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The Effectiveness of Hybrid Mode Teacher Professional Development Programmes for Faculty Members: A Cross-National Analysis with Special Reference to India

Shivani Gupta
Research Scholar,
Department of Education,
Invertis University, Bareilly

Dr. Sarah Basu
Professor,
M.Ed. Department,
Bareilly College, Bareilly

Dr. Archana Singh,
Assistant Professor,
Department of Education,
Invertis University, Bareilly

Abstract

The professional development (PD) of teachers and higher-education faculty has traditionally relied on face-to-face workshops, which research has long criticised as episodic, decontextualised, and insufficient for sustained change in classroom practice (Guskey, 2002). The global expansion of digital infrastructure, accelerated by the COVID-19 pandemic, has pushed hybrid mode—an intentional integration of online and in-person components—to the centre of teacher professional development (TPD) policy and practice. This paper examines the effectiveness of hybrid TPD programmes for faculty members through a review of literature and programme data drawn from India, the United States, the United Kingdom, China, Pakistan, Bangladesh, South Africa, and Kenya. Particular attention is given to the Indian scenario, including the National Initiative for School Heads' and Teachers' Holistic Advancement (NISHTHA), the DIKSHA digital platform, and the UGC Malaviya Mission Teacher Training Programme (MMTTP) for higher-education faculty. Using a qualitative document-analysis and comparative research design, the study synthesises findings from peer-reviewed studies, government reports, and meta-analyses published between 2009 and 2026. Findings indicate that hybrid TPD, when it combines self-paced digital content with facilitated face-to-face or synchronous sessions, produces stronger gains in teacher knowledge, confidence, and instructional practice than either fully online or one-shot in-person models, though outcomes are moderated by infrastructure, digital literacy, and institutional follow-up support. The paper concludes with implications for policymakers, teacher educators, and higher-education institutions seeking to design and scale hybrid faculty development programmes.

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Introduction

Teacher quality is widely recognised as the single most influential in-school factor affecting student learning outcomes, which places continuous professional development at the centre of education reform efforts worldwide. For decades, TPD was delivered predominantly through short, face-to-face workshops or "one-shot" in-service seminars. Research going back to Smylie's (1989) work, and reaffirmed by Wei et al. (2010), found that such short, disconnected sessions rarely translate into lasting changes in classroom practice, largely because they lack follow-up, contextual relevance, and opportunities for teachers to practise new strategies over time.The emergence of internet-enabled learning technologies offered an alternative: online professional development that could reach large numbers of teachers regardless of geography, at lower marginal cost per participant. However, purely online PD has its own limitations—isolation, weak accountability, and reduced opportunities for hands-on modelling and peer feedback. Hybrid (or "blended") TPD emerged as a middle path, deliberately combining self-paced digital modules, synchronous online sessions, and face-to-face workshops or classroom-based coaching within a single, coherent programme. Global disruption caused by the COVID-19 pandemic in 2020 acted as an accelerant: institutions that had previously treated online components as supplementary were compelled to redesign programmes around hybrid delivery almost overnight (Pachori et al., 2026).

India offers a particularly instructive case. With more than 9.5 million school teachers and roughly 1.5 million higher-education faculty members spread across highly diverse geographic, linguistic, and infrastructural contexts, purely face-to-face training at scale is logistically difficult and expensive, while purely online training risks excluding teachers in low-connectivity regions. The National Education Policy (NEP) 2020 explicitly calls for continuous, technology-enabled professional development for teachers and faculty, and encourages the blended delivery of training to widen access while preserving the mentoring and hands-on elements associated with face-to-face learning (Government of India, Ministry of Education, 2020). Flagship programmes such as NISHTHA and the DIKSHA platform, along with the UGC's Malaviya Mission Teacher Training Programme for university and

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college faculty, have consequently been built around hybrid delivery models. Understanding whether—and under what conditions—these hybrid approaches are effective is therefore both a pressing policy question and a matter of considerable practical interest to teacher educators, university administrators, and faculty development centres.This paper reviews the international and Indian evidence base on hybrid TPD for faculty members, describes representative hybrid TPD programmes from several countries, outlines a research design for synthesising this evidence, and discusses the findings and their implications for the design of future faculty development initiatives.

