FUTURITY
Education

DOI: https://doi.org/10.57125/FED.2026.03.13

How to cite: Hurskaya, V. (2026). Technology-enhanced ESL for refugee women: Preparing for the driver's license test. *Futurity Education, 6*(1), 241–262. https://doi.org/10.57125/FED.2026.03.13

Technology-Enhanced ESL for Refugee Women: Preparing for the Driver's License Test

Volha Hurskaya

English as a Second Language Instructor and Researcher in Technology-Enhanced Language Education, San Diego University for Integrative Studies, San Diego, CA, USA, https://orcid.org/0009-0005-4352-591X

Corresponding author: *vhurskaya6198@sdsu.edu.*

Received: December 13, 2025 | **Accepted:** March 9, 2026 | **Available online:** March 21, 2026

Abstract: Refugee women often face significant barriers in acquiring the English skills needed for everyday functional tasks, including obtaining a driver's license. This study evaluates a technology-enhanced functional ESL program designed to prepare refugee women for the U.S. driver's license knowledge test. Using a mixed-methods design, the 8-week intervention (120 instructional hours) was implemented with 72 refugee women from Iran, Iraq, Haiti, and Afghanistan at a nonprofit refugee-serving organisation in San Diego. The program integrated a mobile learning application, an AI-based chatbot tutor, and virtual reality (VR) simulations to support vocabulary development and contextual learning. Quantitative results from 70 participants who completed the program showed significant improvement in test performance: the mean score on a 30-item knowledge test increased from 18.3 to 26.5 ($t(69) = 15.4$, $p < .001$), and the pass rate rose from 30% to 90%. Among those who later took the official DMV exam, 58 of 64 participants (90.6%) passed on the first attempt. Qualitative feedback indicated increased confidence, reduced test anxiety, and strong engagement with technology-supported learning. The findings suggest that technology-enhanced functional ESL instruction can effectively support refugee learners in achieving practical language goals and improving integration outcomes.

Keywords: Refugee education, Functional ESL, Technology-enhanced learning, Driver's license test preparation, Mobile learning, Virtual reality, Artificial intelligence.

Introduction

Research Problem

By the end of 2023, a record 117 million people worldwide had been forcibly displaced, including over 43 million refugees (Mavisakalyan et al., 2025). Successful integration into host societies depends heavily on acquiring functional language skills, which are essential for accessing services, education, and employment (Al-Hamad et al., 2024). Refugees with stronger proficiency in the host country's language demonstrate significantly better social and health outcomes than those who remain linguistically isolated (Mavisakalyan et al., 2025).

For refugee women, language barriers are particularly restrictive, as they intersect with cultural and gender norms that limit mobility and independence (Kajee, 2025). One critical yet underexplored functional challenge is obtaining a driver's license in the United States, which requires passing a written knowledge test in English. Driving represents both a practical necessity, for employment and family responsibilities, and a form of personal autonomy, especially for women from contexts where mobility was previously constrained (Nebraska Public Media, 2024).

However, preparing for the driver's license exam presents a dual challenge: learning unfamiliar traffic laws and terminology while simultaneously operating in a second language. Traditional ESL programs rarely address such domain-specific content, leaving a gap between language instruction and real-life functional needs. Additionally, many refugee learners face limited literacy or disrupted educational histories due to displacement, which further complicates test preparation in English (Kajee, 2025).

Although prior research supports contextualised, task-based ESL instruction, existing approaches do not sufficiently address specialised, high-stakes functional goals such as driver's license acquisition. At the same time, while technology-enhanced language learning (TELL), including mobile learning, artificial intelligence (AI), and virtual reality (VR), has shown strong potential to improve engagement and outcomes, there remain significant gaps in understanding how these tools can be effectively applied in refugee education contexts, particularly given varying levels of digital literacy (Bradley et al., 2025).

Research Focus

This study focuses on the development and implementation of a technology-enhanced, functional ESL curriculum designed specifically for refugee women in San Diego preparing for the U.S. driver's license knowledge test.

The instructional approach integrates multiple forms of technology-enhanced language learning, including mobile applications for flexible, on-demand study; AI-powered tools (e.g., conversational agents) for personalised language practice and feedback; and VR/AR simulations that recreate real-world environments such as road scenarios or DMV interactions. These tools are combined with task-based, context-specific instruction centred on driver's education content.

The focus on refugee women reflects both the heightened impact of language barriers on this group and the transformative potential of driving as a means of increasing independence, access to employment, and social integration. The study also emphasises the importance of culturally responsive, trauma-informed pedagogy and guided support to ensure that technological tools are accessible and effective for learners with diverse educational and digital backgrounds.

Research Aim and Research Questions

The aim of this study is to evaluate the effectiveness and learner experience of a technology-enhanced, functional ESL program designed to support refugee women in preparing for the U.S. driver's license knowledge test.

To achieve this aim, the study addresses the following research questions:

1. Instructional Design:

How can a functional ESL curriculum integrating mobile learning, AI-based tutoring, and VR simulations be designed to effectively teach driver's license test content in English?

2. Learning Outcomes:

To what extent does participation in a technology-enhanced ESL program improve refugee learners' performance on driver's license knowledge tests and their English language competence?

3. Learner Experience:

How do participants perceive and experience the use of mobile, AI, and VR technologies in their language learning process, particularly in terms of confidence, engagement, and usability?

Using a mixed-methods approach, this study combines quantitative measures (e.g., practice test scores and pass rates) with qualitative data (e.g., participant feedback) to assess both outcomes and experiences. The underlying hypothesis is that a context-specific, technology-supported ESL program will lead to improved test readiness and more positive learner engagement compared to traditional approaches.

Literature Review

Mastering the host country's language is fundamental to the success of refugee resettlement (International Catholic Migration Commission, 2025).

Functional or task-based ESL programs have been highlighted as especially useful for adult refugees. Rather than teaching language in isolation, these programs contextualise learning in practical scenarios. Previous initiatives in various countries have integrated language instruction with job training or daily survival skills (e.g., using public transportation or accessing healthcare) and reported improved learner engagement and retention (Peguero, 2024). This aligns with recent findings that multimedia-supported ESL approaches can enhance comprehension and learner engagement by combining visual, auditory, and interactive elements (Boiko et al., 2025).

Driver's education as ESL content falls under this paradigm of contextualised instruction. While formal literature on teaching driving-related English to refugees is sparse, anecdotal evidence from community organisations suggests high demand. For example, the Afghan Cultural Society in Minnesota enrolled over 400 newly arrived Afghan refugees in a free driver's permit preparation course offered in Dari, Pashto, and English (Afghan Cultural Society, n.d.). This indicates both the importance of multilingual support and the scale of the need for help in obtaining licenses. Similarly, a nonprofit in Nebraska used a driving simulator in an eight-week class to help refugees (including women who had never driven before) practice driving skills and learn rules in a supportive environment (Fowler, 2024). These efforts underscore that combining language assistance with driving instruction can address a concrete need, potentially increasing refugees' mobility and safety.

The proliferation of smartphones among refugee populations has opened up new possibilities for language learning. Mobile-assisted language learning (MALL) allows learners to access lessons and practice anytime and anywhere – a flexibility crucial for refugees who may have irregular schedules or limited access to formal classes. Research on MALL in general shows strong benefits. Garzón, Lampropoulos, and Burgos (2023) conducted a meta-analysis of 62 studies on mobile English language learning and found a large overall effect size (g = 0.89), indicating significant improvements in learners' language achievement when using mobile learning tools.

Mobile apps can provide multimedia content (text, audio, video) and interactive quizzes that cater to different learning styles. They also enable spaced repetition and micro-learning, which are effective for vocabulary acquisition and retention. In refugee contexts, mobile learning has been used in initiatives such as language-learning MOOCs and WhatsApp-based tutoring. Molin-Karakoc (2025) discusses Language MOOCs for refugee learners, noting opportunities and barriers. While such online courses can reach thousands of learners simultaneously with minimal cost, challenges include patchy internet connectivity, varying literacy levels, and dropouts due to a lack of in-person support. At the same time, research shows that well-designed online learning environments can positively influence learners' psychological comfort, which is especially important for vulnerable populations such as refugees (Baidyk et al., 2024).

