

Revitalizing Viena Karelian dialect and culture with gamification

Triando Damiri Burlian¹[0000-0001-8849-1286], Parsa Sharmila²[0000-0002-6797-0365],
Paula Alavesa²[0000-0003-3546-5150], and Leena Arhippainen¹[0000-0001-6698-9788]

¹ University of Oulu, INTERACT Research Unit, 90014, Oulu, Finland

Triando.DamiriBurlian@student.oulu.fi

Leena.Arhippainen@oulu.fi

² University of Oulu, Center for Ubiquitous Computing, 90014, Oulu, Finland

Parsa.Sharmila@student.oulu.fi

Paula.Alavesa@oulu.fi

Abstract. Revitalizing Viena Karelian dialect by finding new ways of learning and teaching Karelian culture and language is important. Karelian is a Finnic language and it is the closest linguistic relative to Finnish. It is spoken in Finland and Russia and its dialects must not be mixed up with Karelian (south-eastern) dialects of Finnish. It is estimated that there are approximately 5,000 speakers of Karelian language in Finland and about 20,000 persons can understand it to some extent. According to the 2002 census, there are approximately 53,000 Karelian speakers in Russia. In both countries, speakers are mainly elderly. Therefore, the gamification approach was used to design and develop an educational game from non-gaming contexts for aiming to prevent language or its dialects extinction. In this study, a "Let's Learn Karelian" game prototype was designed for learning Viena Karelian dialect where English and Finnish users can use it and learn in a fun and effective way. A non-functional prototype was developed with the Microsoft PowerPoint in a mobile context to get preliminary feedback from users. A relatively small user experience study with five participants was conducted in the early phase of development at the University of Oulu. Based on the feedback, the game prototype was perceived as visually pleasant, creative, easy to use, playful and entertaining. This paper also briefly introduces our new functional "Learn Viena Karelian" prototype. According to our findings there is a need to develop various games for revitalizing Viena Karelian dialect and culture.

Keywords: Gamification · Educational game · Viena Karelian dialect · Language and culture · User experience

1 Introduction

Language and culture are non-gaming contexts, where it is usually learned from books, formal studies, and social interactions in social life. Those contexts can be applied with game design elements to develop educational games, where it increases motivation and engagement of users to learn [9,10]. The gamification approach is an implementation of non-gaming contexts to increase fun experiences and improve the effectiveness of learning. An evaluation of empirical study in [3] shows that educational games are

very effective for educational purposes compare to traditional teaching methods. This evidence motivated us to create an educational game for learning Viena Karelian dialect and culture.

Based on the Russian Population Census in 2010, there were 643,548 people who lived in the Republic of Karelia [32]. According to the 2002 census, there are around 53,000 Karelian speakers in Russia. This amount includes 35,000 speakers in the Republic of Karelia and 12,000 in the Tver oblast [27]. Relatively many Finnish have ancestry and relatives in Karelian, but approximately only 5,000 Finnish speak Karelian language and around 20,000 can understand it [37]. The small number of Karelian speakers in both countries can be a threat to Karelian language and culture, so there is a need to revitalize language and its dialects with an innovative approach for users from different age groups and language backgrounds.

During the last few years, there have been different projects, such as [13,25] which aim has been to revitalize Karelian language. In addition, different language courses have been organized, for instance by Karjalan Sivistysseura in Finland and the Republic of Karelia, also new books have been published in Karelian and its dialects. However, language teaching is still quite traditional, because courses are organized in certain locations with available teaching resources. Our long-term aim is to enable interesting language and culture learning context-independently for different user groups e.g. children and teens, adults, and senior citizens.

In educational games, knowledge acquisition is an important aspect where users can gain new experiences for educational purposes [6]. Language and cultural aspects can be included in educational games to motivate beginner users. Therefore, the gamification approach was used in this game development project to design and build an educational game from non-gaming contexts. In this study, our aim was to help English and Finnish speakers to learn Viena Karelian dialect, thus facilitate and increase the communication between new learners and citizens in the Republic of Karelia, especially in the North-Viena.

