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Blended Pedagogy in the Light of National Education Policy of India (2020): A Detailed Analysis of UGC's Concept Note on Blended Mode of Teaching and Learning

Soniya Tufail Khan

Department of English, Aligarh Muslim University, UP, India
Email: khansoniyatufail@gmail.com

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Abstract— *The 21st century saw significant growth and adoption of technology into the field of education. The educational sector was gradually embracing digitalization and Web 2.0. Nearly all across the world, tools like language applications, online learning software, virtual tutoring, and video conferencing were becoming a component of the academic curriculum. Despite technological advancements in the education sector Third-world nations like India were falling behind and were hesitant to venture into this brand-new field of educational technology. However, the world turned upside down with the outbreak of COVID 19, it forced the entire world to change in many different ways. Clearly education world was not ready to shift from the traditional system to the online mode, the shift was sudden, unplanned, and the teachers did not get time for preparation or training. One cannot deny that the world is not the same ever since, such an event has caused lasting impression on the world. Hence, it is now essential to give technology the attention it deserves and to implement approaches like blended learning as a fundamental component of learning and teaching in the current educational system. The Indian government has been effective in identifying this need. Thus, giving birth to the New National Education Policy (NEP 2020). The National Education Policy 2020 (NEP 2020) is a comprehensive policy framework for the future trajectory of education in India. Since the National Policy on Education (NPE) of 1986, it is India's first comprehensive education policy. An extensive change of India's educational system is envisioned by NEP 2020, with a focus on online and blended learning in particular. Thus, this paper aims to discuss Blended Pedagogy in the Light of National Education Policy of India (2020) and to conduct a detailed review and analysis of UGC's Concept Note on Blended Mode of Teaching and Learning.*

Keywords— ***Blended Learning (BL), Concept Note, National Education Policy (NEP), University Grants Commission (UGC).***

I. INTRODUCTION

The 21st century saw significant growth and adoption of technology into the educational field. The educational sector was gradually embracing digitalization and Web 2.0. Nearly all across the world, tools like language applications, online learning software, virtual tutoring, and video conferencing were becoming a component of the academic curriculum. Despite technological advancements in the education sector Third-world nations like India were falling behind and were hesitant to venture into this brand-new field of educational technology. However, the world turned upside down with the outbreak of COVID 19, it forced the entire world to change in many different ways. Clearly education world was not ready to shift from the traditional system to the online mode, the shift was sudden, unplanned, and the teachers did not get time for preparation or training. One cannot deny that the world is

not the same ever since, such an event has caused lasting impression on the world. It has opened doors to a world of possibilities; among the many to investigate are the evolving trends in pedagogy and research.

For educational institutions to be forward-thinking, numerous strategies must be used and put into practise. According to a report by Financial Advisor, majority of the Indians prefer a combination of online and in-person training or courses. In India, 81% of the people think that mixing in-person and online learning can result in a positive educational experience, giving rise to blended learning. Furthermore, 88% of learners worldwide say that moving forward, online learning will be from now on a permanent part of primary, secondary, and higher education. 87% of students in India believe that in the future, online learning will be a part of the educational process. In the new normal that educators have chosen, the blended learning approach will be standard.

Hence, it is now essential to give technology the attention it deserves and to implement approaches like blended learning as a fundamental component of learning and teaching in the current educational system. The Indian government has been effective in identifying this need. Thus, giving birth to the New National Education Policy (NEP 2020).

II. NATIONAL EDUCATION POLICY OVERVIEW

The National Education Policy 2020 (NEP 2020) is a well-planned comprehensive policy framework for the future trajectory of education in India. Since the National Policy on Education (NPE) of 1986, it is India's first comprehensive education policy. An extensive change of India's educational system is envisioned by NEP 2020, with a focus on online and blended learning in particular. The policy suggests that, in order to efficiently deliver high-quality education, all educational institutions—from primary to higher education—use online and blended learning approaches. In addition, it proposes for the establishment of a National Education Technology Mission to guarantee that all educational institutions have access to the technology and infrastructure required for online and blended learning.

According to NEP (2020) of the Indian government, blended learning must be experiential and activity-based. It is not a mere combination of both physical and virtual modes; rather, it is a carefully planned integration of relevant activities in both the modes. "Unless combined with experiential and activity-based learning, online education will tend to become a screen-based education with little emphasis on the social, emotional, and psychomotor components of learning" (National Education Policy, 2020, p. 59).

