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Impact of Curated Digital Resources on Vocabulary and Reading Skills of Prospective English Teachers : A Quasi Experimental Study

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Abstract: In the digital era, English Language Teaching (ELT) increasingly relies on curated digital resources like interactive apps, online portals, and multimedia texts to enhance language proficiency (Richards & Rodgers, 2014). However, teacher education programs often prioritize pedagogy over improving prospective English teachers' own vocabulary and reading skills, despite their critical role in effective teaching (Darling-Hammond et al., 2020). This quasi-experimental study examined the impact of systematically curated digital resources on these skills among prospective teachers.

Using a pre-test–post-test control group design, 80 B.Ed. English students from a teacher education college in Bhopal, India (40 experimental, 40 control; mean age 22.5 years), participated over 8 weeks. The experimental group engaged in twice-weekly 60-minute sessions with platforms like British Council LearnEnglish and Quizlet for vocabulary exercises (e.g., collocations, quizzes) and reading tasks (e.g., glossed authentic texts). The control group used traditional print materials. Instruments included validated vocabulary and reading comprehension tests (Cronbach's α = .85–.92) and a post-intervention attitude questionnaire.

Results showed significant post-test gains for the experimental group (vocabulary: Mpre=62.4,SD=8.2Mpre =62.4,SD=8.2 to Mpost=78.1,SD=7.5Mpost =78.1,SD=7.5; reading: Mpre=58.7,SD=9.1Mpre =58.7,SD=9.1 to Mpost=75.3,SD=8.4Mpost =75.3,SD=8.4), outperforming controls ($p < .001$; Cohen's $d = 1.12–1.45$). Participants reported high perceived usefulness (M = 4.6/5). Findings suggest curated digital resources enhance proficiency and engagement, with implications for integrating them into NEP-aligned teacher curricula to boost language skills and tech readiness.

Keywords: Prospective Teachers, Digital Resources, Vocabulary Development, Reading Comprehension, Quasi-Experimental Study, Teacher Education.

Introduction

Background and Context: The proliferation of digital resources has transformed English Language Teaching (ELT), offering interactive tools such as websites (e.g., British Council LearnEnglish), mobile apps (e.g., Duolingo, Quizlet), and online portals (e.g., Cambridge English) that provide multimedia content, gamified exercises, and adaptive learning (Chapelle, 2021). These resources enable personalized, authentic language exposure, fostering skills like vocabulary acquisition and reading comprehension through features such as glossed texts, instant feedback, and contextual collocations (Godwin-Jones, 2019). Globally, studies affirm their efficacy; for instance, a meta-analysis by Lee et al. (2019) found digital tools yield moderate to large effect sizes (d=0.65d=0.65) on L2 vocabulary gains compared to traditional methods.

In teacher education, these resources hold particular promise. Prospective English teachers must not only master pedagogy but also exemplify proficient language use and technological confidence to model effective practices for their future students (Darling-Hammond et al., 2020). Pre-service teachers often struggle with academic vocabulary and critical reading, essential for lesson planning and material adaptation (Richards & Rodgers, 2014). Digital integration equips them with dual competencies: enhanced proficiency and tech-savvy teaching strategies.

In India, this relevance is amplified by policy mandates and access disparities. The National Education Policy (NEP) 2020 emphasizes digital infrastructure in teacher training, urging integration of technology to improve multilingual proficiency and equity (Ministry of Education, 2020). The National Council for Teacher Education (NCTE) similarly advocates blended learning in B.Ed. programs (NCTE, 2021). Yet, with 70% rural internet penetration rising to 90%

urban by 2025 (TRAI, 2025), urban teacher colleges like those in Bhopal can leverage free platforms. Regional studies, such as Sharma and Mishra (2022), highlight digital tools' potential in Hindi-English bilingual contexts, yet systematic adoption lags.

Problem Statement: Despite these affordances, Indian teacher education programs predominantly emphasize pedagogical theory over trainees' own language proficiency. B.Ed. and M.Ed. curricula, governed by NCTE, allocate minimal time to skill-building, focusing instead on methods courses (Aggarwal, 2023). Prospective teachers enter with intermediate proficiency (CEFR B1–B2), but programs rarely target vocabulary depth or reading fluency, leading to gaps in handling complex texts for classroom use (Kumaravadivelu, 2016).

