators interpret BL differently, resulting in varied practices and fragmented learning experiences for students. What one academic considers a balanced blend of digital and physical instruction may be considered superficial or inadequate by another. This conceptual ambiguity makes it difficult to design, evaluate, and improve BL consistently across higher education. Compounding this issue are persistent structural and technological barriers. Many universities face limited technological support systems, unreliable infrastructure, and insufficient training opportunities for lecturers who are expected to adopt new instructional tools. These barriers not only undermine the quality of BL delivery but also contribute to educators' reluctance to embrace innovative teaching practices. Lecturers often experience increased workloads when transitioning to blended formats, and some remain sceptical about whether online components can deliver the same quality of learning as traditional, in-person methods.

Another core problem is the fragmented nature of existing research. Most studies examine blended learning from a single perspective, typically focusing either on students or lecturers. Very few consider the interconnected perspectives of students, educators, and administrators simultaneously, even though successful BL implementation requires alignment among all three groups. As a result, institutions often lack a holistic understanding of BL experiences, making it difficult to design policies and practices that meet the needs of all stakeholders. Furthermore, current evaluations of BL tend to measure isolated outcomes, such as student satisfaction or grades, without examining whether BL leads to meaningful improvements in learning, behaviour, or long-term academic outcomes. Without a comprehensive evaluation framework, universities are unable to determine whether BL genuinely enhances engagement and performance or simply adds technological complexity without educational benefit. These issues collectively create a critical gap. Universities are pressured to modernize and integrate digital learning tools, yet many lack clear guidance, evidence-based evaluation methods, or a shared understanding of what effective blended learning looks like. Because of this, BL initiatives risk becoming inconsistent, unsustainable, or ineffective. Thus, the core problem driving this research is the absence of a unified, evidence-based understanding of the factors that influence the successful adoption and implementation of blended learning in higher education. It is essential for institutions that aspire to build meaningful, student-centred learning environments, ones that fully harness the unique strengths of both digital and face-to-face instruction to create richer, more engaging educational experiences.

LITERATURE REVIEW

Evolution and the Impact of Blended Learning

Blended Learning (BL) is a major transformation in teaching and learning from teacher-centred learning to the student centered learning, which focuses on the construction of knowledge. BL, instead of treating students as passive recipients of knowledge, underscores autonomy, self-management, and ownership of learning, thereby restructuring both the learner and the teacher. According to Bokolo Jr. et al. (2019) states that with the introduction of blended learning, instruction moves from "teaching" to "learning," allowing students to learn deeper through more personalized learning paths and adjusted pacing. When properly designed, blended learning environments achieve higher levels of achievement, motivation, and engagement than face-to-face



instruction, as demonstrated by published empirical research. Digital platforms enable adaptable ways of instruction, such as cooperative online and multimedia studies, flexible assessments, and online teaching resources, which customize learning strategies for different learning needs.

Learning Management Systems (LMS) provide access for teachers to systematic means of organization for instruction, feedback, assessment, and the documentation and monitoring of learning progress. These systems enable continuous lecturer-student communication, allowing students to obtain immediate, data-informed assistance through instructional modifications. Moreover, a blended learning approach, such as the flipped classroom, is linked to higher student engagement from reconfiguring pedagogical time. With this strategy, digital information is accessed in digital format outside of school, enabling face-to-face sessions and high-order thinking such as problem-solving, discussion, and the application of knowledge. Dias and Diniz (2014) emphasize that this type of model encourages active participation and instant feedback, essential conditions to consolidate learning and to correct errors. Together, these characteristics demonstrate that blended learning is not only advantageous to education but also contributes to critical thinking, student autonomy and long-term engagement in current learning situations.

Educators Attributes and Pedagogical Shifts

The effectiveness of blended learning (BL) environments is directly influenced by the characteristics of the lecturers, as the effectiveness of a blended approach in an industry is not simply the result of the technological infrastructure employed, but rather of the teachers' beliefs, competences and instructional practices. Tondeur (2017) also highlights that the effective application of BL depends on the formation of "adaptive attributes," such as a student-centred pedagogical orientation, a willingness to embrace pedagogical innovation, and an ability to try new digital technologies. Because of this, people who have these characteristics are more likely to plan the learning experience in a way that engages students, allows them to become independent, and integrates technology as useful rather than just superficial. A critical analysis of teaching practices as a key adaptive characteristic enables teaching to be modelled on student needs and learning. So, being reflective means treating technology as a pedagogical resource, not an end, thereby enabling educators to align digital tools with their learning and assessment objectives. It ensures the continuity of professional development for educators and helps them adapt to or navigate the evolving context of blended learning environments.

