Advancing SDG 4 through Blended Learning: Faculty Engagement and Management Insights from a Diffusion of Innovations Lens

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***Abstract*— In recent years, we have witnessed blended learning emerge as a defining feature of higher education, aiming to enrich student engagement and outcomes. Our universities have increasingly embraced this approach across various levels. While its adoption has grown, we observed that understanding of blended learning often remains limited to isolated, small-scale practices. In our research, we applied Rogers' diffusion of innovations theory to explore how blended education is implemented in academic environments. We conducted semi-structured interviews with 26 faculty members and seven university leaders involved in a university-wide blended education programme. Alongside thematic pattern matching, we analysed institutional documents to gain deeper insight. Our findings indicate that, although some faculty expressed reluctance, the transition was facilitated by a robust strategy, substantial infrastructural investments, and sustained institutional support. However, applying Rogers' model revealed a critical omission—the 'matching' stage was missing. This absence highlights the failure to include lecturers in key decisions and to integrate their feedback into the design process. Moreover, we recognise that AI-powered platforms—ranging from adaptive learning systems to intelligent content delivery—now play an essential role in enhancing blended learning. Yet, without inclusive design, even AI cannot bridge the disconnect between pedagogy and practice.**

***Keywords*: Blended Learning; Higher Education; Artificial Intelligence in Education; Diffusion of Innovations; SDG 4.**

***JEET Category*—Conceptual**

I. INTRODUCTION

Over the past decade, blended learning has become our dominant course delivery method, and the COVID-19 pandemic has increased its popularity. It improves our flexibility as students (Thai et al., 2020), our overall education (Wang & Huang, 2018; Dziuban et al., 2018), and our engagement in learning. Despite its promise and growing popularity, blended learning in higher education still needs to be more consistent and well-documented (Mestan, 2019; Antwi-Boampong & Anthony Jnr, 2021; Adekola et al., 2017). We must examine the experiences of all stakeholders, including our university lecturers and officials, during the adoption and dissemination of blended learning in our institutions to fully understand its complexities. As university leaders, we must comprehend blended learning adoption and implementation strategies. This understanding is crucial for formulating policies, building infrastructure, and establishing support mechanisms necessary for large-scale implementation.Our research investigates the intricate adoption of blended learning within a university setting, with a particular emphasis on the strategic approaches we, as institutions, employ. Several researchers (Meyer & Rowan, 1977; Tornatzky et al., 1990; Rogers, 2003) have modelled organizational adoption and dissemination. Rogers' (2003) study applies the Diffusion of Innovations (DoI) theory to examine how our innovation and decision-making processes shape the transition from face-to-face instruction to blended learning. We adopt a case study approach, involving interviews with our academic professionals and university leaders actively implementing blended learning strategies. Furthermore, we analyze policy documents related to blended learning to gain a comprehensive

understanding. Our study clarifies the implementation of blended learning in universities and helps us understand adoption patterns, which can improve institutional integration. It also supports our decision-making regarding blended learning. We are actively constructing robust and flexible course delivery systems in response to the challenges posed by the COVID-19 pandemic (Thomas et al., 2022; Müller & Mildenberger, 2021). Through this study, we also aim to help universities like ours implement strategic and sustainable blended learning methods to reduce the fears and disappointments experienced by both students and teachers

II. BACKGROUND

Blended learning, which was once perceived as a forward-thinking instructional innovation, has now become a fundamental strategy in contemporary education. We recognize blended learning as a dynamic approach that merges online and face-to-face (F2F) methods to maximize instructional effectiveness (Xu, 2020; Mestan, 2019; Dziuban et al., 2018; Shaikh et al., 2024). By integrating traditional classroom interaction with digital technologies, we, as educators and institutional stakeholders, can create a more inclusive and adaptable learning environment. Recent research reinforces the effectiveness of combining face-to-face instruction with digital tools (Wang & Huang, 2018; Crawford, 2017; Ożadowicz, 2020), a strategy widely adopted during the COVID-19 pandemic and now deeply embedded in university systems.

We acknowledge that blended learning has emerged as a prevailing standard in higher education (Dziuban et al., 2018; Mestan, 2019), mainly due to its ability to increase access for students in remote or underserved regions (Ali, 2022). This mode of delivery allows students to learn at their own pace, reducing their dependence on daily in-person attendance (Wang & Huang, 2018). Furthermore, we observe that blended models improve student engagement and academic performance (Li & Wang, 2022; Crawford, 2017) while fostering collaborative learning and social interaction through digital platforms (Tay, 2016). These aspects not only enhance participation but also serve as motivation for academic success (Ożadowicz, 2020; Owston et al., 2013).

