

Blended Learning in School Education: A Focused Review with Special Reference to CBSE Secondary Schools

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ABSTRACT

Blended learning combines planned face-to-face teaching with online and digital learning activities. This focused narrative review synthesizes conceptual, empirical, and policy literature on its relevance to school education, particularly CBSE secondary schools. It examines major models, benefits, implementation barriers, teacher and learner roles, and the relevance of the National Education Policy (NEP) 2020. Evidence indicates that a well-designed blend can strengthen participation, feedback, self-regulation, collaboration, digital literacy, and learning outcomes. However, results depend less on simply adding technology than on coherent instructional design, teacher competence, access to devices and connectivity, accessible resources, valid assessment, and school-level support. The literature is dominated by higher-education research and gives limited attention to the joint perspectives of teachers and students in regional CBSE settings. The review identifies a need for context-sensitive empirical work in Ranchi, Jharkhand, examining readiness, practice, barriers, and NEP 2020 alignment.

Keywords: *Blended Learning; CBSE Secondary Schools; Digital Pedagogy; NEP 2020; Teacher Readiness; School Education.*

1. INTRODUCTION

Information and communication technologies have changed how schools organise instruction, resources, interaction, and assessment. Blended learning has gained importance because it joins the social and instructional strengths of classroom teaching with the flexibility of digital environments. It is not emergency remote teaching or the mere use of presentation slides. Rather, it is a purposeful integration of face-to-face and computer-mediated experiences in which each mode serves defined learning goals (Graham, 2006; Garrison & Vaughan, 2008).

The COVID-19 school closures made digital access and teacher capacity urgent concerns, while also demonstrating that online instruction alone cannot reproduce every function of the classroom (OECD, 2020; World Bank, 2020). In India, NEP 2020 and initiatives such as DIKSHA, PM eVIDYA, e-Pathshala, and NISHTHA support technology-enabled and competency-based learning (Government of India, 2020; NCERT, 2021). CBSE guidance similarly encourages digital resources, online assessment, and interactive activities alongside classroom teaching (CBSE, 2021). The issue is therefore how technology can improve understanding, inclusion, and learner agency without widening inequalities.

Despite its potential, the successful implementation of blended learning depends on several institutional and technological factors. Limited digital infrastructure, unequal access to devices and internet connectivity, inadequate teacher training, and variations in students' digital competencies remain major challenges, particularly in developing countries (Kaur, 2013; Oliver & Trigwell, 2005). Addressing these challenges is essential for ensuring equitable and effective implementation of blended learning in schools.

Table1: Comparison between Traditional Learning, Online Learning, and Blended Learning

Aspect	Traditional Learning	Online Learning	Blended Learning
Mode of Instruction	Face-to-face classroom	Fully online	Combination of classroom and online learning
Teacher's Role	Primary source of knowledge	Facilitator and online instructor	Facilitator, mentor, and guide
Student Interaction	High classroom interaction	Mostly virtual interaction	Both face-to-face and online interaction
Learning Resources	Printed books and classroom materials	Digital content and e-resources	Printed as well as digital resources
Flexibility	Limited	High	Moderate to High
Technology Use	Minimal	Extensive	Integrated with classroom teaching
Assessment	Mainly classroom-based	Mostly online	Combination of online and offline assessment
Learning Experience	Teacher-centred	Technology-centred	Learner-centred and technology-supported

Source: Based on Bonk & Graham (2012), Garrison & Vaughan (2008), and NEP (2020).

Table2: Major Features of Blended Learning in School Education

Feature	Description
Flexibility	Students can learn both inside and outside the classroom.
Personalized Learning	Learning activities can be tailored according to students' needs and pace.
Technology Integration	Digital tools, online platforms, videos, and multimedia resources support classroom instruction.
Active Learning	Encourages collaboration, discussion, project-based learning, and problem-solving.
Continuous Assessment	Enables both formative and summative assessment through online and offline methods.
Digital Skill Development	Enhances ICT skills and digital literacy among teachers and students.
Better Learning Outcomes	Improves engagement, motivation, participation, and academic achievement when implemented effectively.

Source: NEP (2020).

2. REVIEW METHODOLOGY

This focused narrative review draws on peer-reviewed articles, influential books, meta-analyses, government policy documents, and official reports published mainly between 2003 and 2025. Search terms included “blended learning”, “secondary education”, “CBSE schools”, “digital learning”, “teacher perception”, “student perception”, “ICT in education”, and “NEP 2020”. Google Scholar, ERIC, Scopus, Web of Science, JSTOR, and official institutional sources were consulted. The selected literature was compared under concept and evolution, models, benefits, stakeholder roles, implementation barriers, policy alignment, and research gaps. It is a qualitative synthesis, not a statistical meta-analysis.

