User Testing of a Language Learning Game for Mandarin Chinese

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Abstract

Polyglot Cubed is an educational game to facilitate the learning of multiple languages. The game is an implementation of contemporary theories in motivation, education and entertainment. This document provides the results from a formal user evaluation of the game. This evaluation was designed to determine user defined difficulties in game experience and understand user interest in its solution. Preliminary results indicate favorable interest in the game as a tool for learning Mandarin Chinese and minor challenges in gameplay experience.

Keywords

Games and learning; video games; language learning;

ACM Classification Keywords

H.5.2. [Information Interfaces and Presentation]: User Interfaces – Graphical User Interfaces (GUI).

Introduction

The primary goal of the Polyglot Cubed game is to provide a general audience with a way to learn basic vocabulary for planned foreign language immersion. The game is designed to assist people who are planning a trip to a foreign country, a visit with foreign language speakers, or other situations in which a few common

vocabulary words will be useful. The game seeks to create a casual gameplay environment for learning vocabulary.

Background

The impetus for developing Polyglot Cubed comes from a few common observations about many educational games. This includes understanding that more than 75% of educational games are focused on children [4], despite the needs of adult learners. Adult learners often have a higher degree of intrinsic motivation and a great capability to work with little guidance [9].

Many educational games result in an awkward coupling of game-goal with educational goal [1]. This is often the result of interrupting the play experience with testing or other tasks not directly related to the game's goal. These tendencies are anti-immersive, divorcing players from the enjoyable experience of the game [2] and ultimately detracting from the game's value.

It is also understood that many educational games are mini-Games [3], typically offering very specific learning objectives (e.g. learning colors or numbers). This model often requires the learner to mix and match games to complete their fundamental objective of learning a language.

Educational games also often lack professional aesthetics on par with non-educational game design. As Klopfer states, "there is no reason that good learning games couldn't similarly appeal to players while embodying aesthetics that differ from the mainstream game industry" [7].

The Polyglot Cubed game seeks to address these observations. The game's original prototype has been recognized by awards [5,8] and informally critiqued at a variety of academic conferences [6].

Design

Polyglot Cubed is a matching game designed around 6 rooms of floating, cubicle tiles. Each tile is assigned a foreign language word, and a pictographic representation of that word. The cubes are clustered by topic, usage, or form of speech to encourage contextual recognition and aid visual memory. These clusters are described as rooms. The player must match the spoken word with the cube that corresponds to it. When the player has matched a word and its image correctly, the cube becomes a piece of an unfinished image. When the player collects enough matches, the image is completed. In analogy, as the player collects words their understanding of the language becomes clearer.

The game is designed to be played on touch devices or with a traditional mouse and keyboard setup. The Mandarin Chinese version tested contains a 180 word vocabulary.

User Testing

The researchers invited 21 volunteers to assess the game's potential for a wider audience. Users were provided a pre-evaluation digital survey to gauge their experience with foreign language and computer-based learning systems. Each user was then provided an opportunity to play the game in a lab environment. Once users concluded play, they were asked to complete a post-experience digital survey. All

participants were provided a copy of the game at the conclusion of the study.

Pre-Survey Results
The group of research participants represented a fairly appropriate demographic set. 67% were female, the remainder were male. The mean age of the participants was 31, with a median of 21 and a range from 19-61. 60% had completed a high-school education or beyond.

19 participants, or 90%, were native English speakers. 67% of the users listed experience with another language, most commonly Spanish (7 participants) and French (4 participants). 2 participants were native Mandarin Chinese speakers. 3 users were novice speakers of Mandarin Chinese, with some exposure to the language through former immersion or education of at least 2 weeks.

All participants claimed comfort with using a computer and indicated they were comfortable using new software. 86% of the participants played games less than 2 hours a week, and 14% (3 participants) played such games for 5 or more hours a week. 71% never used a computer game to practice language, and 48% never used a computer application of any type to practice a language.

Playing the Game
Participants were asked to play the game in a laboratory environment. Each participant was asked to play for as long as they'd like at a workstation as a non-directed qualitative means of gauging interest. Sessions were played on IBM/Lenovo Thinkpad Tablet x40's. Players were introduced to the game via a standardized script which demonstrated the controls and goal of the game using both conventional mouse-keyboard interaction and tablet based play.

On average players elected to play for 20 minutes. Play time was recorded in 5 minute intervals. The x40 computers allowed players to use tablet-play and mouse-keyboard interaction simultaneously. As a result, data on usage preference was unclear. From researcher observation the majority of players biased toward mouse-keyboard interaction.

Post-Survey Results
As survey questions allowing only yes or no answer, 90% (19 participants) of the participants claimed they did enjoy playing the game. 71% of the users indicated that they felt more comfortable with Chinese vocabulary. 71% also felt the game helped them increase recognition of Chinese vocabulary.

90% of the participants believed the game was a useful tool to practice vocabulary. 90% also felt they would recommend the game to other people interested in learning Chinese vocabulary. 80%, or 16 users, found the game easy to play.

When asked to identify any difficulties they experienced while playing the game, the largest group at 60% identified at least one problem in selecting a cube while playing. The second most common gameplay challenge was seeing pictographic representations of words with 40% of the players noting it.

Future Work
This preliminary research was designed to highlight any distinct problems through user feedback. In essence, the researchers wanted to understand if the project is

headed in the right direction. As such, the researchers solicited simplified feedback, preferring for example binary responses of yes and no to Likert scales. Subsequent research will use more traditional means of user evaluation and higher fidelity data collection (e.g. shortening 5-minute recording interval to 1 minute). Future research will also involve comparative analysis of the Polyglot Game to other language learning systems.

Conclusion

The researchers regard this feedback as generally positive. The results are most favorable when considering that after a single session of play, 71% of the players felt more comfortable with Mandarin Chinese. Qualitatively, this is the most compelling evidence that the Polyglot Cubed goals are being met. The game merely aims to help players become more comfortable with a few commonly used words in Mandarin Chinese.

90% of the group selected the words enjoyable, useful and worth recommending in the post-survey. This is surprising since 43% never played a computer or videogame, an indicator of relative disinterest in digital games. As one participant wrote, "I am not a gamer but this was an interesting way to learn a language."

Of the players who did not enjoy the experience (10%) or players who did not find the game easy to play (20%), the most common complaint was the feeling of being overwhelmed by an unfamiliar language. As one participant wrote, "It was fun, but frustrating because I was so bad at it. I'd like less word options, so that I could focus more on learning."

While no design will be an optimal experience for all users, it seems that Polyglot Cubed is headed in the right direction. From this study it is clear that reducing the number of words presented to new users would reduce player stress.

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