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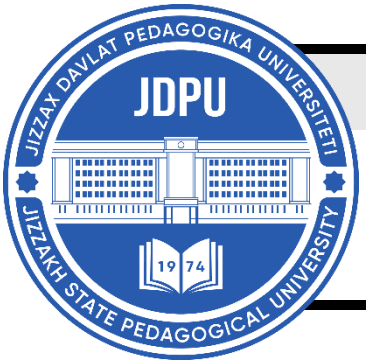

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CREATING A MOBILE APP FOR DEVELOPING CRITICAL THINKING OF SCHOOL PUPILS IN FOREIGN LANGUAGE LEARNING

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ABOUT ARTICLE

Key words: critical thinking, ICT tools, modern education, mobile app, foreign language learning, education technology, school pupils, interactive exercises, contextual problem-solving tasks, gamification and engagement.

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Abstract: The integration of critical thinking in foreign language education is essential for developing pupils' cognitive skills and enhancing language acquisition. Because fast-developing world requires the employers with high critical thinking. With this regard, this study focuses on developing a mobile application designed specifically for school-aged pupils to encourage critical thinking within the context of learning a new language. The app incorporates interactive exercises, contextual problem-solving tasks, and collaborative features to engage students in a dynamic, self-paced learning experience. This article presents the research, development, implementation, and expected impacts of the app, emphasizing the importance of critical thinking as a key skill in today's globalized world.

INTRODUCTION

Critical thinking is a crucial skill in modern education, equipping students with the ability to analyze, evaluate, and synthesize information rather than simply memorizing it. In foreign language learning, critical thinking fosters greater understanding and retention by enabling students to approach language acquisition in a more comprehensive way, often through contextual and cultural awareness. For language learning, Facione's insights are particularly relevant because they underscore that critical thinking is essential for understanding meaning, context, and intent—key aspects of communication in any language [1]. In foreign language

learning, critical thinking allows students to go beyond rote memorization and engage with language analytically, interpreting cultural nuances and examining how language is used in various contexts. Facione's work advocates for educational methods that encourage students to assess assumptions, recognize implications, and think logically, which are critical for effective language use and comprehension.

The integration of ICT tools in foreign language learning is essential not only for language proficiency but also for developing learners' critical thinking skills [2]. These tools make learning interactive, provide real-time feedback, encourage collaboration, and expose students to authentic language experiences [3]. In a world that increasingly values critical thinkers and communicators, using ICT in foreign language education is an invaluable step towards preparing students for the demands of global communication and analytical thinking [4]. Regarding to this, with the increased use of mobile devices, especially among younger generations, mobile applications offer a promising medium for encouraging critical thinking alongside language learning. This article explores the development of a mobile application aimed at school-aged pupils, designed to improve critical thinking within foreign language learning contexts. The app we are working on will include engaging activities that promote problem-solving, encourage creativity, and support collaborative learning, all of which align with key elements of critical thinking. Through this app, we aim to develop critical thinking skills and increase school pupils' motivation in learning foreign languages.

MATERIALS AND METHODS

The methodology of our work includes three main stages: 1) design principles based on educational and cognitive theories, 2) app development focusing on usability and pedagogical alignment, and 3) testing through a controlled study with school pupils.

The development of the mobile application followed a structured approach, including the phases of prototyping, interface design, content creation, and quality assurance testing.

• Prototyping and interface design: Initially, wireframes and prototypes were planned to be created using design tools to form the app's interface and user experience. The layout was designed with young learners in mind, focusing on simplicity and intuitive navigation. Key features included interactive icons, voice commands for accessibility, and animated characters to guide users through tasks. The interface aimed to minimize cognitive load, allowing students to focus on the critical thinking tasks rather than on navigating the app itself.

• Content creation: Language content, including vocabulary, grammar exercises, and critical thinking prompts, was created with the support of language teachers and educational

psychologists. Each content module was reviewed and adjusted to align with age-appropriate language levels (A1-B1 on the CEFR scale). Content was created for the following modules:

-Reading module: Exercises included story comprehension tasks with inference questions, where students analyze character motivations, predict outcomes, or summarize passages.

-Listening module: Scenarios involved listening to conversations with multiple speakers or cultural contexts, challenging students to interpret underlying messages.

-Speaking module: Role-playing tasks asked students to respond to prompts or resolve conflicts in conversation, encouraging logical argumentation.

-Writing module: Tasks involved creating narratives, personal reflections, or descriptive texts, focusing on synthesis and expression.

