E-Learning Apps for English Proficiency- A Prototype from Gujarat

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***Abstract*—The National Education Policy (NEP),2020 of India emphasizes affordable technology and innovative tools to address the country's educational challenges. E-learning apps have emerged as essential tools for improving educational access and learning outcomes, particularly for English proficiency, which is critical for academic and professional success. The study explores the specific challenges in Gujarat region, where preference for regional language often hinders acquisition of English language education. In response to the growing demand for English proficiency to secure career opportunities, students increasingly rely on e-learning apps during their graduation programme. There is limited research on the effectiveness and engagement levels of these apps within Gujarat's educational context. The study aims to:1) Identify the specific English language learning needs of students at a private university in Gujarat.2) Develop a prototype app tailored to these needs using the design thinking approach, which includes stages such as needs assessment, design and development, pilot testing, feedback incorporation, and final evaluation. The research involved collaboration with students, faculty, and stakeholders to ensure the app's relevance and effectiveness. Findings revealed that the prototype app significantly enhanced English language proficiency, addressing the educational and linguistic context of Gujarat. The study demonstrates the potential of a structured design thinking approach to create impactful e-learning solutions.**

***Keywords*— E-learning, NEP, Design Thinking, English proficiency.**

***ICTIEE* Track*: (*Technology Enhanced Learning)**

ICTIEE Sub-Track: Navigating the Tech-Enhanced Learning Landscape: Challenges and Solutions

The NEP 2020 emphasizes affordable technology and innovative tools to meet educational needs across India. E-learning apps that use digital platforms and mobile technologies, provide flexibility and access in teaching and learning by overcoming geographical and traditional classroom limitations. The NEP supports multilingualism and highlights the importance of English for academic and professional success, encouraging early English education and flexible language learning to meet personal and professional needs. E-learning apps have multiple benefits like convenience, self-paced learning, and interactive content, they also face challenges in effectiveness, personalization, and user engagement. In Gujarat state, business often takes precedence over education, particularly English education. Reasons could be preference for regional languages in business and English language education often adapts a bilingual approach, impacting the quality of English language education. The research identifies a significant gap in English proficiency among students transitioning from undergraduate courses, affecting their career opportunities. In search of future prospects, many students look for various ways for language acquisition, E- learning apps being one among them.

The study was conducted at a renowned university in Ahmedabad, Gujarat. This study involves diverse institutes and a varied student body across disciplines, making it an ideal setting for the research. The study identifies the problems of students in using E-learning apps and realizes the need for customization and proposes a prototype app to address these challenges using a design thinking approach. By involving university students, the research identifies specific needs and preferences for an effective English learning app. The approach includes needs assessment, design and development, pilot testing and feedback. The prototype apps, developed through empirical study and stakeholder collaboration, showed potential to enhance English proficiency among students. The app is tested with stakeholders, and results for feedback.

I. Literature Review

In India, English is taught as a second language alongside a regional language and the mother tongue (Mangal, 2005). Despite 12 years of learning English, many in Gujarat state struggle with communication (Pathak, 2001). The education system mandates teaching three languages: mother tongue or regional language, official language, and a modern Indian or foreign language (Kahn, 2004). Discussions with Gujarati medium learners and teachers often reveal inadequate English communication skills (Gay, 2005). Similar challenges are seen across other states (Littlewood, 1992). Issues for rural and semi-urban Gujarati students include reliance on the Grammar-Translation Method, which hampers true language acquisition (Saraswathi, 2004), lack of qualified teachers and infrastructure, and an exam-oriented approach that prioritizes passing over proficiency (Tikoo, 2003). This leads to poor vocabulary, pronunciation, and confidence in English (Mangal, 2005) despite early introduction (Prasad, 2003).