III. BLENDED LEARNING

According to Vasileva-Stojanovska (2015), Blended learning is a student-centered approach to education that blends synchronous learning activities from traditional (face-to-face) classrooms with asynchronous learning activities from e-learning (Attard and Holmes, 2020; Kerzłič et al., 2019). Adiguzel et al. (2020) reported that Gambari et al. (2017) highlighted the importance of the e-learning aspect. The ratio of online to offline learning in blended learning varies, according to a study conducted by Owston and York (2018) and Lazar et al. (2020), but the online learning component must be between 33% and 50%, or can even be as high as 80%. E-learning resources are employed in lessons, presentations, training sessions, progress learning, online discussion groups (Adiguzel et al., 2020). (Alammary, 2019). Active teaching methodologies including STEM education as stated by (ElSayary, 2021; Kandakatla et al., 2020; Landenfeld et al., 2018), problem-based teaching and learning, project learning and teaching (Yunus et al., 2021), and collaborative teaching (Kandakatla et al., 2020) can be effectively organised in a blended learning environment. Furthermore, a large number of specialised models with attributes appropriate for blended pedagogy in education have been researched. These include the following: MyMathLab learning system (Chekour, 2018), Modular Object-Oriented Dynamic Learning Environment (MOODLE) research platform (Hoyos et al., 2018; Landenfeld et al., 2018; Lin et al., 2017; Psycharis et al., 2013), Massive Open Online Courses (MOOCs) (Avineri et al., 2018; Borba et al., 2016), Personal Online Desk, viaMINT (Landenfeld et al., 2018), and machine learning techniques (Ho et al., 2020).

In order to comprehend why the Nation's government places such a strong emphasis on blended learning in its National Education Policy, it is necessary to examine the Blended Learning approach and its characteristics. After researching several different successful blended learning programmes, here are a few characteristics of Blended Learning that stand out:

Research on BL shows that it gives positive results for both educators and learners' educational journeys. Blended learning's features allow this kind of instruction to maximise the benefits of both in-person and online mode (Alsalhi et al., 2021; Hu et al., 2021; Kashefi et al., 2017; Kerzłič et al., 2019). In contrast to face-to-face mode, online instructions make use of robust learning management system (LMS) features that enable effective

goal-setting, document organisation, learning facilitation, student interaction, and academic performance assessment (Adiguzel et al., 2020; Sun, 2016). Moreover, online learning promotes even more individualised learning and assessment (Mundt et al., 2020), teacher-student, teacher to teacher, and teacher-pupil-parents' interactions (Alammary, 2019; Alsalhi et al., 2021; Attard and Holmes, 2020; Hoyos et al., 2018; Miyaji and Fukui, 2020; Sánchez-Gómez et al., 2019). According to a significant amount of research, BL facilitates a flexible teaching learning environment where students can readily access and choose from a variety of learning resources, enabling them to revisit lessons at the appropriate time and location (Zhang and Zhu, 2017). (Sánchez-Gómez et al., 2019; Uz and Kundun, 2018). Furthermore, a number of studies have demonstrated that blended learning can have a positive impact on students' learning attitudes (Alsalhi et al., 2019; Balentyne; Varga, Gambari et al., 2017, Rifa'i and Sugiman, 2018; Zhang and Zhu, 2017). These effects include fostering a desire to learn, enhancing flexibility, boosting self-confidence, and enhancing self-assurance (Alammary, 2019; Alsalhi et al., 2021; Attard and Holmes, 2020; Lin et al., 2017; Mumtaz et al., 2017; Uz and Kundun, 2018), as well as the capacity for group work (Kashefi et al., 2012) and the students' Uz and Kundun, 2018). Numerous research studies have validated the favourable association of personality, learning style, and happiness with advancement in student accomplishment (Cheng and Chau, 2016; Vasileva-Stojanovska, 2015). For example, blending learning increases students' ability to think critically (Attard and Holmes, 2020; ElSayary, 2017, 2021), solve problems more effectively (Attard and Holmes, 2020; Dziuban et al., 2018; Kashefi et al., 2012; Kashefi et al., 2017), improve communication skills (Kashefi, 2012).