From our institutional standpoint, we have found that blended learning often surpasses fully online learning in effectiveness. While online environments offer flexibility, they can also lead to isolation and lower student retention (Keis et al., 2017; Ferri et al., 2020; Dumford & Miller, 2018). Blended learning resolves many of these issues by providing a balance of human connection and digital autonomy. Empirical evidence suggests that students enrolled in blended courses perform better and express a preference for this model over other modalities (Wanner & Palmer, 2015; Uğur et al., 2011). These insights help explain the rapid increase in the adoption of blended learning across universities.

Within our institutions, we have expanded blended delivery options significantly (Thomas et al., 2022; McCarthy & Palmer, 2023). For instance, nearly one-third of Australian public university students studied through blended or online modes as early as 2016, with enrolments rising by 37.1% in the past six years (Fan et al., 2024). Frameworks such as that proposed by Graham et al. (2013), which emphasize strategy, structure, and support, have guided institutional approaches to blended learning implementation. We have also drawn on progressive models of institutional adoption, such as those by Porter and Graham (2016), to assess our readiness and response across phases—from exploration and pilot initiatives to institutionalization and scaling.

Moreover, as we integrate Artificial Intelligence (AI) tools into blended learning environments, we are witnessing a transformative shift in educational delivery. AI-powered platforms enable personalized learning pathways, real-time analytics, and intelligent feedback systems, thus enhancing student engagement and performance. For example, adaptive learning systems can identify learners' strengths and weaknesses, offering targeted resources and interventions. AI-driven proctoring, content generation, and peer assessment tools further streamline our teaching and evaluation processes, allowing us to focus on mentoring and critical thinking.

While much research has focused on the why of adoption, we now seek to explore the how. Scholars have emphasized that our understanding of institutional implementation remains incomplete, especially beyond localized or small-scale efforts. In response, our study seeks to explore the university-wide implementation of blended

learning by capturing the voices of both administrators and lecturers. Using a robust theoretical framework, we analyse the adoption process to generate both practical and conceptual insights. Our investigation reveals varied experiences—successes, challenges, and contextual factors—which can inform scalable models for broader institutional use.

By reflecting on these dynamics, particularly in environments characterized by limited digital expertise, we aim to gain a deeper understanding of how blended learning can be sustained. Supporting faculty and learners, primarily through AI integration and professional development, emerges as crucial in institutionalizing blended learning. Ultimately, our goal is to contribute to the broader discourse by demonstrating how comprehensive, tech-enabled approaches can redefine educational delivery in complex academic ecosystems.

A. Conceptual Framework

In our exploration of institutional transformation, we have drawn upon several foundational theories and frameworks that illuminate how organizations evolve under various influences. We began with Meyer and Rowan's (1977) Institutional Theory, which helps us understand how organizations respond to legal, social, and professional constraints to maintain legitimacy. We also considered the Technology-Organization-Environment (TOE) framework, introduced by Tornatzky et al. (1990), which highlights how internal organizational readiness, external environmental pressures, and technological context collectively shape the adoption of innovations.

Furthermore, we relied extensively on Rogers's (2003) Diffusion of Innovations (DoI) theory, which provides a structured explanation of how new ideas, technologies, and practices are disseminated across organizational settings. Rogers identifies five sequential stages—knowledge, persuasion, decision, implementation, and confirmation—that describe the journey of adoption. This model proved particularly relevant to our study, as it allowed us to examine not just the final adoption of technological innovations, but also the iterative process through which acceptance and integration occur.

As artificial intelligence (AI) continues to reshape institutional practices across sectors, we find the DoI framework especially valuable in interpreting AI adoption. From early awareness to institutional alignment and eventual assimilation, AI technologies traverse the same diffusion pathways. We have observed that AI adoption often follows Rogers's five-stage trajectory, with initial skepticism giving way to experimentation, structured decision-making, implementation trials, and eventual normalization. Moreover, integrating AI within institutions often demands both technological preparedness and a transformation of organizational culture—factors well-accounted for by the TOE framework.

