Learning as Adventure: An App Designed with Gamification Elements to Facilitate Language Learning

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Abstract. The increasing spread of mobile technologies provides educators and developers with more opportunities for creating a wider range of education tools. In this paper we propose a game-based language learning system called ADVENTURE to improve the learners' skills for language learning and self-motivation to learn. Firstly we introduce a focus group conducted to understand learners' needs and language learning behavior, then we review some of the background research works in the field of gamification and language learning. Following the research finding and user study, the paper presents the design and development of ADVENTURE which creates immersive experience for language learners. The application adds not only the gamification elements included game mechanism and the aesthetics but also the elements in the process of learning. The final output reaches the target of improving the learning efficiency and interesting the progress of learning.

Keywords: Gamification elements · Language learning · Motivation · Mobile application design

1 Introduction

In the context of language learning learners tend to increasingly rely on independent, individual study—instead of taking conventional classes and have face to face oral practice. Learners do not have enough opportunities and appropriate situations to communicate in the second language. This paper introduces a gamified mobile learning tool in order to address this issue.

The development and usage of mobile apps for language learning has become increasingly popular in recent years [1]. Mobile apps have the advantages of providing new opportunities for visualizing learning material, allowing rapid feedback to learner's task, which enhance traditional teaching and learning process.

By reviewing research on gamification and learning strategy, we get design inspirations. The concepts explored from the game world is helpful for visualizing and distributing language learning materials and tasks in a motivational and effective manner. The aim is to increase motivation through the integration of gamification elements and learning.

Following this direction, we proposes ADVENTURE as a gamified learning application for second language acquisition. The application adds not only the gamification elements included game mechanism and the aesthetics but also the elements in the process of learning.

The main intension is to make independent learning more interesting, improve learning efficiency and effectiveness, and strengthen learning outcomes. In short, we seek to satisfy learners' language learning needs.

2   Identifying Learners' Needs

At the beginning of design process, we would like to have some general information about learners' needs and current products. A focus group was conducted with fifteen Chinese participants who were willing to self-learn English as a second language by using mobile learning tools. The participants were selected with both experience in using mobile English learning applications and playing various games. The aim of the focus group is to understand potential users' learning motivations, current products and in the consumer market and potential users' gaming behaviors. These are the set of subjective questions.

2.1   Learning Motivations

What's your aim and objective for learning English? Which language level are you at? How do you use the current mobile learning aid products? Are you satisfied with them?

The result shows more than half (60%) of the interviewees are learning English as a second language for specific time-limited goals, such as preparing for examinations or applying to study abroad. While 40% users left are learning second language just for personal interests. They have a long-term and on-going learning manner and believe mastering a second language will be beneficial in the future though there are no direct benefits for them right now. Their time schedule is quite flexible. For the users who have definite goals, the learning content is decided by the exact examination type e.g. TOEFL or IELTS. For the other users who have more flexible plan, they focus on strengthening practical language skills such as listening and speaking.

2.2   Market Landscape

What kind of apps have you used for language learning and why? Are they effective? If there is room for improvement, what features of products do you expect?

The language learning mobile applications on the current market can be divided into three categories: 1. Full-range app covers all dimensions of language learning aspects including listening, speaking, reading, writing and translating, e.g. VOA English; 2.

Particular-focus app concentrates on one specific aspect of language learning such as apps for vocabulary increase or grammar acquisition; 3. Play-and-learn app motivates users through singing songs or dubbing as native speakers for English movies. The examples in this category are Mofunshow, Sing English and etc.

2.3 Gaming Behaviors

What kind of games are you playing and why? Can you give an example? What are the elements in game attracting you?

Most of the respondents are keen on Role-playing games (RPG), online multiplayer games (MMO) and Adventure game (AVG), which are the main types of mobile games. People play games for various purposes, they seek for excitement, enjoy exploring in adventure, build social networking in virtual world and etc.

2.4 Summary

Regardless the growing trend of using apps for language learning, the great majority of learning tools still focus on individual vocabulary or grammar learning which do not enable learners to effectively communicate with others in the target language. Instead we should take advantage of the communication capabilities mobile devices provide its users with. The fragmented knowledge such as vocabulary and grammar need to be complemented by other skills such as interaction.