Nonetheless, case studies have shown that when designed with refugee needs in mind, online and app-based programs can help refugees acquire basic language and civic knowledge. One salient example is an app named Tarjimly (not part of this study but reported in the literature), which connects refugees with volunteer translators in real time, demonstrating how mobile technology can break language barriers in practical situations such as a DMV visit or a doctor's appointment (Pollard, 2024).

For our target use case of driver's test preparation, we identified several existing digital resources: state DMV practice test apps, flashcard apps for road sign vocabulary, and YouTube videos explaining driving rules. However, most are designed for the general population and assume proficiency in reading English at the high school level. Refugee ESL learners often require simpler language, translation support, and explicit teaching of underlying vocabulary (e.g., words like "yield," "right-of-way," or "brake lights"). Our approach leverages a custom mobile app that builds on these existing resources but adapts them for ESL learners, providing features such as audio narration (for low-literacy users), bilingual dictionaries (English-to-learners' first languages), and interactive exercises focused on language form and meaning in traffic contexts. This approach is consistent with research emphasising the role of cultural and linguistic contexts in shaping language practices and comprehension in bilingual and multilingual communities (Nikolaieva et al., 2025).

Prior research supports the effectiveness of such features: text-to-speech and visual aids in apps have been shown to improve comprehension among low-literacy learners (Shorr et al., 2024). Additionally, smartphone use itself can foster a sense of autonomy and resilience among displaced populations. A study by Netto et al. (2022) on urban refugees in the Global South found that smartphones played a key role in maintaining social connections, accessing information, and practising multiple languages, thereby supporting resilience-building strategies among refugees. However, inequalities in digital literacy and access limited these benefits for the most disadvantaged groups.

The advent of generative AI and intelligent tutoring systems offers powerful new tools for language education. Chatbots and AI assistants can simulate conversational practice, provide instant grammar correction, and personalise feedback to each learner's performance. In ESL contexts, generative AI (like ChatGPT) has been used experimentally to help students practice writing and speaking in a low-stakes setting. Research by Faiz and Hazilan (2024) reviewed current studies on ChatGPT in ESL. It concluded that such AI can facilitate personalised content generation, information retrieval, and knowledge synthesis for

students, thereby enhancing engagement and learning experiences. However, they also caution that over-reliance on AI, concerns about accuracy, and ethical issues (e.g., cheating or inappropriate content) must be addressed.

Jamshed et al. (2024) surveyed Saudi EFL learners and found generally positive attitudes toward the use of AI-powered tools for language learning. Most students reported favourable attitudes toward integrating AI into English learning; however, they also identified several challenges, including technological limitations, insufficient digital literacy, privacy concerns, and the need for clearer guidance on using AI tools effectively.

In our program, we incorporated an AI-based chatbot tutor that could quiz learners on traffic rules in a conversational format. The AI was programmed to accept answers in simple English and to provide explanations or hints when the learner was struggling. The concept of scaffolding in education informed this design – the AI can prompt and guide the learner step by step, much like a human tutor might.

Early studies on AI chatbots for language practice (e.g., in university settings) have shown improved vocabulary retention and student motivation when using chatbots, compared to control groups without AI support (Zhang, 2024). Furthermore, Leslie and Meng (2024) argue that the rise of generative AI represents a paradigm shift in education. When harnessed appropriately, it can augment teaching by taking over routine practice and freeing teachers to focus on higher-order support. Our implementation of AI aimed to do exactly that: handle repetitive Q&A drilling (like asking "What does this road sign mean?" or "When can you turn right on red?") so that class time with the human instructor could focus on discussion, clarification, and addressing learners' individual concerns.

VR provides an immersive environment that closely mimics real-life scenarios, which is extremely beneficial for contextual learning. In language education, VR has been used to create virtual scenes (e.g., a marketplace, a job interview, a science lab) where learners can practice relevant dialogues and vocabulary. The immersive aspect can increase engagement and help learners overcome fear, since mistakes in the virtual world carry no real consequences.

Recent research underscores VR's potential to reduce foreign language anxiety: in a cross-sectional study, Gu (2025) found that VR exposure was positively associated with learners' communicative confidence and perceived fluency, thereby indirectly reducing language anxiety.

By role-playing in VR, learners often forget about traditional classroom pressures and focus on completing tasks, encouraging more spontaneous language use. Wu (2024) noted that VR creates a safe, low-pressure environment where learners can practice without fear of negative evaluation. For refugee learners, many of whom may have had traumatic experiences, this sense of psychological safety is valuable.

VR has also been trialled in refugee mental health interventions – for instance, a pilot study by Basmaji (2025) successfully used VR exposure therapy to help Syrian refugee women with PTSD, demonstrating that refugees can tolerate and accept VR technology in an intervention setting. In the educational realm, VR combined with AI has been identified as a frontier for immersive language-learning experiences that adapt to learners' input in real time (Lingua Learn, 2024).

In the context of driver's education, VR is particularly promising. Driving involves a spatial and visual component that is hard to convey through textbooks or lectures alone. VR driving simulations can place learners in a virtual car as they navigate streets with traffic signs, signals, and other vehicles. This allows refugee learners to experience scenarios (such as a four-way stop or highway merging) while simultaneously hearing and practising the language (e.g., verbalising "I see a stop sign, I must stop and yield to the car on the right").

VR thus marries language with action, embodying the principles of experiential learning. A study by Ding and Cha (2024) showed that multilingual middle school students who used immersive VR in a science class retained more content vocabulary and scored higher on tests than those who used traditional methods, highlighting VR's effectiveness in aiding content learning for ESL students.

Our program's use of VR drew on these insights. We developed simple VR scenarios, such as a virtual road with common signs, and a simulation of the DMV computer-based knowledge test interface. These not only helped learners practice English in context but also familiarised them with the test format and environment, potentially reducing test-day anxiety.

Challenges and Considerations: While the benefits of technology integration are evident, researchers also note several challenges. Access to devices and the internet is one concern – not all refugees can afford sufficient data or have modern smartphones (though many do invest heavily in connectivity) (Ennaji, 2021). In our study setting, we mitigated this by providing tablets and a Wi-Fi hotspot at the learning centre and ensuring that our app could work offline once downloaded.

Another challenge is digital literacy: some participants might be first-time tech users. Thus, an initial orientation to the devices and apps was necessary. We dedicated sessions to teaching basic skills (tapping icons, speaking to the chatbot, and wearing the VR headset) and included multilingual instructions.

Teacher training is equally critical; as Guichon (2024) observes, many language teachers lack the training or resources to effectively integrate digital tools for adult migrants.

For our implementation, the instructors were involved in the design process from the start and received coaching on using the tech components. We also adopted a blended learning approach – technology was used to supplement, not replace, human instruction. This aligns with findings from an AR in language learning review by Schorr et al. (2024), which concluded that AR's potential lies in contextual learning but that "technology alone may not satisfy all needs," and that it should be combined with traditional methods. Likewise, Hanh (2024) emphasises that digital tools should be thoughtfully woven into the curriculum to enhance language learning rather than distract from it.

Finally, it is worth noting policy support for such innovative programs. Global frameworks, such as UNHCR's Refugee Education Strategy, call for improved access to quality education and highlight digital learning as a means to reach more learners, especially in displacement contexts (USA for UNHCR, 2024). Our project aligns with these broader goals by increasing refugee women's access to a specific yet impactful opportunity – driver's education – through language and technology. The literature suggests that when refugee learners are given the right opportunities and support, they can excel. For example, despite language barriers, refugee students who manage to take national exams often achieve high pass rates, sometimes exceeding national averages (USA for UNHCR, 2024). This speaks to the resilience and potential of our learners. Our task as educators and researchers is to design interventions that unlock that potential. In summary, this study builds upon literature strands in contextualised ESL, educational technology, and refugee integration to inform a novel intervention. Next, we detail how we operationalised these ideas in our Materials and Methods section.