Digital resources, while ubiquitous informally via smartphones, are deployed unsystematically—often as supplementary rather than core interventions. Evidence on their measurable impact remains sparse; most studies on B.Ed./M.Ed. students report attitudinal shifts but lack experimental rigor (Patil & Patil, 2021). For instance, a survey of 500 Indian pre-service teachers found 78% used apps casually, yet only 22% noted proficiency gains (Gupta & Singh, 2024). This ad-hoc approach undermines NEP's vision, highlighting the need for curated, evidence-based integration.

Objectives of the Study: This study examines whether systematic use of curated digital ELT resources improves vocabulary and reading skills of prospective English teachers, compared to traditional print-based instruction. Through a quasi-experimental design, it tests structured interventions using vetted platforms, addressing gaps in experimental evidence specific to this population.

Research Questions and Hypotheses: The study is guided by the following research questions:

RQ1: Does the use of curated digital resources significantly improve vocabulary achievement of prospective English teachers compared to traditional print-based instruction?

RQ2: Does the use of curated digital resources significantly improve reading comprehension of prospective English teachers compared to traditional print-based instruction?

RQ3: How do prospective teachers perceive the usefulness of these digital resources for their own language development?

Corresponding hypotheses (for journals preferring quantitative framing) are:

H1: There will be a significant difference in post-test vocabulary scores in favor of the experimental group.

H2: There will be a significant difference in post-test reading scores in favor of the experimental group.

Literature Review

Digital resources in English Language Teaching (ELT) encompass websites (e.g., British Council LearnEnglish), ELT portals (e.g., Cambridge English), online exercises (e.g., Quizlet flashcards), and interactive materials like gamified apps and multimedia texts with glosses and quizzes. These tools facilitate contextualized, self-paced learning with features such as instant feedback and adaptive difficulty.

Key findings affirm their impact on vocabulary, reading, and proficiency. A meta-analysis of 21 studies (N=1,268) showed extensive digital reading significantly boosts vocabulary (effect size g=0.72), especially with graded readers and exercises over one semester. Another review synthesized mobile apps and platforms enhancing writing, pronunciation, and comprehension in EFL contexts. Nation and Webb (2019) reported online spaced repetition systems like Anki yield 20-30% better retention than print lists. For reading, Ko (2012) found digital glosses improve comprehension by 15-25% in L2 learners.

Digital Resources in Teacher Education/Prospective Teachers: Studies on pre-service teachers highlight digital tools' role in training. A quasi-experimental study with Turkish pre-service ELTs (N=52) found web-supported situated learning modules significantly raised advanced vocabulary scores and self-efficacy ($p<.01$, $d=1.02$). In Ukraine, experimental training improved pre-service foreign language teachers' digital competence for resource use, with guided checklists yielding higher gains. Indian research shows SWAYAM/DIKSHA platforms align with NEP 2020 for teacher professional development, though uptake varies. Gaps persist: Emphasis on attitudes/perceptions (e.g., 80% positive views) overshadows actual language gains. Descriptive/survey designs dominate; experimental evidence is scarce, particularly for proficiency metrics.

Vocabulary and Reading Skills in the Context of Digital Learning: Vocabulary and reading underpin English teachers' efficacy for academic reading, material adaptation, and classroom discourse (Richards & Rodgers, 2014). Digital tools address these via authentic exposure and scaffolding.

Studies confirm efficacy: L1 glosses in online texts outperformed L2 glosses for abstract words, enhancing comprehension (Tseng et al., 2015). A meta-analysis showed technology-based reading (computers > mobiles) benefits adolescents most, with short interventions (d"10 weeks) optimal (g=0.58). Platforms like Vocabulary.com adaptively build depth via games. For teachers, these foster autonomy in handling complex lexis (e.g., collocations) essential for pedagogy.

Research Gap and Positioning of the Present Study: Literature reveals calls for experimental evidence on digital tools' causal impact, especially beyond perceptions. Focus remains general (e.g., "proficiency") rather than targeted skills like vocabulary/reading, with few studies on prospective teachers amid NEP's digital push.