Karelian is a Finnic language and it is the closest linguistic relative to Finnish. Karelian language is divided to Karelian Proper and Olonets Karelian (Livvi-Karelian). Karelian Proper is divided to North Karelian (Viena, White Sea) and South Karelian. Nowadays, Lude has been seen as own language, not as a dialect of Karelian [27,36,37]. Our VIENA-PELI game development project focuses on Viena Karelian dialect, which is very close and similar to Finnish language. According to our prior interviews with Karelian teachers and learners, there is a need to develop mobile and web games for learning Viena Karelian dialect and culture. Therefore, Duolingo and Gardens of Times were used as basic references in the concept and design elements. Those games are quite popular games to learn languages and cultures, and free to use as computer games and mobile games.

Our first mobile touch phone game concept was implemented as a non-functional prototype by using the Microsoft PowerPoint. In the early design phase, we utilized a low-cost and time-effective game prototype for gathering preliminary feedback from users. The prototype was designed available for English and Finnish speakers, and users were able to explore the learning and playing modes. There were only limited number of features available and users were able to use certain specific procedural tasks.

This paper presents the "Let's Learn Karelian" game prototype and preliminary user experience results. In the user experience (UX) [21] study, the five participants were given approximately 10 minutes to play the game with procedural tasks which were guided and observed by the researchers. After that, each participant selected four out of 24 adjectives to express their feelings and opinion about the game. In this paper, we also introduce our new functional prototype, which will be tested with authentic users.

2 Related Work

2.1 Gamification and Educational Games

Gamification is the use of game design elements to make non-gaming contexts more motivating, engaging, and enjoyable [9,10,22,38]. Non-gaming contexts of language and culture are books, face-to-face learning, and social interactions. Moreover, gamification of language learning was the most common implementation with positive results and can increase the motivation of users [1,18]. Therefore, gamification is a suitable approach to make a learning environment within games that focus on educational elements. Design elements are more simple than games for pure entertainment and the elements consist of badges, levels, points, and leaderboards [9]. Those elements can be applied in non-gaming contexts to create an educational game with simple features and less focus on entertainment.

Gamification has been widely used to enhance language learning. Language learning has been at the forefront of digitalizing learning environments, perhaps because of the ease of implementing learning vocabulary and grammar in text-based digital applications [28]. Current language learning environments provide also possibilities for training speech and connecting with other language users [29]. Gamification solutions, in addition, emphasize motivation, which is known to be a key component in the learning process [14]. For this reason, although as pedagogical strategy gamification is new, it has been used in teaching in a similar way and was in use already before being called gamification [31]. Gamification can contribute positively to learning experiences [14]. It can bring teachers and students learning goals closer [7]. It enhances learning outcomes of both children [24,35] and adults [5,7]. All of these benefits have been studied and observed specifically in language learning.

Furthermore, educational games are serious games in educational contexts that focus on learning environment [3]. Educational games are a better learning environment than traditional games and usually implemented as computer games and mobile games [3,15,17]. The main goal of educational games is knowledge acquisition, where users can learn new topics for different educational purposes [6]. Educational games focus on user's engagement, simple features, context of play, and learning activities [3,6,8,22,38]. Those aspects increase the willingness of users to learn and increase the effectiveness of learning. Additionally, educational games should be easy to install, easy to learn, and less social interaction than pure entertainment games [19].

There was previous research of language learning with an educational game, where students who studied English with educational games achieved the better result in listening, writing, and reading skills rather than students who studied with traditional face-to-face learning [40]. Moreover, the use of audio and video are more effective than only

using written texts to improve listening and speaking skills [3]. Additionally, there are four basic contents that can be applied in educational games for language learning, which are observing, vocabulary, listening, and questioning [39,42]. Those contents are distributed to four different skills for language learning, which are listening, reading, writing, and speaking. Cultural learning is included in every skill to make users learn cultural aspects easier rather than learning language and culture separately.