In contrast, Tondeur (2017) describes "maladaptive attributes" that hinder the acceptance of blended learning, for instance, fear of technology, resistance to change, and reliance on rigid, lecturer-centred instructional models. Such knowledge-transmitting individuals may find it difficult to relinquish control over any process, and, therefore, the benefits of BL for learners will not be realized. Such attitudes make less use of digital tools, or, worse still, duplicate and reuse their old teaching styles online, which, in fact, doesn't transform pedagogical strategies. When we look at blended learning, we see that a fundamental paradigm shift in the lecturer's role is needed, as a facilitator, mentor, and designer of the learning experience, rather than as the main source of content delivery. In this role, lecturers help students navigate experiences in both online and physical spaces, design scaffolding experiences, facilitate collaboration, and provide timely feedback. This pedagogical shift provides opportunities for higher-order thinking skills, self-directed learning, and continuous learner engagement, emphasizing the importance of lecturer attributes in the effective implementation of blended learning.

Institutional and Technological Context

The literature clearly describes that blended learning (BL) initiatives cannot exist in a vacuum and must be framed around a supportive institutional and technological framework. An effective BL implementation would require robust institutional commitment, in the form of dependable technological infrastructure, continuous pedagogical development, and well-coordinated governance frameworks that help shape instructional design and delivery. But without this high degree of systemic support, we can see blended learning fading into ad-hoc, haphazard uptake, or even an outdated model (Garrison & Vaughan, 2008). Infrastructure, in the form of technology, is the foundation of blended classroom learning. Institutions require stable web services, interoperable learning platforms, and technical support that enable students and faculty to use their tools purposefully. Tools such as Google Classroom and Learning Management Systems (LMS) facilitate content

sharing, communication, and assessment, while resources such as Audience Response Systems (ARS) enable interactive work moments, formative assessment, and instant feedback. Incorporating ARS into teaching has been shown to enhance student engagement, support collaborative knowledge construction, and encourage student participation in heterogeneous instructional models across face-to-face and online learning environments (Kay & LeSage, 2009; Beatty & Gerace, 2009).

But access to the tech is no substitute. The investment of institutional resources in continual professional development is key to positioning these tools pedagogically, not operationally; these are educational, not merely pragmatic and effective. Training packages must include lessons on technical skills, instructional design, digital assessment, and learner-centred pedagogies, in a blended setting (Tondeur et al., 2017). Blended learning is considerably more consistent and successful when teachers facilitate and synchronise technology usage with learning results. The institutional leadership and governance are just as critical in this respect. Administrators must provide clear guidance on how they will align and operationalize blended learning efforts with institutional and staff needs and expectations. Porter and Graham (2016) argue that sustainable uptake of BL depends on a multifaceted approach to alignment, from curriculum policy to policies on workload, evaluation, and resource allocation. The disruption introduced by a surfeit of faculty without an equivalent institutional push will undermine continued adoption and innovation. Additionally, schools that actively involve their administrative, instructional design, IT, and faculty in working together and taking ownership of their success in the blended learning initiative are most likely to continue it. This joined-up approach serves all learning staff involved, supporting each other's technological and teaching decisions to promote program scale and long-term effectiveness (Graham et al., 2013). More generally, these results help make clear that blended learning is more than a pedagogical option and should be pursued as an intentional organizational metamorphosis with long-term strategic planning, technology preparedness and sustained organizational help.

Research Gap

Although there are many studies on blended learning, they typically take only one perspective: the student or teacher perspective. There is a scarcity of empirical studies that examine this alignment among students, lecturers, and administration simultaneously. Moreover, academic performance (grades) is often measured, but it lacks a comprehensive approach to evaluation that integrates learner satisfaction (reaction), skills acquisition (learning), transfer of behaviors (implementation) and institutional impact into a single framework that can be widely considered (results) as one single model (Van Laer & Elen, 2020).