IV. NATIONAL EDUCATION POLICY AND BLENDED LEARNING

The benefits of blended learning have been explicitly recognised by NEP (2020) and UGC. So much so that the UGC issued a detailed concept note in 2020 on Blended Mode of Teaching and Learning. Consequently, both NEP and UGC have discussed Blended Learning's characteristics in great detail in their drafts. In many ways, a blended learning environment offers the utmost flexibility. It can be used with any programme that includes digital media while adhering to the principles of traditional classroom. Students, academics, policy-makers, stake holders and others are able to comprehend the need for more freedom and flexibility. (University Grants Commission, 2020, p. 3).

4.1 Some key benefits of Blended Learning as mentioned by NEP

Blended learning, as emphasized by the (National Education Policy, 2020). Offers students the opportunity for remote collaboration on projects, increased flexibility with technology-enabled learning, enhanced interaction between students and teachers, and improved learning outcomes through additional activities. NEP supports the development of virtual citizenship skills and effective use of technology for learners of all ages. Making learning resources and experiences reliable, repeatable, and reproducible ("University Grants Commission, 2020, p. 5"). NEP also discusses about practical ways in which blended learning can be incorporated. With regard to the curriculum, consider utilizing the five "E" s (Engage, Explore, Explain, Elaborate, Evaluate): Resources - Ministry of Human Resource Development (University Grants Commission, 2020).

4.2 UGC's Concept Note on Blended Learning

The University Grants Commission released a detailed concept note on Blended Mode of Teaching and Learning. This Concept note by UGC has been prepared in accordance with the National Education Policy NEP 2020. According to the draft, "improved satisfaction, learning outcomes and opportunities both to learn with others and to teach others," will come from blended pedagogy techniques. According to the draft, learners would have more access to knowledge and will also be able to learn more effectively. The UGC panel thinks blended learning will make a variety of learning modalities, such as in-person instruction, online instruction, and remote or virtual instruction, acceptable. UGC Secretary Rajnish Jain said, "The UGC had decided that HEIs should be allowed to teach up to 40 per cent of each course through online mode and the remaining 60 per cent of the concerned courses can be taught offline mode. Exams for teaching under both modes can be conducted online." The panel set by UGC has even sought suggestions and feedback from various stakeholders on the draft of concept note.

V. RESEARCH QUESTIONS

- To what extent does blended learning play a crucial role in the educational strategies of the University Grants Commission (UGC) and the National Education Policy (NEP)?
- How does a detailed analysis of the blended learning concept contribute to our understanding of its importance within the UGC and NEP frameworks?
- What are the key challenges in implementing Blended Learning in India?

- What specific implications does it have for the enhancement of educational practices?

VI. OBJECTIVES

- To review the UGC's Concept Note on Blended Learning
- To analyse the UGC's Concept Note in detail
- To examine the major challenges in implementing Blended Learning in India
- To suggest strategies to overcome the challenges in implementing Blended Learning in India
- To generate feedback and provide suggestions to the Policy Makers of Nation

VII. RATIONALE AND SIGNIFICANCE OF THE STUDY

It is evident that the NEP and UGC both has realized the importance of BL. Thus, they are constantly striving to incorporate BL into their educational policy and trying to change India's educational narrative through it. Hence, this research aims to review and analyse the UGC's Concept Note on Blended Learning, as the policy is destined to change the future of the coming generations in India. UGC has even sought suggestions and feedback from various stakeholders on the draft of concept note. Thus, the feedback and suggestions generated from the research work will prove to be highly beneficial for the policy makers. Such a policy that will change the educational game of the country will definitely undergo various changes, as it will be a work in progress for a long time.

VIII. CRITICAL REVIEW

The Concept Note by UGC outlines the concept of blended learning, particularly in the context of the National Education Policy (NEP) of 2020 in India. Here is a review of the text:

In this comprehensive exploration of blended learning within the framework of the National Education Policy (NEP) 2020, the text delves into the definition and key components of this instructional methodology. Blended learning, as presented, seamlessly integrates traditional face-to-face classroom methods with computer-mediated activities to optimize instructional delivery. Emphasizing the importance of combining synchronous and asynchronous learning tools, the text underscores the significance of effective learning processes. Distinguishing blended learning from traditional classroom teaching, the text articulates that although students and teachers share the same physical space, digital tools play a pivotal role in maintaining control over the pace and topics of learning. The flipped classroom model, introduced in the discussion, harnesses technology to provide learning materials online before in-person classes, fostering more interactive and engaging classroom activities.