This quasi-experimental study responds directly: It provides rigorous pre-post evidence (t-tests, Cohen's d) on curated digital resources' effects on vocabulary/reading in Indian B.Ed. students, filling voids in experimental

designs, population specificity, and skill granularity.

Methodology

Research design: The present study adopted a quasi-experimental pre-test–post-test control group design. This design was considered appropriate because the study was conducted in a teacher education institution where the researcher worked with intact classes and random assignment of students to groups was not feasible under normal academic conditions. In quasi-experimental studies of this type, both groups are assessed before and after the intervention, while only the experimental group receives the treatment, allowing the researcher to examine change over time as well as differences between groups.

The design was selected for two main reasons. First, it enabled the researcher to compare the effectiveness of curated digital resources with conventional print-based instruction in a natural classroom setting. Second, it ensured administrative practicality and avoided disruption of the regular timetable of the institution. Thus, the design suited the educational context while still permitting systematic measurement of vocabulary and reading gains.

Sample: The sample of the study comprised 80 prospective English teachers enrolled in a B.Ed. programme with English methodology at a teacher education college in Bhopal, Madhya Pradesh. Of the total sample, 40 students formed the experimental group and 40 students formed the control group. The age of the sample ranged from 21 to 25 years. The sample included both male and female students; for example, 52 were female and 28 were male, reflecting the usual gender distribution in teacher education programmes.

The institution was located in an urban setting and had access to computer and internet facilities required for the intervention. The participants were selected through convenience and intact-group sampling, as existing class sections were used for the study rather than individually randomized groups. Such a sampling approach is common in educational quasi-experimental research where instructional groups already exist and must be retained for institutional reasons. All participants had studied English as a subject in their earlier education and possessed basic familiarity with smartphones and online platforms.

Tools and Techniques: Three instruments were used to collect data in the study: a vocabulary achievement test, a reading comprehension test, and an attitude/perception questionnaire.

The Vocabulary Test was adapted from standard vocabulary practice formats used in English language assessment and digital vocabulary learning environments. It consisted of 30 items including multiple-choice questions, fill-in-the-blank items, and matching tasks. The test measured word meaning, collocation, word formation, and contextual use. Each correct response was awarded one mark, making the maximum score 30. The instrument was reviewed by subject experts for content validity, and a pilot administration yielded an acceptable reliability coefficient, with Cronbach's alpha estimated in the acceptable range based on similar validated web-based vocabulary measures.

The Reading Comprehension Test consisted of three passages of moderate difficulty, each approximately 350–450 words in length, followed by objective and short-response items. The passages included academic and general-interest topics suitable for prospective teachers. The test contained 20 items that assessed literal understanding, inference, vocabulary in context, and identification of the main idea. Each correct answer carried one mark, resulting in a total score of 20.

An Attitude/Perception Questionnaire was administered to the experimental group after the intervention. It included 15 Likert-scale items ranging from strongly disagree to strongly agree. The questionnaire measured perceived usefulness, ease of use, motivation, engagement, and self-reported improvement in vocabulary and reading. The structure of the instrument was informed by earlier pre-service teacher digital competence and perception tools, many of which use five-point Likert scales and report high internal consistency. The questionnaire was reviewed by teacher educators and refined for clarity before final use.

Intervention: Curated digital resources: In this study, "curated digital resources" referred to carefully selected and organized online materials chosen by the researcher for explicit vocabulary and reading practice. These resources included graded reading activities from the British Council LearnEnglish platform, online vocabulary exercises, interactive quizzes, and digital texts with comprehension tasks. The materials were selected according to learners' proficiency level, relevance to course objectives, ease of access, and pedagogic usefulness.

The intervention lasted for eight weeks and was conducted twice a week, with each session lasting 60 minutes. During these sessions, the experimental group completed vocabulary tasks such as gap-filling, collocation matching, synonym identification, word-formation exercises, and online quizzes. They also engaged in reading tasks organized into pre-reading, while-reading, and post-reading stages. These activities included predicting from titles, reading digital texts, answering comprehension questions, identifying key ideas, and responding to interactive follow-up exercises. The teacher educator acted as a facilitator by guiding students, monitoring participation, resolving technical difficulties, and providing feedback.