Materials and Methods

Sample and Participants

The study was conducted with a sample of 72 adult refugee women enrolled in a nonprofit refugee assistance organisation in San Diego, California. All participants were between 20 and 45 years old (mean age ≈ 32.4, SD ≈ 7.1) and originated from four countries: Iran (n = 18), Iraq (n = 16), Haiti (n = 14), and Afghanistan (n = 24). These countries were selected because refugee women from these backgrounds

formed the majority of the nonprofit's clientele and often expressed interest in obtaining driver's licenses. The participants had been in the United States for an average of 1.5 years (range: 6 months to 4 years). Their educational backgrounds varied: approximately 50% had 0–6 years of formal education, 35% had 7–12 years, and 15% had some post-secondary education. Despite this variation, all participants were functionally literate in their first language (Persian, Arabic/Kurdish, Haitian Creole/French, or Pashto/Dari) and had basic English proficiency corresponding roughly to a high beginner or low intermediate level (determined by a placement test and an oral interview at program intake). None of the participants had a U.S. driver's license at the start of the study; a few had driving experience in their home countries, but most (especially among Afghan and some Middle Eastern women) had minimal or no prior driving experience due to cultural or legal restrictions in their home country on women driving (Afghanistan International, 2025).

Crucially, all participants expressed a personal goal of passing the California driver's knowledge test and obtaining a learner's permit. This shared goal helped create a cohesive learning community. Participation in the study was voluntary and did not affect the regular services they received from the nonprofit. We obtained informed consent, with translations in the participants' native languages read aloud by bilingual staff to ensure comprehension. Pseudonyms were assigned to participants during data analysis to protect identities. The study protocol was reviewed and approved by the Institutional Review Board of San Diego University for Integrative Studies.

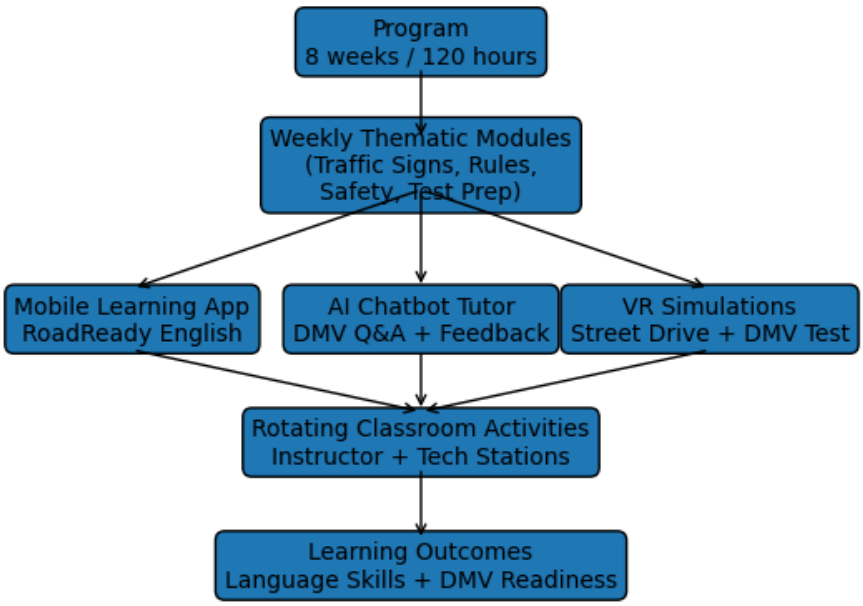
In terms of technology access and experience, about 60% of the women owned smartphones, though their primary use was WhatsApp communication with family. Fewer (around 20%) owned personal computers. None had prior experience with virtual reality. Recognising this, we provided necessary hardware for the program (tablets and a VR headset) and offered a digital orientation session at the outset. We also gauged digital literacy using a simple checklist (ability to turn on a device, open an app, type on a virtual keyboard, etc.); the majority required at least some initial assistance, especially those with limited schooling. This baseline informed how we paced the introduction of tech tools in the curriculum.

Instrument and Procedure

Instructional Method Design: The intervention – dubbed the "Driving Ahead ESL Program" – was an 8-week course that met five days per week for 3-hour sessions (total 120 instructional hours). The curriculum was co-developed by the researchers and two ESL instructors at the centre, with input from a subject-matter expert (a former DMV examiner) to ensure accuracy of driving-related content. The course was structured around the California Driver Handbook, which was used as the primary content source. However, instead of simply reading the handbook, we created thematic modules each week (e.g., Traffic Signs and Signals, Rules of the Road, Driving Etiquette and Safety, Practice Test Prep). Each module integrated language objectives (vocabulary, reading comprehension, listening, and basic writing) with driver's education content.

Figure 1

Instructional Design of the Driving Ahead ESL Program



Source: Author's own development.

Three main technology components were integrated into each module:

1. Mobile Learning App: We developed a custom mobile application called RoadReady English for Android devices (since affordable Android tablets were provided). The app included bilingual glossaries (English–Persian, English–Arabic, English–Haitian Creole, and English–Pashto) for key terms, illustrated flashcards of road signs, short video clips demonstrating driving manoeuvres (with captions and voice-over in simple English), and interactive quizzes. Participants were encouraged to use the app both during class (in guided activities) and at home for self-study. For instance, in the Traffic Signs module, the app would present a stop sign image, play audio, "This is a stop sign. S-T-O-P means you must halt," and then quiz the learner ("What does a stop sign mean?" with multiple-choice answers). The app tracked user progress and usage time, which the instructors monitored via a teacher dashboard. This allowed us to see, for example, which content areas were most challenging (based on quiz scores) and who might need extra help. The app's content and interface were intentionally kept simple to accommodate learners with low digital literacy. All instructions within the app were available in the learner's native language with a tap of a translation icon.

2. AI Chatbot Tutor: To supplement the content, we integrated an AI-driven chatbot (built on an open-source conversational AI framework fine-tuned with our dataset of DMV questions and explanations). Participants could access the chatbot through the app or a messaging platform. They were instructed to ask the chatbot any questions about driving rules or to take a practice Q&A with it. For example, a learner might type (or use voice input), "What does yield mean?" and the chatbot would respond with a simplified explanation ("'Yield' means you must slow down and let others go first.") – the chatbot could also explain in the user's first language on request. Another feature: the chatbot would simulate the DMV knowledge test by asking a series of 10 practice multiple-choice questions, scoring the attempt, and providing feedback on incorrect answers. The AI was programmed to use encouraging language and to adjust the difficulty based on the learner's performance (drawing on a pool of easier or harder questions as needed). We moderated the chatbot's responses using preset rules to avoid misinformation. During class sessions, instructors sometimes demonstrated the chatbot to the group (e.g., by projecting a conversation and

discussing why the chatbot's answer was correct). Outside class, learners used it sporadically; to facilitate usage, we allotted 15 minutes at the end of each class for learners to try the chatbot on the provided tablets while the instructor and a teaching assistant circulated to help.

3. Virtual Reality (VR) Simulations: We utilised one high-end VR headset (Oculus/Meta Quest) for in-class shared use, as well as Google Cardboard headsets with smartphones for a more basic VR experience, so that up to 5 learners at a time could participate in VR activities. We created two VR simulation experiences: (a) a Virtual Street Drive, where the learner "rode" in a virtual car moving through a neighborhood – they had to identify signs, signals, and potential hazards (the simulation would pause and prompt questions like "You see this sign (yield sign) at the intersection – what do you do?" and the learner would answer verbally or select from options); and (b) a DMV Test Simulator, which reproduced the look and function of the California DMV computer-based test – a VR environment of sitting at a computer kiosk, where questions appeared and the user could select answers. The purpose of the first simulation was to contextualise vocabulary and to allow learners to practice applying rules in real time. The purpose of the second was to familiarise them with the test format and reduce test anxiety by making the formal test environment feel more familiar. Due to hardware limitations, VR activities were done in small groups rotating through stations. While five participants engaged with VR, the others would be at parallel learning stations (one working with the instructor on a simplified reading passage from the driver handbook for ESL, another group practising dialogue, such as asking for directions). Each participant experienced VR at least once per week. We observed considerable excitement around the VR sessions – many participants were initially astonished to "visit" an American street virtually. In line with findings by Ding & Cha (2024) that VR can facilitate more visual communication, we encouraged learners in VR to call out what they saw and to discuss in English, thereby practising spontaneous speaking.

