

Ali Gadraoui

**GAMIFYING LANGUAGE LEARNING: MERGING IT AND
EDUCATION IN THE DEVELOPMENT OF A FINNISH LANGUAGE
LEARNING VIDEO GAME**

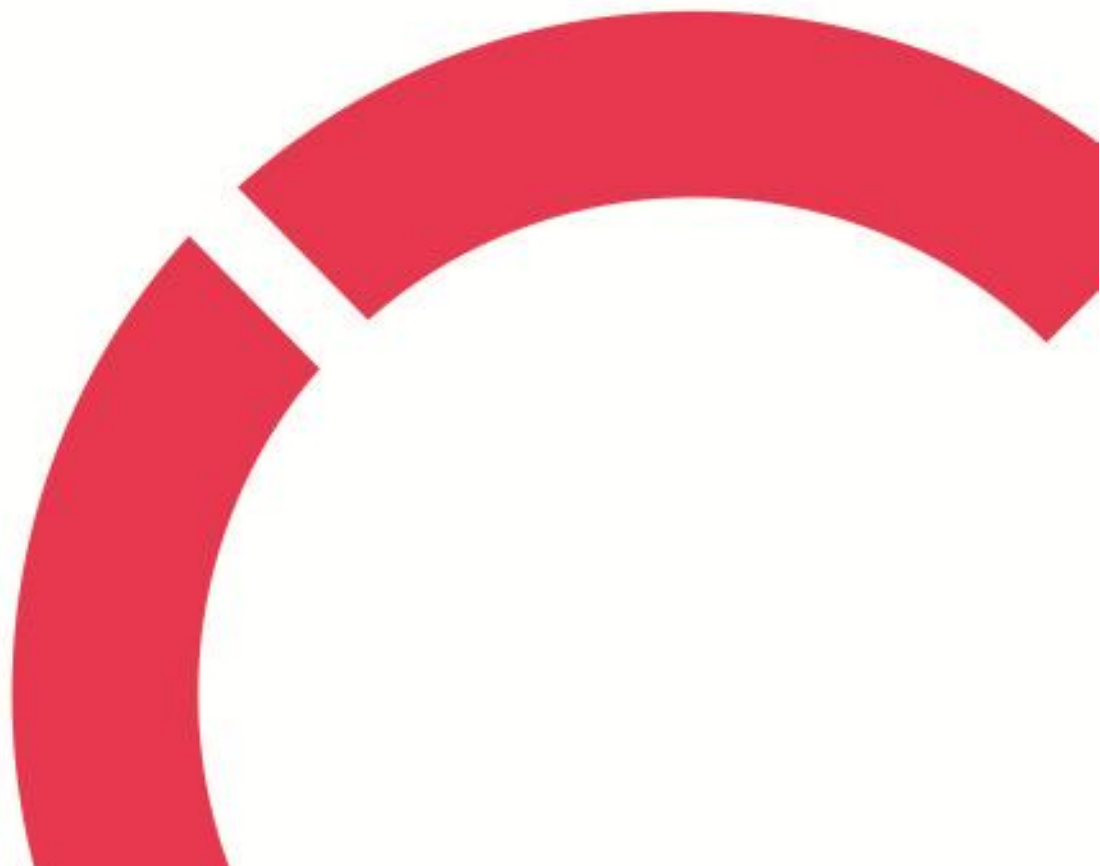
**A Research-Based approach to developing gamified tools for Finnish language
Acquisition**