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The Grammar-Translation Method has hindered effective English learning, leaving students dependent on their mother tongue and unable to express confidently in English (Nagraj, 1996). It failed to teach proper pronunciation, spelling, and grammar (Hashmi, 2011) and neglected the importance of English (Alahmad, 2019). Limited resources like language labs and audiovisual aids worsen the issue (Beechler & Williams, 2012). A systematic approach focusing on listening, speaking, reading, and writing skills is essential (Blattner & Fiori, 2009). Teachers should encourage vocabulary expansion and practical language use (Klimova & Prazak, 2019). Improving app usability with audio-visual aids and gamification can make learning more engaging (Rahimirad, 2019). By the establishment of English language clubs and speaking circles help students create supportive practice environments (Thornton & Houser, 2005). Blended learning, when combined with online resources and traditional instruction, caters to diverse preferences (Yiping & Lei, 2005). Continuous assessment and data-driven insights can enhance teaching methods and curriculum design (Miangah & Nezarat, 2012).

Despite its global importance, English teaching in India, particularly in Gujarat, faces challenges due to students' poor competence, that affects academic and professional prospects (Susikaran, 2013). Issues include neglecting speaking and listening skills, overreliance on the mother tongue, ineffective teaching aids, and lack of comprehensive skill development (Tikoo, 2003). Solutions include to adopt linguistic approaches, enhance conversational practice, motivate English interaction, practicing writing skills, and introduction of pronunciation drills, using simple vocabulary, improving reading comprehension, and utilizing audio-visual aids and real-life listening exercises to build linguistic and communicative competence (Prasad, 2003).

During the COVID-19 pandemic, online classrooms and educational apps have become essential for remote learning, that offered interactive and personalized experiences that lack in traditional methods (Pathak, 2001). These apps are available on Android and iOS in India that enhance learning with engaging media, real-time doubt resolution, gamification (Hashmi, 2011), and micro-learning (Best & Kahn, 2004). Personalized learning, supported by modern technology, caters to individual needs, improving engagement and academic outcomes (Gay, 2005). E-learning's flexibility, repeated access to lectures, quick lesson delivery, scalability, consistency, and cost-effectiveness make it a compelling alternative to traditional education, that significantly enhance student achievement and knowledge retention (Kramarski & Gutman, 2006).

Technology plays a key role to develop English language learning (Mangal, 2005), providing unlimited resources (Hashmi, 2011) and improving cooperative learning through computer-based activities (Saraswathi, 2004). Students, though born into a technologically rich world, need meaningful development of technology-based knowledge to maximize learning (Tikoo, 2003). Issues in using technology for teaching English highlight the increasing importance of mobile technologies and applications (Prasad, 2003). Research shows mobile learning through devices like smartphones and tablets supports language acquisition due to features like interactivity, portability, and instant feedback (Hashmi, 2011). Mobile phones positively impact literacy, numeracy, and language skills, for the promotion of both independent and collaborative learning (Alahmad, 2019). Integrating multi-media technology in classrooms drives motivation and attention, while social networking sites provide platforms for authentic language practice (Blattner & Fiori, 2009). Despite mobile learning's flexibility and personalized opportunities, it can also lead to increased screen time and potential distractions (Klimova & Prazak, 2019). Mobile learning is a vital resource in modern education, making learning more mobile, flexible, and engaging, that encourages students to use mobile apps to learn English both inside and outside the classroom (Kukulska-Hulme & Traxler, 2007).

E-learning for English education offers a vast range of resources available through the internet (Rahmatirad, 2019), making platforms like Google and Baidu easy access to multimedia courses, textual information, and audiovisual materials (Kramarski & Gutman, 2006), that enrich the learning experience (Alahmad, 2019). This accessibility makes it more convenient and nurture interest by allowing immediate exploration of topics (Thornton & Houser, 2005). Students can engage with current events or scholarly discussions using resources that deepen their understanding and engage in meaningful dialogue (Yiping & Lei, 2005). E-learning allows students to learn at their own pace, showcasing varied speeds of understanding new information (Miangah & Nezarat, 2012).