Classroom Implementation: The program blended teacher-led instruction with tech-based independent or pair work. A typical class began with a warm-up (e.g., reviewing vocabulary with flashcards or a short conversation about driving experiences). Then we introduced the day's topic using a brief PowerPoint or pictures (for instance, showing images of different road signs and eliciting prior knowledge). Next would be a rotation through activities: one station might use the mobile app for a quiz game, another might use VR as described, and another might have an instructor-led mini-lesson (e.g., practising reading a paragraph from the driver's manual and answering comprehension questions). Participants rotated, ensuring each got tech exposure and direct instruction. Classes ended with a recap and discussion in which learners could ask questions in their native language (interpreters or bilingual staff were often present, especially for Persian and Arabic; for Pashto and Haitian Creole, we occasionally had community volunteers help or used proficient peers to translate key points).

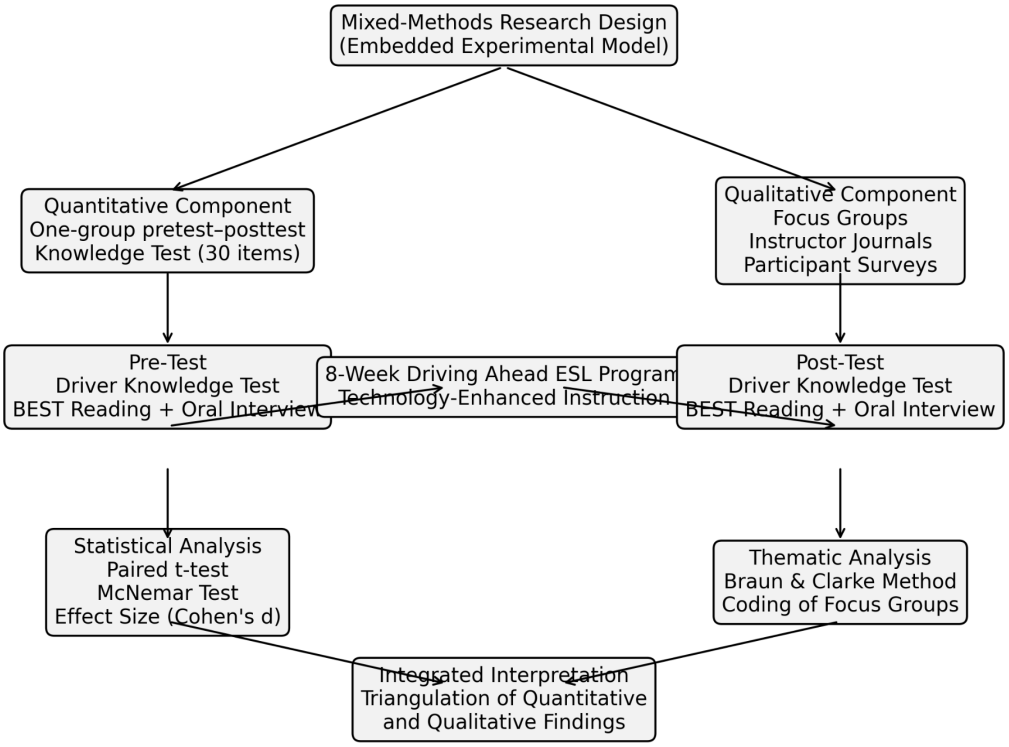
Throughout the 8 weeks, we administered three practice tests (not counting the pre- and post-tests used for research data, which are described in the Results section). These were for pedagogical purposes: one at week 3, one at week 6, and a final practice exam in the last session to build confidence. The practice tests were modelled on the DMV exam (in fact, we used released sample questions and some modified ones). They were initially done on paper in class, then the final one was done on the VR DMV simulator for realism. After each practice test, we reviewed the answers as a class to clarify any misunderstandings. The AI chatbot was also used in review; e.g., if many missed a particular question, the instructor demonstrated asking the chatbot that question to show how to find an explanation. We also included brief life-skills content, such as how to schedule a DMV appointment and what documents are needed to apply, to ensure that passing the test would indeed lead to obtaining the permit.

Data Analysis

Research Design: We employed a mixed-methods design, specifically an embedded experimental model in which qualitative data on learner experiences complemented quantitative data on learning outcomes. The quantitative component was a one-group pretest–posttest design (with additional reference to historical pass rates as an external comparison), given that a true control group was not available within the program (ethical and practical considerations prevented denying the new instructional method to some refugees once it was implemented as part of the nonprofit's offerings). However, to strengthen inferences, we compared the participants' pre–post gains to expected gains based on past cohorts who took the test after self-study or traditional classes (using archival data from the nonprofit, when available).

Figure 2

Mixed-Methods Research Design Framework



Source: Author's own development.

Instruments for Quantitative Data: The primary outcome measure was performance on a simulated driver's license knowledge test. We created a 30-item multiple-choice test (in English) that closely resembled the official DMV written test in format and content. This test was administered before the program (pre-test) and after the 8-week program (post-test). The same test form was used for pre- and post to allow direct comparison, but with answer orders shuffled to minimise recall. It covered all key areas: road signs, traffic laws, safety rules, and driving scenarios. An experienced driving instructor checked content validity. We scored each test as the number correct out of 30 and recorded whether the score met the DMV passing threshold (80%, or 24/30). In addition, we collected data on how many participants took the actual DMV permit test within one month after the program and whether they passed, as a real-world outcome indicator (the nonprofit helped schedule tests and kept records of results when clients reported back).

We also measured English language progress in a more general sense using a brief oral proficiency interview and a reading assessment from the Basic English Skills Test (BEST) at pre- and post-test.

However, those results were secondary; our focus was on the functional outcome (readiness for the knowledge test). The oral interview was useful for noting any increase in confidence when speaking about driving topics.

For qualitative data, we conducted two focus group discussions (one with 5 participants from Iran/Iraq with an Arabic interpreter present, and one with 5 participants from Haiti/Afghanistan with a Dari interpreter). These were semi-structured, guided by questions about the learners' experiences: "How did you feel about using the app/VR/headset?" "What was most helpful for learning?" "What difficulties did you face during the program?", and "Do you feel more confident about the driver's test and driving? Why or why not?" We also encouraged any feedback on cultural or emotional aspects ("Did you find any content confusing or not relevant?" or "Did using these technologies make you feel more motivated or more stressed?"). Each focus group lasted ~60 minutes and was conducted in the learners' preferred language to allow free expression (the transcripts were later translated into English).

Additionally, weekly reflections were collected from instructors as journal entries. Brief surveys were given to participants at the end (with statements like "I enjoyed using the mobile app to study" or "Practising in VR helped me feel less nervous about driving," rated on a 4-point scale from Strongly Disagree to Agree Strongly, plus open comments). These qualitative inputs provided context to interpret the numbers.

Analysis Methods: Quantitatively, we used paired t-tests to compare pre-test and post-test scores on the 30-item knowledge exam. We also calculated the proportion of participants passing at pre- and post-test, using McNemar's test for the paired binary outcome (pass/fail). The effect size for score improvement was reported (Cohen's d). We set significance at $p < 0.05$. Given the sample size (n=72), the study was powered to detect a medium effect size difference with >80% power. We also performed exploratory subgroup analyses, for instance, comparing outcomes by subgroup (e.g., native language or education level) using ANOVA, though with caution given unequal group sizes.

Qualitative data (focus group transcripts and open-ended survey responses) were analysed thematically. We followed Braun and Clarke's approach to thematic analysis: first, familiarising ourselves with the transcripts; then, coding segments of data that corresponded to key topics (e.g., "confidence," "technology challenges," "language improvement," "cultural relevance"). Two researchers independently coded and then reconciled their codes through discussion. From these, we distilled a set of themes. Three prominent themes that emerged were: (1) Increased Confidence and Autonomy – women reported feeling more independent and capable after the program, not just in approaching the test but in using English for other tasks; (2) Engagement and Motivation through Technology – most participants found the app and VR "fun" and motivating, describing the learning as more engaging than traditional rote study, though a few noted initial intimidation with VR; (3) Continued Barriers – despite overall positive feedback, some mentioned ongoing difficulties such as limited study time at home (due to work or family) and, for a minority, persistent struggles with reading comprehension of longer texts (indicating that even more scaffolding might be needed for low-literacy learners).

We triangulated the quantitative and qualitative findings during interpretation. For instance, if test scores improved significantly, did participants also feel more prepared? (Yes, according to focus group statements about confidence.) Where there were discrepancies or unexpected quantitative patterns, we looked to qualitative data for explanations (e.g., one or two participants did not improve on the test – their survey comments indicated they had very low education and still struggled with reading, highlighting a limitation of our approach for those individuals).