2.2 Similar Games to Learn Languages and Cultures

Education, including language learning, are familiar targets for gamification and serious games [34]. In fact of serious games, 63% [34] are for education and nine out of 24 papers in an extensive review by Hamari et al. [18] presented gamification for educational context. However, there is no current game to learn Viena Karelian language and culture, therefore benchmarking was conducted from similar mobile games. There were two games for prototyping references, which were Duolingo and Gardens of Times, and both of them can be played online for free. The games were analyzed to gather relevant features that can be applied in the non-functional prototype. Both games have a different focus, where Duolingo is used to learn languages and Gardens of Times is used to learn cultures. The relevant features are combined to develop a game with simple features and learning activities that increase the engagement of users. These gamified language learning applications show that gamification does not just work for this purpose, but it can also help to create solutions that are accessible and commercially viable.

The first game reference is Duolingo, which is the most used language games in Android and iOS, and it offers free learning activities with in-game advertisements. There are several popular languages that can be learned such as Spanish with 21.3 million active learners, French with 12.5 million active learners, and German with 7.02 million active learners [12]. This game can increase reading, listening, writing, and speaking skills which are distributed in every topic such as greetings, clothing, and numbers. Each task in every topic has several multiple choices challenge, translation of a specific word, translation of a basic sentence, and voice recognition. This application uses streak counts, score points, and badges to keep track of learning progress. The idea of several multiple choices challenge and translation were adapted in the prototype to increase reading and listening skills. Moreover, score points were also adapted to keep track of learning progress and users can have a sense of achievement from collected points.

Another game reference is Gardens of Times, which is a popular Facebook game with more than 2 million followers [16]. This game introduces different eras of historical evolution and culture by finding hidden objects in different scenes. The idea of finding hidden objects from scenes was used in the prototype to help users learn new words by matching hidden objects with pictures. This feature is an interactive and effective way to learn new words in the playing mode, and users can get scores that later can be used to buy virtual items. Score points are included together with the learning mode and different cultural scenes are used to keep the learning progress.

3 Implementation and Evaluation

In this study, we utilized an interaction design process, which consists of establishing requirements, designing alternatives, prototyping, and evaluating [33]. This chapter presents our first non-functional prototype, the evaluation methods and findings. The second functional prototype is briefly introduced as well.

3.1 Establishing Requirements

We wanted to develop a mobile game prototype where beginner users can learn Viena Karelian dialect and culture in an interesting and effective way. In this study beginner users are people in general who do not know much the Viena Karelian dialect or culture. However, in this case, we focused on adult users with age from 20 - 35 years old. Our users were university students who were interested in learning new languages and prospective tourists who want to travel to the Republic of Karelia.

On the landing page, users can choose the game language in English and Finnish (see Fig. 1) and users are given an option to register. There are two modes, where the learning mode is available to learn alphabets³, and in the playing mode users can find hidden objects in different scenes of Karelian culture. There are two skills that can be improved in this game, which are listening and reading skills. For the prototype design, the images of church and the character were taken from^{4 5}.