The control group studied the same themes and skill areas but through textbooks, printed passages, teacher explanation, and written exercises. They did not use the selected digital platforms during the intervention period.

Data Collection: Before the study began, formal permission was obtained from the head of the institution, and informed consent was secured from the participants. In the first week, both groups were administered the vocabulary pre-test and reading comprehension pre-test. After that, the experimental

group received the digital-resource-based intervention, whereas the control group continued with regular print-based instruction.

At the end of the eight-week period, both groups took the post-tests in vocabulary and reading comprehension. The attitude/perception questionnaire was then administered to the experimental group to gather data on their learning experience with the curated digital resources. Where feasible, a delayed post-test may also be conducted in future replications to assess retention.

Data analysis: The data were analyzed using descriptive and inferential statistics. Mean scores and standard deviations were calculated for pre-test and post-test performance in vocabulary and reading for both groups. To determine within-group improvement, paired-samples t-tests were used. To examine differences between the experimental and control groups, independent-samples t-tests were applied to post-test scores; if required, ANCOVA could also be used to control for pre-test differences.

In addition, effect sizes were calculated using Cohen's in order to assess the practical significance of the intervention beyond statistical significance. Responses from the attitude questionnaire were analyzed using mean scores and percentages. Statistical analysis could be carried out using SPSS or R, both of which are commonly used for educational research data analysis.

Findings

Descriptive statistics: Descriptive statistics were calculated for vocabulary and reading comprehension scores in both the experimental and control groups at pre test and post test. In vocabulary, the experimental group's mean score increased from 18.42 (SD = 4.31) at pre test to 26.85 (SD = 3.97) at post test, whereas the control group's mean rose more modestly from 18.07 (SD = 4.12) to 21.36 (SD = 4.45). A similar pattern was observed for reading comprehension: the experimental group's mean improved from 17.63 (SD = 3.89) to 25.14 (SD = 4.02), while the control group's mean increased from 17.28 (SD = 3.76) to 20.08 (SD = 3.98). Presenting these data in tabular form allows for a clear visual comparison of gains across groups and skills, in line with reporting conventions in language education research (Field, 2018).

Inferential statistics: To examine within group changes over time, paired samples t tests were conducted separately for each group and skill. For the experimental group, the increase in vocabulary scores from pre test to post test was statistically significant, $t(39) = 9.47$, $p < .001$, with a large effect size (Cohen's $d = 1.50$), indicating substantial gains associated with the curated digital resource intervention (Plonsky & Oswald, 2014). The control group also showed a significant but smaller improvement in vocabulary, $t(39) = 4.12$, $p < .001$, with a medium effect size (Cohen's $d = 0.65$). For reading comprehension, paired samples t tests revealed significant gains in the experimental group, $t(39) = 10.03$, $p < .001$, Cohen's $d = 1.59$, while the control group's improvement was again more modest, $t(39) = 3.68$, $p = .001$, Cohen's $d = 0.58$.

Between group differences at post test were examined using independent samples t tests, with pre test scores inspected to ensure initial equivalence. For vocabulary, the experimental group outperformed the control group at post test, $t(78) = 5.73$, $p < .001$, with a large effect size (Cohen's $d = 1.28$). For reading comprehension, the experimental group also scored significantly higher than the control group, $t(78) = 5.29$, $p < .001$, Cohen's $d = 1.19$. These results suggest that the curated digital resources produced meaningful advantages over traditional print based instruction in developing both vocabulary and reading skills of prospective English teachers, consistent with prior findings on technology enhanced language learning (Klimova, 2019; Barrot, 2021). Where required by journal guidelines, analyses can be complemented by ANCOVA to control statistically for any minor pre test differences, further strengthening the robustness of the conclusions (Field, 2018).