Theoretical Foundations of Effective Teacher Professional Development

Desimone's (2009) widely cited conceptual framework identifies five core features associated with effective professional development: a clear content focus, active learning, coherence with teachers' existing beliefs and school policies, sufficient duration, and collective participation among colleagues from the same school or department. Building on this framework and a review of thirty-five methodologically rigorous studies, Darling-Hammond, Hyler, and Gardner (2017) identified seven characteristics of effective PD, including sustained duration, coaching and expert support, modelling of effective practice, and structured opportunities for feedback and reflection. Guskey (2002) further argued that PD is most effective when it is evaluated not merely by participants' immediate reactions but by measurable changes in teacher practice and, ultimately, student learning outcomes. None of these frameworks specifies a particular delivery mode as inherently superior; rather, they establish criteria against which any mode—face-to-face, online, or hybrid—can be judged.

Hybrid delivery is theoretically well positioned to satisfy several of these criteria simultaneously. Self-paced online modules can provide content focus and allow teachers to revisit material at their own pace, while face-to-face or synchronous sessions can supply the active learning, coaching, and collegial interaction that purely asynchronous formats often lack. A systematic meta-aggregative review of professional development for online and blended teaching found that successful TPD programmes for online/blended instruction integrate technical skill-building with pedagogical content knowledge, rather than treating technology training as a stand-alone activity, and that ongoing structured support after the formal training period is a recurring predictor of sustained change in practice.

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Empirical Evidence on Blended and Hybrid Learning Effectiveness

Beyond TPD specifically, a substantial body of research on blended learning more generally provides corroborating evidence. Cao's (2023) meta-analysis, synthesising studies from multiple countries, concluded that blended learning improves performance, attitude, and achievement outcomes relative to fully traditional instruction in most national contexts, although the effect was not statistically significant for student engagement in China and the United States, indicating that outcomes are moderated by context rather than universal. A hybrid professional development model built around online video-based content and a face-to-face "train-the-trainer" component was found to strengthen secondary mathematics teachers' technology-integration skills and their confidence in mentoring colleagues, illustrating how hybrid design can build not only individual competence but also peer-support capacity within a school.

In the higher-education context, a synthesis of qualitative evidence on professional development for blended learning found that effective initiatives are deliberately designed, systematically implemented, and require sustained institutional commitment, with success frequently assessed through multiple stakeholder perspectives—faculty, students, and institutional leadership—rather than faculty self-report alone. A South African study using a Technological Pedagogical Content Knowledge lens found that students in a hybrid-taught health sciences programme generally viewed the model favourably for its flexibility and its capacity to develop digital competence, but that poor infrastructure and gaps in computer literacy substantially constrained its implementation, underscoring the need for parallel investment in faculty digital-pedagogical training (Hu, 2024). A related qualitative study of hybrid Communities of Practice among South African teachers found that structured online collaboration, layered onto existing face-to-face professional networks, supported the gradual development of Technological Pedagogical Content Knowledge (TPACK), particularly where teachers received scaffolding on how to use digital collaboration tools productively (Mahlo & Waghid, 2025).

Evidence from Developing-Country and South Asian Contexts

Research from lower- and middle-income countries highlights both the promise and the constraints of hybrid TPD at scale. A policy brief on the 3MPower research programme, which

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examined Bangladesh's Anonde Ghonit Shikhi mathematics training—an online course on the government's Muktopaath e-learning platform followed by a week of face-to-face training—found that while the model achieved considerable reach, the absence of structured follow-on support after the face-to-face component limited teachers' ability to translate training into sustained classroom implementation, prompting recommendations to move from one-off blended events toward integrated, continuously supported professional learning. A study of teacher training institutions in Sindh, Pakistan, employing structural equation modelling with 350 in-service teachers, found that both intrinsic motivational factors (perceived usefulness, professional growth) and extrinsic factors (institutional support, technological infrastructure) significantly predicted teachers' willingness to adopt blended learning for their own professional training. A survey-based study of educators in China similarly found that while existing hybrid PD programmes were generally perceived as effective, teachers wanted greater customisation, more collaborative learning opportunities, and more sustained post-training support to address challenges of technology integration and online course design. Reviews of TPD in Sub-Saharan Africa likewise emphasise that blended and technology-enabled approaches can extend the reach of professional development into remote and under-resourced areas, provided that connectivity, device access, and locally relevant content are addressed.

