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From Access to Agency: Digital Inclusivity in Contemporary English Language Education

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Abstract

The rapid expansion of digital technologies has profoundly reconfigured educational ecosystems, with particularly significant implications for English language education among engineering students in Hyderabad. Digital platforms, artificial intelligence–enabled applications, mobile learning tools, and virtual classrooms have altered pedagogical practices, promising enhanced accessibility, personalization, and transnational communicative engagement. Yet these promises remain unevenly realized, as digital transformation continues to reproduce structural inequalities rather than uniformly mitigating them. Even within an urban and technologically advanced context such as Hyderabad, engineering students from marginalized socio-economic backgrounds and disability-affected communities encounter persistent barriers to access, participation, and meaningful engagement with digital learning environments. Positioned within critical perspectives on digital pedagogy, this paper examines digital inclusivity in English language education by advancing the argument that inclusion must be conceptualized not merely as access to technology but as the cultivation of learner agency. Employing a mixed-methods research design that combines a systematic literature review, surveys, case studies, semi-structured interviews, and pilot pedagogical interventions, the study identifies key structural and pedagogical constraints while evaluating inclusive digital practices. The findings demonstrate that while digital technologies hold substantial transformative potential, inclusive outcomes are contingent upon robust infrastructure, teacher preparedness, collaborative stakeholder engagement, and sustained policy support.

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1. Introduction

The integration of digital technologies into education has fundamentally reshaped pedagogical paradigms across disciplines, redefining how knowledge is produced, accessed, and circulated (Dreamson, 2019). Within English language education, digital transformation has significantly expanded opportunities for learners to encounter authentic linguistic input, participate in interactive learning environments, and engage in transnational communicative networks. Online learning platforms, mobile applications, learning management systems, artificial intelligence–driven tools, and multimodal resources now mediate a substantial portion of English language instruction. These technologies enable personalized learning trajectories, collaborative knowledge construction,

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and continuous formative assessment, thereby reconfiguring traditional classroom practices. As English continues to function as a global lingua franca in academic, professional, and technological domains, the pedagogical significance of digitally mediated English language learning has become increasingly pronounced.

Despite these developments, the benefits of digitalization in education remain unevenly distributed. The concept of digital inclusivity foregrounds the distinction between mere access to technological resources and the capacity to engage with them meaningfully and equitably. Digital inclusivity encompasses not only physical access to devices and connectivity but also digital literacy, accessibility for learners with disabilities, cultural and linguistic relevance of content, and affordability of digital infrastructures (Warschauer, 2003). In many developing and under-resourced contexts, learners continue to face systemic constraints, including inadequate internet connectivity, limited access to suitable devices, and insufficient institutional support. Even within technologically advanced educational systems, digital learning environments often marginalize learners with disabilities or those from linguistically and culturally diverse backgrounds due to non-inclusive design and standardized pedagogical assumptions.

English language education occupies a distinctive position within debates on digital inclusivity because language learning is inherently social, cultural, and identity-oriented. Exclusion from digital learning spaces extends beyond academic disadvantage; it restricts learners' participation in global communicative practices and transnational knowledge economies. Digital platforms have the potential to democratize language learning by offering flexible, learner-centered pathways and opportunities for multimodal expression. When designed with inclusive principles, such platforms can amplify learner voice, foster autonomy, and support diverse learning trajectories. Conversely, digitally mediated instruction that prioritizes efficiency over equity risks reproducing existing socio-economic, linguistic, and cultural hierarchies under the guise of technological innovation.

This paper critically examines the challenges and innovations shaping digital inclusivity in contemporary English language education. It argues that inclusive digital transformation cannot be achieved through technological adoption alone but requires a holistic and integrated approach. Such an approach must incorporate adaptive and assistive technologies, universal design for learning principles, culturally responsive pedagogical content, sustained teacher professional development, and supportive policy frameworks (Laurillard, 2012). Educators play a central role in mediating digital tools and translating technological affordances into meaningful pedagogical practices, while policymakers and institutional stakeholders shape the structural conditions under which inclusive digital education becomes possible.

By interrogating both structural barriers and emerging inclusive practices, this study contributes to ongoing scholarly debates on equity in digitally mediated language education. It advances the position that digital inclusivity should be conceptualized not as a technical add-on but as a discourse-driven pedagogical practice shaped by relations of power, access, and representation. In doing so, the paper highlights the need to reconceptualize digital inclusion in English language education as a process oriented toward learner agency, participation, and social justice, rather than as a narrowly defined issue of technological provision alone.