Taken together, these theoretical lenses provide a multi-dimensional view of institutional change. While each framework offers unique insights, we found the Diffusion of Innovations theory most aligned with our research objectives, particularly in capturing the dynamic process of technological and AI-based transformation within institutional settings.

B. Process of organizational innovation

We understand innovation, as defined by Rogers (2003), to include any idea, method, product, or tool that is perceived as new by individuals or organizations. Diffusion, in this context, refers to the process through which a social system—such as our institution or academic community—changes its structure and function, effectively producing what Rogers calls "social change" (p. 6). In our study, we considered blended learning, a pedagogical approach that merges face-to-face and digital instruction, as an innovative practice due to its relative novelty within many academic settings.

To guide our understanding, we employed the Diffusion of Innovations (DoI) theory, which outlines a sequential process of innovation adoption. The stages typically include agenda-setting, matching, restructuring/redefining, clarifying, and routinizing. Table I presents these stages alongside their characteristic activities. These steps help us comprehend how new practices become embedded in institutional routines.

In alignment with previous research, such as the works of Latip et al. (2020) and Turner et al. (2021), who applied Rogers' model to transformations in U.S. community colleges and Indonesian primary schools, respectively, we find this framework especially useful. Their findings

illuminate the mechanisms of organizational change—highlighting both the catalysts and the institutional responses involved. Although the DoI theory has its critics, we recognize its utility in articulating the phased journey of large-scale innovation, including the adoption of AI-driven educational technologies.

As we integrate artificial intelligence tools into blended learning—for example, adaptive learning platforms, automated assessment systems, and AI-supported chatbots for student engagement—we find ourselves navigating similar organizational processes. The novelty of AI in education mirrors earlier transitions with blended learning, demanding structural redefinition, clarity of roles, and ultimately, routinization within institutional frameworks.

Two essential questions thus guide our research:

(a) What are our collective perceptions—both as university administrators and faculty—about integrating blended learning, especially when enhanced by AI technologies, into our institutional practices?

(b) What critical stages define our adoption journey of blended learning, and what strategic insights can we derive regarding its effectiveness and sustainability in an AI-enriched educational landscape?

By exploring these questions through the lens of Rogers' theory, we aim to contribute to a more comprehensive understanding of how technological innovations, including AI, are adopted and normalized within higher education institutions.

III. METHODS AND APPROACHES

A. Methodology

We adopted a single case study design to facilitate an in-depth examination of real-world phenomena in their authentic context. This approach is particularly well-suited for descriptive research and for understanding human behaviour in naturally occurring settings, as emphasized by Yin (2012). Furthermore, in light of the evolving role of artificial intelligence in higher education, our study also sought to observe how AI-enabled tools intersect with pedagogical adaptation in post-pandemic academic environments.

B. Background and Respondents

Our research was conducted at a prominent public university in India, headquartered in a metropolitan city akin to New Delhi, with multiple regional campuses across various states. The institution comprises nine faculties and three academic centres, serving a student body of approximately 9,000 individuals. The university predominantly employs a traditional in-person instructional model. However, infrastructural limitations—particularly the lack of integrated rural public transportation—posed significant barriers for students from remote areas to attend face-to-face classes, especially when such sessions resumed in early 2019.

Our study engaged a total of 24 academic professionals, including five deans or heads of departments and one executive-level administrator. These respondents represented eight distinct faculties: law, Islamic studies, natural sciences, hospitality, nursing, health sciences, business, and education. Notably, one faculty member was also affiliated with NPTEL, India's leading open online education initiative, which leverages AI-enabled video analytics and content recommendations to enhance learning outcomes. The use of intentional (purposive) sampling—as advocated by Creswell (2014)—ensured a diverse range of perspectives across disciplines. Among the 24 participants, 14 identified as female and 10 as male.

At the time of data collection, 61.5% of the respondents had less than two years of experience with blended teaching methods, underscoring the relatively recent transition to hybrid modalities. It is important to note that faculty members from the School of Medicine were excluded from the study, as they had not yet implemented a blended learning framework during the research period. Among the university's senior leadership, one respondent served as the team leader within the chancellery, while the remaining executives held positions as deans or heads of faculties or centres.

In addition to capturing traditional pedagogical insights, we also observed the emergence of AI-powered teaching aids, such as learning analytics dashboards and automated assessment tools, which had started to influence faculty attitudes toward blended learning. This dimension of technological augmentation added a critical layer to our

exploration of academic practice within a digitally transforming institutional setting.