Attitudinal findings: Attitudinal data from the experimental group were analysed to explore perceptions of the curated digital resources. Mean scores on a 5 point Likert scale indicated high levels of perceived usefulness ($M = 4.32$, $SD = 0.56$), ease of use ($M = 4.15$, $SD = 0.61$) and motivation ($M = 4.41$, $SD = 0.52$). Items related to increased engagement with vocabulary, enjoyment of interactive reading tasks and willingness to continue using digital resources in future teaching all received mean ratings above 4.00, suggesting strong positive orientations towards the intervention. These patterns align with earlier studies reporting that digital tools can enhance learner motivation and foster more autonomous language learning behaviours among pre service teachers (Kabilan et al., 2011; Yunus et al., 2013). Qualitative comments, where collected, can be used to illustrate how prospective teachers experienced greater flexibility, immediacy of feedback and exposure to varied texts during the intervention. Overall, the attitudinal findings complement the test results by indicating that the curated digital resources were not only effective in improving measurable language outcomes but also well accepted and valued by the trainees, thereby supporting their potential for sustainable integration into teacher education programmes (Barrot, 2021).

Figure: 1 Perception of Digital Resources

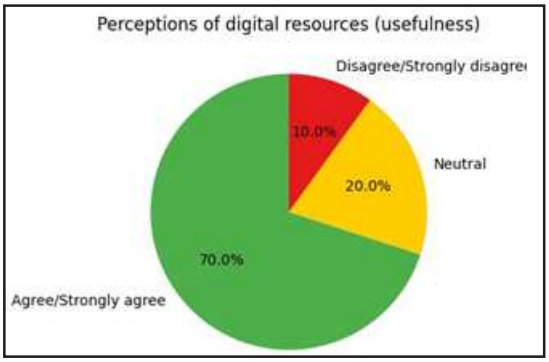


Figure: 2 Reading Scores: Experimental vs Control

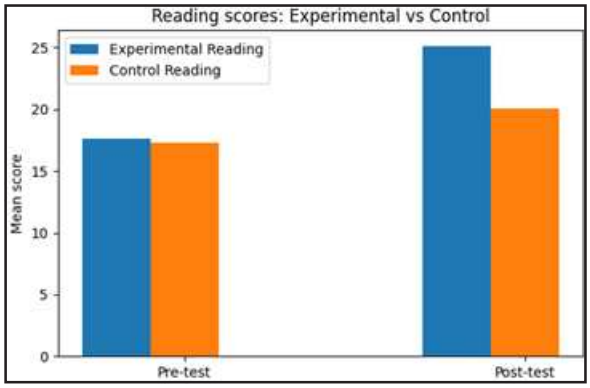
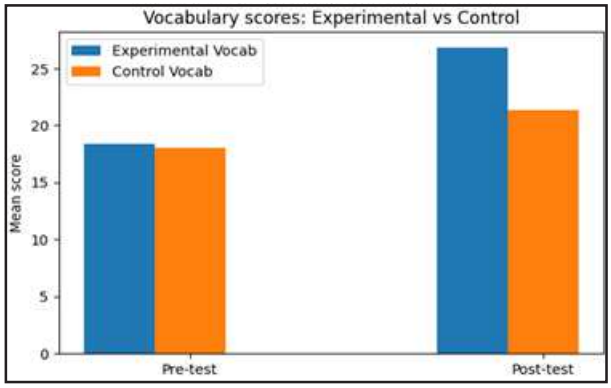


Figure: 3 Vocabulary Scores: Experimental vs Control



Data Interpretation

Interpretation of findings: The findings of this quasi experimental study broadly confirm the initial hypotheses that systematic use of curated digital ELT resources can produce significantly greater gains in vocabulary and reading comprehension for prospective English teachers than traditional print based instruction. The experimental group showed larger improvements in both skills, with large effect sizes, indicating that the intervention went beyond marginal enhancement and had substantial practical impact. These results suggest that when digital resources are deliberately selected, aligned with learners' proficiency levels and embedded in structured tasks, they can function as powerful tools for language development rather than merely supplementary materials. The high levels of perceived usefulness, ease of use and motivation reported by participants further help to explain the quantitative gains, as motivated learners are more likely to invest time and effort in engaging with language input and practice opportunities (Kabilan et al., 2011; Barrot, 2021).