The text then transitions into the NEP 2020's emphasis on a student-centric approach in education, aligning with the shift towards responding to students' dreams and aspirations. Acknowledging various modes of learning, including face-to-face, online, and virtual modes, the NEP 2020 also advocates for vocational and multi-disciplinary courses. The concept of the Academic Bank of Credit (ABC) emerges, introducing flexibility in terms of time, place, mode, speed, and language in education, with an emphasis on multiple entry and exit points for learners. Highlighting the indispensable role of technology in implementing the NEP 2020's teaching and learning processes, particularly in blended modes, the text establishes the critical link between technology and the realization of the policy's objectives. The advantages of blended learning and the ABC system are extolled, emphasizing their effectiveness in providing flexibility, convenience, and a diverse array of learning options.

Overall, the text not only introduces and explains the concept of blended learning but also contextualizes it within the NEP 2020, shedding light on its advantages and the instrumental role of technology in shaping modern education. The innovative ABC system, aligning with the overarching goals of flexibility and student-centricity in education, further reinforces the significance of these educational approaches in contemporary pedagogy. In this insightful exploration of BL and its implications, the text moves on further by acknowledging the dynamic changes in the education landscape, emphasizing the transition from traditional teaching methods to digital learning platforms. BL is defined as more than just a mix of online and face-to-face modes; it represents a meticulously planned combination of activities, focusing on learning outcomes and a learner-centered approach. Linking BL to the NEP 2020, the text underscores the recommendation for blended learning models and stresses the importance of recognizing face-to-face in-person learning alongside digital learning. The key features of BL, such as increased student engagement, enhanced interaction, and flexibility, are highlighted, along with its association with improved learning outcomes and the potential to enhance institutional reputation. Advantages of BL for students are outlined, including greater access to information, increased learning skills, improved satisfaction, and opportunities for collaborative learning. Recent research on BL is discussed, emphasizing key benefits such as collaboration at a

distance, enhanced interaction, increased flexibility, improved learning, digital literacy, and the development of technology-related skills.

Moving on to the role of teachers in a BL environment, the text highlights the evolving role from knowledge providers to coaches and mentors. BL enables customization and differentiation in teaching, leading to more frequent and personalized interactions between teachers and students. Strengthened trust and relationships emerge as byproducts, allowing teachers to better understand students' struggles and needs. The role of learners in a BL environment is then explored, emphasizing the positive impact of technology integration on student interest, engagement, and focus. BL empowers students to set their own learning goals, promotes self-driven learning, and instill skills that are transferable to various areas of life. The text underscores BL's ability to provide tailored support, allowing students to learn at their own pace and preparing them for future challenges and real-world skills. The text positions BL as a response to the evolving education landscape, emphasizing its advantages for both students and teachers. It underscores the importance of a learner-centered approach and the role of technology in modern education. This comprehensive exploration highlights the potential benefits of BL and the changing role of teachers in this environment, emphasizing the importance of BL in enhancing student engagement, autonomy, and preparedness for future challenges.

Furthermore, the text underscores the crucial role of tailoring BL models to individual student needs, emphasizing factors like age, life circumstances, and learning preferences. It highlights the responsibility of teachers and learning designers in selecting BL activities aligned with curriculum requirements. Seven sample BL configurations are discussed, each illustrated with actual scenarios of implementation, ensuring flexibility and customization. In the context of Indian higher education, the text details practical applications of BL, referencing the UGC BL Implementation notification. It discusses credit-based curricula, presenting scenarios for a Master's program and a national-level institute's teacher training initiatives, showcasing BL's adaptability. Flexibility in course design, pedagogical goals, and learner needs are emphasized, along with the importance of notifying institutions about proposed BL weightage.