3 Gamification Theory

3.1 Gamification

Although games are originally designed to serve fun and entertainment, since they can motivate learners to engage with them with unparalleled intensity and duration, game elements have the capacity to make other non-game products and services more enjoyable and engaging [2]. Recent years have witness a fast expansion of consumer applications in various contexts that takes inspirations from games. This phenomena can be summarized as "gamification".

Industry has tried to describe "gamification" practically in terms of client benefits. Helgason, CEO of Unity Technologies (the company produces one of the most popular game engines Unity) described gamification as "*the adoption of game technology and game design methods outside of the games industry*" [3]. Zicherman presented in Gamification Summit about "*the process of using game thinking and game mechanics to solve problems and engage users*" [4]. Another famous game company Bunchball defines it as "*integrating game dynamics into your site, service, community, content or campaign, in order to drive participation*" [5]. In order to define the term for research use, Deterding examined the gamified applications and then described "*gamification*" as "*the use of game design elements in non-game contexts*" [6].

3.2 Gamification Elements

Deterding also suggests narrowing "*gamification*" to the description of "*gamification elements*" characteristic to games [6]. The elements should be found in most but not necessarily all games, and play a significant role in gameplay. This definition is quite blurred, which directly leads to the questions: what is "*characteristic*" for games? Which elements can be categorized into the list of "*gamification elements*"?

Obviously not only visible, easily distinguishable elements such as point and avatars are gamification elements, but also more fundamental game structure and mechanics. In the research field of game, there are already some similar, competing and overlapping definitions of gamification elements. MDA model is a formal game framework consisted with game mechanics, game dynamics and aesthetics [7]. The MDA model suggests that designers work with mechanics to create aesthetics, whereas players experience aesthetics, and in so doing, infer knowledge about mechanics [7]. It identifies mechanics as game elements on the technical level, dynamics as interaction with the player, and aesthetics as the desired player experience triggered by mechanics and dynamics. Based on MDA model, "*game design atoms*" was further identified by Brathwaite and Schreiber [8]: game state, game view, player representation, game rule system, game dynamics, goals, and game theme.

Haimari and Koivisto proposed nine dimensions of a gamified environment [9]: Challenge-skill balance, clear goals, control, feedback, experience, loss of self-consciousness, time transformation, concentration, and merging action awareness. These nine dimensions represent outcomes of gamification.

Reeves and Read listed the "*Ten Ingredients of Great Games*" as [10]: Self-representation with avatars; three-dimensional environments; narrative context; feedback and behavior reinforcement; reputations such as ranks and levels; marketplaces and economies; competition under rules; teams; parallel communication systems that can be easily configured; time pressure.

Some research looks at game structures. According to Prensky there are six elements of game structure [11]: Rules, Goals and Objectives, Outcomes and Feedback, Conflict/Competition/Challenge/Opposition, Interaction, Representation or Story.

3.3 Gamification in Education

These definitions and lists above allows defining what specific elements that gamification cover and inspires us to make use of them for designing in education context. Garris believed that games have multiple advantages such as enabling knowledge acquisition, increasing learners' motivation, encouraging analysis, synthesis and evaluation of concepts [12]. Game-based learning refers to the process and practice of learning through games [13]. The use of gamification elements combines both fun and entertainment with educational purposes [14]. The integration of gamification elements can leverage people's natural desire for mastery, achievement, etc. Lawley values the complexity of a well-designed games, he argues that reducing the surface elements such as interface characteristics and game dynamics falls short of engaging students and can even damage users' emotions and engagement [15]. With so many research and literature

at place, though few studies are conducted in the area of language learning to explore such new opportunities.