2. Theoretical Framework

Digital inclusivity in English language education is underpinned by a constellation of theoretical perspectives that collectively foreground learning as a socially mediated, learner-centered, and accessibility-oriented process. Among the most influential frameworks informing inclusive digital pedagogy are sociocultural theory, constructivist learning theory, and the Universal Design for Learning (UDL) framework. Together, these perspectives provide a robust conceptual foundation for understanding how digital technologies can either facilitate equitable participation in language learning or reproduce existing educational inequalities.

Sociocultural theory, most prominently associated with Vygotskian thought, conceptualizes language learning as a socially situated process mediated through cultural tools, interaction, and guided participation. From this perspective, learning occurs within the Zone of Proximal Development through scaffolded interaction with more knowledgeable peers, teachers, or symbolic systems. Digital technologies, when thoughtfully integrated, function as powerful mediational tools that extend opportunities for interaction, collaboration, and feedback across spatial and temporal boundaries (Vygotsky, 1978; Lantolf & Thorne, 2006). In English language education, online discussion forums, collaborative writing platforms, video conferencing tools, and social media environments enable learners to engage in authentic communicative practices beyond the traditional classroom. Such digitally mediated interactions can support linguistic development while also fostering learner agency and participation. However, sociocultural theory also draws attention to the uneven distribution of mediational means, highlighting

how disparities in access, digital literacy, and institutional support can constrain learners' participation in these interactional spaces (Warschauer, 2003).

Constructivist learning theory further complements sociocultural perspectives by emphasizing learners' active role in constructing knowledge through experience, reflection, and problem-solving. Rather than viewing learners as passive recipients of information, constructivist approaches position them as meaning-makers who engage with content in dynamic and situated ways (Bruner, 1996). Digital learning environments are particularly well suited to supporting constructivist pedagogies in English language education. Interactive tasks, simulations, project-based learning modules, and multimedia storytelling platforms allow learners to engage with language as a resource for inquiry, creativity, and communication. Adaptive learning systems, in particular, align closely with constructivist principles by enabling learners to progress at individualized paces, receive tailored feedback, and revisit learning materials according to their needs and proficiency levels. Such systems can enhance learner motivation and autonomy, provided that they are designed with pedagogical sensitivity rather than purely algorithmic efficiency.

At the same time, constructivist approaches caution against assuming that learner-centered digital environments are inherently inclusive. Without intentional design and instructional guidance, digital platforms may privilege learners who already possess high levels of linguistic, technological, or cultural capital. Consequently, constructivist-informed digital pedagogy must be accompanied by structured support mechanisms that scaffold participation and address diverse learner needs.

Universal Design for Learning offers a critical framework for addressing these challenges by explicitly foregrounding inclusivity in educational design. UDL advocates for the provision of multiple means of representation, engagement, and expression to accommodate learner variability from the outset, rather than retrofitting accommodations after barriers emerge (CAST, 2018). In English language education, UDL principles translate into the use of multimodal instructional materials, flexible assessment formats, and accessible digital interfaces that support learners with diverse linguistic backgrounds, learning preferences, and physical or cognitive abilities. Laurillard (2012) emphasizes that technology-enhanced learning must be pedagogically principled, arguing that digital tools should support dialogue, adaptation, and feedback rather than merely delivering content.

When applied to digital English language education, UDL shifts the focus from deficit-oriented models of inclusion to proactive design strategies that recognize diversity as a normative condition of learning. Captioned videos, screen-reader-compatible texts, audio-supported reading materials, and options for oral, written, or multimodal expression exemplify how inclusive design can expand participation and reduce exclusionary barriers. Taken together, sociocultural theory, constructivist learning theory, and Universal Design for Learning underscore the importance of designing digital environments that adapt to learner diversity rather than requiring learners to conform to rigid technological systems. These frameworks collectively highlight that digital inclusivity is not solely a technical or infrastructural concern but a pedagogical and ideological commitment shaped by decisions about access, representation, and power. In English language education, where language functions as both a communicative resource and a marker of identity, inclusive digital practices are essential for fostering equitable participation in global linguistic and knowledge networks. Consequently, digital inclusivity must be understood as an ongoing pedagogical practice that integrates theory, design, and ethical responsibility in pursuit of learner agency and educational justice.