Thesis

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ABSTRACT

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Name of thesis GAMIFYING LANGUAGE LEARNING: MERGING IT AND EDUCATION IN THE DEVELOPMENT OF A FINNISH LANGUAGE LEARNING VIDEO GAME. A Research-Based approach to developing gamified tools for Finnish language Acquisition.		
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<p>The thesis examined the integration of information technology and pedagogical theory in the development and creation of a playful and entertaining tool for teaching Finnish language. The main objective was to design and evaluate a prototype of a video game that enhanced language learning through gamification. The research focused on creating an engaging, effective and convincing learning environment by using interactive game mechanisms such as feedback loops, reward systems and immersion.</p> <p>The theoretical framework of this work was based on theories of language acquisition and appropriation, motivation, self-regulated learning and gamification elements concerning interactivity, retention and memorization. Ren'Py was used as the game development engine and, through prototyping, testing and game redesigning, the game was matched to meet the educational objectives and mission.</p> <p>Two evaluation methods with structured procedures enabled usability testing alongside the collection of qualitative feedback. The game accomplishment was evaluated, and conducted quantitative assessments based on the evaluation framework. This analysis showed that gamification improves and enhances learners' satisfaction, enriches vocabulary and motivation compared to traditional techniques. The results are useful for designing other tools in which game elements are integrated into educational progress, based on the fundamental concept of language teaching.</p>		

Key words educational technology, Finnish language, gamification, game-based learning, Ren'Py, self-regulated learning, video game design, zone of proximal development

CONCEPT DEFINITIONS

Gamification

The use of game design features and techniques in other contexts. It improves processes, services, and activities by creating experiences like those experienced when playing a video game.

Game-Based learning (GBL)

An educational learning technique, where the user is encouraged to learn through games and takes an active role, with particular emphasis put on enjoyment.

Ren'Py

An interactive storytelling and educational game generation tool that uses scripting and custom visuals.

Self-Regulated learning (SRL)

A learning paradigm in which the students manage learning activities through objectives, assessments and evaluation.

Usability testing

A technique of assessing a product via people and users testing it.

Zone of Proximal Development (ZPD)

Lev Vygotsky's theory of constructivism calls this the space between what someone learns on their own and what they can learn with help from their teacher, classmates, or educational tools.

ABSTRACT
CONCEPT DEFINITIONS
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1 INTRODUCTION

This thesis explores how technology impacts teaching approaches while demonstrating that advanced technological systems serve as a major educational driver that creates innovative methods for student engagement. Traditional language education methods based on mindless memorization with passive learning receive regular criticism because they fail to effectively keep students interested and motivated. The research shows that typical instructional approaches fail to deliver essential interactive components required for student engagement and memorization enhancement. The adaptation of gaming elements into non-game scenarios creates gamification as an effective method to engage learners in educational experiences that stay enjoyable from start to finish. (Demirbilek, Talan & Alzouebi 2022.) The main goal of this thesis involves creating a gamification platform for Finnish language instruction which combines technological resources with educational principles.

The purpose of this research is to conceptualize and assess the effectiveness of a video game model that is used to teach language acquisition using its game elements. It bases on Ren'Py as the development engine, with the feedback of local and native Finnish speaker helping to improve the vocabulary acquired and the learning interest of the players. The main objective of this research is to design a tool that showcases the successfulness of applying game elements in learning activities to address the general issues in teaching languages.

The analysis centers on several important reviews:

1. In what way can interactive gamified experiences be useful in language learning?
2. How do feedback, repetition, and immersion help students stay more engaged and help them retain information?
3. In what extent can Ren'Py be used efficiently for creating educational applications that incorporate game features?

The present thesis is grounded on three concepts: gamification, language acquisition theories, and self-regulated learning paradigms and archetypes. Holding these concepts together, this research connects them to the iterative process of game design and usability evaluation, which creates the bridge between the educational theory and information technologies practices. This study is purposely restricted to the prototype assessment since it involves only 10 participants with the aim of gathering data for

subsequent versions. However, it is pertinent to note that there are several limitations that restrict the ability to generalize the results of this research to broader educational settings. The same findings are believed to offer relevant information to education theorists, instructional designers and developers wishing to implement gamification in learning contexts. This thesis finds its place within the given debate on the use of gamification approaches towards the education, with more focus on the Finnish language. The purpose of this thesis is to set the groundwork for further research and development in the general area of gamified educational technologies.

The thesis targeted Finnish language education through gamification to resolve an identified learning gap. Examining game elements through a prototype approach to investigate methods for connecting technology with pedagogical practices. The research results present preliminary findings that serve as guidance for educators and instructional developers who want to boost learner engagement and motivation through new tools. This study uses a focused strategy to add significant value to educational technology research while creating foundations for future gamified learning implementations.