Results

Participant Retention and Engagement: Of the 72 enrollees, 70 completed the full 8-week program and both pre- and post-tests (two had intermittent attendance due to health issues and did not take the post-test; thus, they were excluded from analysis). Attendance was high overall – averaging 85% across all sessions, indicating strong interest. The provided technology was utilised at varying levels: app usage logs showed that about 60% of participants used the app independently at home at least once a week, whereas 40% primarily used it during class. All participants tried the AI chatbot at least once; 50% engaged with it regularly (5 or more sessions), while the others used it minimally, preferring human interaction. Each participant averaged 10-15 minutes of VR use per week.

Knowledge Test Performance

Table 1

Pre- and Post-Test Performance on the Driver's License Knowledge Assessment (N = 70).

Metric	**Pre-Test**	**Post-Test**
Mean score (out of 30)	18.3	26.5
Standard deviation (SD)	4.5	2.8
Pass rate (≥24/30)	21/70 (30%)	63/70 (90%)

Source: Authors' own development.

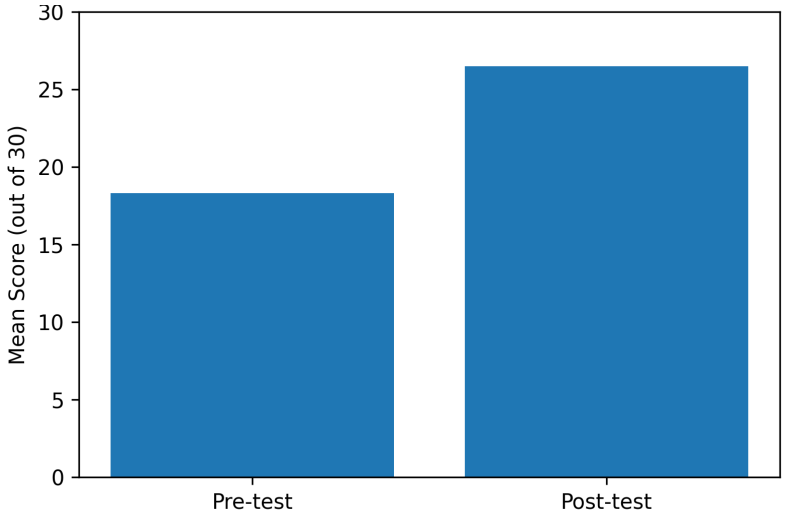
The table displays the mean scores (out of 30) and standard deviations, as well as the percentage of participants who achieved a passing score (≥24/30), before and after the instructional program.

On the 30-item simulated knowledge test, participants' mean score improved from 18.3 (SD 4.5) on the pre-test to 26.5 (SD 2.8) on the post-test. This gain of over 8 points represents a substantial improvement of roughly 27 percentage points in correct answers (from ~61% to ~88% on average). A paired t-test confirmed that the increase in scores was statistically significant ($t(69) = 15.4$, $p < 0.001$). The effect size was very large (Cohen's $d \approx 1.8$), indicating that the program had a strong impact on test performance.

The pass rate (scoring ≥ 24/30) jumped markedly. Before the program, only 21 of 70 participants (30%) passed the practice test. After the program, 63 of 70 participants (90%) scored at or above the passing threshold. This threefold increase in pass rate is illustrated in Figure 3, which shows the pre- and post-test outcomes. A McNemar's test on the paired pass/fail outcomes was highly significant ($\chi^2 \approx 38.0$, $p < 0.001$), confirming that many more individuals passed after the intervention than before.

Figure 3

Mean Knowledge Test Scores Before and After the 8-Week Instructional Program.



Source: Authors' own development.

The bar chart shows an improvement in average scores from the pre-test (M = 18.3) to the post-test (M = 26.5) across 30 questions. Error bars indicate standard deviations. Note: The DMV passing threshold of 24 is marked with a dashed line.

In fact, 90% of participants exceeded the passing cutoff by the end, and even those who did not pass showed some improvement (the 7 participants who remained below 24 had an average pre-score of 12 and post-score of 20 – so they gained 8 points, though still fell short; these individuals tended to be those with the lowest initial literacy, an issue we address later). To contextualise these results, we compared them to historical data from the nonprofit's records. In the previous year, among refugee clients who self-studied or took a general ESL class and then attempted the DMV test, the first-time pass rate was around 55% (based on staff estimates and self-reported outcomes). Our program's post-test pass rate of 90% suggests a notable improvement over the norm, though caution is warranted, as the comparisons are not strictly controlled.

Of the 70 who completed the course, 64 took the actual DMV knowledge exam within 1 month of the course (the remaining 6 postponed due to personal reasons). Out of those 64, 58 passed on the first attempt (90.6%), 5 failed but have since retaken and passed, and 1 had not yet passed at the time of reporting. This real-world outcome closely mirrored our post-test results, lending ecological validity to our simulated test scores. It is worth noting that participants from all four national backgrounds succeeded; there was no significant difference in post-test scores by country of origin or native language group (ANOVA $F(3,66) = 1.02$, $p = 0.39$). There was a slight trend that those with higher formal education achieved higher absolute scores. However, even those with minimal education mostly reached the passing level due to the visual/audio supports provided. This indicates that the multi-modal approach benefited learners across different literacy levels.

In addition to the knowledge test, gains were observed in general English skills. While not the primary focus, oral proficiency interviews showed that many participants became more comfortable speaking about everyday topics. For example, when asked in English, "What do you do when you see a red light?" during the post-program interview, nearly all could respond with a correct simple sentence ("Stop the car" or "I must stop."), whereas at the start, some could not answer or responded in their first language. On a basic reading comprehension exercise (a short paragraph about driving safety), average scores improved

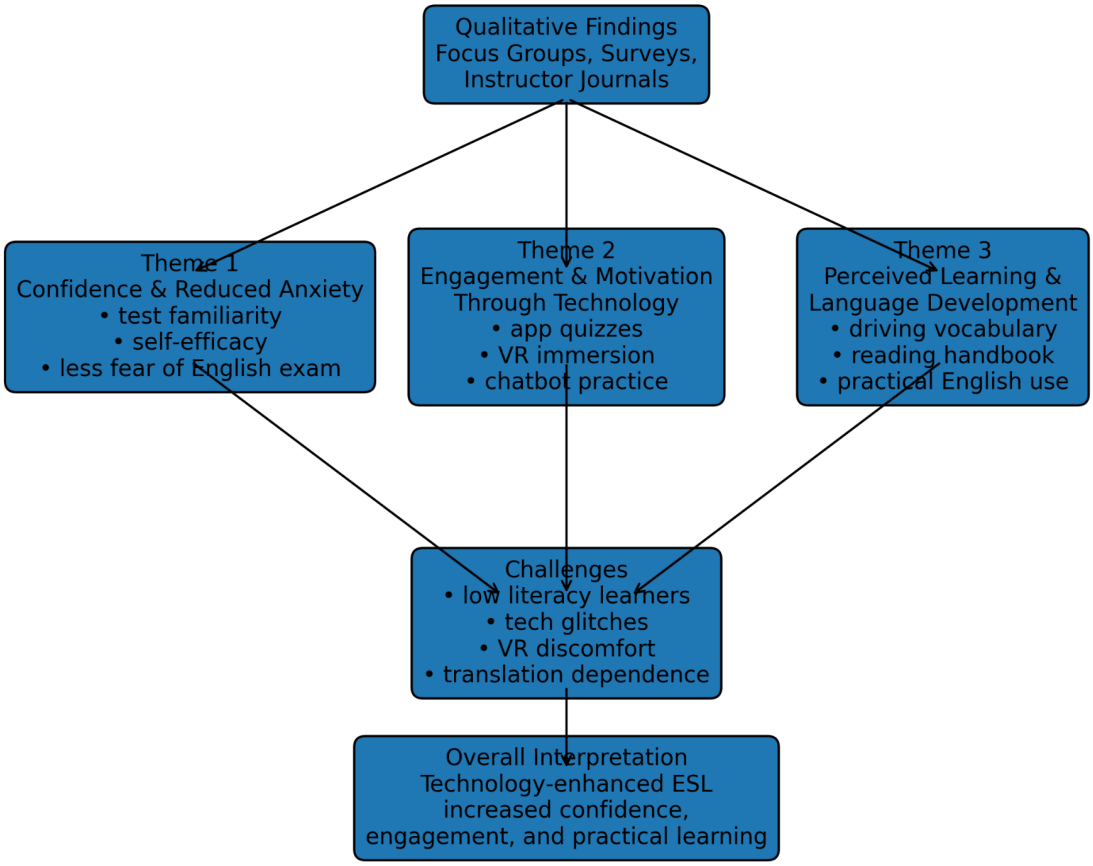
modestly (from ~60% to ~75% correct answers). These indicate that context-specific learning did spill over into better English comprehension, at least for practical texts.