Conceptual Framework: Adapting Kirkpatrick's Model for Blended Learning

This is due to the fact that while the reviewed published studies on blended learning (BL), for instance, use frameworks such as the Model of Personal Computer Utilization (MPCU) (Anthony, 2022; Wang, 2021), Community of Inquiry (CoI) framework, and Technological Pedagogical Content Knowledge (TPACK), they are mainly oriented toward specific dimensions of teaching and learning over holistic outcomes evaluation. It is important to note that Kirkpatrick's Four-Level Training Evaluation Model, which is commonly used in both the field of professional development and organizational education context has not been utilized in the studies reviewed. Nonetheless, the empirical insights presented in these references align closely with Kirkpatrick's evaluative framework, resulting in a proper fit and an integrated approach to evaluating the utility of blended higher education. Kirkpatrick's analysis takes an evaluative hierarchical approach to evaluation, with four levels (Reaction, Learning, Behavior and Results) (Kirkpatrick & Kirkpatrick, 2006). Applied within a blended learning design, these levels offer an organized framework to analyze individual learner experiences, pedagogical effectiveness, behavior change, and institutional outcomes comprehensively.

Level 1: Reaction (Student Satisfaction and Engagement)

REACTION, at level 1, evaluates students' perceptions of, satisfaction with, and interactions with the BL environment. In a BL studies context, this is relevant to students' perceptions of instructional design, digital settings, modes of interaction, and applications of technology in activities. The MPCU model emphasizes constructions such as perceived usefulness, ease of use, and affect, all of which are directly translated to Kirkpatrick's Reaction level (Anthony, 2022; Thompson et al., 1991). Similarly, results from implementing the



CoI framework show the importance of social, cognitive, and teaching presence to students' satisfaction and engagement in blended environments (Garrison, Anderson & Archer, 2000). This evidence, compiled, demonstrates that positive learner reactions are one of the building blocks for success when using the BL paradigm.

Level 2: Learning (Cognitive and Skill Development)

The Learning level assesses how much students learn, develop skills and competencies as a result of the instructional intervention. In blended learning, this translates into better school results, a broader understanding of ideas, and stronger digital literacy and higher-order thinking skills. Empirical data show that learning outcomes are better when BL is designed to align the online and face-to-face components, and vice versa (Wang, 2021; Garrison & Vaughan, 2008). To support this level, the TPACK framework further elaborates that effective instructional design requires the simultaneous mobilization of technological, pedagogical, and content knowledge (Mishra & Koehler, 2006). To provide a structured assessment of gains made at blended instructional strategies, mapping these findings to Kirkpatrick's second level is warranted.

Level 3: Behavior (Changes in Teaching and Learning Practices)

The third, Behavior, considers how closely learning changes take place. In the blended educational sector, this may manifest in changes in how students learn, including enhanced self-regulation, collaboration, independent learning, and pedagogical practices on the part of teachers. CoI and TPACK-based research indicate that blended learning facilitates more active learning behaviors, peer learning participation, and reflective teaching (Garrison et al., 2000; Tondeur et al., 2017). These behavior changes demonstrate a process of learning occurring beyond immediate instructional learning, and this is in line with Kirkpatrick's behavior evaluation.

Level 4: Results (Institutional and Educational Impact)

The results level focuses on bigger organizational and institutional outcomes. In higher education, that means better student retention, higher student academic achievement, greater teaching effectiveness, a larger scale of model of instruction, and institutional innovation. Research on blended learning implementation within institutions confirms that, in terms of program design, resource utilization and long-term strategic priorities, the use of blended learning may be beneficial (Graham, Woodfield, & Harrison, 2013; Porter & Graham, 2016). Evaluating an individual's level of blended learning as a course in this way will allow institutions to gauge pedagogical effectiveness, return on investment and sustainability.

Synthesis of the Framework

By integrating findings from existing blended learning models into Kirkpatrick's Four-level Evaluation framework, this dissertation constructs a conceptual framework that connects pedagogical theory with evaluative practice within a well-defined structure. This framework captures the learning model's impact at multiple levels, capturing experiences, learning outcomes, behavior change, and institutional impact at both an individual and group level in a cohesive and systematic manner, and is indicative of a comprehensive system for multi-dimensional evaluation of blended learning. Theoretical perspectives on learning: This makes Kirkpatrick's model both a strong and flexible evaluative lens that aligns well with and enhances existing BL theories and addresses the challenge of evaluating learning outcomes in higher education.