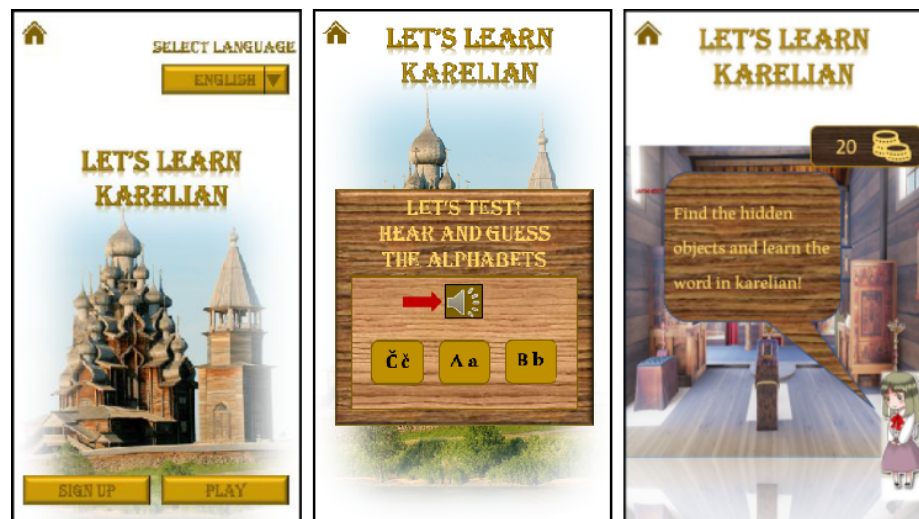


Fig. 1. Landing Page, Learning Mode, and Playing Mode of Non-Functional Prototype

³ Aa, Bb, Čč, Dd, Ee, Ff, Gg, Hh, Ii, Jj, Kk, Ll, L'l, Mm, Nn, N'n', Oo, Pp, Rr, Ss, S's', Šš, Zz, Žž, Tt, T't', Uu, Vv, Yy, Ää, Öö [43]

⁴ <https://goo.gl/FxFSzi>

⁵ <https://goo.gl/1CcEx3>

Learning Mode Users can start to learn all alphabets by reading the alphabets then listen to the correct pronunciation. Users can select an alphabet to repeat the pronunciation, after that users can hear an alphabet and choose a correct option. Users are given with score points if they can answer the alphabets by listening to the pronunciation. If users want to continue the game more than just learning the basic alphabets, they can continue to the playing mode.

Playing Mode In this mode, users can play to find hidden objects from scenes inspired by Karelian culture and enrich vocabulary knowledge. When users click a hidden object, then an object name is displayed in Viena Karelian dialect. Users can match words with hidden objects, so they can memorize figures and words that refer to objects. After completing each level in the learning and playing mode, users are given with score points. Those score points show a progress achievement of users and later on can be used to buy virtual items that represent the Karelian culture.

3.2 Designing Alternatives

The design was evolved from a paper prototype to a non-functional prototype, which was built with Microsoft PowerPoint. During the brainstorming session, alternative ideas were drawn by using the given Self-Expression Templates [2], which were in this case printouts of tablet and mobile phone frames. The drawings were evaluated by several users apart from the researchers. The ideas were analyzed and improved before the prototype implementation.

Brainstorming was conducted to achieve an ideal design to learn Viena Karelian dialect and culture. In this phase, we utilized the Kizhi Island virtual 3D model [26] and its newer version developed by Matti Pouke. Moreover, we utilized several Viena Karelian study books for gathering ideas and designing learning tasks for the game. Especially we utilized books by Olga Karlova [23] and Pekka Zaikov [43], and The Dictionary of Karelian [11]. Karlova's online version of the book enables remote learning⁶. Also, in the brainstorming phase, each researcher worked independently to provide suitable designs based on two language games as references. Finally, all different design sketches were combined for internal evaluation, then the relevant ideas were selected and finally the non-functional prototype was implemented for mobile touch screen device. Moreover, a conceptual model was built to define flows of the game and every user action was defined in the flow diagram.

3.3 The First Non-functional Prototype: Let's Learn Karelian

At first, a paper prototype was created based on the ideas gathered from the brainstorming phase. Then, a non-functional prototype was developed. The visual non-functional prototype is a good approach for the evaluation phase as participants can get a real experience of how the game would look like [30]. The non-functional prototype for touch phone context was implemented by using the Microsoft PowerPoint. Features such as

⁶ <http://avtor.karelia.ru/elbibl/karlova/vienankarjalan/index.html>

animations, actions, icons, and shapes were used to give to the users a real impression what kind the final application could be. The prototype screenshots can be seen in the Fig. 1.