4   Learning Theory and Strategy

Although vocabulary input and grammar knowledge is a primary learning task during the early stages of language learning process, learners still require consistent, meaningful language interaction. The focus should be more on learning to use the language as a supporter for effective communication rather than the vocabulary or grammar alone [16]. Flipped Learning Approaches [17] place the emphasis on actively working through challenges, which is interacting and communicating with the second language in real situations instead of decontextualized learning. Some theories of language learning put emphasis mainly on enabling learners to communicate effectively in the second language [18]. Beth Kemp Benson describes Scaffolded learning [20] as framing, guiding, and supporting learners by organizing information into categories in order to focus attention. She believes it can eliminate the learning problem at the beginning and allow learners to restart whenever they gets stuck. It is noted that learners are not given enough opportunities to practice in the second language, which is essential to successful language acquisition [19].

5   App Design

Upon reviewing the available literature about gamification theory and learning strategies, we propose ADVENTURE as a gamified learning application for second language learning. The setting of the application take reference of AVG and RPG, which lets the learner play the main role in an adventure story. In order to support the learning process, this game based application creates an attractive storyline with mystery, user-friendly game environment and immersive and appropriate visual effects. Some featured dynamics and concepts found in game design are applied to this learning context, these are:

5.1   Storytelling by the Learner

Most games employ some type of story. Kapp notes that "*people learn facts better when the facts are embedded in a story rather than in a bulleted list*" [21]. Storytelling by the learner instead of by the system is featured in ADVENTURE. Once the game starts, the learner will play the main character in an adventure story and try to overcome the challenges step by step with the enhancement of language acquisition in order to complete and reveal the mysterious adventure story. The learner can get hints from the images and some random words generated by the application. A handy digital dictionary is always available (Fig. 1).
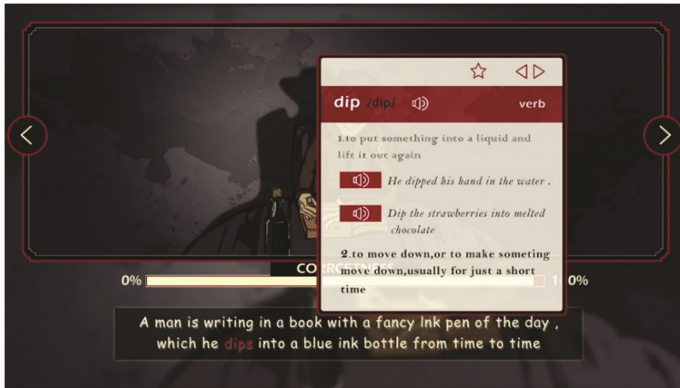
Fig. 1. The learner writes the narratives with a digital dictionary

It is the learner write and speak the narratives of the story himself. The experience created by the application is like acting in a movie and exploring in an adventure.

The gamification elements: challenge, curiosity and achievement are used to motivate learner to follow the storyline in ADVENTURE and gradually improve his or her language skills simultaneously. In this game-based learning tool, learners don't simply watch and memorize what the application has placed before them, they need to interact in second language to make things happen. Their learning effort decides how the story goes.

5.2 Progression

Progression is applied throughout ADVENTURE in the form of levels and missions. As shown below, the virtual credits are used as rewards for the learner to achieve each fragment of the adventure story. With more fragments unlocked, the result of the mysterious adventure story is being revealed (Fig. 2).
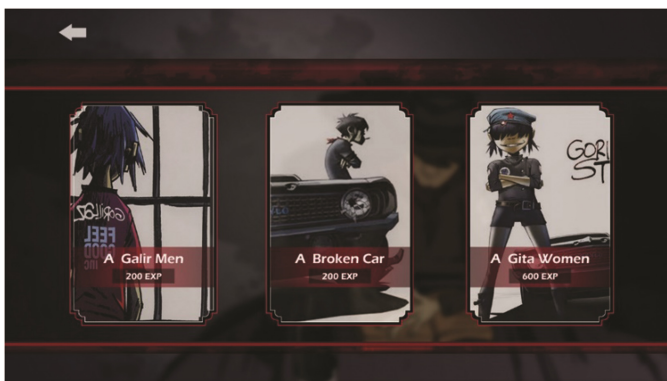

Fig. 2. Levels and missions in the app

Once all the levels are completed, a movie will be played as a final reward for the learner, in which the narratives are created by the learner. Here visualization is an effective way of sharing results as graphical representations, which create immersive experience for the learner.