2 THEORETICAL FRAMEWORK

The 21st century educational variation uses interactive digital tools to help students learn better. Pedagogical programs that utilize language learning theories along with gaming design and premises rules show better student participation and assimilation results (Hwang, Chen, Chu, Chuang, Juan & Chen 2023). To successfully create gamified language tools, educators need clear theoretical principles that support their work, in addition to the examination of fundamental concepts that shape the creation of a video game for Finnish language instruction (Zhang, Cheng & Chen 2020).

Today's educationalists turn to gamification as tool more than a definite option to increase student interest by building learning activities with rewards, challenges, and feedback systems. The constructivist studying style helps learners build knowledge through participation and group interaction. The ideas of Vygotsky regarding the zone of proximal development (ZPD) and instructional scaffolding plus expert guidance from more knowledgeable other (MKO) experts has shown how to best support learners in game-based environments. Gamified tools assist learners through complex tasks by providing progressive support systems which include hints as well as feedback or contextual assistance. The game features virtual characters which function as more knowledgeable others (MKOs) to provide support and clarification that helps learners maintain their zone of proximal development (ZPD). (Rohman & Fauziati, 2022; Thurairasu 2022.)

Language acquisition theories show how learners remember and practice new language skills through their learning process. Through gamification users can experience opportunities to become deeply absorbed in learning vocabulary and grammar by performing game actions (Hwang et al. 2023). Analysis shows learners achieve finer self-regulated learning (SRL) when they work in game-based learning environments. Through these strategies learners control their learning progress and adapt their methods after receiving feedback (Zhang et al. 2020).

Incorporating game design principles further enhances the educational potential of gamification by ensuring that the user experience is both engaging and intuitive. Basic educational principles like feedback tools, learning advancement steps and interactive design help students stay interested and motivated to reach their learning targets (Hwang et al. 2023; Thurairasu 2022). Developers create efficacious language tutoring systems when they combine Ren'Py development instrument and pedagogical theories.

Blending game concepts into education systems makes learning work greater by constructing content and idea that new language learners find both enjoyable and easy to follow. Principal teaching characteristics with assessment tools and advancement systems along with user interactivity uplift learners' motivation and assist them reach their objectives (Hwang et al. 2023; Thurairasu 2022).

This structure permits the build of Finnish language learning video game and test its impact on users during development. The following sections describe the core research principles and study methods on which this project depends. Developers create efficacious language tutoring systems when they combine Ren'Py development instrument and pedagogical theories. Blending game concepts into education systems makes learning work greater by constructing content and idea that new language learners find both enjoyable and easy to follow. Basic learning characteristics with assessment tools and advancement systems along with user interaction uplift learners' motivation and help them reach their objectives. (Hwang et al. 2023; Thurairasu 2022.)

This framework enables the development of a Finnish language learning video game and the testing of its impact on users using structured evaluation. The game tries to merge gamification principles with educational theories to develop an entertaining and interactive environment for learning language. Game based learning has been proven to enhance motivation, retention, and active participation of the students, thus making it an appropriate tool for second language acquisition (Hwang et al. 2023). By following the iterative design, testing, and refinement process, the game will be adapted to satisfy pedagogical objectives as well as user feedback to increase usability (Zhang et al. 2020). In addition, scripting and interactive dialogues and visual storytelling are also important for technological considerations that help improve the immersion (Thurairasu 2022). The subject of this thesis is presented following the core research principles and methodological approaches that underpinned the project, elaborating on the development strategies, implementation steps and evaluation methods that were used to assess whether the project was educational impact.