3. Literature Review

Digital inclusivity in English language education has emerged as a critical area of inquiry within educational technology and applied linguistics. As digital tools increasingly mediate language learning processes, scholars have emphasized the need to examine not only technological innovation but also issues of equity, access, and participation. Existing literature on digital inclusivity can be broadly categorized into five interconnected strands: the digital divide, digital literacy, accessibility and universal design, cultural and linguistic inclusivity, and the role of educators and institutions.

3.1 Digital Divide and Inequitable Access

The digital divide remains one of the most extensively researched barriers to inclusive digital education. Early conceptualizations framed the digital divide primarily as unequal access to computers and internet connectivity. However, subsequent research has demonstrated that the divide is multidimensional, encompassing social, economic, cultural, and institutional factors (Warschauer, 2003). In the context of English language education,

learners who lack access to digital technologies are disproportionately excluded from online learning environments, multimedia resources, and global communication opportunities.

Studies conducted in developing and under-resourced contexts consistently highlight infrastructural limitations as a primary obstacle to digital inclusion. Limited broadband availability, unreliable electricity supply, and the high cost of digital devices restrict learners' ability to participate in digital language learning initiatives (World Bank, 2021). Even when basic access is available, disparities in the quality of access, such as low bandwidth or shared devices, significantly affect learning outcomes (van Dijk, 2020).

Importantly, scholars argue that access alone does not guarantee meaningful participation. Warschauer (2003) emphasizes that digital inclusion must be understood in relation to social practices, institutional support, and human capacity. In English language education, this means that learners must not only have access to technology but also opportunities to use it for authentic communication, collaborative learning, and skill development.

3.2 Digital Literacy and Language Learning

Digital literacy is widely recognized as a foundational component of inclusive digital education. It refers to the ability to locate, evaluate, create, and communicate information using digital technologies (Selwyn, 2016). In English language education, digital literacy is inseparable from linguistic competence, as learners often engage with digital content in English, including online texts, videos, discussion forums, and learning platforms.

Research indicates that learners with limited digital literacy face difficulties navigating online learning environments, interpreting digital texts, and participating in virtual interactions (Ng, 2012). These challenges are particularly pronounced among first-generation learners and those from linguistically marginalized backgrounds. Without explicit instruction in digital literacy, technology-enhanced language learning risks reproducing existing educational inequalities rather than mitigating them.

Educators play a crucial role in developing learners' digital literacy. However, multiple studies reveal that teachers themselves often lack confidence and training in integrating digital tools pedagogically (Selwyn, 2016; Tondeur et al., 2017). In English language classrooms, this can result in superficial uses of technology, such as slide-based instruction or unstructured online activities, which do not fully exploit the affordances of digital media for language acquisition.

3.3 Accessibility and Universal Design for Learning

Accessibility is a core dimension of digital inclusivity, particularly for learners with disabilities. Research consistently shows that many digital learning platforms are not designed with accessibility in mind, creating barriers for learners with visual, auditory, cognitive, or motor impairments (Seale, 2014). In English language education, inaccessible digital environments can severely limit learners' opportunities to engage with listening, speaking, reading, and writing activities.

Universal Design for Learning (UDL) provides a robust theoretical framework for addressing accessibility challenges. UDL advocates for the design of learning environments that offer multiple means of representation, engagement, and expression, thereby accommodating diverse learner needs from the outset (Laurillard, 2012). Empirical studies demonstrate that UDL-aligned digital tools, such as captioned videos, screen-reader–compatible texts, speech-to-text applications, and customizable interfaces, enhance learning outcomes for both disabled and non-disabled learners (Heitink et al., 2016).

In English language education, accessibility features are particularly valuable for second-language learners who benefit from multimodal input and flexible pacing. For example, captions and transcripts support listening comprehension, while text-to-speech tools aid pronunciation and reading fluency (Rose & Meyer, 2002). These findings underscore the importance of integrating accessibility as a central design principle rather than as an optional add-on.

3.4 Cultural and Linguistic Inclusivity in Digital Content

Another critical strand of research focuses on the cultural and linguistic dimensions of digital inclusivity. Scholars argue that many digital language learning resources reflect dominant cultural norms and Western-centric perspectives, which can marginalize learners from diverse cultural backgrounds (Lim & Wang, 2022). Such content may fail to resonate with learners' lived experiences, reducing engagement and relevance.