The text then explores Information and Communication Technology (ICT) initiatives supporting BL in India. Open Educational Resources (OER), Creative Commons licenses, MOOCs, SWAYAM, Learning Management Systems (LMS), and innovative technologies like SimLab+, Virtual Labs, Robotics, and FOSSEE are introduced. The significance of ICT tools for collaboration, including blogging and concept mapping, is emphasized. These insights highlight the diverse ways ICT tools contribute to effective BL implementation in higher education, promoting collaboration and enhancing the learning experience. Moreover, the concept note explores significant ICT initiatives that can support higher education teachers in implementing BL in India. It emphasizes the role of OER, Creative Commons, MOOCs, SWAYAM, LMS platforms, and various innovative technologies in enhancing the learning experience. Additionally, the text highlights the importance of collaborative learning and provides examples of ICT tools that foster collaboration among learners. These initiatives and tools aim to promote accessible, equitable, and effective education in the context of BL.

The text delves into the realm of BL implementation in higher education, with a focus on pedagogies, technology infrastructure, and support systems. It starts by emphasizing the systematic planning required for effective BL, highlighting the symbiotic relationship between pedagogies and technologies. In the exploration of pedagogies for online and face-to-face modes, the text underscores learner-centered teaching-learning activities. Various approaches such as idea generation, brainstorming, concept-mapping, creative presentations, exposure to the real world, case studies, and cooperative learning strategies are discussed. The importance of teacher innovation to engage learners in both settings is emphasized. Moving to Project-Based Learning and Project Management Platforms, the text introduces Blended Project-Based Learning, combining conceptual learning with practical skills development. Platforms for online lectures, collaborative projects, and assessment are mentioned, with a focus on curriculum design supporting these pedagogical approaches.

The discussion on technology infrastructure covers diverse BL approaches and lists essential requirements, including user computing devices, network setups, software, and support infrastructure. The importance of a reliable internet connection, software tools, and cloud-based solutions for scalability and disaster recovery is stressed. The text underscores the crucial role of both pedagogical approaches and infrastructure in empowering effective BL implementation for teachers and students. The text provides a comprehensive examination of BL implementation, emphasizing the synergy between pedagogies and technology infrastructure, offering valuable insights for educators and institutions. The text discusses the importance of reevaluating assessment and evaluation methods in higher education in the context of implementing BL. It provides insights into continuous comprehensive evaluation, the shift towards learner-

centered education, and the need for innovative assessment strategies. The concept note critically reviews assessment and evaluation methodologies, with a notable emphasis on Continuous Comprehensive Evaluation (CCE). It advocates a significant shift from summative to continuous assessment, underlining the need to evaluate cognitive skills beyond traditional tests, including logical thinking and synthesis of concepts. The note encourages innovative assessment methods, particularly in modular curricula, and urges an increase in the weightage of internal evaluation, highlighting the importance of formative assessment.

Innovative Trends in Evaluation and Assessment, the note prompts teachers to think creatively within the context of BL. It discusses various strategies for both summative and formative evaluation. Noteworthy summative strategies include advocating for open book examinations to prepare students for real-world scenarios, group examinations to enhance knowledge sharing, spoken examinations with technology-based approaches, and on-demand examinations for flexibility. The formative evaluation strategies underscore the significance of ePortfolios as comprehensive tools reflecting learners' journeys. Encouraging creative products and assignments, such as digital stories and case studies, is highlighted for formative assessment. The note acknowledges the value of quizzes and games while cautioning against their replacement of other assessment methods. Additionally, it recognizes the role of artificial intelligence in proctoring online assessments and suggests its exploration for aspects like attention levels and learning speed. In essence, the concept note critically assesses the landscape of assessment and evaluation, particularly emphasizing a shift towards continuous assessment and innovative methods within the BL framework. The integration of technology and artificial intelligence is acknowledged as a forward-thinking approach to enhance assessment practices.