2.1 Gamification in Education

Game-like features are added to learning spaces to make students more engaged, drive them to learn more, and give better results. The process turns passive learning into an interactive experience using gaming benefits (Thurairasu 2022). Gamification works best when it matches the way constructivist teaching works. It focuses on involving students in their learning and having them work together to build

new knowledge. The zone of proximal development (ZPD) grows stronger when gamification provides tasks that push learners past their current abilities while offering guided. According to Vygotsky's theories learners achieve higher skills through interactive elements, which means working with more experienced digital tools instructors and peers. (Rohman & Fauziati 2022.) Different studies show people can study better and remember lessons longer when learning games are used because accomplishments and advancement give them more drive. When teaching connects levels and rewards, learners want to accomplish their work and handle rugged conditions. Studies prove this method works, and it improve students' learning experiences especially when motivation plays an important role in language education. (Hwang et al. 2023.)

Students stay motivated when learning in regular schools by playing games that make education more enjoyable and interesting. Research show gamification improves both how well students understand language and how they feel about learning. It reduces their learning anxiety and builds their self-confidence. (Zhang et al. 2020.) Duolingo and Kahoot! demonstrate that adding game elements to learning, both online and in-person makes studying more enjoyable and helps students learn faster (Thurairasu 2022). Through proper gamification users can enjoy learning experiences while maintaining their enjoyment level. Teachers need to make personalized study programs because studies show that too much competition blocks students' educational progress. More research is needed to understand how studying changes as students play gaming-based learning activities, and these studies must be run in different countries and school settings. Recent studies find that when game elements are added to teaching methods students become more involved thus improving their understanding. (Hwang et al. 2023.)

2.2 Language Acquisition Theories

Language acquisition theories form the basic building blocks for studying how people learn and keep new languages. These theories must be understood to make the language learning games better, because they show how to get users to keep playing and remember what they learn. Language learning research studies how people understand language through their brains while also learning by interacting with others. According to Krashen's input hypothesis, learners develop language skills most effectively when they encounter input that is just above their current language ability. (Krashen 1985.) Vygotsky's theory of ZPD matches perfectly here. When students work with assistance to complete tasks they cannot

manage alone, they learn better. Games with interactive features that give learners input help copy how people learn best by using the ZPD. (Rohman & Fauziati 2022.)

Learning by repeating activities over and over helps students remember words, grammar, and sentence structure better. Students learn better and remember more when they take part in game-based learning activities that let them repeat tasks and receive feedback while solving challenges. (Hwang et al. 2023.) Games designed to help students learn new words use repetitive tasks within engaging and interactive environment to help them remember what they have learned for a long time. To learn a language well, a strong motivation is needed. The way people learn best comes from Deci and Ryan's Self-Determination Theory, which shows why internal and external reasons drive people to study. The elements in gamification that make learning enjoyable help users naturally want to study more, and the points, badges, and leaderboards that come with it push learners to stay involved and stay focused. When tools combine intrinsic and extrinsic motivation, they create a complete learning system for language development. (Thurairasu 2022.)

Through situated learning theory we know that educational outcomes improve best when lessons happen in authentic environments and gamification effectively implements these principles by creating realistic gameplay scenarios. Learners develop better skills in practical language use when they participate in games that adapt classroom learning content to genuine circumstances. Through game-based learning students actively guide their educational journey while monitoring their development and assessing their accomplishments. Game-based learning tools offer users tracking features to monitor progress and perform assessments. These instruments also create plans for upcoming steps which generates increased independence and student engagement. (Zhang et al. 2020.)

The research data indicates that gamification enables learners to develop better self-management skills in their educational process. Through a combination of situated learning theory integration and gamified tools learners can establish personal authority in their educational progression. The ownership experience leads to higher student engagement along with stronger bridges between classroom lessons and real-world outcomes. (Zhang et al. 2020.) Using both theories when making gamified learning tools helps teachers and creators build experiences that stay in learners' minds and keep them interested. Using the combination of cognitive, motivational, and contextual elements makes gamification methods work well for teaching students in different learning environments. (Rohman & Fauziati 2022.)