E-learning's limitations include reduced human interaction often present in online education (Susikaran, 2013). Despite multimedia courses' engagement, the absence of face-to-face communication can detract from the educational experience's richness (Alahmad, 2019). E-learning environments can lack dynamic discussions and immediate feedback critical for effective language learning (Klimova & Prazak, 2019). While computer-based activities increase cooperative learning, they cannot entirely replicate nuanced interactions in physical classrooms (Tikoo, 2003). This limitation is significant for tasks requiring social interaction and immediate verbal feedback (Prasad, 2003).

E-learning provides access to resources and flexible learning opportunities but cannot completely substitute interpersonal interactions and immediate feedback integral to traditional classrooms (Alahmad, 2019). Balancing technology use with in-person teaching methods may offer a more holistic educational experience (Rahmatirad, 2019).

II. Research Methodology

The study used a design thinking approach, that focussed on understanding user needs, teamwork, and look for solutions through repeated testing. A questionnaire was shared with 330 students to assess their English proficiency and learning challenges, and 250 responses were included in the analysis. Stratified random sampling was used to ensure representation based on age, gender, academic programme, and year of study. The sample consisted of 58% male and 42% female students,

aged 18–22, from engineering (40%), management (35%), and law (25%) programmes. The analysis highlighted challenges such as grammar, vocabulary, and spoken English, mentoring. Solutions were designed during the ideation stage, and prototypes were developed and tested. Feedback from students, teachers, and administrators was used to refine the app, ensuring it effectively addressed the specific needs of undergraduate students in Gujarat. The research followed several distinct phases. The phases of the design thinking approach are shown through figure 1.

Fig. 1. Design Thinking Phases

A. *Empathize Phase:*

Researchers used a structured questionnaire to understand learners' experiences with English language learning. They gathered insights on students' educational backgrounds, school instruction medium, and self-assessed English proficiency up to class 12. The study explored various learning methods outside school, including private tuitions, self-learning, coaching centers, and e-learning apps. It aimed to understand students' preferences, challenges, and motivations for using e-learning apps, such as accessibility, convenience, and interactive features. Feedback on the effectiveness of e-learning apps and suggestions for improvements provided valuable insights to develop language learning outcomes.

B. *Design Phase*

Based on the information gathered during the empathy phase, the researchers had undertaken to consider problems through analysis of major questions from the administered questionnaire. The understanding happened at various levels and is as follows:

1) *Medium of Instruction in School*

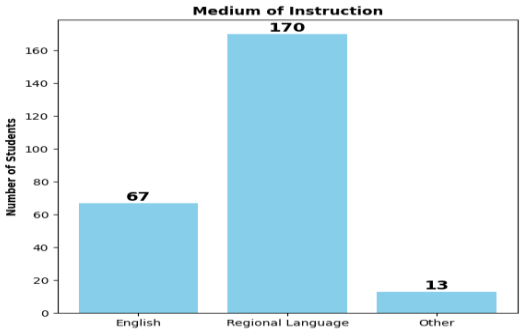

Fig. 2. Medium of Instruction

Participants were asked about their school medium of instruction to understand their linguistic background. From the fig:2, it can be analyzed that most 170 (68%) learners had regional language instruction, 67(26.8%) had English, and 13(5.2%) had other mediums, often a mix of regional language and English after till grade10.

2) *Self-assessment of English Proficiency Levels*

In the study, participants assessed their English proficiency from their school years up to class 12. Fig:3 shows the analysis of the self-assessment at three levels: Basic, Intermediate, and Advanced. Most students 110 (44%) rated their proficiency as Basic, indicating foundational understanding and communication skills. some students 93 (37.2%) rated themselves as Intermediate, showing moderate comprehension and basic fluency. A smaller group 47 (18.8%) assessed their proficiency as advanced.