In addition, the text presents a comprehensive framework for BL pedagogy in Indian Higher Education Institutes (HEIs). It defines BL as a combination of online and face-to-face learning, aligning with UGC encouragement. The IPSIT Model is introduced, emphasizing phases like resource identification, LMS use, scaffolding, gap identification, and testing. Within the IPSIT Model, planning for infrastructure and active learning environments is stressed. The significance of Learning Management Systems (LMS) is highlighted, emphasizing eResource availability and online activity announcements. The teacher's role as a facilitator, continuous support, and ICT training are advocated. Monitoring learner progress through quizzes, presentations, and corrective feedback is emphasized. The need for innovative assessments, including open and closed book assessments, is recognized. The essential technology and resource requirements for BL are discussed in detail, considering institutional variability. Guidelines for teaching-learning activities, focusing on learner-centered approaches, are presented. Continuous assessment, rubrics for higher-level outcomes, and a shift from traditional tests to open/closed book assessments are recommended. The importance of continuous feedback, including self-feedback and feedback on teaching-learning processes, is emphasized. The text provides a meticulous guide for BL implementation in higher education, emphasizing planning, infrastructure, learner-centric activities, assessment innovation, and feedback mechanisms. It recognizes the changing roles of teachers and students in the BL environment, promoting a holistic and innovative approach to education.

IX. THEORITICAL AND PRACTICAL DISCUSSION

As the landscape of education continues to evolve, the integration of technology has become increasingly imperative. This review has diligently explored the intricacies of incorporating BL into educational frameworks, uncovering a wealth of insights and perspectives. The preceding sections have shed light on the merits, advancements, and notable outcomes associated with BL. However, no exploration is complete without acknowledging the challenges and limitations inherent in such transformative endeavours. In this final section, we delve into the nuanced terrain of challenges faced, the limitations encountered, and subsequently offer thoughtful recommendations for navigating these hurdles. The essence of these recommendations lies in aligning educational practices with the guidelines set forth by regulatory bodies, notably the UGC. The synthesis of our analysis not only emphasizes the hurdles but also provides a roadmap for the pragmatic implementation of BL in accordance with UGC's minimum recommendations. This holistic approach aims to facilitate a more nuanced understanding and effective integration of BL into educational institutions, fostering an environment that aligns with both technological advancements and established regulatory standards.

X. CHALLANGES AND LIMITATIONS IN IMPLEMENTATION OF BLENDED LEARNING IN THE CONTEXTS OF NEP 2020

10.1 Technology Accessibility and Inadequate Technology Infrastructure

One of the primary obstacles faced in implementing blended learning within the framework of the National

Education Policy 2020 (NEP 2020) is the inadequacy of infrastructure. In India, there exists a substantial disparity between the presence of technology and its practical application in the realm of education. To illustrate, as of 2019, a mere 7% of government schools in the country had access to the internet (Rao & Cheruvu, 2019). Additionally, even in schools equipped with technological infrastructure, there is a shortage of technical support and a deficiency in understanding how to leverage technology effectively (Khan & Prakash, 2020). This deficit in infrastructure and technical assistance acts as a barrier to the efficient implementation of blended learning. Merely 24% of Indians are smartphone owners (Pew, 2019), 11% of households own a computer of any kind (NSO, 2018), and just 55% have internet connection (TRAI, 2020). According to Mission Antyodaya (2017–18), just 47% of rural Indian families have access to power for more than 12 hours each day. Several challenges related to accessibility arise when utilizing technology for blended learning. For instance, numerous students may lack the essential hardware and software required to access digital materials (Garg & Sharma, 2018). Furthermore, students with disabilities may encounter difficulties in accessing digital resources or utilizing the necessary technology for participating in blended learning courses (Garg & Sharma, 2018). Apart from the terrible situation in places like Jammu and Kashmir, the picture is further complicated by stratifications along regional, class, caste, and gender lines, disparities in family sizes, and the number of students in a home. The intersection of these variables results in a range of challenges and doubts regarding the availability of online learning.

10.2 Digital Literacy

Achieving digital literacy stands as a pivotal factor for the effective execution of blended learning. A considerable number of students may lack the essential skills needed to navigate the technology and digital resources essential for blended learning courses (Garg & Sharma, 2018). In the absence of these requisite skills and knowledge, students may encounter challenges in deriving benefits from a blended learning approach (Garg & Sharma, 2018).

In addition, financial constraints pose a significant hurdle in implementing blended learning, given that acquiring and utilizing technology and internet resources often demands a substantial financial commitment. A case in point is provided by a report from the National Council of Educational Research and Training, stating, "the cost associated with providing computers, tablets, and other digital devices to all students and teachers, along with the expenses related to training teachers and establishing internet connections for schools, is considerably high" (Srivastava et al., 2020, p. 22).