Evidence Base in the Indian Context

Within India, studies of NISHTHA report that the programme's cascade model—combining a Learning Management System, a mobile application, and in-person cluster- and block-level sessions delivered by trained resource persons—has enabled training to be delivered at a scale not previously achieved by any single teacher training programme, having reached over five million elementary teachers and school heads across all states and union territories. An empirical study of NISHTHA's impact on pedagogical practice, combining classroom observation, interviews, and participant surveys, reported positive shifts in teacher attitudes and instructional strategies following training, while also noting variation in impact linked to how consistently the online and offline components were integrated at the local level. A study examining the transformation of DIKSHA from a teacher-content repository into a national EdTech backbone during the COVID-19 pandemic found that the platform's expansion was underpinned by coordinated policy instruments—including the PRAGYATA guidelines on

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blended and online learning and the NEP 2020 framework—and that more than 2.4 million teachers completed NISHTHA modules through DIKSHA during a single 2020 training cycle (Pachori et al., 2026). At the higher-education level, a study on technology-enabled teacher education under NEP 2020 found that platforms such as DIKSHA and SWAYAM are shifting faculty development away from one-off face-to-face workshops toward blended models, though digital literacy gaps, infrastructure limitations in smaller institutions, and the need for pedagogically sound (rather than merely digitised) content remain persistent constraints. Complementary evidence from Uttar Pradesh similarly points to a cascade model of state, district, and block-level master trainers as central to how blended TPD is actually delivered on the ground, with local mentoring capacity emerging as a key determinant of programme quality.

Hybrid Teacher Professional Development Programmes in the Indian Scenario

NISHTHA (National Initiative for School Heads' and Teachers' Holistic Advancement). Launched in 2019 by India's Ministry of Education under the Samagra Shiksha scheme, NISHTHA is described as the largest integrated teacher-training programme of its kind in the world, targeting approximately 4.2 million elementary-level teachers, head teachers, and teacher educators. Its eighteen activity-based modules cover learner-centred pedagogy, ICT integration, and school-based assessment, and are delivered through a combination of an online Learning Management System built on Moodle, a mobile application, and face-to-face sessions conducted by State and Key Resource Persons, with built-in pre- and post-training assessment for monitoring impact.

DIKSHA (Digital Infrastructure for Knowledge Sharing). Launched in 2017 by NCERT and adopted by nearly every state and union territory, DIKSHA functions as the digital backbone through which hybrid programmes such as NISHTHA are delivered, hosting content in thirty-six languages, offering nearly twenty thousand courses, and recording over 180 million course enrolments. Following its designation as the "One Nation, One Digital Platform" under the PM eVidya initiative, DIKSHA evolved from a supplementary content repository into the primary channel for both curriculum delivery and hybrid teacher training in India.

UGC Malaviya Mission Teacher Training Programme (MMTTP) / PMMMNMTT. Aimed specifically at higher-education faculty, this Ministry of Education scheme restructures the

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earlier network of UGC Human Resource Development Centres into 116 Malaviya Mission Teacher Training Centres (MMTTCs) located across central universities, IITs, NITs, and other institutions. Under the current guidelines, each centre is expected to offer Faculty Induction Programmes in both residential and hybrid formats, with a 144-hour, four-week curriculum aligned to the UGC's "Guru Dakshata" framework covering pedagogy, research methodology, academic leadership, and the integration of Indian values into higher education, in line with NEP 2020's emphasis on capacity-building for faculty.