Flowchart of the Review Methodology

Identification of Research Topic ↓
Define the Objectives of the Literature Review ↓
Selection of Keywords and Search Terms ↓
Literature Search (Google Scholar, ERIC, Scopus, JSTOR, Web of Science, ResearchGate, etc.) ↓
Collection of Relevant Studies ↓
Screening and Selection of Literature ↓
Categorisation into Major Themes ↓
Critical Analysis and Synthesis ↓
Identification of Research Gaps ↓
Interpretation of Findings ↓
Conclusion

3. CONCEPT, EVOLUTION, AND DISTINCTIVENESS OF BLENDED LEARNING

Definitions vary because “blend” can describe several proportions of online and classroom activity. The most useful definition is pedagogical: a planned combination in which the modes are integrated rather than delivered as parallel experiences (Graham, 2006; Hrastinski, 2019). Classroom meetings provide explanation, discussion, laboratory work, social support, and immediate clarification. Digital components can offer multimedia explanation, revision materials, discussion spaces, quizzes, learning analytics, and asynchronous access. Their value depends on the quality of the connection

between activities. The approach evolved from computer-assisted instruction and early web-based learning toward Learning Management Systems, virtual classrooms, mobile applications, digital repositories, and interactive assessment. The pandemic accelerated adoption but also exposed unequal connectivity, device availability, and home learning conditions. Post-pandemic blended learning must therefore be a sustainable redesign of instruction, not a continuation of crisis-era online teaching (UNESCO, 2021).

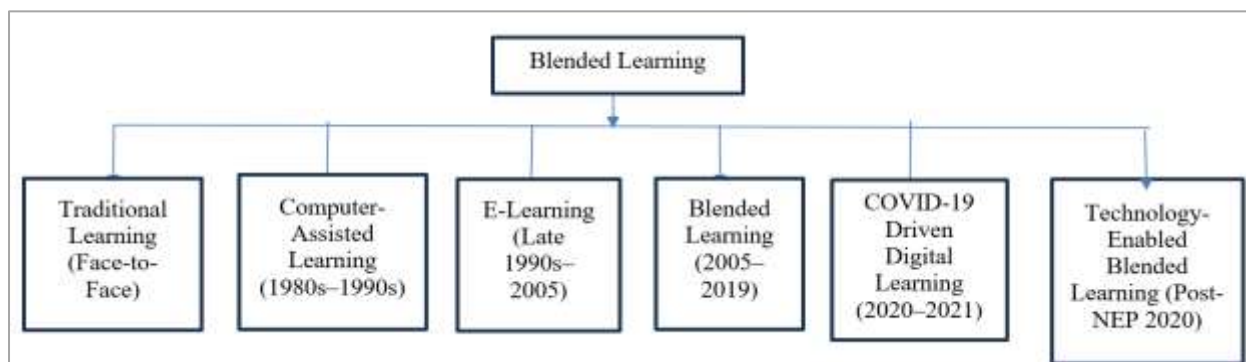
Table 3. Comparison of Learning Modes

Aspect	Traditional learning	Online learning	Blended learning
Primary setting	Physical classroom	Virtual platform	Coordinated classroom and digital spaces
Teacher role	Main instructor	Online facilitator	Instructor, mentor, and designer
Interaction	Mostly face-to-face	Mostly virtual	Face-to-face plus online interaction
Resources	Texts and classroom materials	Digital content and e-resources	Print, digital, multimedia, and practical resources
Assessment	Predominantly classroom based	Predominantly online	Integrated formative and summative assessment
Flexibility	Limited by timetable	High, but may be isolating	Moderate to high with structured support

Source: *adapted from Bonk & Graham, 2012; Garrison & Vaughan, 2008.*

Secondary learners benefit from structure, peer interaction, and teacher monitoring while developing self-regulation. Blended learning can support inclusion by allowing students to revisit content and use differentiated resources, but schools cannot assume equal devices, home support, or digital confidence. Low-bandwidth, printable, and offline alternatives remain essential.

Evolution of Blended Learning



Blended Learning Models and Approaches

Blended learning is not a single instructional model but a flexible pedagogical approach that combines face-to-face classroom teaching with online and digital learning experiences. Educational institutions adopt different blended learning models depending on learners' needs, curriculum

requirements, technological infrastructure, and teaching objectives. Researchers have proposed several models of blended learning, each differing in the extent and manner in which technology is integrated into classroom instruction. Graham (2006) emphasized that blended learning should be viewed as a continuum rather than a fixed model, where educators determine the most appropriate balance between traditional and online learning.

One of the most widely accepted classifications of blended learning models was proposed by the Christensen Institute (Horn & Staker, 2015), which categorizes blended learning into four major models: Rotation Model, Flex Model, Self-Blend Model, and Enriched Virtual Model. These models have been extensively adopted across educational institutions worldwide.