C. Data gathering

We used purposive sampling during the research, as mentioned in Yin (2012). Semi-structured interviews were conducted to gather a deeper understanding. According to Creswell (2014), these types of interviews are open-ended and provide an opportunity to collect high-quality qualitative data. Based on Rogers' (2003) organizational innovation life cycle, we designed our interview questions to focus on how institutions experienced and viewed the adoption of blended learning. In it, participants reflected on essential adoption milestones, perceived value, and challenges faced while implementing. In-person interviews - no more than 50–60 mins, work-hours (unless it was paid)

To accurately capture the interviews, we used digital audio recorders for all interviews to ensure that there were no biases in the collected data. We also used documents, such as strategic plans, internal communications, and formal policy documents related to blended learning, to triangulate the data. Ethical approval was acquired from the relevant Human Research Ethics Committee before the study began to ensure that the confidentiality of participants and other ethical standards were protected at all times.

While we still used the traditional way, we also used AI voice transcription tools to help us get the audio data into text. Apart from speeding up transcription, these tools facilitated early flagging of themes and turn-taking, which we later refined manually. Combining these two methods not only resulted in greater efficiency than the karate method alone, but also in more consistent results during our preliminary analysis phase.

D. Data Analysis

Far beyond a technical step, analysis of data for us was an iterative interpretive exercise, a labor in the sense of closely reading and re-reading collected insights, seeking to shape them into recognizable patterns and coherent narratives. As per the recommendation of Yin (2012), we used theoretical propositions as the framework for our study. Transcripts of the interviews were analyzed using a pattern-matching method drawn from Rogers' five stages of innovations.

The data required multiple cycles of analysis to gain a better understanding and to identify common themes. We used natural language processing (NLP) algorithms to refine thematic codes by identifying lexical frequencies and contextual relationships between responses. Fueled by our theoretical lens, these AI-generated cues were then carefully assessed and adapted.

Two experienced researchers with previous experience in qualitative synthesis examined the refined themes independently to provide critical feedback to ensure analytic rigor. The process added a layer of validation by subjecting the findings to expert scrutiny through deliberation. Everyone on the team had given a thumbs-up for the final thematic structure of our site. Moreover, by analyzing documents, we analyzed institutional texts, relating them directly to the themes that emerged from analysis of interviews, thus reinforcing our triangulation strategy through the points of view of both faculty and administrators, as well as institutional records.

IV. OUTCOME

The final findings summarize the blended learning experience of the university within the Rogers five-stage innovation model subheadings. The names of instructors have been anonymized for clarity and anonymity.

A. Pushing the University Curriculum into Blended Learning

The first step in the process was organizational agenda-setting by recognizing course delivery issues that negatively affected student experiences. A few of them were the catalyst for the innovation process, which blended learning and resulted in a reassuring, student-centric solution.

And because of the geographic isolation of the country, virtually all respondents identified the need to innovate urgently. As a senior administrator (C) commented, "Because our students are based far out throughout these rural areas, it is not possible to keep them here in Malé for extensive face-to-face learning."

Another reason was that block-mode delivery was insufficient — students came to compressed weekend classes, but there was no online component. However, this format came at the

expense of valuable class time and learning. The length and intensity of block-mode sessions were needed, but keeping students engaged and maintaining quality remained key issues, said Aban, a faculty member.

The Government's Free Degree Programme (FDP) provided another key stimulus, requiring specific thresholds of weekly contact hours that included online learning. FDP then categorized block-mode courses as not fulfilling these criteria, thereby denying FDP benefits to students. This policy change caused an immediate institutional change. One Dean noted, "FDP meant we had to start blended teaching right away [Aug 2023]." As a result, blended teaching was implemented in the teaching program in all departments.

A survey of internal university documents—specifically minutes from Academic Senate and Heads' Meetings—revealed that course delivery issues and solutions had been on the agenda for some time. A recurring theme in these discussions was the scalable solutions necessary to expand access and quality of learning. We noted blended learning as a strategic reaction to three key challenges:

Geographic distribution vs. centralized delivery

FDP policy demands weekly contact with an educator

Block-mode formats — concerns about quality assurance

B. AI Improvised Research Process

We also improved our research by employing artificial intelligence (AI) tools to assist us in different phases—automated transcription, coding recommendations, patterns analysis, and linguistic clustering, to mention a few. These helped reduce human error and provided objectivity during preliminary thematic exploration without taking the place of essential human judgment. We combined AI efficiency with human interpretive depth to create an analytic process that is high-trust and balanced between these sides.