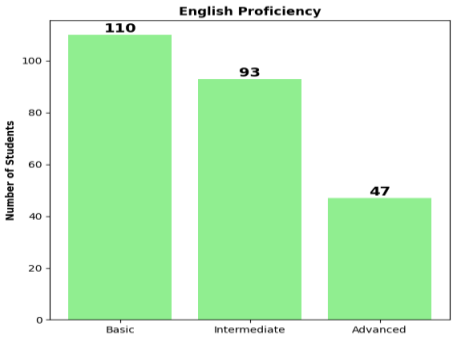

Fig. 3. English Proficiency

3) *Different Methods of Learning*

The study questioned methods of learning English, with participants choosing one, two, or three options. From fig:4, it is analyzed that when choosing a single method, 42(34.15%) preferred authorized coaching centers, 37(30.08%) opted for self-learning (newspapers, podcasts, etc.), and 33(26.83%) chose private tuitions (offline). E-learning apps were selected by 28 (22.76%), and private tuitions (online) by 24(19.51%), offline 33(26.83).It can be understood from fig:5 that when selecting two methods, the combination of e-learning apps and private tuitions (offline) was the most popular at 36.76%, followed by e-learning apps and private tuitions (online) at 23 (33.82%), and e-learning apps with self-learning at 20(29.41%) E- learning and offline private tuitions at 25(36.76%). Learners who chose 3 options which included e- learning apps, both private online and offline tuitions are at 59 (For three methods, all participants (100%) chose e-learning apps combined with both offline and online private tuitions.

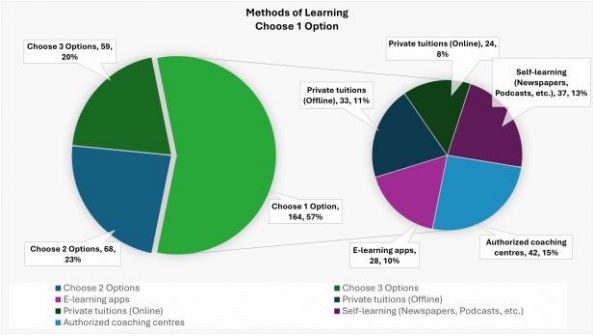

Fig. 4. Methods of learning- chose 1 option

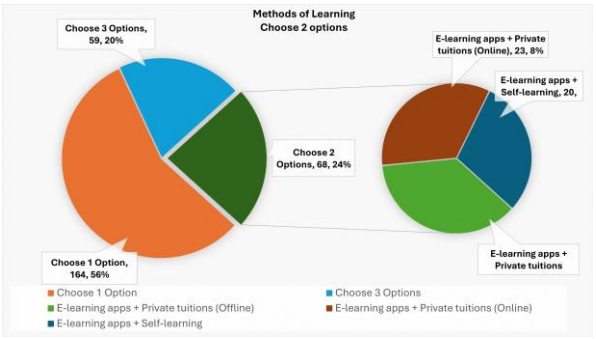

Fig. 5. Methods of learning- chose 2 and 3 options

4) E-learning Apps

The data indicates users' preferences for e-learning apps. Fig 6, it can be analyzed that when choosing a single app, Duolingo is the most popular with 50 (20%) users, followed by Hello English (30 users), FluentU 20 users (8%), Memrise 10 users (4%), and Babbel 8 users (3%). For two-app combinations, it can be understood from fig:7 that Duolingo & Hello English is the most preferred 25 users (10%), with Duolingo & FluentU 15 users (6%), Hello English & Memrise 10 users (4%), and Babbel & Others 18 users (7%) following. Among three-app combinations, fig:8 states that Duolingo, Hello English & FluentU are favored by 20 users (8%), Duolingo, Memrise & Babbel by 15 users (6%), Hello English, Memrise & Others by 10(4%) users, and FluentU, Hello English & Babbel by 19 users (8%). Duolingo consistently appears as a top choice, highlighting its popularity among users.