10.3 Digital Divide

The expenses associated with maintaining and upgrading technology, along with the costs of providing online content and other materials, can be excessively high. Moreover, in numerous parts of India, there is limited access to technology and the internet, posing challenges to the adoption of blended learning. For instance, as reported by the National Association of Software and Services Companies (NASSCOM), "Merely 15 percent of schools in India have internet access" (NASSCOM, 2020). Additionally, in many rural and remote areas, the absence of electricity and internet connectivity further complicates the implementation of blended learning.

10.4 Lack of Skilled Teachers

There is a lack of qualified educators possessing expertise in blended learning methodologies. As per a Ministry of Human Resource Development report, "there exists a considerable shortage of trained teachers capable of handling blended learning" (Ministry of Human Resource Development, 2018, p. 7). Moreover, a scarcity of instructional materials, such as textbooks customized for blended learning, is often observed. Moreover, the lack in knowledge and comprehension of blended learning techniques poses another significant challenge in implementing the approach within the context of NEP 2020. According to a report from the Central Board of Secondary Education, "many teachers lack familiarity with the concept of blended learning and its various methods, tools, and techniques" (Central Board of Secondary Education, 2020, p. 6).

XI. RECOMMENDATIONS

While acknowledging that these limitations are temporary, here are some suggestions to navigate, overcome and ultimately eradicate these challenges in the widespread application of blended pedagogy across every region of the country.

11.1 Designing a Curriculum that Supports this Pedagogical Approach; Bringing it to Life

Developing a dynamic curriculum tailored to BL principles, ensuring seamless integration of online and offline components. This involves aligning learning objectives, resources, and assessments to optimize the benefits of BL for both educators and learners. In order to optimize the advantages of BL principles, a critical recommendation for educational institutions is the development of a dynamic curriculum that is specifically tailored to the nuances of BL. This involves the meticulous alignment of learning objectives, resources, and assessments to ensure a seamless integration of online and

offline components. Crafting learning objectives that strategically leverage the strengths of both modalities, curating resources that complement these objectives, and designing assessments that comprehensively evaluate student understanding are integral components of this approach. The emphasis is on creating a cohesive learning experience that not only benefits learners but also supports educators. By aligning the curriculum with BL principles, educational institutions can create an environment that fosters active engagement and effective learning, addressing the diverse needs of students in today's evolving educational landscape.

11.2 Accessibility of Technology

It is essential to address the issue of unequal access to technology by implementing policies that facilitate the provision of devices and internet access to all students. Bridging this gap is essential to create an inclusive BL environment and prevent marginalized groups from being left behind. To tackle the issue of unequal access to technology within the educational landscape, it is imperative to advocate for and implement policies that actively facilitate the provision of devices and internet access to all students. This proactive measure is crucial for establishing an inclusive BL environment, ensuring that every student, regardless of socio-economic background, has equal opportunities for participation and success. By bridging the digital divide, educational institutions can prevent marginalized groups from being left behind in the increasingly technology-driven educational landscape. Such policies not only level the playing field for all students but also contribute to breaking down barriers to education, fostering a more equitable and accessible learning environment that aligns with the principles of BL. This recommendation emphasizes the need for a comprehensive approach to technology access, addressing a fundamental aspect of ensuring fairness and inclusivity in modern education.

11.3 Building Technology Infrastructure

In order to support the demands of BL the government must invest in robust technological infrastructure, including reliable internet connectivity and hardware. Strengthening the technological backbone of educational institutions is crucial for the effective implementation and sustainability of BL initiatives. In order to fortify the successful implementation and long-term sustainability of BL, it is essential to prioritize investments in robust technological infrastructure. This encompasses ensuring reliable internet connectivity and sufficient hardware resources to meet the demands of a blended learning environment. By strengthening the technological backbone of educational institutions, administrators can mitigate challenges related to connectivity issues and hardware constraints, thereby creating a more seamless and reliable BL experience for both educators and learners. This investment not only enhances the overall efficiency of BL initiatives but also establishes a foundation for the continual evolution and integration of technology in the educational landscape.