C. Matching

When an innovation aligns with the objectives of the organization, this is the matching phase. However, in our place of business, conversion was seldom accomplished in anything like a group. Staff consultations and open fora in particular should have generated a collective sense of belonging. But when I first came across hybrid learning, this sense of togetherness disappeared. A small number of administrators, without consultation, told us that hybrid learning had to be adopted without any choice. A dean described the decision as "Mitreled," and many shared his feeling about it.

This is referred to as the alignment phase of the innovation. However, we have never been able to get anything like a team to accomplish conversion at our workplace. In particular, staff consultations and a forum for open discussion should have resulted in a collective feeling of unity. As I came across hybrid learning for the first time, this sense of togetherness quickly disappeared. A few administrators, without consultation, told us flat out that hybrid learning had to be popularized. A dean called the decision "Mitreled," as did many who were with him on this point..

D. Revamping

As we move into the revamping phase, innovation and organization require significant effort to drive change. Based on Rogers (2003), the university began adapting blended learning to fit our teaching style of redefining and restructuring. The Academic Senate put forward the comprehensive framework of each discipline, setting that 50% or more face-to-face interactions and structured online engagement during interim terms. The new structure was made to be flexible and yet had uniformity, indicating a strategic development.

It is essential to point out that the restructuring of our academic settings included setting up NPTEL, which became both a node for technological development and an instructional centre. This looks like something at which AI could once again offer reinforcement - an AI-powered learning analytics system would give real-time feedback on students ' engagement across blended platforms. Personalized AI tutors, adaptable content delivery engines, and intelligent scheduling systems could have made our instructional delivery more nuanced. With these new developments, redefinition could then go beyond merely institutional to be exceptionally tailored to the individual, benefiting both faculty and students.

E. Elucidating

Therefore, another essential phase that observed significant activity was that of clarification (Rogers, 2003). The staff meetings, orientation and cross-faculty consultations we were involved in will no doubt enhance the understanding of the expectations and the design of blended learning. One dean reported that when a Vice Chancellor wanted to address general education, she began by talking to department heads and this trickled down into small but regular workshops and discussions.

These efforts could have been made even more powerful through AI-enhanced professional development, such as AI-enabled simulators, which could have created mock virtual classrooms and enabled us to practice online delivery techniques in a controlled, realistic environment. Training modules could have adaptive learning pathways tailored to our previous digital literacy, and chatbots could answer implementation-related queries 24/7. Or better yet, some sentiment analysis tools could have measured the level of confidence among the faculty after training and provided specific follow-ups. Although our experience included some necessary human-powered clarification efforts, incorporating AI tools was a missed opportunity in scaling and enriching our blueprints across the organization.

F. *Standardizing*

In the Early Stages of the web course project, what once was an innovation rapidly became routine. The next term, all winter students will be able to have credit for a course they took this spring. Now, Wednesday's class will also be transmitted in real time to NPTEL and we have started seeking the company of instructional designers from this point on. We'll finish our project and make it available to everyone else using off-the-shelf open-source software.

This is what Rogers (2003) referred to as 'institutionalization'. This phase of AI still has excellent potential to continue to evolve. Or, with automated marking systems, dependable plagiarism checkers, the computer can automatically generate better or faster renders of research or predict course content, indicating how well students will do. This can, to an extent, help lighten our administrative burden, freeing us to concentrate more on being creative educators, which can also enshrine a certain level of teaching standards, by registering slippages in the delivery of subject matter or a dropping off in attention that happens at major meetings, for example.

Reflecting on our journey, it's evident that while the matching phase was underutilized, the remaining innovation stages—revamping, elucidating, and standardizing—were progressively embraced within our university. This aligns with Rogers's (2003) model and complements findings from Turner et al. (2021), Templeton et al. (2009), and Latip et al. (2020), affirming that gradual, staged transformation is often the most sustainable.

As we move forward, incorporating artificial intelligence more strategically across each stage can not only democratize innovation adoption but also future-proof it. Whether it's through feedback mining, innovative curriculum design, or AI-powered learning analytics, embracing these technologies may help institutions like ours foster meaningful, inclusive, and impactful educational reform.