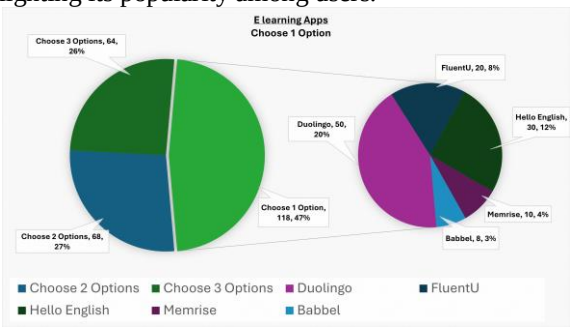

Fig. 6. E- learning apps- chose 1 option

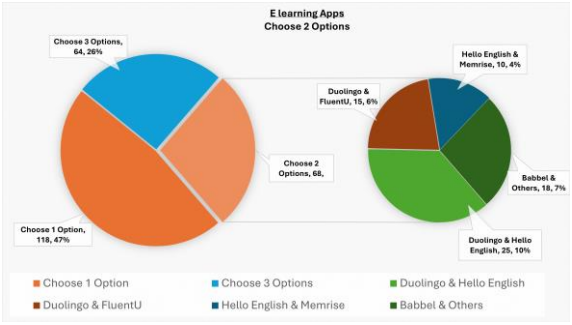

Fig. 7. E- learning apps- chose 2 options

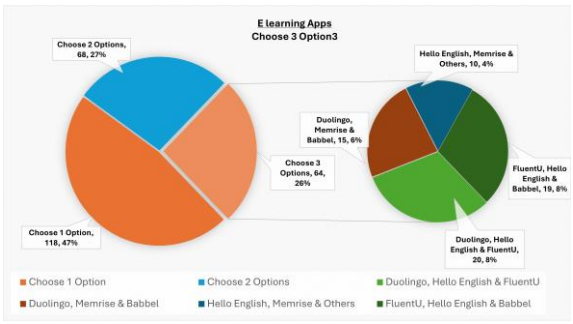

Fig. 8. E- learning apps- chose 3 options

5) Reasons for using Apps

It can be understood from the fig:9 that most students 104(41.6%) use these apps because they are easy to access. Many 74 (29.6%) like that they can use the apps on their phones. Some students 22 (8.8%) are attracted by free trials. Convenience is important to 40(16.0%) of students. A small number of 10 (4.0%) have other reasons like importance, suggested by friends etc.

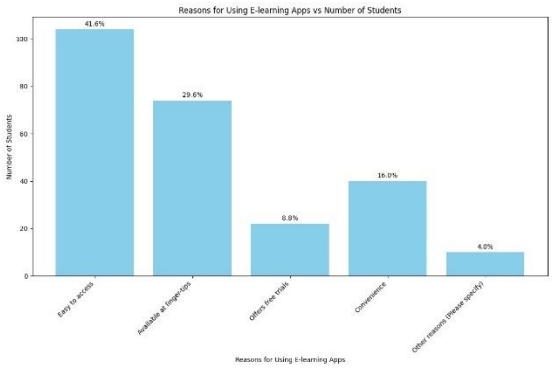

Fig. 9. Reasons for using E apps

*6) **Frequency of engagement with the apps***

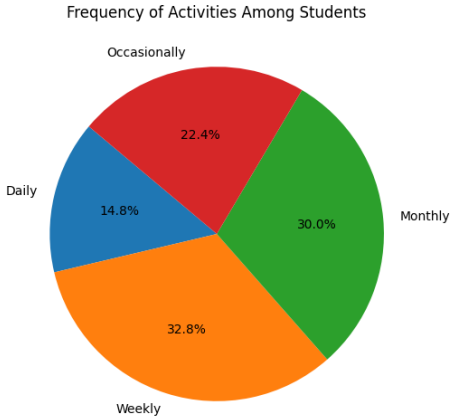

Fig. 10. Frequency of Engagement

Participants in the survey showed varied frequency of engagement with e-learning apps for English language learning. Fig:10 shows that 37(14.8%) reported using these apps daily, that showed consistent learning habits. Weekly usage was prevalent among 82(32.8%) of students. Monthly usage was by

for 75(30%) of respondents, showed their periodic engagement for skill enhancement. 22(4%)reported occasional usage.