2.3 Game design principles for learning

Educational content requires knowledge of game design principles to become both effective and engaging. Educational principles help teachers convert traditional ways of teaching into interactive learning experiences that captivate students. Continuously technology-based games that use feedback loops and rewards along with interactive components students experience enhanced motivation and better knowledge storage. (Thurairasu 2022.) Game design systems use feedback loops to deliver instantaneous player responses which both reinforce proper actions and direct learners. According to Vygotsky's theory of the Zone of Proximal Development (ZPD) students learn best through timely support and scaffolding. (Rohman & Fauziati 2022.)

The system elements such as levels, achievements, and unlockable features create an organized structure that helps students know exactly what to work toward. Research shows that progress systems boost learner focus while increasing their success and training drive (Thurairasu 2022). Uncovering new vocabulary and grammar levels in a language learning game feels great, and keeps learners interested. The best way to design games is through interactivity which allows students' participation to be more active. The game lets students practice what they know by giving them tasks where problem solving skills and role-playing are required. (Zhang et al. 2020.) For instance, a program that invigorates Finnish for students may help them practice and acclimatise with new language structure.

Research shows that giving rewards helps learners keep doing good tasks and stay focused. Rewards such as earning points, badges, and leaderboards creates stronger motivation that are labelled as extrinsic motivators. While the levels' scenarios and challenges fit into the box of intrinsic motivators. These techniques significantly boost both interest and long-term memory retention. (Hwang et al. 2023.)

The game designers must create flexible gameplay to meet the needs of all students. The system changes the difficulty of tasks based on how well players do in them, making sure the challenges are hard enough to keep players interested, but easy enough for them to succeed. The modern use of educational technology focuses on tailoring learning for each individual person. (Zhang et al. 2020.)

The best games for learning make stories and storytelling an important part of how they connect with students emotionally. When students enjoy a well-told story, it helps them learn better and creates stronger memories. (Thurairasu 2022.) For example, when students solve problems in a Finnish village through a well story-based learning experience users tend to develop better connections to the language.

When combining these learning methods into games, the creation of an effective balance of learning and fun is possible. Game-based learning tools make learning more interesting and keep students focused. In addition, students are given plenty of chances to practice and remember what they learn.

2.4 Tools and technologies in Game-Based learning

Technology integration into game-based learning creates new ways for students to learn through exciting interactive lessons. Learning tools now include basic game apps plus advanced systems that use artificial intelligence and virtual reality technology. Educators use three main game engines: Ren'Py, Unity, and Unreal Engine. For creating educational games. Ren'Py seamlessly lets developers make visual novels that mix storytelling with players making important choices. Its basic features and adaptability let game designers build effective language learning platforms. (Hwang et al. 2023.) Duolingo and Babbel show how making language learning into games helps people learn more effectively. Building gameplay that shows how long you stay involved and lets users progress through levels while earning points. Kahoot brings students together for live quizzes and lets them compete on a leaderboard system. (Thurairasu 2022.)

New AR and VR technology lets learners train their language skills in actual-life settings through immersive digital experiences. VR training lets students practice speaking and pronunciation through natural interactions with digital characters. While AR technology let them place virtual information on real places so that student can learn better in actual locations (Zhang et al. 2020.) Moodle and Google Classroom help students learn better using games by offering additional plugins that add game features. With these plugins teachers can build tailored game-based learning modules that show student achievements and track their progress while offering interactive tasks. These tools succeed because of the adjustment and flexibility provided to what learners need, respond quickly with feedback, and make students feel they've accomplished something. Game- based learning helps connect traditional education to modern learning methods by selecting the best available technologies.

3 METHODOLOGY

This chapter explains how the Finnish language learning video game was planned, made, and tested. This section explains how research strategy was developed, including development stages and evaluation methods while remaining connected to earlier theoretical foundation. The development combined different research methods, kept improving the game design, and gathered user opinions to make a learning game that people enjoy and learn from well. The project used a model where the game prototype was made better by testing, redesigning, and getting feedback from users and theory (FIGURE 1). This method keeps game systems connected with teaching methods and user requirements. (Hwang et al. 2023.) Constructivist learning ideas were blended into the development process by using scaffolding and the Zone of Proximal Development (ZPD) principles to build learning tasks that challenge students and help guide them. (Rohman & Fauziati 2022.) Interactive stories with feedback systems were created to help players stay motivated and stick with the game (Zhang et al. 2020).