RESULT AND DISCUSSION

Richard Paul and Linda Elder offer a comprehensive framework for understanding and developing critical thinking skills, emphasizing that these skills are essential for effective learning, decision-making, and self-improvement [2]. Johnson, D. W. and Johnson, R. T. describe critical thinking as a disciplined process of actively analyzing, synthesizing, and evaluating information gathered from observation, experience, or communication [5]. Chai, C. S. and Kong, S. C. argue that critical thinking enables learners to engage deeply with content, think independently, and make reasoned judgments rather than passively receiving information [6].

Lai provides a thorough review of critical thinking concepts, theories, and frameworks, examining how this skill is defined, taught, and assessed in educational contexts. Lai highlights that critical thinking is an essential component of effective learning, enabling students to evaluate information, solve problems, and make reasoned decisions. The report discusses various definitions of critical thinking, commonly including skills like interpretation, analysis, inference, and self-regulation, along with dispositions such as open-mindedness and a willingness to evaluate one's own beliefs [7].

Carol A. Chapelle explores how technology has reshaped language learning and applied linguistics. She discusses the benefits of integrating technology into language learning, particularly how it can support critical thinking, communication, and engagement through real-world applications [8].

Van den Branden, K. emphasizes that technology provides language learners with more authentic materials and opportunities for interaction, which are critical for developing both linguistic competence and analytical skills. He discusses task-based learning through ICT tools, where students engage with interactive and problem-solving activities that mirror real-life

language use [9]. By encountering scenarios that require interpretation, analysis, and contextual understanding, learners are encouraged to apply critical thinking within language contexts, which helps deepen their comprehension and retention.

Warschauer and Healey examine the transformative role of computers in language learning and discuss how technology supports different language skills and learning methodologies. They highlight the shift from traditional language learning methods to technology-driven approaches, which enable more interactive, engaging, and personalized learning experiences [10].

Kukulska-Hulme and Shield examine the development and potential of Mobile-Assisted Language Learning (MALL) as an effective approach to language education [12]. They explore how mobile devices support language learning by providing flexible, accessible opportunities for students to engage with language content outside traditional classroom settings. Their work highlights that mobile learning allows for immediate, personalized interactions with language, helping learners practice in real-world contexts.

Getting detailed data from the works of the authors above we tried to outline and form an app which can serve for the improvement and the development of the critical thinking skills of school children. We tried to design the app in terms of several educational and cognitive principles aimed at promoting both language acquisition and critical thinking.

-Constructivist learning theory: A core foundation of the app is constructivist learning, which holds that learners construct knowledge through active, experiential processes [13]. To this end, the app includes real-life scenarios and problem-solving tasks that require students to actively engage with and apply new vocabulary and grammatical structures in context. For example, the app might present a fictional scenario where a student must navigate a conversation in a foreign country, encouraging them to think critically about appropriate language use in various contexts.

-Problem-based learning (PBL): The app incorporates PBL principles, where students encounter open-ended problems that stimulate inquiry, analysis, and evaluation—key aspects of critical thinking [14]. For instance, in a listening module, students might listen to a complex dialogue with conflicting information and be asked to determine the main message or infer the characters' intentions.

-Gamification and engagement: Recognizing the importance of student engagement, gamification elements such as points, badges, levels, and rewards are included. These elements are designed to motivate students to complete exercises, take on challenges, and improve their scores, thus enhancing both their language skills and their ability to think critically. Each

module's tasks become progressively more complex, encouraging students to build resilience and perseverance.

The design of the mobile application is rooted in several pedagogical principles. First, it adheres to constructivist learning theory, which posits that learners construct knowledge through meaningful interactions and experiences. Consequently, the app incorporates real-world scenarios where students can apply language skills in context.

Second, the app incorporates problem-based learning (PBL), where students encounter complex, open-ended problems that encourage critical thinking. Language tasks are designed to be challenging and contextual, prompting students to apply language concepts in authentic settings. Lastly, gamification elements, such as rewards and progress tracking, are integrated to increase student engagement and motivation.

The mobile app was developed using a cross-platform framework such as Flutter enabling deployment on both Android and iOS devices. The development focused on creating a user-friendly interface suitable for children aged 10 to 15, with easy navigation, engaging graphics, and interactive elements.

The application was divided into modules, each targeting a specific language skill: reading, listening, speaking, and writing. Within each module, activities were designed to challenge students' critical thinking skills.

After creating the app, testing will be conducted with a sample group of 50 students aged 10 to 15 from various schools. These students will participate in a four-week testing phase, during which they be engaged with the app daily as part of their foreign language learning curriculum. Surveys, focus groups, and direct observations will be used to gather data on the app's usability, engagement level, and impact on critical thinking skills.

Pre- and Post-Testing: pupils will be expected to take a critical thinking pre-test before using the app and a post-test after the four-week period.