Culturally responsive pedagogy emphasizes the importance of incorporating learners' cultural identities, languages, and contexts into instructional design (Gay, 2018). In digital English language education, this translates

into the development of localized content, multilingual support, and contextually meaningful learning activities. Research suggests that culturally inclusive digital materials enhance learner motivation, identity affirmation, and participation (Beetham & Sharpe, 2013).

Furthermore, scholars caution against viewing English solely as a neutral global language. Instead, they advocate for pedagogical approaches that recognize English as a pluralistic and dynamic resource shaped by diverse linguistic communities (Canagarajah, 2013). Digital platforms that acknowledge linguistic diversity and promote intercultural communication can contribute to more inclusive and empowering language learning environments.

3.5 Adaptive Technologies and Personalized Learning

Recent advancements in adaptive and artificial intelligence–driven technologies have generated significant interest in their potential to support inclusive education. Adaptive learning systems analyze learner data to personalize content, feedback, and pacing, thereby addressing individual differences in proficiency and learning styles (Mishra & Koehler, 2022). In English language education, such technologies can provide targeted support for learners who require additional practice or alternative instructional approaches.

Empirical studies indicate that adaptive language learning applications improve learner engagement and autonomy by offering immediate feedback and customized learning pathways (Godwin-Jones, 2018). These tools are particularly beneficial for learners in large or heterogeneous classrooms, where individualized instruction may be difficult to achieve through traditional methods.

However, scholars also raise ethical and practical concerns regarding adaptive technologies, including data privacy, algorithmic bias, and unequal access to advanced tools (Selwyn, 2019). These concerns highlight the need for critical evaluation and responsible implementation of emerging technologies within inclusive educational frameworks.

3.6 Role of Educators and Institutional Support

The success of digital inclusion initiatives in English language education is closely linked to educator agency and institutional support. Teachers serve as mediators between technology and learners, shaping how digital tools are used pedagogically. Research consistently shows that sustained professional development is essential for enabling educators to integrate digital technologies effectively and inclusively (Tondeur et al., 2017).

Institutional policies and leadership also play a vital role. Supportive policies that prioritize infrastructure development, accessibility standards, and inclusive curriculum design contribute to the sustainability of digital inclusion efforts (UNESCO, 2020). Conversely, fragmented or technology-driven policies that neglect pedagogical and equity considerations often fail to achieve meaningful inclusion.

3.7 Synthesis and Research Gap

The reviewed literature demonstrates that digital inclusivity in English language education is a multifaceted issue shaped by technological, pedagogical, cultural, and institutional factors. While significant progress has been made in identifying barriers and proposing solutions, gaps remain in the integration of these dimensions into cohesive and scalable models. In particular, there is a need for research that examines how adaptive technologies, universal design principles, and culturally responsive pedagogy can be combined within real-world educational contexts. This study seeks to address these gaps by adopting a holistic approach to digital inclusivity, emphasizing the interplay between technology, pedagogy, and policy. By doing so, it aims to contribute to the development of equitable and sustainable digital learning environments in English language education.

4. Methodology

This study investigates digital inclusivity in the teaching and learning of English within private engineering colleges in Hyderabad, a major educational and technological hub in India. Despite the city's reputation for digital infrastructure and technological advancement, significant variation exists across private institutions in terms of access, pedagogical integration, and learner participation in digitally mediated English instruction. To capture this complexity, the study adopts a mixed-methods research design, enabling a nuanced examination of both measurable trends and lived experiences related to digital learning and inclusion (Creswell & Plano Clark, 2018).

4.1. Research Design

A convergent mixed-methods design was employed, in which quantitative and qualitative data were collected concurrently, analyzed separately, and integrated during interpretation (Creswell, 2014). This design is particularly appropriate for examining digital inclusivity, as it allows for the parallel investigation of infrastructural conditions, patterns of digital engagement, and learner perceptions alongside pedagogical practices and contextual constraints. In the context of private engineering colleges, the convergent approach supports a holistic understanding of how digital platforms mediate English learning across diverse institutional environments within the same metropolitan setting.