11.4 Overcome Financial Constraints

Developing strategies to mitigate financial barriers hindering the adoption of BL. This may involve exploring cost-effective solutions, seeking external funding sources, and establishing partnerships to ensure that financial limitations do not impede progress. To overcome financial barriers hindering the widespread adoption of BL, it is imperative to develop comprehensive strategies. This involves exploring cost-effective solutions, such as open-source platforms or shared resources, to reduce initial implementation costs. Additionally, seeking external funding sources, including grants or partnerships with educational foundations, can provide the necessary financial support for institutions looking to invest in BL initiatives. Establishing collaborative partnerships with industry stakeholders or other educational institutions can further leverage resources and share costs. By addressing financial limitations through strategic planning and resource allocation, educational institutions can ensure that economic constraints do not impede the progress and accessibility of BL, fostering a more inclusive and sustainable learning environment.

11.5 Taking Steps to Eradicate Digital Divide

Initiatives must be taken to eliminate the digital divide, addressing disparities in technology access among various socio-economic groups. This includes outreach programs, subsidies, or collaborative efforts with tech companies to ensure equal opportunities for all learners. To eradicate the digital divide and promote equity in technology access across socio-economic groups, it is imperative to implement targeted initiatives. These initiatives may encompass outreach programs aimed at underserved communities, providing education and resources to bridge the knowledge gap. Subsidy programs can be established to make technology more affordable for economically disadvantaged families. Collaborative efforts with technology companies can involve partnerships to provide devices, internet connectivity, or digital literacy training. By addressing these disparities through focused strategies, educational institutions can create an inclusive BL environment, ensuring that all learners have equal opportunities to engage in and benefit from the evolving educational landscape.

11.6 Necessary Actions to Enhance Digital Literacy

Launching comprehensive programs to enhance digital literacy among both educators and students. This involves imparting essential skills for navigating online platforms, critically evaluating digital content, and utilizing digital tools effectively for educational purposes. Initiating comprehensive programs to boost digital literacy is crucial for the success of BL. These programs should focus on equipping both educators and students with essential skills to navigate online platforms adeptly. This includes providing training on critically evaluating digital content for reliability and relevance. Additionally, emphasis should be placed on enabling effective utilization of various digital tools to enhance the educational experience. By fostering digital literacy, educational institutions can empower their stakeholders to navigate the intricacies of the online learning environment, promoting a more informed, engaged, and proficient community within the framework of BL.

11.7 Teacher Training Programs/ Workshops

The government must strive to establish ongoing professional development programs and workshops to equip educators with the skills and knowledge needed for effective BL instruction. This includes training on utilizing digital tools, managing online classrooms, and adapting teaching methods to the blended environment. Creating sustained professional development programs and workshops is pivotal to empower educators with the requisite skills for effective BL instruction. Ongoing training should encompass adept utilization of digital tools, enabling educators to navigate online platforms seamlessly. Equipping them with strategies to manage online classrooms effectively is crucial for maintaining a conducive learning environment. Furthermore, educators need guidance on adapting traditional teaching methods to suit the dynamics of the blended learning landscape. By investing in continuous professional development, educational institutions ensure that their faculty remains abreast of the evolving technological and pedagogical aspects of BL, ultimately improving the quality of education delivered in the blended format.

11.8 Interim Strategies: Maximizing Available Resources and Encouraging Innovation in existing Approach

Although these long-term suggestions will take time to be fully implemented, in the meanwhile, it is important to maximize the utilization of available technology, techniques, materials, and resources for both teachers and students. Encourage educators to innovate new techniques and tailor-made approaches for students, efforts must be made to bridge the gap until the complete implementation of blended learning is achieved nationwide.

XII. CONCLUSION

The journey through this review has uncovered the vast potential of BL in shaping the future of education. While the advantages are evident, our scrutiny has also brought to light the challenges and limitations inherent in implementing BL. The symbiosis between technological innovation and regulatory frameworks, particularly as delineated by UGC, emerges as a pivotal factor. As we navigate the ever-changing landscape of education, it is imperative to heed the recommendations outlined here. By aligning BL practices with UGC guidelines, educational institutions can strike a harmonious balance, ensuring that the benefits of technology-enhanced learning are realized without compromising on established standards. This synthesis not only facilitates a nuanced understanding but also provides a practical roadmap for educators and policymakers to embrace BL effectively, thereby fostering a resilient and adaptable education system for the future.

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