7) Features of the App

The fig:11 shows what students want as features of e-learning apps that students are interested in. The most popular feature is progress tracking, with 66 students (26.4%) wanted to see their progress. Interactive lessons are important to 57 students (22.8%), who prefer engaging content. Personalized learning paths are desired by 50 students (20.0%), indicated a need for customized learning experiences. Gamified learning, which appealed to 37 students (14.8%), adds game-like elements to make learning more enjoyable. Availability of native speakers is valued by 30 students (12.0%) for practical language practice. Lastly, other features are mentioned by 10 students (4.0%). On the whole students favor features that make learning interactive, track their progress, and offer personalized experiences.

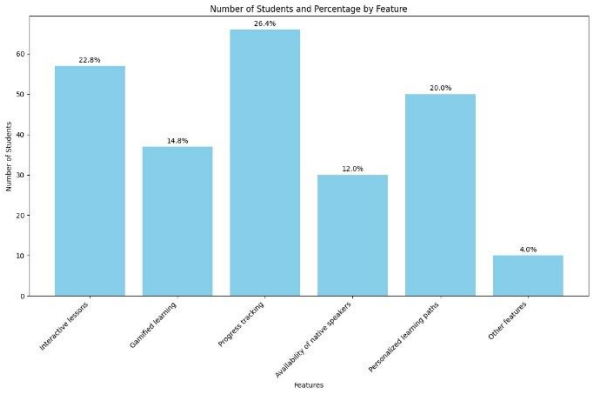

Fig. 11. Features of the app

8) Students Perceptions of the app

The analysis of student responses regarding the use of e-learning apps for learning English reveals following perceptions. Fig:12 shows that a significant proportion, 40.8% (102 students), expressed a positive inclination towards utilizing these apps. 20% (50 students) indicated a clear reluctance to use them. A notable 25.6% (64 students) fell in between, expressing a willingness to use e-learning apps to some extent.

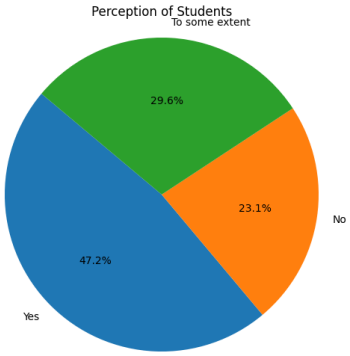

Fig. 12. Students perceptions of the app

9) Likes and Dislikes of the Existing Apps

The semi structured interviews with the respondents on their likes and dislikes about the apps are tabulated in Table 1, which is as follows:

TABLE I
LIKES AND DISLIKES OF EXISTING APPS (DATA COLLECTED THROUGH SURVEY)

Likes	Dislikes
Fun and engaging ways to learn	Technical problems and bugs
Ability to learn at convenience	No personal feedback
Games to keep them motivated	Limited interaction with proficient speakers
Available in trial version	High data use
Too many learning resources	Limited access without the internet
Tracking progress and performance	Too much content at once

10) Students' Requirements of the E- learning app

The semi- structured interviews revealed specific preferences for an English learning app. Students preferred Interactive conversations, personalized ways of learning, games, offline accessibility, motivation from experts, progress tracking and analytics, contextual learning features, specific cultural content, regular content updates as part of the app they are looking for.

C. Ideate Phase

With the data collected, the study required a specific technique in the ideate phase. Researchers found out that the SCAMPER technique (Razzouk & Shute, 2012) effectively aided ideation for the problem

- Substitute: Use interactive video lessons with real-life scenarios instead of traditional text lessons for better engagement.
- Combine: Add games with progress tracking to motivate students and show their achievements.
- Adapt: Include features from other apps like personalized reminders and learning paths to improve the experience.
- Modify: Make the app easier to use with clear icons and simple menus.
- Put to Another Use: Analyse user data to give personalized tips and identify areas for improvement.
- Eliminate: Remove unnecessary features to keep the app focused and efficient.