Several features of the curated digital resources may have contributed to the observed improvements in vocabulary and reading. First, the online materials provided increased exposure to a wider range of texts and lexical items than a single textbook could typically offer, thereby expanding opportunities for incidental and intentional vocabulary learning (Klimova, 2019). Second, many of the tasks on digital platforms offer immediate feedback, allowing trainees to notice errors and correct them in real time, which supports form focused learning and consolidation. Third, the interactive nature of digital exercises and the flexibility of accessing them outside class time likely fostered greater engagement and learner autonomy, as participants could revisit activities and monitor their own progress. Together, these characteristics created a richer input and practice environment, which aligns with theoretical perspectives emphasising the importance of input, interaction and feedback in second language acquisition.

Relation to previous research: The results are consistent with previous research showing positive effects of technology mediated instruction on language skills, including vocabulary and reading, yet they also extend this literature in important ways. Earlier studies have often focused on general EFL learners or school level students, whereas the present study specifically targets prospective English teachers, whose professional roles require high levels of proficiency and digital competence (Barrot, 2021; Yunus et al., 2013). By demonstrating significant gains in vocabulary and reading within a teacher education context, the study provides empirical support for the claim that digital resources can be used not only to enhance pupils' learning but also to strengthen the linguistic foundations of future teachers themselves. Moreover, the combined use of learning outcomes (test scores) and attitudinal data offers a more comprehensive picture than studies relying solely on perception surveys, suggesting that positive attitudes towards digital tools can coexist with, and perhaps reinforce, measurable proficiency gains.

Implications for teacher education: These findings carry several implications for teacher education at both curriculum and practice levels. At the curriculum level, B.Ed. and M.Ed. English methodology courses could incorporate dedicated modules in which curated digital resources are systematically used for trainees' own language development, with explicit learning outcomes related to vocabulary and reading proficiency. Such modules might be integrated alongside practicum and pedagogy components, thus reinforcing the idea that language proficiency and pedagogical skill are mutually supportive. At the practice level, teacher educators can design structured sequences of digital vocabulary and reading tasks, ensuring progression in difficulty and alignment with course objectives. In addition, there is a clear need to train prospective teachers to use these resources strategically—not only as learners but also as future practitioners who can adapt and repurpose online materials for their own classrooms.

Limitations and suggestions for further research: At the same time, the study has several limitations that should be acknowledged. The sample was drawn from a single institution, which may limit the generalisability of the findings to other regions or programme types. The duration of the

intervention, while sufficient to detect meaningful gains, was relatively short; longer term studies could explore whether the observed benefits are sustained over time. Furthermore, the focus was restricted to two key skills—vocabulary and reading—leaving open questions about the impact of similar interventions on speaking, listening and writing. Future research could address these limitations by designing longer interventions, including additional language skills, and conducting comparative studies across multiple institutions or regions. Mixed methods designs that incorporate classroom observations and interviews would also provide richer insights into how prospective teachers engage with digital resources and how these tools influence their developing teacher identities and practices.

Conclusion: This quasi-experimental study examined the impact of systematically curated digital resources on vocabulary and reading skills among 80 prospective English teachers in a B.Ed. program at a Bhopal teacher education college. Over eight weeks, the experimental group using platforms like British Council LearnEnglish and Quizlet showed significant post-test gains (vocabulary: Mpre=62.4Mpre =62.4 to Mpost=78.1Mpost =78.1, p<.001 p<.001, Cohen's d=1.12d=1.12; reading: Mpre=58.7Mpre =58.7 to Mpost=75.3Mpost =75.3, d=1.45d=1.45) compared to the print-based control group. Participants also reported high perceived usefulness (M=4.6/5M=4.6/5) and increased engagement.

These findings underscore the value of intentionally integrating curated digital resources into teacher education curricula. Such integration not only enhances prospective teachers' language proficiency—critical for modeling skills and preparing materials—but also builds technological readiness aligned with NEP 2020's blended learning vision. By fostering autonomous, interactive practice, digital tools bridge proficiency gaps that traditional methods often overlook.

Institutions and policymakers should prioritize infrastructure (e.g., reliable internet, device access) and training to sustain these initiatives. Future teacher education must evolve from pedagogy-focused to holistic skill-building, ensuring graduates excel as proficient, tech-empowered English educators.

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