4. MAJOR MODELS AND CLASSROOM APPROACHES

Blended learning is not a single model. Horn and Staker (2015) identify rotation, flex, self-blend (à la carte), and enriched virtual arrangements. In CBSE secondary schools, station rotation and flipped learning are commonly practical because they preserve regular classroom contact while adding short, purposeful digital tasks. Project-based blended learning can connect classroom inquiry with online research, collaboration, and presentation.

Table 4. Common Blended-Learning Models and Their School-Level Implications

Model or Approach	Core Design	School-Level Implication
Rotation	Students move between teacher-led, collaborative, independent, and online stations.	Useful where device sharing is necessary; requires timetabling and monitoring.
Flipped classroom	Content is accessed before class; class time is used for application and feedback.	Effective only when pre-class materials are accessible and brief (Bergmann & Sams, 2012).
Flex	Most learning is online with teacher support as needed.	Requires strong connectivity, self-regulation, and technical support.
Self-blend / à la carte	Students add optional online courses to regular schooling.	Supports enrichment but may intensify inequality if access is uneven.
Enriched virtual	Online learning predominates, with periodic in-person sessions.	More suitable for older, highly independent learners.
Project-based blend	Classroom inquiry is supported by digital research and peer feedback.	Builds collaboration; assessment criteria must be explicit.

Source: Horn and Staker (2015)

5. EVIDENCE ON EDUCATIONAL BENEFITS

The literature broadly suggests that blended learning can improve learning experiences and, in some conditions, learning outcomes. Meta-analytic evidence indicates that blended or online-supported conditions may outperform purely face-to-face instruction, although outcomes should not be attributed to technology alone: additional learning time, richer materials, assessment opportunities, and instructional design often explain the difference (Means et al., 2013; Bernard et al., 2014; Vo et al., 2017). The relevant comparison is therefore between coherent pedagogies, not between a screen and a classroom.

A well-designed blend can strengthen engagement through varied media, rapid feedback, simulations, and collaborative tasks. It allows students to pause, repeat, and review explanations, supporting different learning paces. Digital tools can also support formative assessment by making misconceptions visible before high-stakes examinations. These advantages are meaningful only if task volume is manageable and the online and offline parts of a lesson have a clear sequence (Garrison & Vaughan, 2008; Hrastinski, 2019).

Table 5. Benefits Associated with Blended Learning

Potential Benefit	How it Operates	Condition for Value
Engagement and participation	Interactive multimedia, discussion, and active classroom time.	Activities must be purposeful rather than add-ons.
Learning outcomes	Multiple explanations, practice, and feedback opportunities.	Strong design and adequate support are necessary.
Personalisation	Students revisit material and receive differentiated tasks.	Requires accessible content and teacher monitoring.
Collaboration	Shared documents, peer review, and group problem-solving.	Roles and assessment criteria should be defined.
Digital literacy	Use of search, media, platforms, and online communication.	Includes privacy, safety, and information evaluation.
Continuous assessment	Online quizzes and short tasks support rapid feedback.	Assessment must be valid, inclusive, and secure.

Students can experience cognitive overload when platforms, messages, and deadlines are fragmented. A coherent blend needs a simple routine: what learners do before class, what happens in class, what is submitted after class, and how feedback is used in the next lesson. This clarity is especially important in secondary schools.

6. TEACHER AND STUDENT ROLES

Blended learning changes teachers' work from delivering content alone to designing sequences, facilitating interaction, interpreting evidence of learning, and providing timely support. This requires technological pedagogical content knowledge: teachers must understand not simply a tool, but how it serves a particular subject, learner group, and objective (Mishra & Koehler, 2006). Professional development should cover lesson design, inclusion, assessment literacy, and troubleshooting, not

merely platform orientation. Students should participate actively, manage tasks, communicate responsibly, and use digital materials critically; however, autonomy must be scaffolded through weekly plans, guided practice, peer roles, and regular feedback.

7. IMPLEMENTATION CHALLENGES AND EQUITY CONCERNS

Infrastructure and equity are central constraints. Learners may lack reliable internet, an individual device, electricity, quiet study space, or digital support at home. Such disparities can make supposedly flexible activities burdensome or exclusionary. UNESCO (2021) and the World Bank (2020) stress that education systems must address access and capability together; putting content online does not ensure participation.

Teacher readiness is a second major issue. Teachers may face increased workload while preparing materials, communicating across channels, and reviewing digital submissions. Some have limited confidence with platforms, online assessment, or digital pedagogy. Institutional support technical assistance, time for collaboration, appropriate procurement, and clear policy is therefore essential. The literature also identifies concerns around attention, motivation, privacy, academic integrity, and the quality of online interaction (Boelens et al., 2017; Rasheed et al., 2020).