Qualitative Findings

The qualitative data provided rich insights into how and why the program led to the improvements noted above. Three major themes emerged from the focus groups and feedback:

Figure 4

Key themes emerging from qualitative analysis of participant feedback.



Source: Author's own development.

1. Confidence and Reduced Anxiety: A majority of participants reported that they felt significantly more confident about taking the driver's license test after the program. Many described feeling intimidated at first – both by the prospect of a written exam in English and by using new technologies – but these fears subsided over time. One Afghan learner in the focus group shared (through an interpreter): "Before, I was afraid even to try the test. I thought I would fail because my English reading is not good. However, practising in class and on the computer, I am not afraid now. I know what to expect." Another participant from Iraq said in English, "I can do it now," with a big smile, referring to taking the test. Learners particularly cited the practice tests and the simulated test environment as helping reduce their test anxiety. Experiencing the test format in VR or on the app multiple times made the real exam feel "familiar, not foreign" (as one Iranian participant put it). This supports the notion that authentic practice builds self-efficacy. Moreover, the supportive atmosphere – where making mistakes in the app or with the chatbot was consequence-free – contributed to a growth mindset. Participants also noted an increase in confidence in daily life: a Haitian learner said she now felt bold enough to converse with English-speaking neighbours about driving tips, something she had hesitated to do before.

2. Engagement and Motivation through Technology: The integration of technology was overwhelmingly received as a positive, motivational element. In surveys, 95% of participants agreed with the statement "Using the app and other technology made the class more interesting." The focus group discussions revealed that the interactive nature of the learning kept them engaged. For instance, participants described the mobile app's quizzes as feeling like a game – "When I got questions right, the app said 'Good job!' and I wanted to keep going," said one participant – which introduced a friendly competition element (some would compare scores on the app's leaderboard in class). The VR component was often described as the favourite part of the activity. Even participants who were initially nervous about wearing the VR headset ended up enjoying it. One quote (translated from Persian) stood out: "It was like I was really driving on those roads. I could see the stop signs and houses. It made everything real. I remember those signs better now because I saw them." This indicates that VR's immersive imagery helped imprint vocabulary and scenarios into memory, consistent with cognitive theories of multi-sensory learning. The AI chatbot had a mixed but mostly positive reception. Several learners anthropomorphised it, referring to the bot as if it were a teacher: "The computer teacher always had time for my questions," one Haitian woman joked. She explained that late at night, when her children were asleep, she would practice questions with the chatbot because no human teacher was available. Others, however, used the bot less, with a few participants indicating that typing in English was difficult or that they were not sure the answers were always correct. (In one instance, the chatbot misunderstood a poorly phrased question and gave a confusing answer, which the participant brought up in class, and we clarified.) This highlights the importance of guiding learners on effective chatbot use. Overall, though, the novelty and interactivity of the tech tools seemed to sustain higher motivation compared to traditional lecture-based instruction. Instructors noted improved attendance and punctuality – participants often arrived early to get extra app practice or try VR again.

3. Perceived Learning and Language Development: Participants overwhelmingly felt that their knowledge of driving rules and related English terminology had improved. By the end of the program, focus group members could spontaneously recall and explain terms such as "yield," "right-of-way," "speed limit," and "blind spot," both in English and in their first language. One Iraqi participant said (in Arabic, translated), "Now when I ride with my husband, I read the road signs aloud in English and explain to him. I could not do that before – I did not know the words." This is a powerful indicator that the content has been internalised. Many also mentioned improvements in their ability to read the DMV handbook. Initially, most found the handbook's dense text difficult to read. However, after weeks of vocabulary work and practice questions, they reported being able to tackle short sections of the English manual. For instance, a Pashto-speaking participant explained that although she still found large paragraphs hard to read, she could now understand bullet points or short sentences in the handbook, especially if they contained familiar words like "stop" or "turn".

Interestingly, some women noted that the program was their first experience with a computer or VR, and that learning these digital skills in an academic context sparked their interest in further education. A participant from Iran said she had gained not only driving knowledge but also "learned how to learn" with new tools and expressed interest in taking online courses in the future. This unintended outcome aligns with broader goals of digital inclusion – building refugees' digital literacy can have long-term benefits beyond the immediate course[30].

Challenges and Areas for Improvement: Despite the positive outcomes, the qualitative feedback also surfaced a few challenges:

A small number of participants (particularly two women with very low literacy who had never attended any school before) struggled even with the highly supported curriculum. They improved, but not enough to pass the written test by the end of 8 weeks. In their feedback, they expressed frustration with

reading and said they relied on memorising answers. For these learners, even simpler language materials or a longer duration might be needed. This suggests that one size may not fit all, and additional remedial literacy support could be integrated.

Occasional technological glitches occurred: e.g., the app crashed on older phones, the VR headset battery died mid-session once, and the chatbot sometimes required unstable internet connectivity. These caused minor disruptions or delays. Participants took these issues in stride, but they highlight the importance of reliable infrastructure.

Some participants initially felt dizzy or nauseated using VR. We addressed this by limiting VR sessions to short 5-minute bursts and ensuring that learners could opt out if they were uncomfortable. Only one participant chose not to continue VR after an initial try due to motion sickness. Others adapted with no lingering issues.

A couple of learners mentioned feeling "too dependent on the translation". For example, Haitian Creole speakers had a Creole-translated driver handbook, which they found helpful, but it may have made them less inclined to practice reading in English. Moving forward, a gradual weaning off translation (perhaps restricting its use as they advance) might be beneficial to encourage English reading practice.

Mixed-Methods Integration

Combining the quantitative and qualitative findings provides a comprehensive picture. The robust improvement in test scores and pass rates quantitatively demonstrates that the instructional method was effective in achieving its primary objective (knowledge test preparation).

The qualitative data explain why it was effective: increased confidence, high engagement through interactive learning, and contextual understanding all likely contributed to better test performance. The fact that participants reported reduced anxiety and greater familiarity with the test environment likely helped them perform to their true ability on the post-test, rather than the pre-test, where nerves and unfamiliarity may have suppressed scores. Moreover, the gains in specific vocabulary and concepts (as reported) align with the types of questions that showed the greatest improvement. For instance, analysis of item-level performance showed that questions about road signs and right-of-way rules, which were heavily emphasised in the app and VR, had the largest increase in correct responses from pre to post. This suggests that the targeted, multimodal practice on those topics was particularly effective.

The qualitative feedback also highlighted an important point: the program not only taught content, but also taught learning strategies and digital skills. Participants learned to learn – e.g., using the chatbot to get information, or recognising that they could replay videos until they understood. This empowerment aspect might contribute to sustained benefits beyond the immediate test. Indeed, one month after the course, instructors reported that many of the women continued to use the app or discuss driving topics, indicating retained interest. Additionally, through the focus groups, we learned that some participants had begun to informally teach their spouses or friends what they had learned, acting as multipliers of knowledge in their communities. This is a wonderful ancillary outcome that a purely quantitative lens might have missed.

To sum up the results: the technology-enhanced functional ESL instruction led to significant learning gains, with 90% achieving a passing score on a simulated test and similar success on the actual DMV test soon after. Learners attributed their success to the engaging, realistic practice afforded by the app, AI, and VR tools, as well as supportive teaching. They not only learned English and driving rules but also gained confidence, an intangible yet critical component of success for adult refugee learners whose self-efficacy may have been shaken by displacement. These outcomes validate approaches that integrate relevant

content with innovative pedagogy in refugee education, echoing broader research findings that refugees excel when given the right opportunities.

