To Gamify or not to Gamify: Towards Developing Design Guidelines for Mobile Language Learning Applications to Support User Experience

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Abstract. This paper explores the design and development of two mobile applications that can be used to study a foreign language. Each application is designed with a different approach to learning. One immerses the learner into a traditional environment with the ability to review grammar, track personal statistics, and complete tasks. The other employs gamification as the primary method to engage learners. After the prototypes for both applications were created, we carried out extensive, in-depth interviews to assess the applications' user experience and learning experience. The findings suggest that gamification can support long-term student retention, but "gamified" applications should provide some degree of language instruction to help guide users towards proficiency.

Keywords: Gamification, Mobile Learning, ESL, Design, Language Learning

1 Introduction

The popularity of games has caused many industries to shift from their traditional offerings to products that are gamified, including the foreign language industry. The top language learning applications, such as DuoLingo, use gamification to retain users and enhance the user experience. Gamification is the usage of game-play mechanics in a non-game context by involving *gamefulness, gameful interaction,* and *gameful design* [3]. The integration of gamification in education has been extensively studied in several settings, such as to support location-based educational activities [2] and language learning [6]. However, few studies explore the effects of gamification on second language learning. Furthermore, it is unclear which gamification elements or design guidelines effectively support aspects of learning unique to language learning [4].

This paper aims to develop design guidelines for mobile language learning applications and whether gamification is advised and to what extent. We focus on mobile applications as they are relatively easier to build and test while having generic and scalable features, and language learning applications are currently popular. To that end, we designed two applications - LearnIT ASAP and Starfighter - for learning English as a second language using two different design approaches: LearnIT ASAP uses a traditional approach to language learning while Starfighter uses gamification. Then, we conducted user interviews to evaluate the design prototypes in terms of user experience and

to gain insight with respect to designing guidelines [1]. The research question we aimed to study was how gamification can be integrated into language learning applications and which mechanics are the most effective.

2 Methodology

In this work, we present two applications - LearnIT ASAP and Starfighter (see **Fig. 1**) - that were designed in order to facilitate language learning following two different pedagogical and design approaches. LearnIT ASAP was designed as a website paradigm to facilitate traditional language learning using content and feedback to support learners and, at the same time, minimizing the amount of text and other distractions for the interface. Learners complete tasks by filling in the missing words. Based on the learner's response, the application provides feedback by coloring buttons green for correct responses and red for incorrect. Should all buttons be green, the advance button appears, allowing the user to move to the next task. LearnIT ASAP provides feedback in a summative manner and records statistics to allow users to track their progress. Starfighter employs a gaming interface with buttons positioned in the center or at the bottom. Implemented gamification mechanics seek to increase engagement. The game mechanics used were selected from a list of the most common mechanics [5]. The learner practices vocabulary and grammar by steering through an asteroid field. The app also maintains a Leaderboard to track the user's score and competitive game-play mechanics for practicing with peers.

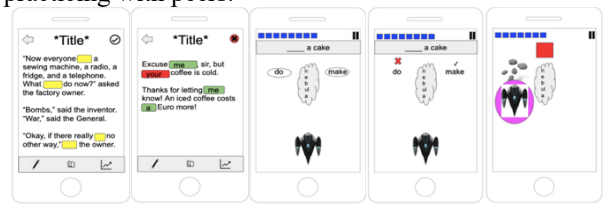

Fig. 1. LearnIT ASAP and Starfighter prototypes: The first two screens show LearnIT ASAP. The last three screens show Starfighter.

To evaluate both design prototypes, we carried out user interviews following a tested interview protocol. The interviews focused on user experience and usability aspects. Eleven individuals participated in the interviews. Participants aged between 20 and 50 years old with seven participants in the 18-29 demographic. One was a native English speaker, while the other ten had an English level of at least B2. Participants came from Europe, North America, South America, Asia, and Africa, and all were enrolled in or had completed some level of university education. Seven reported using a language learning application before, and eight believed such applications could be effective. Data was collected in video and written form. Prior to the interview, participants were provided a brief description of each application, its purpose, and user scenarios. Then, they were instructed to interact with the application and navigate to specific sections or to complete certain tasks without assistance, voicing their thought processes as they did so. After the interaction sequence, the participants critiqued each application. The final questions asked if they perceived the applications as useful and what changes are needed to enhance the effectiveness.