METHODOLOGY

The purpose of this study is to explore the factors that influence the successful adoption and implementation of blended learning in higher education. To achieve this objective, the study adopts a quantitative research approach. A total of 150 students from the Faculty of Administrative Science and Policy Studies (FSPPP) at UiTM Seremban participated as respondents. The selected respondents were chosen because there are three faculties offering at UiTM Seremban, which are the FSPPP, the Faculty of Sports Science and Recreation (FSR) and the Faculty of Computer Science and Mathematics (FSKM) and the blended learning is only done by the FSPPP during the current semester, and that is why the respondents were from the faculty. Data were

collected using a structured questionnaire designed to capture students' perceptions, experiences, and academic behaviours. A non-probability sampling strategy, specifically convenience and purposive sampling, was employed to identify and recruit participants. This approach was selected because it allows researchers to efficiently access respondents by approaching individuals in the general population, visiting common public areas, and requesting their voluntary participation. Such sampling methods are commonly used in educational research due to their practicality and suitability for studies requiring timely data collection. They also enable the collection of simple, manageable samples that fit most research contexts, especially when the population is easily accessible. Once data collection was completed, the responses were coded and analyzed using the Statistical Package for the Social Sciences (SPSS). The statistical procedures were applied to interpret the findings, including descriptive statistics to summarize key characteristics of the sample, and analyse which specific factors predict the effectiveness of BL.

FINDINGS

Table 1's demographic profile shows balanced proportions of respondents across a few features. Regarding gender, participants were nearly evenly distributed, with 51.3% females ($f = 77$) and 48.7% males ($f = 73$) in each demographic. It indicates that there remain very low gender bias and both sexes are well represented in the sample. By age, a substantial number of the sample were aged 21–23, comprising 90.0% ($f = 135$). By contrast, only a small number of respondents were aged 18–20 (4.7%, $f = 7$) and 24–26 (5.3%, $f = 8$). For these reasons, the sample consists mostly of students within the average educational age group who are in the university academic context. In education performance, the majority of subjects' CGPA were also between 3.00 and 3.49 (60.0%, $f = 90$). The CGPA values of 20.7% ($f = 31$) were below 3.00, and 19.3% ($f = 29$) had CGPA levels of 3.5 or greater. This distribution suggests that most students displayed moderate to good academic achievement, although a few performed relatively well at higher levels of study. College degree studies accounted for 58.7% of respondents (58.7%, $f = 88$), while diploma students were 41.3% ($f = 62$). Over the various semesters, the distribution shows that participants came at varying stages in their academic programs. Semester 6 had the highest percentage of respondents (26%, $f = 39$), followed by Semester 4 (22%, $f = 33$) and Semester 5 (20%, $f = 30$). This indicates a slight bias in the sample toward students in the later phases of their college courses, with greater exposure to blended learning environments. Regarding participation in blended learning courses, many respondents took 1-3 weeks per semester (59.3%, $f = 89$), followed by 4-6 weeks per semester (33.3%, $f = 50$). This implies that blended learning is utilized on a moderate basis rather than intensively among students.

Table 1: Demographic profile

Items		Frequency (f)	Percent (%)
Gender	Male	73	48.7
	Female	77	51.3
Age	18-20 years old	7	4.7
	21-23 years old	135	90.0
	24-26 years old	8	5.3
Current CGPA	Below 3.00	31	20.7
	3.00 to 3.49	90	60.0
	3.5 and above	29	19.3
Frequency in blended learning	1-3 (weeks)	89	59.3



	4-6 (weeks)	50	33.3
	7-9 (weeks)	8	5.3
	More than 10 (weeks)	3	2.0
Level of Study	Diploma	62	41.3
	Degree	88	58.7
Semester	Semester 1	12	8.0
	Semester 2	15	10
	Semester 3	21	14
	Semester 4	33	22
	Semester 5	30	20
	Semester 6	39	26

Table 2 shows the mean data and standard deviation of the four evaluation dimensions: reaction, learning, behaviour, and results, as calculated from scores and responses of 150 respondents. In general, mean scores exceed the midpoint of the scale across levels of Kirkpatrick's model, indicating a generally positive overall belief in blended learning experiences. Good evaluation in training and learning (Kirkpatrick's Four-Level Evaluation model) should be achieved by the training or learning programs, sequentially across reaction, learning, behaviour, and results. The Learning level in the study had the highest mean score ($M = 3.6381$, $SD = 0.60489$), indicating that the blended learning approach was more beneficial for education and skill development in the present study. It fits with Kirkpatrick's middle level, which considers cognitive and skill-based enhancements to be key predictors for instructional effectiveness. The next most relevant level was Behaviour ($M = 3.6275$, $SD = 0.68457$), indicating that learners believed their learning was transferable to the practical environment. In theoretical terms, this indicates that the attained learning outcomes were meaningful enough to be of a meaningful nature to change learners' behaviors and support Kirkpatrick's theory of learning as behavioral change being contingent on effective learning. The mean score on the Reaction level was slightly lower than the mean response ($M = 3.4514$, $SD = 0.59631$).