Discussion

The results of this study provide strong evidence that a technology-enhanced, task-specific ESL program can significantly improve refugee learners' functional language skills and domain knowledge, enabling refugee women to pass the driver's license knowledge test successfully. The findings demonstrate that contextualised language instruction, combined with digital tools, can yield substantial educational outcomes for adult refugee learners.

The intervention's effectiveness aligns with previous research emphasising the importance of contextually and purpose-driven language learning. By situating English instruction within the concrete goal of obtaining a driver's license, the program leveraged participants' intrinsic motivation and supported meaningful learning. The dramatic increase in pass rates (from 30% to 90%) suggests that when language is taught as a practical tool for real-life goals, comprehension and retention improve significantly. Participants developed not only test-taking skills but also a functional understanding of traffic rules and related vocabulary.

A key contribution of this study is the integration of multiple technologies within a single instructional framework. Mobile applications supported vocabulary development and flexible practices; AI chatbots provided personalised explanations and feedback; and VR simulations created immersive learning environments. Together, these tools formed a blended learning ecosystem in which different modalities reinforced each other. Vocabulary learned through the app could be applied in VR scenarios, while questions explored through the chatbot were discussed in class, strengthening conceptual understanding.

Another important outcome was an increase in learner confidence and a reduction in test-related anxiety. Many participants initially expressed fear of taking an English-language exam or using unfamiliar technologies. However, repeated exposure to practice tests and simulated environments helped reduce these concerns. The supportive and low-risk learning environment allowed learners to make mistakes and gradually build self-efficacy. As a result, improved performance may reflect not only knowledge gains but also reduced anxiety and increased familiarity with the test format.

Beyond test preparation, the program had broader implications for integration and mobility. Obtaining a driver's license can significantly improve refugees' access to employment, childcare, and community participation, particularly in areas with limited public transportation. By enabling participants to obtain driving permits, the program may improve economic and social integration.

The intervention also supported the development of digital literacy. Many participants had limited prior experience with digital tools, and learning to use apps, chatbots, and online resources increased their confidence in navigating digital information. Such digital empowerment is increasingly important for accessing services and opportunities in modern societies.

Despite these promising outcomes, the study has several limitations. The absence of a control group limits the ability to attribute improvements solely to the technology-enhanced approach. Additionally, the sample consisted exclusively of women, and the results may not generalise to other refugee populations. The eight-week duration was also insufficient for participants with extremely low literacy levels, suggesting that longer or additional support programs may be necessary.

Future research should explore the long-term retention of both language and content knowledge, as well as the relative contributions of individual technological components. Further studies could also

investigate how similar technology-enhanced approaches may be applied to other functional ESL domains, such as healthcare navigation or vocational training.

Overall, the findings demonstrate that integrating relevant content with innovative pedagogical technologies can effectively support refugee education, improving both practical language skills and learners' confidence in real-world contexts.

Conclusions

This study set out to examine whether a technology-enhanced, functional English program could effectively prepare refugee women for a specific real-world challenge – the driver's license knowledge test – while also improving their ESL skills. The evidence from our 8-week intervention is resoundingly positive. We observed significant gains in test performance, with the vast majority of participants achieving a passing score after the program, and qualitative reports of increased confidence, engagement, and self-efficacy. These findings lead us to several key conclusions:

1. Integrated functional instruction is highly effective. Teaching language in the context of immediate, practical needs (like obtaining a driver's license) proved far more impactful than generic ESL instruction. Participants were motivated by the clear goal and could directly see the relevance of what they learned. This contextualization helped retain and apply knowledge. The success of our program reinforces the value of needs-based curriculum design for adult refugee learners, as it addresses specific gaps that hinder their integration (in this case, mobility and transportation literacy).

2. Technology multipliers boost learning outcomes. The strategic use of mobile apps, AI tools, and VR created a rich, multimodal learning environment that catered to diverse learning styles and helped overcome some traditional barriers. When appropriately adapted to learners' linguistic and cultural contexts, technology can greatly enhance engagement and provide experiences (such as immersive simulations and on-demand tutoring) that would be impossible to replicate in a conventional classroom. Our results show that these tools, rather than overwhelming learners, can empower them – even those with limited formal education – to grasp complex content and practice skills safely. However, the human element remained crucial; technology complemented teacher instruction, but it did not replace it.

3. Confidence and autonomy are crucial outcomes. Beyond the measurable academic gains, an equally important outcome was the boost in participants' confidence in both their English abilities and their capacity to learn new things. This affective dimension often determines whether learners will persist and apply their skills in real life. By reducing anxiety (through familiarisation and supportive feedback) and fostering a sense of achievement, the program helped participants not only learn to drive in English but also see themselves as capable drivers on their own learning journey. Such empowerment is hard to quantify, but it was evident in participants' anecdotes and demeanour. In the context of refugee integration, instilling confidence can have ripple effects, encouraging learners to pursue further education or better employment.

4. Importance of cultural and linguistic adaptation. The program's culturally sensitive approach – offering native-language support, using examples and metaphors familiar to learners, and ensuring that female learners felt safe participating and making mistakes – was fundamental to its success. Participants felt respected and understood, which likely increased their willingness to engage. This underscores that any replication of this model must tailor content to the target population's languages and cultural norms. For instance, including Haitian Creole and Pashto translations, or acknowledging that some women had never been behind the wheel before, were critical design choices. A one-size-fits-all digital solution would not have worked as well; localisation is key.

In conclusion, the study demonstrates that marrying technology with functional content in an ESL framework can yield impressive educational and practical outcomes for refugee populations. It provides a viable model for similar programs that aim to equip refugees with critical life skills in their new countries – be it driving, vocational skills, or navigating systems – while improving their language proficiency. The mixed-methods evidence provides confidence that our approach was effective across multiple levels (cognitive, behavioural, and affective).

For the participants, the immediate consequence is that dozens of refugee women are now better prepared to operate vehicles safely and have the legal credentials to do so. This can reduce their reliance on others, improve access to jobs (e.g., those that require commuting or even obtaining jobs like delivery drivers, if desired), and increase their engagement with the community (e.g., attending distant appointments, classes, and social events). On a larger scale, initiatives like this can facilitate refugees' economic contributions and social integration, benefitting the host society as well. Policymakers and educators should note that investing in targeted educational technology interventions can yield high returns in terms of refugee self-sufficiency and integration – our case focused on driving. However, the same logic applies to other domains.

Ultimately, the success of the "Driving Ahead" program paints an optimistic picture: with innovative approaches and determination, we can help remove practical barriers that prevent refugees from fully participating in their new communities. Language need not be a wall but rather a bridge – and with modern tools at our disposal, we can build those bridges more efficiently and inclusively than ever before. The women in our program started as learners of English and traffic rules; they emerged not just as prospective licensed drivers, but as confident navigators of their new lives. This journey from dependency towards autonomy is, in many ways, the essence of the refugee resettlement experience. Education, especially when augmented by technology and responsive to learners' needs, is a catalyst in that journey – turning challenges into opportunities and fears into newfound freedoms.

Suggestions for Future Research

Building on the findings and limitations of this study, several directions for future research are suggested. First, longitudinal studies should examine whether the short-term gains observed in this intervention translate into lasting outcomes, such as improved English proficiency, successful driver's license acquisition, employment opportunities, and broader social integration. Second, controlled experimental designs, including randomised controlled trials, could compare technology-enhanced instruction with traditional ESL approaches to determine the specific contribution of digital tools.

Future research should also investigate which components of the intervention—mobile applications, AI tutoring, or VR simulations—have the strongest impact on learning outcomes. Such component analysis would help optimise program design and resource allocation. In addition, researchers should explore the transferability of this model to other life-skill domains (e.g., healthcare navigation or workplace communication) and across different refugee populations and cultural contexts.

Further studies are also needed to examine the digital literacy challenges faced by adult refugees and to identify effective strategies for introducing technology-based learning tools. Economic and scalability analyses help determine whether technology-enhanced programs are cost-effective and feasible for broader implementation. Finally, research should investigate learner variability and language development outcomes, as well as refugee learners' perspectives on technology-assisted education.

Overall, expanding research in these areas would support the development of scalable, evidence-based approaches to technology-enhanced refugee education and integration.

Acknowledgements

None.

Conflict of Interest

None.

Funding

The Author received no funding for this research.