3 Results

Figure 2 displays the results of the user interviews according to five user experience criteria and three learning criteria. For user experience, gamification indicates how users felt while using the application. Interaction refers to if users considered the interactions natural. Navigation measures if users could logically reach the target screen. Aesthetics is if the application has a visually appealing style, and Usability is how usable the users found the application. In Learning, Gamification defines whether the users perceived the application as effective at helping them learn. Content was divided into two categories: informative and engaging. Informative indicates the users perceive the application as providing valuable educational information, while engaging encouraged the user to continue out of interest. Each criterion is graded according to a five-point Likert scale, which was then mapped to a positive-neutral-negative spectrum.

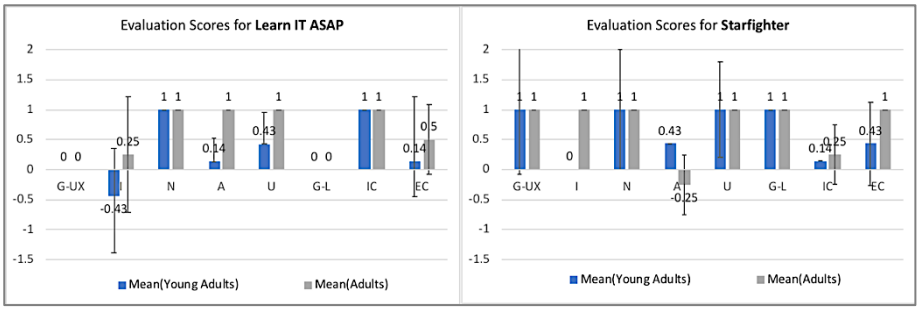

Fig. 2. User Interview Scores for LearnIT ASAP and Starfighter by age group. The evaluation criteria for User Experience were: Gamification (G-UX), Interaction (I), Navigability (N), Aesthetics (A) and Usability (U). The evaluation criteria for learning were: Gamification (G-L), Informative Content (IC) and Engaging Content (EC).

LearnIT ASAP was considered more educational than Starfighter. One user said, *"For a student of the level it is intended for, it would be useful. It practices one of the main tasks students do in school…*" The usage of dropdown menus over writing or swiping was contended. One user in favor stated that dropdowns were perfect because of the size of the standard smartphone screen. Adults had a positive impression of the interaction patterns, aesthetics, and usability, likening them to a comfortable webpage, while young adults possessed a lower opinion, stating that a webpage style does not fit a mobile app. Starfighter was preferred because of the gamification and aesthetics. One user said, "*It was good for me to have this concept like I'm in space… I keep answering and going forward so that my ship doesn't crash into the nebula.*" Similar to LearnIT ASAP, young adults disliked tapping, while adults accepted the interaction, yet were more likely to be ambivalent to the space and gaming aesthetics. Young adults wanted to swipe, with one saying, "*I wish I could have controlled the ship.*" Leaderboards were an interesting point of contention. Participants who considered themselves averse to competition or games disliked the function, but those who loved games enjoyed the communal and motivational aspect.

4 Discussion

The primary objective of both applications is to scaffold the user's skills in the target foreign language. The main difference between the two applications is the usage of gamification, which means the debate centers on whether gamification is a necessary and effective method for use in a language learning application. The results seem to confirm existing literature on the effects of gamification and the balancing of short-term and long-term educational goals [5]. While the pedagogical approach of LearnIT ASAP is perceived as having greater instructional value and being more effective in the long term by exposing the user to a greater amount of vocabulary and grammar in potential real-life situations with more challenging tasks, the non-existence of a clear incentives-based system may render the application unable to retain users. At the same time, Starfighter may be incapable of scaffolding a user to proficiency due to limited content, short prompts, and no real-life context, but the game mechanics were indicated as the reason for content being engaging and motivating for users. The lack of grammar could be appealing to casual learners who do not want to stress over grammar lessons. Comparing the demographic groupings of young adults aged 18-29 and adults aged 30-50, while there was no major difference in the perception of the applications' contents, young adults preferred swiping whereas adults indicated tapping was better.

For future work, we aim to test these applications using functioning apps with animations and timing to accurately evaluate user experience. We also plan to integrate further functionalities (Learning Analytics mechanisms) to provide personalized and adaptive, user-specific learning experiences and multiplayer game modes to facilitate group and classroom play.

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