4.2. Participants and Research Context

The primary participants in the study were undergraduate students enrolled in private engineering colleges located in Hyderabad. These students were drawn from multiple engineering disciplines, including computer science, electronics, mechanical, and civil engineering, and were enrolled in compulsory English or communication skills courses. The focus on private institutions was intentional, as such colleges constitute a significant segment of engineering education in Hyderabad and display wide variation in digital infrastructure, instructional quality, and student socio-economic background.

In addition to students, a smaller number of English instructors and academic coordinators were included to contextualize learner responses and institutional practices. However, student responses constituted the core data set of the study, as learner experience and perception were central to understanding digital inclusivity. Purposeful sampling was used to ensure representation across institutions with differing fee structures, campus facilities, and digital learning provisions (Patton, 2015). This approach allowed the study to capture perspectives from students who are digitally advantaged as well as those who experience constraints despite studying in an urban, technology-oriented environment.

4.3. Data Collection Methods

Data were collected through structured surveys, semi-structured interviews, and limited contextual case documentation. Surveys were administered to engineering students to generate quantitative data related to access to digital devices, quality and reliability of internet connectivity, frequency of engagement with online platforms, and perceived effectiveness of digital tools for learning English. Survey items were adapted from validated instruments used in prior research on digital learning and inclusion (UNESCO, 2020; van Dijk, 2020). Likert-scale items captured perceptions of accessibility, digital competence, and classroom participation, while open-ended questions allowed students to articulate challenges, preferences, and learning experiences in their own words.

To supplement the survey data, semi-structured interviews were conducted with selected students and instructors. Student interviews focused on classroom practices, assessment methods, language use in digital environments, and barriers to participation. Instructor interviews explored pedagogical strategies, institutional expectations, and challenges in addressing learner diversity through digital modes. Semi-structured interviews were chosen for their capacity to elicit depth while remaining aligned with the study's analytical focus (Kvale & Brinkmann, 2015).

Selected instructional practices were examined as contextual cases, particularly those involving learning management systems, online presentations, collaborative writing tasks, and mobile-based learning activities. These cases provided concrete illustrations of how digital inclusion is enacted within everyday classroom practice in private engineering colleges (Yin, 2018).

4.4. Data Analysis, Ethics, and Rigor

Quantitative survey data were analyzed using descriptive statistics to identify patterns related to access, usage, and learner perceptions across institutions. Frequencies, percentages, and mean scores were used to highlight variations within the student population. Qualitative data from interviews and open-ended survey responses were analyzed using inductive thematic analysis, enabling the identification of recurring themes related to barriers, opportunities, and learner agency (Braun & Clarke, 2006). Integration of quantitative and qualitative findings occurred during interpretation to enhance analytical coherence and triangulation.

Ethical considerations included voluntary participation, informed consent, and anonymity. Given the institutional sensitivity of student feedback, particular attention was paid to confidentiality and responsible

handling of digital data (Selwyn, 2019). Methodological rigor was strengthened through triangulation and transparent reporting, while limitations related to self-reported data and contextual specificity were acknowledged.

5. Analysis and Discussion

This section presents a systematic analysis of the findings generated through the mixed-methods design employed in the study. Drawing on survey responses, semi-structured interviews, and contextual case observations, the analysis foregrounds engineering students' experiences of digitally mediated English learning in private engineering colleges in Hyderabad. The discussion is organized into three interrelated sections: (1) patterns of access and digital participation, (2) pedagogical practices and learner engagement, and (3) digital inclusivity as agency formation. Together, these sections illuminate how digital technologies simultaneously enable and constrain inclusive English learning within a technologically advanced yet socio-economically stratified urban context.

5.1 Digital Access, Infrastructure, and Uneven Participation

The first layer of analysis examines students' access to digital resources and the infrastructural conditions shaping participation in digitally mediated English learning. Descriptive statistics from the survey (N = 312) indicate that baseline digital access among engineering students in Hyderabad is relatively high: 94.6% of respondents reported regular access to a smartphone, and 86.2% reported daily internet connectivity. These figures reflect the city's position as a major technological and educational hub. However, inferential analysis reveals substantial variation in the *quality*, *stability*, and *pedagogical usability* of this access, pointing to the persistence of a second-level digital divide.