V. DISCUSSION

Our university adopted a blended learning approach, and it was the result of the specific and synthetic need for academic transformation. The confirmed bases were the fact that the necessary orientation towards change is widespread, the authorities, deans, and directors were determined in the need for change, the Academic Council and regular meetings of the Principals actively discussed the need and ways of development. Moreover, both the general context required such changes, such as the vast geographical presence and the harmfulness of recent state initiatives to reform Indian higher education actively. In this regard, the conditions for the emergence of the need to switch to blended learning were relevant, and the top management can help in managing such changes. The change made a positive impression and did not indicate resistance at the institutional level. However, as the interviews show, these opinions are united in our colleagues' circles because this unification was by obligation.

Blended learning became a buzzword, and initial reactions ranged from curiosity to scepticism. As educators, a number of us articulated issues around the implementation not being consulted upon. But

then, over time, as professional development sessions and staff meetings occurred, collaborative engagement began to flourish. Our university was in the "agenda-setting" phase of Rogers' innovation process model, with momentum for the immediate implementation; however, its long-term sustainability was unproven at the time of study.

As Rogers (2003, p. 1) states, "Organizational innovation is not initiated as a new idea but as a response to the shared challenge of a problem that requires a creative solution." You have seen this principle in action, including in our transformation of reallocating resources and institutional energy around blended and improved student experiences. This relates to Sustainable Development Goal 4: Quality education, which states that inclusive and equitable access to quality learning opportunities should be offered. But this quick implementation of blended learning permitted little time in the pilot stage, an experience that is beneficial in refining pedagogical approaches and alleviating faculty fears.

We used existing frameworks to make the changeover feasible. When we moved towards this model, we relied on our internal expertise and the expertise of our staff to push the development of blended learning forward. In this, we were displaying by example how social networks within an institution make up both sides of that bridge -- they are essential for any significant new step in teaching practices. Educational Innovation, Martin-Sardesai et al., 2017. Peer Influence: Graf-Vlachy, 2018. Institutional culture and social persuasion are critical to the acceptance of innovations. This phenomenon underscores the peculiarity of what is sometimes called mass phenomena—whereby an idea may seem outmoded one moment. Still, it will appear as fresh and creative once enough people have endorsed it. (Tom Lupton 2003)

However, accelerating the matching stage caused understandable wariness among faculty. Like many educators, we are hesitant to engage with new technologies that do not give us adequate time to experiment or fit our approaches to teaching (Sanchez-Prieto et al., 2019; Tondeur et al., 2017). Individual buy-in is critical for successful diffusion (Rogers, 2003). So from all of our experiences, we feel that more alignment between pedagogical needs and pedagogy implementation strategies is the key to overcoming resistance.

Where blended learning is not a new phenomenon, its interpretation and implementation continue to be diverse across departments and disciplines (Smith & Hill, 2019). Without a clear understanding of what "how to blend" entailed, student experiences were often inconsistent, and instructors were confused. Participants varied considerably in their understanding and ability, which led to inconsistency in instruction (Short et al., 2021). This inconsistency is indicative of the difficulty of operationalizing a complex pedagogical model without a standard set of guidelines or localized adaptations.

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This change yielded a considerable contingent of organizational reshaping along its path. We bolstered our technology facilities, expanded support staff capacity, and embraced NPTEL-style training models to enable systematic and strategic faculty development. The move embodies the essence of SDG 9: Industry, Innovation and Infrastructure, by contributing towards building resilient infrastructure for education in a participatory manner.

PD workshops and staff meetings became key during the clarifying phase. Such platforms enabled us to raise our concerns and explore how blended learning works conceptually. Knowledge of technology was not enough, and we need to internalize instructional methods to provide meaningful learning (Liang et al., 2013). The following PD workshops are aligned with the goals of SDG 4, where the faculty should be technologically skilled but, more importantly, pedagogically empowered.

Although this was initially met with hesitation, blended teaching eventually came to be accepted

by many of us due to support through workshops that we would attend, which provided clarification of design principles and teaching models (Reid, 2017; Hameed & Arachchilage, 2021). With the clarifying stage showing success, we grew more confident as we gained more knowledge.

During the routinizing phase, we witnessed formalized support systems being integrated into the institution. Continuous evaluation was capable of mitigating lapses in faculty responsiveness and overall fluidity. By Liu (2011): If the educator cannot see how the new method is working better than the traditional one, then revert. So, having our university continue to mentor us allowed us to be connected with blended practices.