The development process required multiple tools to achieve both educational outcomes and interactive functionality. Development teams selected Ren'Py because its Python-based scripting capability delivered both control and ease of operation for building dialogue systems with branching stories for educational games. The avatar creation tool Charat enabled developers to build visually appealing characters which improved both the learning experience and entertainment value for students. The game's visual and auditory experience was enhanced by using Pixabay's free images together with Freesound's sound effects. The game benefited from Pixabay's royalty-free visuals which matched the cultural elements and from Freesound's audio resources which deepened gameplay immersion. The chosen tools met accessibility guidelines as well as inclusivity requirements to build a usable prototype using restricted financial constraints.

These tools both improved the development workflow and enabled the creation of an engaging game through interactive elements which were combined with visually pleasing and audibly stimulating features. When technology gets integrated this way it matches the principles of gamified learning that focus on delivering engaging and motivational experiences. (Hwang et al. 2023.) A team consisting of 10 students and a teacher played the game to measure how well it taught while maintaining student engagement. All data retrieval from participants occurred anonymously for the purposes of ethical standards. All demographic data remained untracked while survey results along with questionnaires and

comments received strict protection regarding confidentiality. The project utilized anonymous data collection methods to generate an environment where respondents needed not worry about disclosure of personal information thus promoting authentic feedback. The test feedback generated essential information which helped researchers make successive improvements that strengthened the game's alignment with its educational targets. (Zhang et al. 2020.) Through technology application and learning principal integration and user participation scientists developed a trustworthy system for creating educational video games that deliver effective teaching and gaming engagement. Each section of the methodological approach is described in detail in the subsequent subchapters.