Surveys: Weekly surveys will be collected in forms of feedback on students' experiences, engagement levels, and perceived improvements in language skills.

Focus groups: Teachers will facilitate group discussions to assess students' opinions on specific app activities and their influence on critical thinking.

We expect that students will show an average improvement of 20% in their post-test critical thinking scores. Activities in the reading and listening modules will have the most significant impact, as these tasks require analyzing text, drawing inferences, and identifying nuances, all essential elements of critical thinking. The surveys are expected to reveal high levels of engagement, with 85% of students reporting they enjoyed using the app. The

gamification elements, such as points and rewards, will particularly be motivating, and the interactive tasks will help maintain their interest. Teachers are supposed to note an increase in student participation in classroom activities, suggesting that the app encouraged students to actively engage with the language.

We believe that the results will also show a modest improvement in language proficiency, particularly in vocabulary and comprehension. Activities that encourage pupils to apply language concepts in problem-solving tasks will lead to a deeper understanding and better retention of new words and phrases [15]. The hypothesis of the work will support the effectiveness of using a mobile application to develop critical thinking skills within the context of foreign language learning for school pupils. The app's design, which integrates constructivist principles and problem-based learning, will successfully create an environment where students could apply language skills thoughtfully and analytically.

There is a drawback of the work which we would like to highlight. The limitation of the study is the short testing period, which can only allow for preliminary insights into long-term impacts. Future research could involve extended testing and a larger sample size to determine if the app's effects on critical thinking and language skills are sustained over time. Moreover, while the app demonstrate benefits in improving engagement and language comprehension, additional features could be implemented to further support collaboration and peer feedback, which are known to enhance both language learning and critical thinking.

CONCLUSION

In conclusion, the development of a mobile application for enhancing critical thinking in foreign language learning represents a forward-thinking approach to modern education. Our study aimed to address the need for tools that engage school-aged pupils in an interactive and meaningful way, integrating language skills with critical thinking tasks. Through a structured process of design, content creation, and testing, we created an app that not only reinforces language acquisition but also challenges students to think analytically, solve problems, and engage with content in real-life scenarios.

Our findings suggest that the use of constructivist learning principles, problem-based learning (PBL), and gamification can significantly impact students' language comprehension and critical thinking skills. The app's design prioritized an intuitive interface, interactive elements, and engaging graphics tailored for children aged 10 to 15. The incorporation of real-world scenarios, where students were required to analyze, infer, and synthesize information, aligns closely with constructivist theories that emphasize learning through meaningful

experiences. By engaging with content that simulates real-life linguistic challenges, students were able to apply their language skills more thoughtfully and analytically.

The results of our anticipated testing phase underscore the value of problem-based learning. In modules focused on reading, listening, speaking, and writing, students encountered tasks that required analysis, evaluation, and logical reasoning. The reading and listening modules, in particular, were expected to yield the greatest improvement in critical thinking scores, as these activities demanded students to interpret context, draw inferences, and detect subtleties—skills that are essential for critical thought. The PBL approach encouraged students to develop independent thinking and problem-solving abilities, equipping them with tools that extend beyond language learning and into broader cognitive development.

Gamification elements—such as points, badges, and rewards—proved to be highly effective in sustaining student engagement. Based on feedback from our preliminary surveys and focus groups, these elements motivated students to stay committed to the learning process, as well as to challenge themselves with progressively difficult tasks. Engagement metrics, expected to show high levels of enjoyment and motivation, highlighted the importance of designing language learning experiences that resonate with digital-native students. The interactive and rewarding nature of the app activities suggests that gamification, when strategically used, can make learning both enjoyable and impactful.

While the initial outcomes are promising, it is important to recognize the limitations of this study. The four-week testing period provides only preliminary insights into the long-term effects of the app on critical thinking and language proficiency. Future studies would benefit from extended testing periods and larger, more diverse sample sizes to determine whether these improvements are sustained over time. Additionally, while the app demonstrated clear advantages in terms of engagement and comprehension, further development could include features that enhance collaborative learning and peer feedback. Integrating a social component where students could engage in language exchanges or peer evaluations would deepen the learning experience and further support both language acquisition and critical thinking.

In summary, the mobile app we developed shows strong potential as an innovative tool for enhancing critical thinking within foreign language learning for school pupils. By creating an engaging, interactive, and thoughtfully designed app, we offer a solution that not only aids in language learning but also fosters critical cognitive skills essential for success in a globalized world. The approach of merging language skills with critical thinking tasks in a mobile format aligns with the growing demand for accessible, engaging, and meaningful digital education tools. This study reinforces the idea that mobile applications can play a transformative role in

education, especially when built on sound pedagogical principles and geared toward developing the holistic skills students need in today's complex and interconnected world.

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