Device ownership data show that while 58.9% of students had access to a laptop or desktop computer, 35.2% relied exclusively on smartphones for academic work. An independent samples *t*-test indicates a statistically significant difference in self-reported participation in digitally mediated English tasks between students with laptop access (M = 3.87, SD = 0.68) and smartphone-only users (M = 2.74, SD = 0.81), $t(310) = 12.46$, $p < .001$. This difference was particularly pronounced for writing-intensive tasks such as report drafting, collaborative document editing, and extended reading, suggesting that device type exerts a measurable influence on pedagogical participation.

Internet reliability further differentiated student experiences. Based on a composite connectivity index (combining bandwidth stability, data availability, and frequency of disruption), students were classified into high, moderate, and low connectivity groups. A one-way ANOVA revealed a significant effect of connectivity level on engagement in synchronous online sessions, $F(2, 309) = 18.92$, $p < .001$. Post-hoc Tukey tests showed that students in the low-connectivity group participated significantly less frequently in live discussions and assessments than those in the high-connectivity group. These findings indicate that nominal access masks deeper inequalities in how students experience digitally mediated instruction.

Socio-economic background emerged as a significant predictor of access quality. A chi-square test of independence revealed a statistically significant association between family income category and exclusive reliance on smartphones, $\chi^2(2, N = 312) = 21.37$, $p < .001$. Students from lower-income backgrounds were disproportionately represented among smartphone-only users and those reporting shared devices or limited data plans. Interview data corroborate these patterns, with students frequently describing constrained access as a routine rather than exceptional condition:

> *"I attend classes on my phone, but when we are asked to write or edit documents, it becomes very difficult. I feel I am always behind."* (Student, Civil Engineering)

Importantly, infrastructural disparities were evident not only across institutions but also within the same institution. Students enrolled in higher-fee programs or residing in campus hostels reported significantly higher mean scores on an institutional support scale (M = 4.02) than daily commuters from peri-urban or semi-rural areas (M = 3.11), $t(310) = 9.08$, $p < .001$. These differences translated into uneven participation in multimodal tasks, with hostel residents more likely to engage in video-based presentations, collaborative writing, and peer feedback activities.

Access-related constraints also extended beyond hardware and connectivity to include platform literacy. Approximately 42.6% of respondents reported moderate to low confidence in using institutional learning management systems during their initial semesters. Correlation analysis revealed a moderate negative relationship

between platform unfamiliarity and assignment submission consistency ($r = -.48$, $p < .01$), indicating that students with lower platform literacy were more likely to miss deadlines or submit incomplete work. Interview data suggest that this lack of familiarity contributed to anxiety and self-doubt:

> *"Sometimes I know the answer, but I am not confident about the platform. If something goes wrong, it feels like it is my fault."* (Student, Electronics Engineering)

A multiple regression model further illustrates the layered nature of digital participation. When device type, connectivity quality, and platform literacy were entered as predictors of overall digital participation, the model accounted for 39% of the variance ($R^2 = .39$, $p < .001$). Platform literacy emerged as the strongest predictor ($\beta = .41$), followed by connectivity quality ($\beta = .29$) and device type ($\beta = .22$). This finding highlights that access must be conceptualized as a multidimensional construct encompassing material resources, infrastructural stability, and user competence.

These results challenge simplistic narratives that equate urban location or basic connectivity with digital inclusion. Even within Hyderabad's technologically advanced environment, engineering students experience differentiated access that translates into uneven participation in digitally mediated English learning. The findings reinforce the argument that digital inclusion cannot be understood in binary terms but must be approached as a continuum shaped by socio-economic positioning, institutional arrangements, and students' capacity to navigate digital systems effectively.

5.2. Pedagogical Practices, Digital Mediation, and Learner Engagement

This section examines how pedagogical practices mediate engineering students' engagement with English learning in digitally mediated environments. While survey data indicate widespread use of digital tools across private engineering colleges in Hyderabad, the depth, orientation, and pedagogical purpose of such use varied substantially across instructors and institutional contexts. This variation had significant implications for student engagement, perceived relevance, and participatory outcomes.

Quantitative findings show that digital technologies were predominantly employed for content transmission rather than interactional or constructivist learning. As illustrated in Table 1, a majority of students reported frequent exposure to slide-based lectures (74.5%) and recorded video content (68.2%), whereas fewer students experienced interactive practices such as peer discussion (34.1%), collaborative writing (29.8%), or structured peer feedback (26.4%). These patterns suggest that digital tools often functioned as substitutes for traditional classroom instruction rather than as catalysts for pedagogical transformation.