D. Prototype Phase:

The problem statement, based on the analysis of the students' questionnaire during the define phase and a detailed examination of the SCAMPER technique from the ideation phase gave rise to need of customized app to students of the university in Gujarat. In consultation with student groups, language experts, and administrators of the University, the following prototypes were developed.

1) Prototype Model 1: University E-Learning App

- Restricted Access: Only university students and faculty mentors can access the app using secure university credentials and multi-factor authentication.
- Interactive Video Lessons and Games: Lessons with real-life scenarios and regional language support use points, badges, and leaderboards to motivate students;

detailed progress reports are available to both students and mentors.

- Personal Learning Paths: Personalized paths adjust based on progress and performance, with regular assessments ensuring a tailored experience.
- Reminders and Notifications: Customizable notifications for lessons, assignments, and practice sessions help students stay on track.
- Feedback: Personalized feedback and improvement suggestions are provided, relevant to students' cultural contexts and language needs.
- Conversational Practice with Experts: Real-time conversation simulations with AI and native speakers enhance practical language skills.
- Mentor Involvement: Faculty mentors offer guidance through scheduled virtual office hours for one-on-one coaching and feedback.
- Social Learning Features: Discussion forums and study groups encourage collaborative learning with peer reviews and feedback.

The prototype can be visualized as follows in fig:13

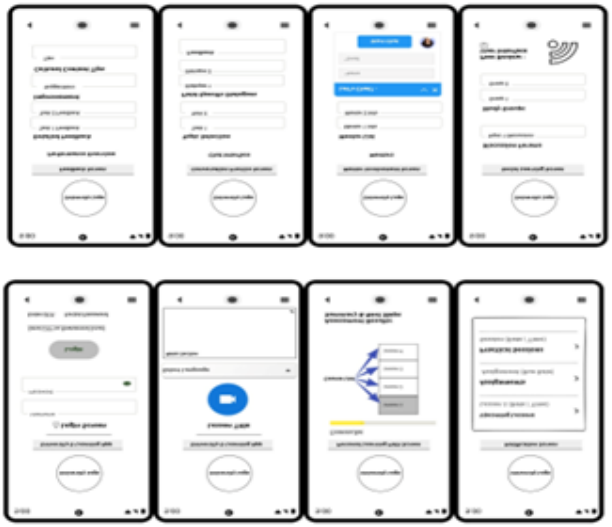

Fig. 13. Prototype Model 1

2) Prototype Model 2: AI-Enhanced Individual App

- Individual Training Modules: Customized learning modules based on assessments and flexible scheduling options cater to specific student needs.
- Interactive Lessons: Real-time feedback and relevant content enhance the learning experience.
- Progress Tracking: Detailed analytics and reports help students monitor growth and areas for improvement.
- Learning Experience through Games: Challenges, quizzes, and leaderboards make learning engaging and competitive.
- Adaptive Learning Paths: Content difficulty adjusts based on performance, with personalized resource recommendations.
- Personalized Coaching and Feedback: One-on-one coaching sessions with feedback considering cultural context.
- Interactive Conversational Practice: Real-time feedback on conversation practice tailored to professional and academic scenarios.
- Resource Library: Access to curated learning materials including articles, videos, and podcasts.
- Offline Access: Downloadable lessons and resources with progress syncing for uninterrupted learning.

The prototype can be visualized as follows in fig:14

Fig. 14. Prototype Model 2

E. Testing Phase:

To evaluate the feasibility and effectiveness of the two proposed e-learning app prototypes, researchers tested them with 100 students, 50 teachers, and 20 administrators from various universities in Gujarat. Researchers presented prototypes to the participants during a semi -structured observation and evaluation period for detailed feedback. Feedback for Prototype 1 and Prototype 2 shows various strengths and weaknesses from students, teachers, and administrators. Students like Prototype 1 for secure access, interactive video lessons, faculty mentorship, and progress tracking, but it lacks flexibility and has complex navigation. Prototype 2 is favored for flexibility, feedback, and interactive practice, but has less human interaction. Teachers value Prototype 1 for mentorship and detailed analytics but dislike its limited flexibility, complex navigation, and time consumption. They prefer Prototype 2 for ease of use and insights, though it lacks personal touch and human interaction. Administrators see Prototype 1 as secure and comprehensive but costly to implement. Prototype 2 is cost-effective and data-driven but relies too much on technology.