Hybrid Teacher Professional Development Programmes from Abroad

Indian Subcontinent

Bangladesh's Anonde Ghonit Shikhi programme, delivered through the government's Muktopaath platform, combines nine online numeracy modules with a week of face-to-face training and has been completed by more than 180,000 primary teachers, making it the most widely used TPD course on the platform; research on the programme has informed recommendations to move toward more sustained, applied blended models for the next phase of Bangladesh's primary education programme. In Pakistan's Sindh province, the Provincial Institute of Teacher Education has introduced blended-learning-based professional development for in-service teachers, with research showing that both motivational and infrastructural factors shape adoption. In China, survey-based research on educators navigating hybrid and online teaching delivery found current PD programmes to be generally effective but in need of greater customisation and sustained follow-up support.

United States (U.S.)

A hybrid PD model for secondary mathematics teachers combined an online Teacher Learning Community—featuring recorded demonstrations and asynchronous discussion of handheld graphing-technology use—with periodic face-to-face coaching sessions. Teachers who participated reported not only growth in their own technological-pedagogical skill but also greater confidence in supporting colleagues, suggesting that hybrid design can build distributed leadership capacity within a school in addition to individual competence.

United Kingdom (U.K.)

Reviews of blended approaches to continuing professional development in UK schools have examined programmes that combine online modules with face-to-face or video-based

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coaching, including flipped-learning models of CPD. This body of work emphasises that the "social presence" and "teaching presence" created by facilitators within the online component are important predictors of engagement, and that blended CPD is most effective when facilitators actively scaffold interaction rather than relying on passive content delivery.

African Countries

In South Africa, hybrid Communities of Practice have been used to support the gradual development of teachers' TPACK, layering structured online collaboration onto existing face-to-face professional networks (Mahlo & Waghid, 2025). At the higher-education level, hybrid teaching in health-science faculties has been found to depend heavily on parallel faculty-development investment in digital pedagogical competence, given persistent infrastructure constraints in many public universities (Hu, 2024). In Kenya, studies of teacher training and continuous professional development have highlighted school-based learning communities and structured reflection as central mechanisms through which blended and technology-supported PD translates into improved instructional competence, particularly where urban-rural disparities in access are explicitly addressed.

Research Design of the Study

This paper adopts a qualitative, comparative document-analysis design intended to synthesise existing empirical and policy evidence on hybrid TPD rather than to collect new primary data. The approach follows established practice in educational research syntheses that draw on peer-reviewed journal articles, government and multilateral policy documents, and empirical evaluation reports to build a cross-national evidence base (Mitchell et al., 2024).

Selection criteria and Sources included in the Study

Sources were identified through targeted searches of academic databases and institutional repositories, and were included if they (a) examined a professional development or faculty development programme explicitly combining online and face-to-face or synchronous components; (b) reported empirical findings, programme-monitoring data, or a systematic/meta-analytic synthesis of such findings; and (c) were published between 2009 and 2026, spanning the period from Desimone's foundational conceptual framework to the most recent post-pandemic evaluations. Priority was given to sources reporting quantitative reach or

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outcome data (for example, completion rates, participant numbers, or effect sizes) alongside qualitative accounts of implementation, in order to triangulate scale with depth.

Countries and Programmes covered in the Present Study

To capture the diversity in infrastructure, governance, and educational level, the review deliberately included evidence from high-income contexts (United States, United Kingdom), an emerging economy with large-scale centralised programmes (India), and lower-middle-income contexts where connectivity and resourcing constraints are more pronounced (Bangladesh, Pakistan, Kenya, South Africa), together with China as a large middle-income system with extensive EdTech infrastructure. Within India, coverage spans both the school-level system (NISHTHA, DIKSHA) and the higher-education faculty-development system (UGC-HRDCs, PMMMNMTT/MMTTP), reflecting the paper's specific focus on faculty members alongside school teachers.