References

Afghan Cultural Society. (n.d.). *Driver's education*. https://afghanculturalsociety.org/drivers-education/

Afghanistan International. (2025, June 13). Taliban orders ban on women driving in Herat. https://www.afintl.com/en/202506139178

Al-Hamad, A., Yasin, Y. M., & Metersky, K. (2024). Predictors, barriers, and facilitators to refugee women's employment and economic inclusion: A mixed methods systematic review. *PLoS ONE*, *19*(7), Article e0305463. https://doi.org/10.1371/journal.pone.0305463

Baidyk, V., Hurskaya, V., & Riabinina, O. (2024). The impact of online learning on students' psychological comfort. *Naukovi Perspektyvy*, *11*(53). https://doi.org/10.52058/2708-7530-2024-11(53)-1208-1221

Basmaji, T. (2025). The reactivation-enhanced therapeutic response: Contextual symptom spikes and their impact on trauma treatment outcomes. *PsyArXiv*. https://doi.org/10.31234/osf.io/hry3m_v1

Boiko, O., Hurskaya, V., Moroz, T., Tron, T. V., & Kozak, V. (2025). Análisis de métodos de enseñanza del inglés como lengua extranjera mediante tecnologías multimedia. *Revista Eduweb*, *19*(2), 70–81. https://doi.org/10.46502/issn.1856-7576/2025.19.02.5

Bradley, L., Guichon, N., & Kukulska-Hulme, A. (2025). Migrants' and refugees' digital literacies in life and language learning. *ReCALL*, *37*(2), 147–156. https://doi.org/10.1017/S0958344025000047

Dang, T. (2025). Language training, refugees' healthcare integration, and the next generation's health. *Journal of Development Economics*, *174*, Article 103470. https://doi.org/10.1016/j.jdeveco.2025.103470

Ding, Y., & Cha, J. (2024). The integration of virtual reality-enhanced multimodal meaning-making improves knowledge acquisition and disciplinary literacy development in science classrooms. *Learning and Instruction*, *94*, Article 101999. https://doi.org/10.1016/j.learninstruc.2024.101999

Ennaji, M. (2021). Mobile phones: An indispensable tool for migrants. *The UNESCO Courier*. https://courier.unesco.org/en/articles/mobile-phones-indispensable-tool-migrants

Faiz, H., & Hazilan, W. F. (2024). *ChatGPT in English as a second language education: A review*. Global Science Foundation. https://gsf.info/wp-content/uploads/2024/05/ChatGPT-in-English-as-A-Second-Language-Education-A-Review.pdf

Fowler, C. (2024, July 24). Lincoln Literacy offers driving classes for immigrants and refugees. *Nebraska Public Media*. https://nebraskapublicmedia.org/en/news/news-articles/lincoln-literacy-offers-driving-classes-for-immigrants-and-refugees/

Garzón, J., Lampropoulos, G., & Burgos, D. (2023). Effects of mobile learning in English language learning: A meta-analysis and research synthesis. *Electronics*, *12*(7), Article 1595. https://doi.org/10.3390/electronics12071595

Gu, L. (2025). Beyond the classroom—Exploring the impact of virtual reality exposure on foreign language anxiety with the mediating role of ESL Chinese learners' communicative confidence and fluency. *Humanities and Social Sciences Communications*, *12*, Article 1349. https://doi.org/10.1057/s41599-025-05030-4

Guan, L., Li, S., & Gu, M. M. (2024). AI in informal digital English learning: A meta-analysis of its effectiveness on proficiency, motivation, and self-regulation. *Computers and Education: Artificial Intelligence*, *7*, Article 100323. https://doi.org/10.1016/j.caeai.2024.100323

Guichon, N. (2024). Reviewing research methods on adult migrants' digital literacy: What insights for additional language teaching? *Apples – Journal of Applied Language Studies*, *18*(1), 67–89. https://doi.org/10.30661/apples.137177

Hanh, T. T. M. (2024). Enhancing language learning through digital literacy: Practical applications in EFL classrooms. *American Research Journal of Humanities & Social Science*, *7*(5), 53–59. https://www.arjhss.com/wp-content/uploads/2024/05/H755359.pdf

International Catholic Migration Commission. (2025, November 26). The importance of language skills in refugee resettlement. https://www.icmc.net/2025/11/26/importance-of-language-skills-in-refugee-resettlement/

Jamshed, M., Alam, I., Sultan, S. A., & Banu, S. (2024). Using artificial intelligence for English language learning: Saudi EFL learners' opinions, attitudes and challenges. *Journal of Education and E-Learning Research*, *11*(1), 135–141. https://doi.org/10.20448/jeelr.v11i1.5397

Kajee, L. (2025). "We are outside, not inside": Refugee women's life stories of transition through language and literacy. *JALL (Journal of Applied Linguistics and Literacy)*, *9*(2), 303–323. https://doi.org/10.25157/jall.v9i2.19263

Leslie, D., & Meng, X.-L. (2024). Future shock: Grappling with the generative AI revolution. *Harvard Data Science Review*, (Special Issue 5). https://doi.org/10.1162/99608f92.fad6d25c

Lingua Learn. (2024, December 12). The future of language learning: Virtual reality in education. https://lingua-learn.com/blogs/the-future-of-language-learning-virtual-reality-in-education/

Mariselvi, T., & Kavithamani, V. (2025). Empowering refugee and migrant learners through English language teaching (ELT). *International Journal of Social Impact*, *10*(3), 345–349. https://doi.org/10.25215/2455/1003038

Mavisakalyan, A., Sotirakopoulos, P., & Tarverdi, Y. (2025). Linguistic integration improves refugee physical and mental health. *Scientific Reports*, *15*(1), Article 16129. https://doi.org/10.1038/s41598-025-96793-y

Mixed Migration Centre. (n.d.). *Information & technology*. https://mixedmigration.org/themes/information-technology/

Molin-Karakoc, L. (2025). Language MOOCs for refugee learners: Opportunities and challenges. *TESL-EJ*, *29*(2). https://doi.org/10.55593/ej.29114int2

Netto, G., Baillie, L., Georgiou, T., Wan Teng, L., Endut, N., Strani, K., & O'Rourke, B. (2022). Resilience, smartphone use and language among urban refugees in the Global South. *Journal of Ethnic and Migration Studies*, *48*(3), 542–559. https://doi.org/10.1080/1369183X.2021.1941818

Nikolaieva, T., Osipchuk, N., & Hurskaya, V. (2025). Linguistic analysis of the influence of cultural features on language practice in bilingual communities. *Futurity Proceedings*, *2*. https://doi.org/10.5281/zenodo.14916459

Perez Peguero, L. (2024). Language learning for refugees and immigrants: Innovative approaches. *International Journal of Enhanced Research in Educational Development*, *12*(2), 135–144. https://www.erpublications.com/uploaded_files/download/lisset-perez-peguero_NZcZt.pdf

Pollard, J. (2024, September 19). A volunteer network of interpreters wants to make refugees' languages more accessible. Will AI help? *Associated Press*. https://apnews.com/article/google-tarjimly-ai-translation-services-refugees-9f5b1e83bcc51b5ce9e36cc72f3a51f3

Schorr, I., Plecher, D. A., Eichhorn, C., & Klinker, G. (2024). Foreign language learning using augmented reality environments: A systematic review. *Frontiers in Virtual Reality*, *5*, Article 1288824. https://doi.org/10.3389/frvir.2024.1288824

Taj, I. H., Sulan, N. B., Sipra, M. A., & Ahmad, W. (2016). Impact of mobile assisted language learning (MALL) on EFL: A meta-analysis. *Advances in Language and Literary Studies*, *7*(2), 76–83. https://doi.org/10.7575/aiac.alls.v.7n.2p.76

USA for UNHCR. (2024, September 26). *Five takeaways from UNHCR's 2024 education report*. https://www.unrefugees.org/news/five-takeaways-from-unhcrs-2024-education-report/

Wu, D. (2024). Application of virtual reality technology in English teaching: Research on the relationship between learning motivation and learning effectiveness. *Journal of Electrical Systems*, *20*, 310–317. https://doi.org/10.52783/jes.1179

Zhang, Y. (2024). ChatGPT: Enhancing learner agency and multilingual practices in English writing class. *Journal of Education, Humanities and Social Sciences*, *26*, 1153–1159. https://doi.org/10.54097/2cwdzn44