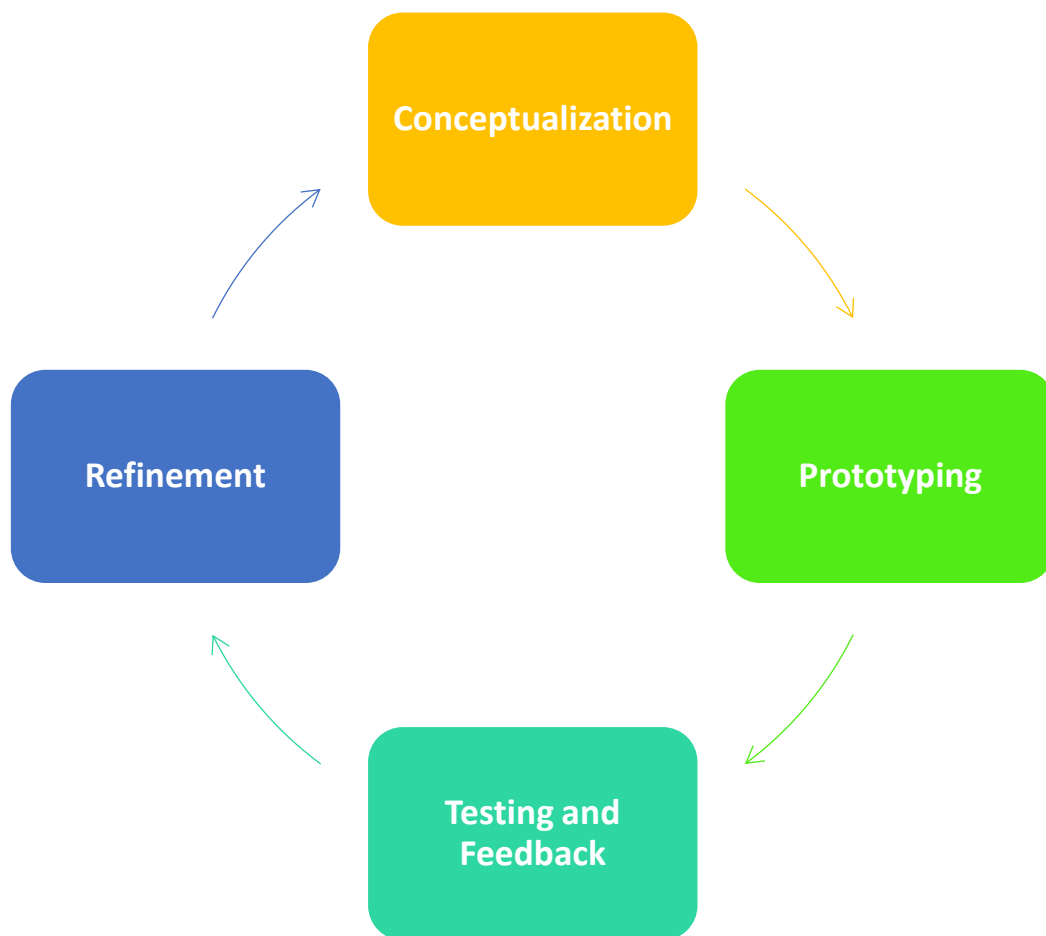
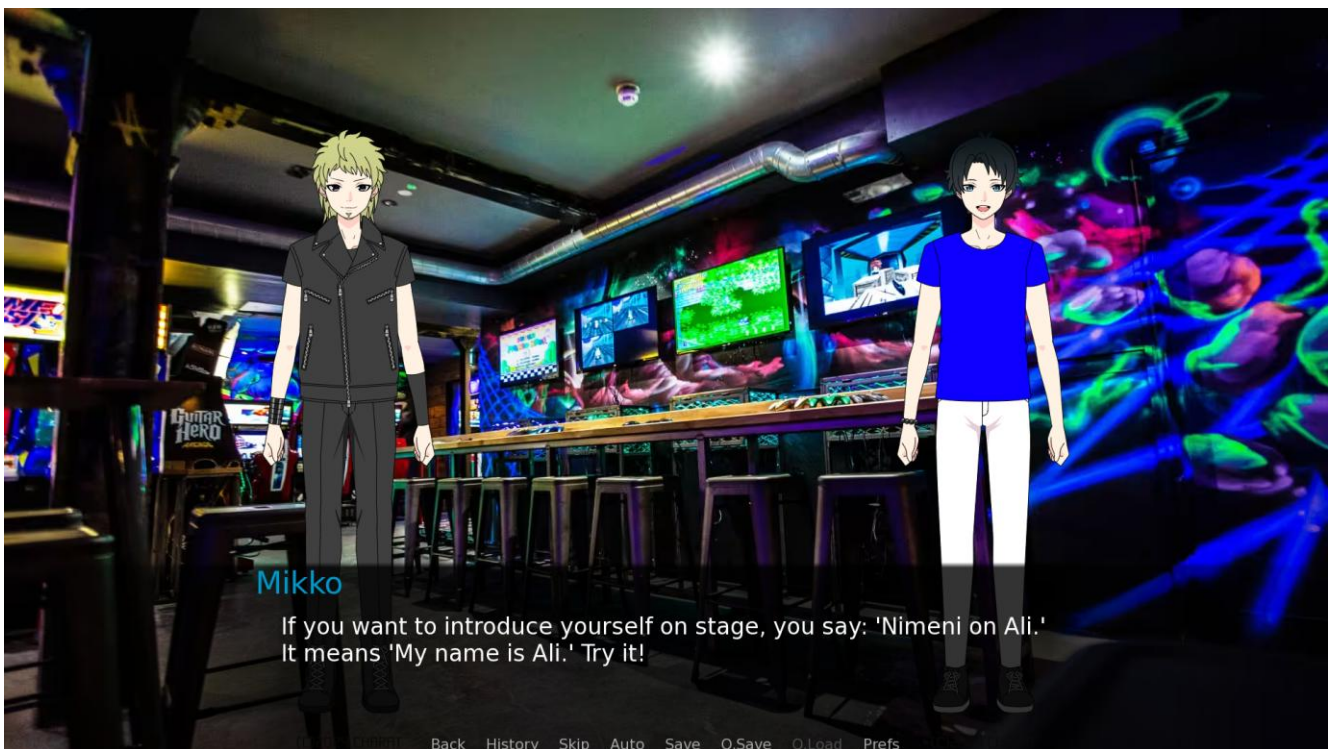


FIGURE 1. Iterative development model for gamified learning tools, illustrating the cyclical process the game.