3.4 User Experience Evaluation

UX evaluations were conducted in the public Tellus Innovation Arena at the University of Oulu. In this experiment, the evaluation was conducted with five randomly selected participants from different educational background and nationality. Users played the game with a touch screen laptop with the simulation of mobile devices (see Fig. 2). Participants were asked to familiarize with the game and conduct two tasks. After the use participants were asked to select four out of 24 adjectives (see Table 1) and then comment their selections. The way of using this adjective selection method was adapted from the methods presented in [4,20,41]. Participants were also observed and interviewed, and test situations were video recorded. Duration of the tests varied from 10-20 minutes including interview.

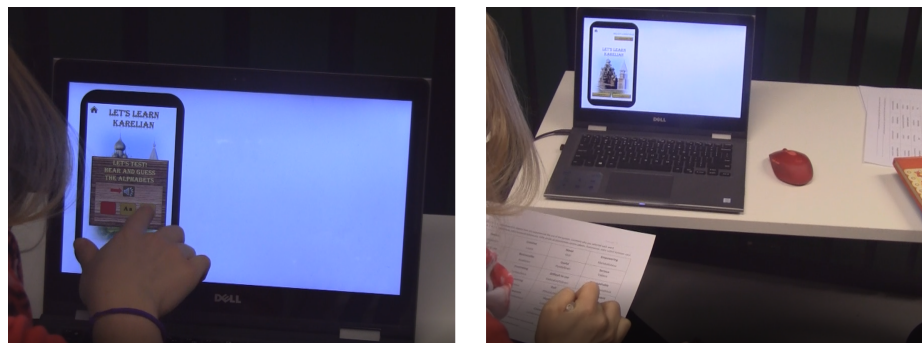


Fig. 2. A user studied alphabets in the learning mode (left) and after the use of the prototype she selected 4 out of 24 adjectives, which depicted her experiences (right)

Table 1. 24 adjectives used in the evaluation

Useless	Creative	Novel	Empowering
Easy to use	Businesslike	Useful	Serious
Dated	Frustrating	Difficult to use	Approachable
Fun	Entertaining	Dull	Visually pleasant
Inspiring	Visually unpleasant	Playful	Restrictive
Inconsistent	Too technical	Consistent	Unapproachable

In general, users liked the game prototype and they found it visually pleasant, easy to use and creative. However, two of the users experienced that the prototype was “In-

consistent” for them, as one participant stated “I am clicking without knowing the goal”. The other user was not sure how to continue the game further on certain screens. For example, one user was not sure, when the game ends, which was quite fatal design lack and needs to be taken into account in the future.

Some texts were not distinguishable enough from the dark and wooden-type background. Also, some interactive objects should be highlighted more visually. The most important findings for us was that the participants were interested in this type of game even without Viena Karelian background or deeper knowledge of the dialect or culture. As one of the participants commented “I would like to continue playing this game”.