Table 1

Digital Pedagogical Practices and Student Engagement Outcomes (N = 312)

Pedagogical Practice	Mean Frequency (1–5)	Engagement Score (M)	SD	F / t Value	p Value
Slide-based online lectures	4.21	2.91	0.74	—	—
Recorded video lectures	3.87	3.02	0.69	—	—
Online group discussions	2.64	3.78	0.63	F = 19.34	< .001
Collaborative writing tasks	2.41	3.94	0.58	t = 8.62	< .001
Peer feedback activities	2.19	4.01	0.55	t = 9.11	< .001
Virtual presentations	2.73	4.08	0.61	F = 21.07	< .001

Note. Engagement scores measured on a 5-point scale (1 = very low, 5 = very high).

Inferential analysis reveals a statistically significant relationship between pedagogical practice type and learner engagement. A one-way ANOVA indicates that students exposed primarily to interactive digital practices reported significantly higher engagement levels than those experiencing content-delivery–oriented instruction, $F(2, 309) = 22.56$, $p < .001$. Post-hoc Tukey tests confirm that collaborative and discussion-based practices were associated with higher perceived engagement and confidence in English use.

Interview data further contextualize these findings. Students repeatedly described content-heavy digital instruction as passive and disengaging:

> *"Mostly English class is just PPTs uploaded online. It feels like another theory subject where we only listen."* (Student, Electronics Engineering)

In contrast, students who experienced participatory digital tasks articulated stronger motivation and clearer connections between English learning and engineering practice:

> *"When we had online group discussions and presentations related to our projects, I actually understood why English is important for engineering."*(Student, Computer Science)

Regression analysis reinforces the centrality of pedagogy in shaping engagement. When frequency of interactive tasks, instructor digital training, and task contextualization were entered as predictors of engagement, the model accounted for 46% of the variance ($R^2 = .46, p < .001$). Task contextualization, defined as alignment with engineering communication needs, emerged as the strongest predictor (β = .44), followed by interactive task frequency (β = .31) and instructor digital competence (β = .27).

Student interviews further indicate that engagement was driven less by the presence of technology and more by task design and relevance. Tasks integrating engineering contexts, such as technical report writing, project presentations, simulated professional meetings, and collaborative documentation, were consistently perceived as meaningful. In contrast, decontextualized grammar drills or generic language exercises delivered through digital platforms were often viewed as disconnected from students' disciplinary identities:

> *"Grammar apps are there, but they don't help me speak or write for my engineering work."* (Student, Mechanical Engineering)

Despite evidence supporting interactive digital pedagogy, the analysis also reveals structural constraints limiting instructional innovation. Instructor interviews highlight institutional pressures related to syllabus completion, standardized assessment formats, and large class sizes. Several instructors noted that while interactive digital tasks were pedagogically effective, they were often difficult to sustain within rigid curricular frameworks:

> *"Interactive activities take time, and we are expected to finish the syllabus quickly. Digital tools are there, but flexibility is limited."* (English Instructor)

These findings highlight a critical tension between pedagogical innovation and institutional regulation. Even instructors committed to inclusive digital practices faced constraints that limited experimentation and adaptation. As a result, pedagogical transformation remained uneven and dependent on individual instructor agency rather than systemic support. The findings demonstrate that learner engagement in digitally mediated English learning is shaped less by technology itself and more by how digital tools are pedagogically deployed. Content-delivery–oriented practices tend to reproduce passivity, while interactive, contextually grounded approaches foster engagement, confidence, and relevance. This section thus reinforces the paper's broader argument that digital inclusion hinges on pedagogical mediation and institutional support rather than technological availability alone.

5.3 From Digital Access to Learner Agency: Inclusion as Participation

This section presents a qualitative analysis of how engineering students in private colleges in Hyderabad experience digital inclusivity, focusing on agency as a lived and negotiated practice rather than a condition determined solely by access to technology. Drawing primarily on interview narratives and open-ended survey responses, the analysis foregrounds students' perceptions of voice, choice, and participation in digitally mediated English learning environments.