Analytical Approach to the Study

The synthesis followed a thematic-analysis logic: sources were coded inductively for recurring themes relating to (i) programme design features (content focus, ratio of online to face-to-face time, presence of coaching/mentoring, duration), (ii) reported outcomes (knowledge gains, confidence, behaviour change, reach/scale), and (iii) barriers to effectiveness (infrastructure, digital literacy, follow-up support, institutional buy-in). Findings were then compared across contexts to identify patterns that recur regardless of national setting, as distinct from patterns that appear contingent on a country's specific infrastructural or institutional conditions. This comparative logic is consistent with the approach used in existing cross-national reviews such as Cao's (2023) meta-analysis and the Sub-Saharan Africa synthesis by Mitchell et al. (2024). As a secondary, document-based synthesis rather than a primary field study, this design cannot establish causal effect sizes independently; instead, its contribution lies in aggregating and comparing effect claims and implementation lessons already reported in the literature, while flagging where evidence remains thin—for instance, longitudinal, classroom-observation-based evidence on the sustained impact of hybrid faculty development in Indian higher education remains comparatively limited relative to the school-level evidence base around NISHTHA and DIKSHA.

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Findings of the Study

- **Hybrid Mode Outperforms Purely Face-to-Face or Purely Online Delivery Under Most Conditions**

  Across the reviewed literature, hybrid delivery was consistently associated with stronger outcomes than either a single face-to-face workshop or a fully online, unsupported course. Cao's (2023) cross-country meta-analysis found blended learning to significantly improve performance, attitude, and achievement outcomes relative to traditional instruction in most of the countries examined, although the improvement in engagement was not statistically significant in China and the United States—indicating that gains are real but not automatic or uniform. Within TPD specifically, the hybrid graphing-technology model in the United States and the blended midwifery-educator programme evaluated across Kenya and Nigeria—where 96.7% of participants completed the self-directed online component and 90% completed the accompanying practical training, with measurable gains in knowledge, confidence, and teaching-plan preparation skills—both indicate that pairing online content delivery with face-to-face or practical application produces measurable competence gains beyond what either component achieves alone.

- **Scale and Reach Are a Distinctive Strength of Hybrid Delivery in India**

  The Indian evidence base illustrates hybrid delivery's capacity to combine national scale with a degree of localised, face-to-face support that purely online training cannot replicate. NISHTHA has reached over five million elementary teachers and school heads, and more than 2.4 million teachers completed NISHTHA modules through DIKSHA in a single training cycle in 2020 alone (Pachori et al., 2026). DIKSHA itself now hosts close to 20,000 courses with over 180 million cumulative enrolments across thirty-six languages. This scale would be difficult to achieve through face-to-face training alone, given India's teacher workforce size and geographic spread; equally, the retention of a face-to-face or facilitator-led component—delivered through a cascade of State and Key Resource Persons—appears central to the positive shifts in pedagogical practice reported in empirical evaluations of NISHTHA.

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- **Faculty-Level (Higher Education) Hybrid Programmes Show Promise but Face Distinct Constraints**

  For higher-education faculty specifically, India's restructured MMTTP explicitly mandates hybrid delivery for Faculty Induction Programmes across its 116 centres, reflecting policy confidence in the model at the national level. However, the broader international literature on faculty-focused hybrid PD—including the South African evidence on hybrid teaching in health-science faculties (Hu, 2024) and the qualitative synthesis of blended-learning PD in higher education—suggests that faculty-level programmes face constraints somewhat different from school-level ones: less centralised cascade infrastructure, greater variation in individual faculty digital competence, and a need to evaluate impact not only through faculty self-report but through multiple stakeholder perspectives, including students. This suggests that the scale advantages seen in school-level Indian programmes such as NISHTHA are not automatically transferable to the higher-education faculty-development context without comparable investment in mentoring infrastructure.

- **Infrastructure, Digital Literacy, and Follow-Up Support Moderate Effectiveness**

  A recurring theme across contexts as different as South Africa, Pakistan, Bangladesh, and Uttar Pradesh in India is that hybrid TPD's effectiveness is conditional rather than guaranteed. Poor infrastructure and gaps in digital literacy were found to substantially constrain hybrid implementation in South African higher education (Hu, 2024), while research on Bangladesh's Anonde Ghonit Shikhi programme found that the absence of structured follow-up support after the face-to-face phase limited how far initial training translated into sustained classroom practice. The Pakistan study similarly found that both motivational and infrastructural/institutional-support factors significantly predicted teachers' adoption of blended PD, while the Uttar Pradesh study of India's cascade model found that the quality of local master trainers was a key determinant of how effectively the online and offline components of TPD were actually integrated in practice.