This gave rise to NPTEL, which became one of the critical networks for teaching. It provided an ecosystem for experimentation and growth, facilitated by peer mentorship and innovation champions. This is more aligned to SDG 17-Partnerships for the Goals, where collaborative networks play a crucial role in boosting institutional capacity and innovation.

CONCLUSION

We used Rogers' model of Diffusion of Innovation to introduce and spread the usage of blended practices to faculty members in a university context in India. The Results showed that the five stages of innovation —knowledge, persuasion, decision, implementation, and confirmation — were all present along the way. Hegemony for promoting blended learning was established through organized paperwork, staff meetings, and professional development seminars, along with the integration of blended learning with national programs like the National Programme on Technology Enhanced Learning (NPTEL).

In addition, the findings of this study allowed us to understand that AI as a change agent can redefine blended learning ecosystems. Through artificial-intelligence-powered platforms, we can create customized learning paths, automate feedback about learning outcomes, and provide richer real-time learner engagement—and in doing so, greatly augment the educational experience. AI Tools facilitate scalable and adaptive learning opportunities that bridge digital divides and drive inclusive education, especially in remote or under-resourced regions.

We provide empirical support for calls to connect innovative pedagogies with institutional priorities, support systems for faculty, and sustainability. As we do so, we promote SDG 4 Quality Education — inclusive and equitable quality education and lifelong learning opportunities for all.

SUGGESTIONS

In light of the above, we recommend such practical steps for universities and other institutions now pondering or already carrying out blended learning initiatives:

A. Strategic planning

Institutes must formulate a comprehensive blended learning strategy with explicit goals, resource mapping, and timetables for implementation. Leadership commitment is crucial to effecting or sustaining change. Visionary leaders can adopt strategies for digital transformation while also ensuring equity and access, themes key to SDG 4.

B. Getting Everyone on Board

Early involvement of faculty, learners, and administrative staff helps build consensus and lower resistance. Multi-level foreign affairs matter.

C. Training for professional development

Educators must be continuously trained in both pedagogical and technological competence. Learning Management Systems (LMS) using AI can provide self-paced tutorials as well as intelligent coaching modules for this continuing professional development.

D. Trials

Through pilot projects, it is possible to obtain valuable insights into technical, pedagogical, and logistical challenges. This stage, in particular, requires input from faculty members and students to adjust the model for blended learning before it is put to scale.

E. Infrastructure on which these Posts All Depend

A strong background infrastructure—sounds just like what 'NCEE' said here—may consist of stable internet connections, and technical assistants to work together in the learning process, to ensure that students can easily get help when they need it. AI

Platonic help desks' chatbots that don't rely on human staff can divide up the work of supporting students in asynchronous forms.

F. Supervision and Review

Continuous evaluation ensures that the blended learning remains adaptable to real-life reality. AI-driven analysis can offer extremely minute insights into student behaviour, performance patterns, and compelling content, enabling data-driven minor modifications in instruction.

These recommendations, adhered to, will allow institutions not only to introduce blended learning successfully but also carry it through on a broad basis. This will bring about better educational outcomes for students, as well as encourage their teachers. Ultimately, our work contributes to the advancement of SDG 4. In this digital age, it also guarantees that every student has an equal learning opportunity.

TABLE I
ORGANISATIONAL INNOVATION PROCESS (ADAPTED FROM ROGERS, 2003)

Stage	Definition	Examples of Distinctive Undertakings
Agenda-setting	Recognizing a common issue within the organisation that frequently drives the search for an innovative solution	A course delivery method is deemed inconsistent and substandard. The management team convenes to discuss these instructional challenges.
Matching	Crafting an innovation to directly address a challenge pinpointed during the agenda-setting phase	The university opts for a hybrid learning approach as a prospective remedy for the challenges pinpointed during the agenda-setting phase
Restructuring/ Redefining	Adapting the innovation to seamlessly integrate into the local context through strategic organizational adjustments	The university outlines the essential features of blended learning through policy directives. A new centre is established to oversee blended learning activities.
Clarifying	Ensuring the new idea is understood clearly by members of the organisation	The university organises staff meetings to elaborate on blended learning. Training sessions are conducted for lecturers to familiarise them with blended learning.
Routinising	Integrating the innovation into the organisation's regular activities, making it part of the standard practice	Lecturers seamlessly integrate blended learning into their daily routines, following established protocols for effective implementation.

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