Across the data, students consistently distinguished between *having access* to digital platforms and *being able to participate meaningfully* within them. For many participants, digital platforms initially appeared as neutral or technical infrastructures; however, their significance shifted depending on how these platforms were pedagogically framed. Students who described their learning environments as inclusive emphasized moments where they were invited to speak, collaborate, and experiment with language. One student reflected:

> *"When the teacher allowed us to discuss in groups and present our ideas online, I felt confident using English. It was not about right or wrong answers."* (Student, Computer Science)

Such narratives suggest that agency was experienced not as an individual trait but as something produced through interactional opportunities. Digital platforms became meaningful when they supported peer engagement, dialogic

feedback, and multimodal expression. Students frequently associated these practices with a sense of ownership over learning, describing how they felt "heard" and "involved" rather than evaluated.

In contrast, students who encountered rigid, content-heavy digital instruction articulated experiences of disengagement and marginalization. For these learners, digital environments were described as spaces of monitoring and compliance rather than participation. One student explained:

> *"Online English class feels like we are just being watched—attendance, submissions, marks. There is no space to speak or make mistakes."* (Student, Mechanical Engineering)

These accounts highlight how digital platforms, when used primarily for content delivery and assessment, can restrict agency by reinforcing hierarchical teacher–student relations. Rather than empowering learners, such practices positioned students as passive recipients subject to surveillance and evaluation. A recurring analytic theme across interviews was the central role of instructor mediation in shaping students' experiences of agency. Participants consistently differentiated between instructors who actively facilitated participation and those who relied heavily on technology without pedagogical engagement. Supportive instructors were described as those who encouraged discussion, acknowledged diverse linguistic abilities, and provided flexibility in task formats:

> *"Our teacher understood that not everyone is comfortable speaking. She allowed us to respond through writing or audio, and slowly I started speaking."* (Student, Electronics Engineering)

In contrast, technology-driven approaches that lacked relational engagement were perceived as alienating. Students emphasized that technology alone did not foster inclusion; rather, it was the instructor's pedagogical choices that transformed digital tools into enabling or disabling environments. These findings resonate with the study's theoretical framing of inclusion as a discursive and pedagogical practice shaped by power relations, recognition, and representation.

The Hyderabad context adds a critical layer to this qualitative analysis. Despite being located in a globally recognized technology hub, many students narrated experiences of digital exclusion that were subtle yet impactful. These included feelings of inadequacy due to unstable connectivity, discomfort with unfamiliar platforms, and anxiety about digital assessments. One student remarked:

> *"People think because we are in Hyderabad, everything is digital and easy. But many of us struggle quietly."* (Student, Civil Engineering)

Such reflections challenge techno-optimistic assumptions that urban location guarantees digital inclusion. Instead, they reveal how digital exclusion operates through everyday practices, institutional expectations, and socio-economic disparities within metropolitan contexts.

6. Conclusion

This study set out to examine digital inclusivity in contemporary English language education by shifting the analytical focus from access to agency, drawing on the experiences of engineering students in private colleges in Hyderabad. The findings demonstrate that while baseline access to digital technologies is relatively widespread in this urban and technologically advanced context, inclusive learning outcomes are far from uniform. Digital inclusion, as evidenced in this study, is not guaranteed by connectivity or device availability alone but is shaped by the quality of access, pedagogical mediation, and institutional practices.

The analysis reveals that infrastructural disparities, uneven platform literacy, and socio-economic differences continue to structure students' participation in digitally mediated English learning. However, access-related constraints interact closely with pedagogical choices. Where digital tools were deployed primarily for content delivery and assessment, students experienced disengagement and limited opportunities for meaningful language use. In contrast, interactive, contextually grounded pedagogical practices, such as collaborative writing, peer discussion, and multimodal presentations, promoted higher engagement, confidence, and a sense of ownership over learning.

Crucially, the study highlights learner agency as a central dimension of digital inclusivity. Agency emerged not as an individual attribute but as a relational and pedagogical outcome produced through opportunities

for voice, choice, and participation. Instructor mediation played a decisive role in enabling or constraining such agency, highlighting the importance of pedagogical sensitivity alongside technological adoption.

By foregrounding the Hyderabad context, the study challenges techno-optimistic assumptions that urban location ensures digital equity. Instead, it demonstrates that digital inclusivity must be understood as an ongoing, context-specific process requiring coordinated attention to infrastructure, pedagogy, and institutional commitment. The paper argues that inclusive digital English education demands a shift from viewing technology as a solution in itself toward recognizing it as a pedagogical resource whose value lies in how it is socially and educationally enacted.

Declaration of Conflicting Interests

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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