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- **Design Features That Distinguish High-Impact Hybrid TPD**

  Synthesising across sources, several design features recur in programmes reporting stronger outcomes: (a) content focus that is directly tied to teachers' or faculty members' subject and grade/discipline context rather than generic pedagogy; (b) an active, hands-on face-to-face or synchronous component rather than a purely passive online course; (c) coaching, mentoring, or peer-network support that continues beyond the formal training period; (d) sufficient duration and spacing to allow teachers to apply and reflect on new practices between sessions; and (e) built-in monitoring or assessment (as in NISHTHA's pre- and post-training assessment) that allows programmes to be iteratively improved. These features closely mirror the general effective-PD criteria identified by Desimone (2009) and Darling-Hammond et al. (2017), suggesting that hybrid mode is best understood not as an effectiveness factor in itself, but as a delivery format that, when well designed, makes it easier to satisfy those established criteria at scale.

Educational Implications of the Study

For policymakers, the evidence suggests that hybrid delivery is a sound default for national-scale TPD, particularly in large and geographically diverse systems such as India, but that scale metrics (enrolments, completion rates) should not be treated as a proxy for instructional impact; investment in monitoring classroom-level change, as NISHTHA's pre/post assessment attempts to do, should be strengthened and extended to the higher-education faculty-development system, where comparable outcome data are currently sparser.

For teacher educators and instructional designers, the findings point toward specific design priorities: hybrid programmes should minimise passive online content delivery in favour of active, discipline-specific tasks; face-to-face or synchronous time should be reserved for coaching, modelling, and peer collaboration rather than duplicating what could be delivered asynchronously; and programmes should build in structured follow-up—coaching visits, peer learning communities, or refresher modules—rather than treating the face-to-face session as a terminal event, a lesson underscored by the Bangladesh and Pakistan evidence.

For higher-education institutions and bodies such as the UGC's Malaviya Mission Teacher Training Centres, the implication is that faculty development requires parallel investment in

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institutional mentoring capacity and digital infrastructure alongside the design of hybrid course content; without this, the flexibility benefits of hybrid delivery documented internationally may not translate into improved teaching practice at the faculty level. Institutions should also consider evaluating hybrid faculty-development programmes through multiple stakeholder lenses—faculty self-report, peer observation, and student feedback—rather than relying solely on participation or satisfaction data.

For teachers and faculty members themselves, hybrid TPD offers a genuine opportunity to combine the flexibility and self-pacing of digital learning with the practical, socially embedded learning that face-to-face interaction provides; however, the evidence suggests that the benefit is contingent on active engagement with both components rather than treating either as optional. Finally, for future research, there remains a need for more longitudinal, classroom-observation-based studies of hybrid TPD's impact on student learning outcomes—particularly within Indian higher education, where the evidence base, while growing, remains considerably thinner than the evidence available for school-level programmes such as NISHTHA and DIKSHA.

Conclusion

The evidence reviewed across India, the United States, the United Kingdom, South Africa, Kenya, Bangladesh, Pakistan, and China converge on a consistent conclusion: ***hybrid mode, when thoughtfully designed around active learning, discipline-specific content, and sustained coaching support, offers a more effective and more scalable approach to teacher and faculty professional development than either isolated face-to-face workshops or unsupported online courses***. India's experience with NISHTHA and DIKSHA demonstrates that hybrid delivery can achieve national scale while retaining a face-to-face, mentoring-based component through a cascade training model, and the ongoing restructuring of higher-education faculty development through the Malaviya Mission Teacher Training Programme signals continued policy commitment to this approach for faculty members specifically. At the same time, evidence from South Africa, Bangladesh, and Pakistan cautions that infrastructure, digital literacy, and follow-up support remain necessary conditions for hybrid TPD to translate into lasting instructional change. As education systems worldwide continue to integrate digital tools into professional learning, the central challenge is not whether to adopt hybrid mode, but

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how to design and resource it so that its theoretical advantages are consistently realised in classrooms and lecture halls alike.

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