Based on the testing and feedback, Prototype 2: AI enabled App emerged as the more feasible and preferred option for a wider range of users. It offers flexibility, personalized learning, and cost-effective implementation, making it suitable for various educational settings. Whereas institutions that can provide the necessary resources and value direct faculty involvement can

prefer Prototype 1: University E-Learning App for its strong mentorship integration and structured learning environment.

III. ANALYSIS & FINDINGS

The study provided important insights into students' experiences with learning English. A majority of the participants (68%) came from regional language backgrounds, and 44% rated their English proficiency as basic. This lack of exposure to English medium instruction influenced their learning needs and preferences. E-learning apps were not widely used as standalone methods (22.76%), but their usage increased significantly when combined with private tutoring (36.76%), which shows preference for blended learning approaches. Among the available apps, Duolingo was the most commonly used, as it was preferred in single, dual, and multiple app combinations, indicating its appeal due to engaging and accessible features. Students preferred e-learning apps for their accessibility (41.6%) and compatibility with mobile devices (29.6%). Features like progress tracking (26.4%) and personalized learning paths (20%) were considered particularly useful. Besides this, challenges such as technical difficulties, lack of detailed feedback, and dependence on internet connectivity were frequently reported. Testing of two proposed app prototypes showed that Prototype 2 was the most favored. Its flexibility, cost-effectiveness, and personalized learning approach made it suitable for students and educators. Despite limited human interaction, it addressed institutional limitations and offered a practical solution to help improve English proficiency.

IV. DISCUSSION

The findings of this study were validated using a triangulated method that combined survey data, semi-structured interviews, and prototype testing. The alignment of student responses across these methods confirmed the reliability of the results. For example, the preference for hybrid learning approaches, where e-learning apps are used alongside private tuitions, was consistently highlighted in survey responses and interviews. Likewise, Duolingo's popularity across different app usage combinations emphasized the demand for user-friendly and engaging platforms. Prototype testing further confirmed these findings by offering practical insights into stakeholder preferences. Prototype 2, designed for individual training, was the most favored due to its adaptability, affordability, and personalized learning features. Students and teachers found it practical and effective, while feedback from administrators highlighted its suitability for large-scale implementation given institutional resource limitations. On the other hand, Prototype 1, with its strong mentorship features and secure access, was less preferred due to its rigid structure and complex navigation. By combining data from surveys, interviews, and prototype feedback, the study incorporated perspectives from students, educators, and administrators. This approach ensured that the results were well-grounded and demonstrated the proposed solutions' potential to address challenges in improving English proficiency among learners in Gujarat.

CONCLUSION

The study focused to develop e-learning apps to improve English proficiency in Gujarat. The NEP emphasizes affordable and innovative tools to improve education, particularly in regions like Gujarat, where regional languages often limit English proficiency. The research identified the specific needs of students at a private university and, using a step-by-step design thinking approach, developed two prototype apps. Input from students, teachers, and other stakeholders ensured the apps were relevant, practical, and engaging for improving English skills. The findings showed that the prototypes were effective in helping students improve their English proficiency. For future research, testing these apps in other regions and institutions could help adapt them to different contexts. Additional features like support for multiple languages, offline access for students in areas with poor internet connectivity, and long-term studies on the apps' impact on student performance and career opportunities could provide further insights. The study achieved its goals of understanding learner needs and developing useful tools for English learning. It offers a starting point for creating more inclusive and practical educational solutions for Indian students.

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