Although they were still positive, this suggests that learners' immediate satisfaction, engagement, and/or emotional response toward the blended learning experience was not as strong as the perceived effect size. In Kirkpatrick's system, reaction is the foundational, initial one—positive reactions can lead to a sense of achievement, but do not ensure learning. The results suggest that significant learning was also reached even when responses were moderately positive. Lastly, the lowest average level of Results ($M = 3.4362$, $SD = 0.74310$) was observed, indicating views on the longer-term effects or broader impacts of blended learning on academic performance and global effectiveness. Kirkpatrick's model assumes that outcomes are determined by successfully achieved outcomes at the previous levels. That this variation in responses across two or more learning levels indicates that while some learners felt the rewards, others may have been less fulfilled or less aware of the long-term utility of blended learning. Overall, the mean scores relative to one another provide the strongest evidence for Kirkpatrick's model, showing that learning and behaviour outcomes were of higher quality than the corresponding reaction and results scores. This indicates that the blended learning approach was successful in enhancing learning and positive behaviour change, though improvements in learner satisfaction and long-term perceived benefits will need to be further refined through instructional procedures. Improved learner engagement, combined with a direct relationship to results, is likely to maximise effectiveness across all four levels of Kirkpatrick's evaluation model.

Table 2: The factors contribute to the effectiveness of the Blended Learning approach based on Kirkpatrick’s Model

Factors	N	Mean	Std. Deviation
Learning	150	3.6381	.60489
Behaviour	150	3.6275	.68457
Reaction	150	3.4514	.59631
Result	150	3.4362	.74310