5.3 Rapid Feedback and Freedom to Fail

In the adventure story set by this application, the learner has to interlink the images from the story with some meaningful words and phrases, which enhances his reading skills and broadens his vocabulary. A correctness bar is used to indicate whether the learner is using the appropriate words and correct grammar to describe a scene in the story (Fig. 3).

Fig. 3. The learner gets feedback from the correctness bar

In order to practice speaking skills, ADVENTURE requires learners to rehearse the narratives, which is like an actor read lines in a movie. The learner can also retry speaking the narratives as many times as he or she wants. The system examines learner's pronunciation and provide rapid feedback for correction afterwards (Fig. 4).
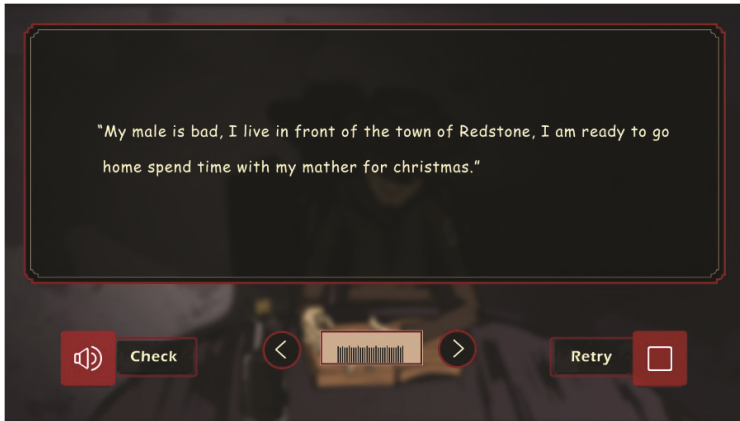
Fig. 4. The learner speaks the narratives

The rapid response and freedom to fail help learners to explore content, gain language skills through playing with the words.

5.4 Information Retrieve

According to the memory theory, people rehearsal the information in short term memory storage in order to transform it to long term memory, which is the knowledge and skills acquisition process. ADVENTURE provides learners with opportunities to retrieve the history data. The information including texts, images, audios and scenes are organized in timeline so that learners can always go back to revise and find the hints for exploration in this adventure story (Fig. 5).
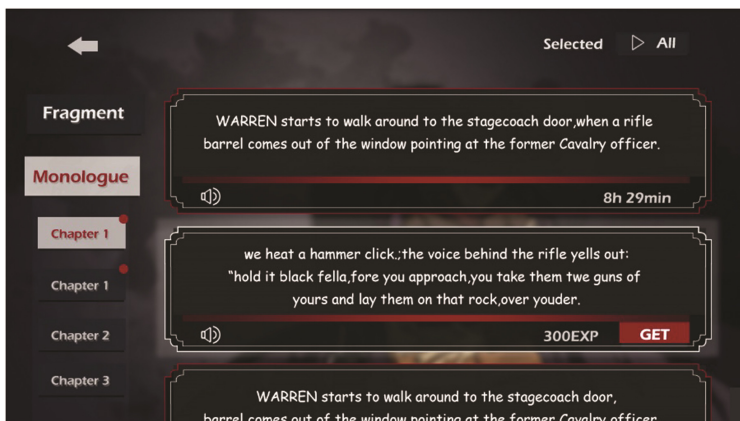

Fig. 5. The learner retrieves history data

By designing this application using gamification elements that not only delivers multimedia learning practice but also need learners to apply their language skills to contextual communication tasks.

6   Conclusions

In this paper, we present ADVENTURE as a gamified learning application for language learning. The application adds not only the gamification elements included game mechanism and the aesthetics but also the elements in the process of learning. The final output reaches the target of improving the learning efficiency and interesting the progress of learning. The results of the work contribute to evidence that gamification theory has the potential to engage users, and be useful in facilitating a language learning experience.

As future work we aim to make a user test to understand how the gamification elements facilitate the learning process for language learning. Some relevant data should be collected including pre-test and post-test results as well as learners' feedback on the learning experience. This way we will be able to draw stronger conclusions on how gamification used in mobile technologies may influence learners' behavior and learning outcomes when they are using ADVENTURE in the target language.

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