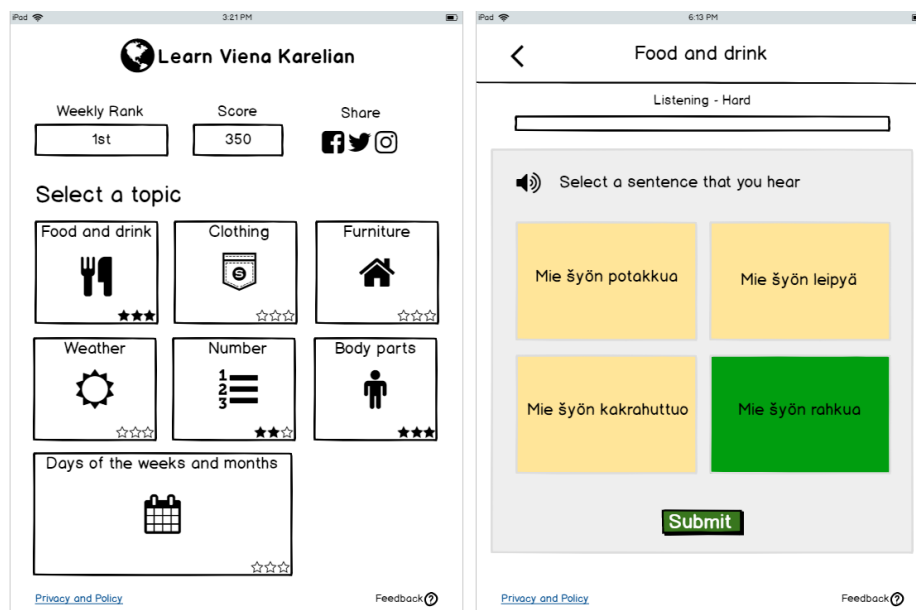


Fig. 3. Wireframes (English version) - Designed with Balsamiq Software

3.5 The Second Functional Prototype: Learn Viena Karelian

In the VIENA-PELI project, our aim is to develop different types of game concepts. Therefore we are designing new functional prototype (see Fig. 3), which will be built with Laravel PHP framework and Bootstrap front-end framework. The design elements will be simpler than in the previous prototype and the game platform will be available as a mobile web application in tablet devices. This advantage can increase the accessibility as users do not need to install the game and the game will be available for any kind of tablet devices.

4 Discussion

According to our knowledge, there is no mobile or web-based games for learning Viena Karelian dialect and culture, thus there is no exact similar game as basic references. However, the first prototype was built based on the similar games to learn languages (Duolingo) and to learn cultures (Gardens of Time). Participants were able to use our non-functional prototype to play the basic features of the "Let's Learn Karelian" game in the Learning and Playing Modes.

The first task of the game was to listen the alphabets pronunciation and select the correct option after the audio is played. This task was selected because in this experiment, our approach was to provide the game for English speaking users as well. For Finnish users alphabets are quite familiar, except consonants š, č, šš and čč and soft consonants l', n', t' and s' which differs from Finnish (e.g. n'apa or min'n'a) [23,43]. In the new prototype, it is important to provide voice examples with words and sentences in order to teach, for instance, when to use s and when š.

In the second task, users can choose an object and choose the correct word that belong to that object. In our design, example objects distinguished from the 3D background very much because they were 2D images from a different context than the background, which consist of altar and iconostasis of Orthodox Church [26]. When teaching, for instance, culture issues it is important that context of game background and objects are consistent, for example, they relate to the same topic area such as church, school, office or home, because visual background gives a context for the application. [30].

In the future concepts, we need to utilize more Karelian culture-specific objects such as items, clothing, architecture, religion and habits. However, for new learners of Karelian language (including its dialects) and culture, objects from everyday life are important to learn as well, as one of the participants commented that basic vocabulary is needed for instance when traveling to the Republic of Karelia. This person did not paid attention to the church background at all, instead she concentrated on vocabulary, because Viena Karelian dialect was new for her even though as a Finn she was able to understand words. On the one hand, it is important to developed different mini games for learning vocabulary and grammar. On the other hand, when revitalizing and informing Karelian culture it is significant to develop various narrative type games, which utilize a history of Karelia, and for instance, Kalevala, which is the Finnish national epic compiled and edited by Elias Lönnrot. As many types of research is needed for improving linguistic and sociocultural situation of the Karelian minority in Finland [37], gamification could be seen as a potential approach for Karelian language (including its dialects) and culture revitalization in Finland, but also in the Republic of Karelia.

5 Conclusion

Our research goal was to develop an interactive game prototype that helps beginner English and Finnish speakers to learn Viena Karelian dialect and culture in a fun and effective way. In this experiment, our users were university students whose age varied from 20 to 35 years old. In the future, we will conduct more tests with authentic users

from all age groups. User experiences of the game prototype were gathered from the participants with adjective selection method and interviews. Our "Let's Learn Karelian" game prototype was perceived visually pleasant, creative, easy to use, playful and entertaining. The participants were motivated to use the game and learn the dialect and culture. Our study indicated that there is a need to develop different games for revitalizing Viena Karelian dialect and culture. Based on the findings, our aim is to develop a mobile web-based game and provide it freely available for all.

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