Table 6. Key Implementation Barriers and Responses

Challenge	Likely Effect	School-Level Response
Unequal devices and connectivity	Non-participation, delayed work, and inequitable outcomes.	Offer shared-device rotation, print alternatives, and low-data resources.
Limited teacher capacity	Technology used superficially or inconsistently.	Provide continuing TPACK-oriented training and planning time.
Low self-regulation	Incomplete online work and weak motivation.	Use predictable routines, short tasks, check-ins, and feedback.
Assessment and integrity	Unreliable evidence of learning.	Combine oral checks, projects, in-class tasks, and formative quizzes.
Fragmented platforms	Cognitive overload and missed instructions.	Use a small, consistent set of approved tools.
Privacy and safety	Data exposure or harmful digital conduct.	Adopt safeguarding, consent, data-minimisation, and citizenship practices.

Source: (Boelens et al., 2017; Rasheed et al., 2020; UNESCO, 2021).

For CBSE secondary schools in Ranchi, these conditions should be assessed locally. A school may have a smart classroom but limited home connectivity; another may have willing teachers but no common learning platform. Planning should begin with a learning pathway genuinely available to all students.

8. NEP 2020 AND THE CBSE CONTEXT

NEP 2020 positions technology as a means to strengthen access, quality, teacher development, and learner-centred education. Its emphasis on competency, experiential learning, critical thinking, and digital literacy aligns with blended pedagogies when technology extends rather than replaces active classroom learning (Government of India, 2020). CBSE guidance supports digital resources, virtual

laboratories, varied assessment, and competency-based activities (CBSE, 2021). DIKSHA and e-Pathshala can supply resources, NISHTHA can support teacher learning, and PM eVIDYA offers multi-modal access; however, schools must map these resources to curriculum outcomes and adapt them to local access conditions (NCERT, 2021).

Table 7. Alignment of Blended Learning with NEP 2020

NEP 2020 Priority	Blended-Learning Contribution	Implementation Requirement
Competency-based learning	Application, inquiry, and feedback can be expanded through digital and classroom tasks.	Align activities and assessment with competencies.
Digital literacy	Guided use of digital resources develops capability.	Teach safe, ethical, and critical use.
Equity and inclusion	Flexible formats may support diverse learners.	Provide offline/low-tech alternatives and accessibility support.
Teacher development	Online modules and communities support professional learning.	Connect training to classroom practice and mentoring.
Assessment reform	Frequent formative evidence can inform teaching.	Use mixed, valid, transparent assessment methods.

Source: (Government of India, 2020; CBSE, 2021).

9. RESEARCH GAPS AND DIRECTIONS FOR FUTURE STUDY

Several gaps remain. Much influential evidence comes from universities rather than secondary schools, where learners need different levels of supervision and developmental support. Indian research also gives insufficient attention to regional and non-metropolitan CBSE settings, including Ranchi and Jharkhand. Studies often isolate student or teacher perceptions; considering both groups alongside school leadership and infrastructure can better explain implementation. Academic performance is frequently emphasized over readiness, wellbeing, workload, inclusive access, digital citizenship, and classroom practice. There is also limited evidence on how NEP 2020 is translated into daily school routines.

Table 8. Current Emphasis of Blended Learning with Research Gap

Current Emphasis	Gap	Suggested CBSE-School Focus
Higher-education settings	Limited direct evidence for adolescents.	Study age-appropriate design, support, and outcomes.
Well-resourced settings	Limited regional evidence.	Compare access and practice across Ranchi school contexts.
Single stakeholder perspective	Experiences are rarely integrated.	Collect matched evidence from teachers, students, and leaders.
Outcome measures alone	Readiness and processes are underexplored.	Assess infrastructure, competency, workload, engagement, and equity.
Policy discussion	Limited NEP implementation evidence.	Examine the use of CBSE and national digital resources in practice.

(Government of India, 2020; CBSE, 2021).

10. CONCLUSION

Blended learning is a planned pedagogical design that combines face-to-face interaction with carefully selected digital experiences. It can support engagement, feedback, flexibility, collaboration, self-directed learning, and digital literacy, but technology by itself does not improve education. Positive outcomes depend on instructional alignment, teacher expertise, accessible resources, coherent assessment, and continuing support (*Graham, 2006; Means et al., 2013; Mishra & Koehler, 2006*). For CBSE secondary schools, a feasible blend retains regular classroom teaching while using manageable digital resources for preparation, practice, revision, assessment, and collaboration. Schools should start with equitable access, a common platform routine, teacher mentoring, and low-bandwidth alternatives. Research in Ranchi can examine how teachers and students experience these approaches and the conditions that support an inclusive, sustainable blend.

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