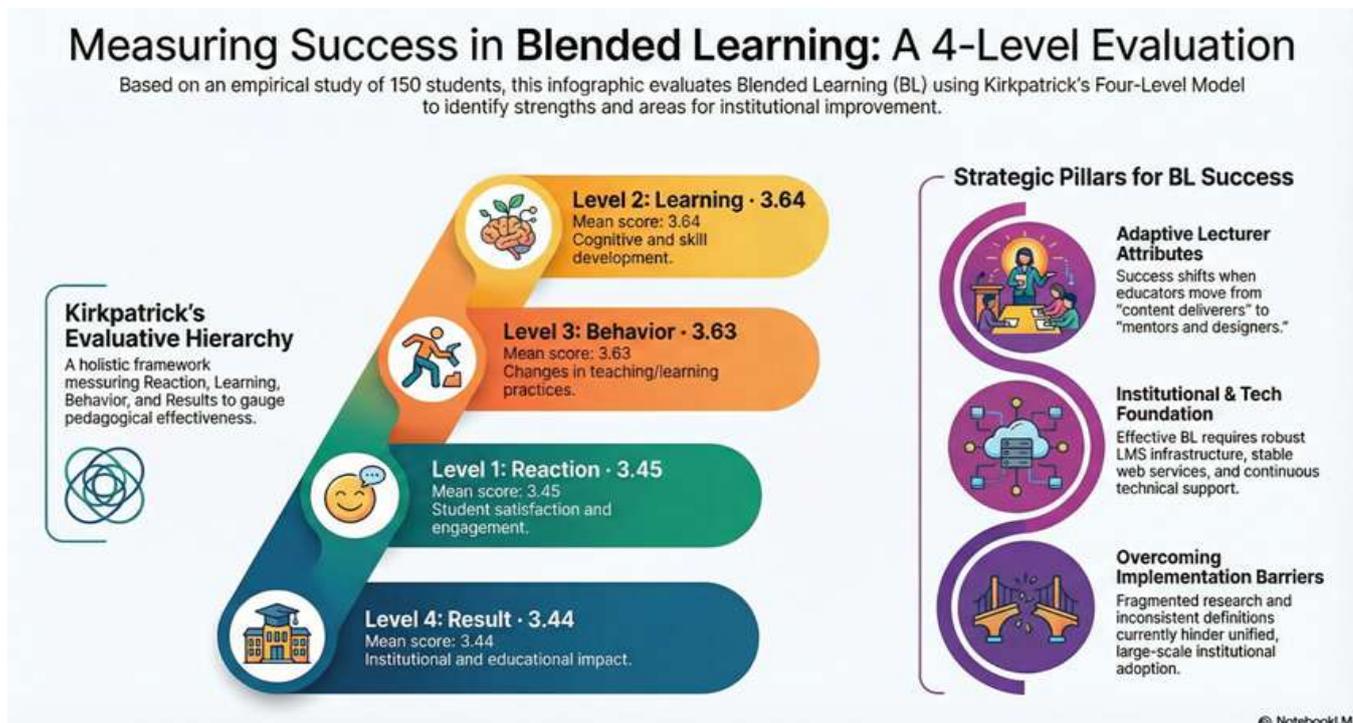


Figure 1: Measuring success in BL

DISCUSSION AND CONCLUSION

Discussion

The research demographic data showed that participants were largely tertiary learners with sufficient exposure to blended learning contexts. The sample was predominantly composed of students aged 21-23 years, approximately equally distributed by gender, and most were enrolled in degrees. Most participants reported medium to high levels of blended study (either daily or weekly), and the majority were in later semesters of their academic schedule. In this context, the participants had sufficient academic maturity and experience to provide thoughtful assessments of blended learning's effectiveness, thereby enhancing the credibility of the findings. A summary analysis of mean scores using Kirkpatrick's Four-Level Evaluation Model shows the perceived effectiveness of blended learning at the learning and behaviour levels. Mean higher scores on these dimensions indicated that students learned something meaningful and were able to put their knowledge into practice. By contrast, slightly lower overall mean scores for reaction and results indicated that learners' immediate satisfaction and perception of long-term outcomes were weaker. This is consistent with Kirkpatrick's theory of good learning, which states that positive reactions do not always promote effective learning and that concrete benefits often take longer to happen. This degree of variability at the result level suggests differences in individual experiences and realization of results. This gap directly connects to broader institutional goals such as workforce readiness and policy effectiveness.



The introduction frames BL as essential to preparing students for future workforce demands by fostering autonomy, higher-order thinking, and digital literacy. However, the findings show that students do not yet strongly associate their BL experiences with long-term career benefits or institutional success. This suggests a need for institutions to better articulate and demonstrate how BL contributes to employability skills and real-world competencies. Aligning BL curricula explicitly with workforce-relevant skills and outcomes could strengthen this perception and enhance the Results dimension. In addition, the literature review and problem statement emphasize that sustainable BL adoption requires aligned institutional policies covering curriculum design, workload management, resource allocation, and professional development. The discussion's identification of weaker learner engagement and long-term impact signals that current policies may insufficiently support these areas. For example, policies might focus more on technology provision than on pedagogical innovation or fail to mandate continuous training in instructional design. Addressing these gaps through strategic policy reforms, such as embedding BL competencies in faculty development programs and incentivizing pedagogical shifts, can improve both immediate engagement and long-term institutional outcomes. UiTM organized many courses to enhance the skills of students and lecturers to use the uFuture as the platform for BL, but the number of courses registered for BL is still not approachable because of the complexity of the process. This issue supports the discussion on institutional strategy and governance, which the findings underscore the importance of systemic support, as noted in the literature review, where institutional leadership and governance are key to embedding BL as an organizational transformation rather than an ad hoc practice. The relatively low Results scores imply that institutions may not yet have fully operationalized this vision, limiting the scalability and sustainability of BL initiatives. Strengthening governance frameworks to integrate BL goals with broader institutional missions and ensuring cross-departmental collaboration can enhance the visibility and effectiveness of BL's long-term impact. In sum, there is a need for institutions to explicitly link BL activities to workforce readiness through curriculum and skill development alignment, reform policies that focus on pedagogical support and faculty development, rather than just on technology infrastructure, and foster institutional governance that promotes strategic, sustained BL adoption with clear metrics for long-term success.

Conclusion

Overall, the results of this study provide empirical support for the effectiveness of the blended learning method in higher education, particularly regarding learning outcomes and student behaviour. Although generally leaning in favour of positive evaluation of it throughout the four levels of Kirkpatrick's model, learner engagement and long-term impact (specifically) could be improved in the future to increase effectiveness. Such findings highlight the need to create blended learning environments which promote not only learning and the dissemination of behaviour but also enhance student satisfaction and the visibility of achievement. Future research may incorporate a longitudinal research design or objective performance markers to obtain a more accurate record of learning outcomes at a higher level of evaluation.

