

WhiteStone: A Tangible interactive device for revitalizing Qiang language and culture

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Figure 1: (a) Audible learning cards. (b) Qiang's Shibi Painting "Shuarile". (c) Game Interface. (d) System Architecture of WhiteStone.

ABSTRACT

The Qiang is an ancient minority in western China. However, the number of people who can speak the Qiang language is decreasing due to a lack of written text. Although the protection of intangible cultural heritage has been widely discussed, there is still a dearth of interactive design for the Qiang people's language and culture. This research aims to determine the efficacy of tangible interactive games to encourage Qiang people's interest in learning the Qiang language and increase their cultural awareness. To better understand the current state and challenges of Qiang language and culture, we conducted a three-day field investigation in the Qiang villages. Based on the field study's key findings, we created "WhiteStone," a tangible interactive projection device based on the heroic epic of Qiang. This poster examines the design opportunities for tangible interactive games to revitalize the Qiang language and culture.

CCS CONCEPTS

• **Human-centered computing** → **Interaction devices.**

KEYWORDS

Qiang people, tangible interaction, cultural heritage, ancient myths and stories, Chinese culture

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1 INTRODUCTION

Inheritance and development of indigenous languages is a vital means to protect intangible cultural heritage [Bedjaoui 2004]. The Qiang is an ancient minority that live in western China's hilly regions. Due to they lack a script, Qiang people can only pass on the Qiang language orally [Thurgood and LaPolla 2016]. The Qiang language has been on the danger of extinction in recent years, as fewer Qiang people are able to speak it. He et al. [Fangfang He and Wu 2018] proposed a mobile application that shows how digital technology might support Qiang language learning. Tangible Interaction was proven to be beneficial in the study of indigenous languages [Taylor et al. 2020]. However, the current research on protecting the Qiang language and culture by designing a tangible interactive game remains underexplored. This research aims to determine the efficacy of entity interactive games to encourage Qiang people's interest in learning the Qiang language and increase their cultural awareness. To gain an in-depth understanding of the challenges of the Qiang language and culture and the insight of the Qiang people on it, we conducted a three-day field investigation in three Qiang villages located in Li County, Sichuan. Inspired by the investigation findings, we created "WhiteStone", a tangible interactive projection device based on the heroic epic of Qiang. Through remote evaluation of young Qiang people, we received positive emotional feedback and valuable suggestions for our prototype.

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2 DISCOVERY SESSION

In October 2020, four researchers conducted a three-day field investigation in Li County, where the Qiang people dwell, in order to gain a deeper insight of their language and culture. Introduced by a local guide, we observed and interviewed 21 Qiang people proficient in the Qiang language (Age between 47-76, 16 males and 5 females). This survey consists of 15-40 minute semi-structured interviews. The following aspects served as a guide for the interview: 1) the state of the Qiang language inheritance 2) the challenges encountered by the Qiang people in learning the Qiang language 3) the Qiang people's ethnic identity and cultural consciousness. With the permission of interviewees, the entire interview process was recorded. The recording file was coded verbatim and proofread by the researcher. We summarize and categorize the interviewee's views.

After analyzing the interview data, we discovered that young people in the Qiang villages had difficulty communicating in the Qiang language on a regular basis. The absence of usage scenarios was also discovered to be a restriction of Qiang language heritage. There is no writable texts in the Qiang language, hence learning the language is based on memory. In addition, most Qiang teenagers lacked the motivation to learn about their culture. Older interviewees mentioned that when they told the younger generations about the Qiang people's historical hero stories, such as "The Qiang-Ge war"¹, the youths behaved indifferently. Based on these findings, we proposed three design principles: 1) Use a tangible interaction game to attract young people's interest in the Qiang language and culture. 2) Through scenario simulation, rebuild the previous use context of the Qiang language. 3) Strengthen their awareness of national culture through nationalized content and visual design. These principles inspired us to design "WhiteStone".

3 SYSTEM DESIGN

3.1 Context Design

WhiteStone is a tangible interactive projection device based on the heroic epic of Qiang, including the Qiang language teaching session and an interactive game. We first taught players the Qiang words that will be used in the game. Based on conventional teaching methods of local elderly, we digitized and visualized the learning process by designing patterned audible learning cards (Fig 1a). The Qiang heroic epic "the Qiang-Ge War" was chosen to run through the game and be presented as an audio-visual book. To enable Qiang young people immerse themselves in the historical traditions of their own nationality, we simulate battle scenarios of repelling enemy invasion. In addition, during the interview, we were informed that throwing stones is one of the Qiang people's favorite childhood games. Therefore, we use throwing action as the main interactive method of the game, and choose white stones² as throwing items. Considering the safety factor, we substitute hard white stones with soft and low-elastic tennis ball props. The infrared touch frame on the wall scans the obstructions through an infrared matrix to

¹The Qiang-Ge war tells a story of the Qiang ancestors using white stones to repel the invasion of the Geji (A group of ferocious aliens with thick body hair and a long tail.)

²The Qiang people believe that white stone is the incarnation of the god Abamubita they worship. White stones are placed on the highest part of the roof to show respect.

locate where the ball hits. In order to enhance the player's sense of engagement, our game allows voice input to encourage players to speak the Qiang language. For instance, shouting a specific Qiang language pronunciation will help you gain more points. When the player shouts out some specific Qiang language pronunciation, the game characters will use special powers to obtain a higher score.

The design of the visual materials integrates the cultural elements of Qiang to enhance intimacy. We attempted to depict the charm of Qiang culture by drawing on the artistic style of an important cultural relic, Qiang's Shibi Painting "Shuarile" (Fig 1b), paired with distinct Qiang components such as Qiang flute and Qiang towers.

3.2 Interactive of WhiteStone

WhiteStone's system architecture is depicted in Fig 1d. After completing the teaching session via card practice, players arrived at the game area to begin the game. "Qiang-Ge War" begins with a fairy tale backdrop projected on the wall, then participants collecting the prop ball from the box and knocking it against the enemy on the wall, much like throwing a "white stone" in fight. Throughout the game, players can demonstrate their abilities by shouting out the Qiang language to earn high scores. For instance, if the player shouts "bu per sa"³, the Qiang warriors will play the Qiang flute to stun and immobilize the enemy (Fig 1c). Our game enables multiple players to throw and roar in unison to attack the enemy, enabling Qiang people to recognize the spirit of their ancestors and battle the attackers bravely.

3.3 User Study

We are not permitted to return to Qiang villages to run user studies due to the pandemic. As an alternate way, we conducted one-on-one remote video demonstrations and online interviews with 9 young Qiang people aged between 14 to 25. We employed coding and classification methods to proofread and analyze the interview scripts. The findings indicated that the majority of interviewees considered this method of learning was innovative. Following the video demonstration, they expressed a desire to play the game in person to learn the Qiang language. They stated that this interactive gameplay enables them to reflect on their language and culture's neglect. Additionally, interviewees mentioned that the game's Qiang elements, historical story, and visual styles brought back memories of their own unique childhood.

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³The pronunciation of "Qiang flute", a traditional musical instrument of Qiang.