It is recommended to develop and implement clear governance frameworks that explicitly define blended learning (BL) goals aligned with institutional missions and long-term strategies by prioritizing investment not only in technological infrastructure but also in ongoing professional development programs that emphasize pedagogical innovation, instructional design, and learner-centred approaches. Apart, the university can establish policies that balance faculty workload to accommodate blended learning preparation and delivery, incentivizing pedagogical experimentation and continuous improvement.

Additional recommendations for lecturers include a pedagogical shift from knowledge transmission to facilitation, adopting learner-centred strategies that promote autonomy, collaboration, and higher-order thinking, while engaging in continuous professional development focused on digital pedagogy, instructional design, and the effective integration of technology to enhance student engagement and satisfaction. The lecturers must actively communicate and demonstrate the long-term relevance of blended learning to students, linking course activities to workforce readiness and real-world competencies. Finally, the institutions must design blended learning experiences that optimize modes of interaction, incorporating active learning, immediate feedback, and personalized pathways to boost learner engagement (Reaction level) and align course content and activities explicitly with desired learning outcomes and workforce skills to strengthen the perceived and actual long-term impact of BL (Results level). Besides, to confirm the success of BL, the units



or the department that develops the system must collaborate closely with lecturers and administrators to ensure instructional design supports behavior change and skill transfer (Behavior level), reinforcing meaningful learning gains. These recommendations aim to enhance the effectiveness of blended learning by addressing gaps identified in learner engagement and long-term institutional impact, ultimately supporting sustainable, scalable, and student-centred educational models.

Recommendation for future studies

The study should consider expanding the scope to include a range of institutions or faculties that registered the BL, thereby enhancing the generalizability of the findings. By integrating viewpoints from both lecturers and administrators, a more complete picture of blended learning implementation could be achieved.

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REFERENCES

1. Anthony Jr., B. (2022). An exploratory study on academic staff perception towards blended learning in higher education. *Educ Inf Technol* 27, 3107–3133 (2022). <https://doi.org/10.1007/s10639-021-10705-x>
2. Anthony, B. (2022). Factors affecting the adoption of blended learning in higher education: A systematic review. *Education and Information Technologies*, 27, 1–27. <https://doi.org/10.1007/s10758-020-09477-z>
3. Beatty, I. D., & Gerace, W. J. (2009). Technology-enhanced formative assessment: A research-based pedagogy for teaching science with classroom response technology. *Journal of Science Education and Technology*, 18(2), 146–162. <http://dx.doi.org/10.1007/s10956-0089140-4>
4. Bokolo, A., Jr., Kamaludin, A., Romli, A., Mat Raffei, A. F., A/L Eh Phon, D. N., Abdullah, A., et al. (2020). A managerial perspective on institutions' administration readiness to diffuse blended learning in higher education: Concept and evidence. *Journal of Research on Technology in Education*, 52(1), 37–64. <https://doi.org/10.1080/15391523.2019.1675203>
5. Bokolo, A., Jr., Kamaludin, A., Romli, A., Mat Raffei, A. F., A/L Eh Phon, D. N., Abdullah, A., et al. (2020). Blended Learning Adoption and Implementation in Higher Education: A Theoretical and Systematic Review. *Technology, Knowledge and Learning* (2022) 27:531–578. <https://doi.org/10.1007/s10758-020-09477-z>.
6. Bram Bruggemana, Jo Tondeura, Katrien Struyvenb,c, Bram Pynooa,d, Anja Garoneb, Silke Vanslambrouckb. (2021). Experts speaking: Crucial teacher attributes for implementing blended learning in higher education. *The Internet and Higher Education* 48 (2021) <https://doi.org/10.1016/j.iheduc.2020.100772>
7. Bruggeman, B., Tondeur, J., Struyven, K., Pynoo, B., Garone, A., & Vanslambrouck, S. (2021). Experts speaking: Crucial teacher attributes for implementing blended learning in higher education. *The Internet and higher education*, 48. <https://doi.org/10.1016/j.iheduc.2020.100772>
8. Dias, S.B. and Diniz, J.A., 2014. Towards an enhanced learning management system for
9. blended learning in higher education incorporating distinct learners' profiles. *Journal of Educational Technology & Society*, 17(1).
10. Garrison, D. R., & Vaughan, N. D. (2008). *Blended learning in higher education: Framework, principles, and guidelines*. Jossey-Bass. <https://doi.org/10.1002/9781118269558>
11. Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2(2–3), 87–105. [https://doi.org/10.1016/S1096-7516\(00\)00016-6](https://doi.org/10.1016/S1096-7516(00)00016-6)



12. Graham, C. R., Woodfield, W., & Harrison, J. B. (2013). A framework for institutional adoption and implementation of blended learning in higher education. *The Internet and Higher Education*, 18, 4–14. <https://doi.org/10.1016/j.iheduc.2012.09.003>
13. Jolly Sahni. (2019). Does Blended Learning Enhance Student Engagement? Evidence from Higher Education. *Journal of e-Learning and Higher Education*, Vol. 2019 (2019). <https://doi.org/10.5171/2019.121518>
14. Kay, R. H., & LeSage, A. (2009). Examining the benefits and challenges of using audience response systems: A review of the literature. *Computers & Education*, 53(3), 819–827. <https://doi.org/10.1016/j.compedu.2009.05.001>
15. Kirkpatrick, D. L., & Kirkpatrick, J. D. (2006). *Evaluating training programs: The four levels* (3rd ed.). Berrett-Koehler.
16. Manwaring, K. C., Larsen, R., Graham, C. R., Henrie, C. R., & Halverson, L. R., 2017.
17. Investigating student engagement in blended learning settings using experience sampling and structural equation modeling. *The Internet and Higher Education*, 35, 21–33. <https://doi.org/10.1016/j.iheduc.2017.06.002>
18. Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017–1054.
19. Namyssova, G., Tussupbekova, G., Helmer, J., Malone, K., Afzal, M., & Jonbekova, D. (2019). Challenges and benefits of blended learning in higher education. *International Journal of Technology in Education (IJTE)*, 2(1), 22–31.
20. Porter, W. W., Graham, C. R., Bodily, R. G., & Sandberg, D. S. (2016). A qualitative analysis of institutional drivers and barriers to blended learning adoption in higher education. *The Internet and Higher Education*, 28, 17–27. <https://doi.org/10.1016/j.iheduc.2015.08.003>
21. Porter, W. W., & Graham, C. R. (2016). Institutional drivers and barriers to faculty adoption of blended learning. *British Journal of Educational Technology*, 47(4), 748–762. <https://doi.org/10.1111/bjet.12269>
22. Serrano, D. R., Dea-Ayuela, M. A., Gonzalez-Burgos, E., Serrano-Gil, A., & Lalatsa, A. (2019). Technology-enhanced learning in higher education: How to enhance student engagement through blended learning. *European Journal of Education*, 54(2), 273–286. <https://doi.org/10.1111/ejed.12330>
23. Shu, H., & Gu, X., 2018. Determining the differences between online and face-to-face student–group interactions in a blended learning course. *The Internet and Higher Education*. <https://doi.org/10.1016/j.iheduc.2018.05.003>
24. Smith, K., & Hill, J. (2019). Defining the nature of blended learning through its depiction in current research. *Higher Education Research & Development*, 38(2), 383–397. <https://doi.org/10.1080/07294360.2018.1517732>
25. Tondeur, J., van Braak, J., Ertmer, P. A., & Ottenbreit-Leftwich, A. (2017). Understanding the relationship between teachers’ pedagogical beliefs and technology use in education: A systematic review of qualitative evidence. *Educational Technology Research and Development*. <https://doi.org/10.1007/s11423-016-9481-2>
26. Van Laer, S., & Elen, J. (2020). Adults’ self-regulatory behaviour profiles in blended learning environments and their implications for design. *Technology, Knowledge and Learning*, 25, 509–539. <https://psycnet.apa.org/doi/10.1007/s10758-017-9351-y>
27. Wang, C. (2021). Employing blended learning to enhance learners’ English conversation: A preliminary study of teaching with Hitutor. *Education and Information Technologies*, 26(2), 2407–2425. <https://doi.org/10.1007/s10639-020-10363-5>
28. Wang, Q. (2021). Design and evaluation of blended learning: A systematic review. *Computers & Education*, 163, 104–124. <https://doi.org/10.14742/ajet.896>