3.1 Research design

This thesis uses a qualitative research design with a user-centered development method. This approach was picked to create a game that matches educational guidelines, gamification standards, and user needs plus can accept feedback during development. The iterative development model was used as the main method to create multiple stages of concept development followed by testing and improvement. The game was updated step by step to enhance usability and learning content plus engagement following feedback results (FIGURE 1). The model helped combine user test results to make the prototype finer as a learning tool. The prototype combines interactive storylines with Ren'Py engine-based contextual storytelling and gamified learning activities. Through its dialogue system the game teaches students to present themselves in Finnish by using real-life scenarios (PICTURE 1). The design features aim to keep players motivated and interested while also helping them retain their knowledge. (Zhang et al. 2020.)



PICTURE 1. Interactive dialogue in the Finnish language learning game prototype, showcasing character design, background imaging, and contextual storytelling.

3.2 Development process of the Finnish language learning game

The Finnish language learning game developed through repeated testing with users and theory-based updates. This process was divided into four key phases: conceptualization, prototyping, testing, and refinement. Each development stage helped build a game-based learning system that matches how people learn new languages. During conceptualization the game's purpose and audience type were set out while choosing its essential gameplay elements. The main purpose was to design an educational tool that delivers memorable learning by combining feedback loops, progression systems, and internal motivation (Hwang et al. 2023). The learning objectives follow language learning principles by teaching students how to remember words, make sentences and engage in interactive studies.

The design system integrated Finnish cultural elements together with interactive dialogue functions to establish a more profound user experience at this development stage. Users learned basic Finnish speech by saying hello and introducing themselves according to typical social encounters in Finland. The integration of cultural elements in language learning education remains essential because it delivers essential context to linguistic features and social rules and idiomatic expressions which helps students build communicative competence. Educational research shows how cultural knowledge integration enables learners to handle language properly in real-world situations which leads to an enriched language learning process (Liddicoat 2015).

The Finnish language learning game was prototyped using initial version created with Ren'Py, a free visual novel development tool. Combining interactive dialogues and role-playing situations, the prototype integrated interactive dialogues, where characters engaged students in immersing users in different situations to reinforce vocabulary, and grammar acquisition. Enabling learners to engage in these dialogues actively. This method furthers with self-regulated learning (SRL) strategies, so players will be able to check their progress and improve their skills based on their interplay. To provide an immersive experience, the game included cultural elements within it. Visually authentic Finnish settings were provided, in the background that was sourced from Pixabay. Therefore, the prototype was composed of a comprehensive learning environment connecting linguistic development, interactivity and cultural awareness, thus turning this project into a successful gamified tool for the Finnish language learning.



PICTURE 2. Interactive scene from the Finnish language learning game, demonstrating character interactions, contextual dialogues, and background imaging.

Educational game development requires user testing because this method helps developers understand engagement levels and how well users achieve educational goals. Game developers benefit from observing participant interactions to recognize improvement points that help the game maintain educational relevance. The iterative design process benefits from user feedback which produces improved game quality and keeps educational content tailored to learner preferences. (Pietriková, Sobota, & IntechOpen 2021.) In this study, a group of 10 participants, including students and a teacher, tested the game and evaluated it based on three criteria: engagement, usability, and educational value. Anonymous surveys together with observational notes allowed researchers to create a complete picture of which elements worked well and what aspects needed improvement in the game. Educational game development best practices recommend user testing as a fundamental approach to validate theories about engagement levels and usability and learning effectiveness. (Pietriková, Sobota, & IntechOpen 2021.)

The inclusion of structured user feedback enables development processes to adapt better to real learner requirements. User feedback from this testing phase guided prototype improvements which led to better interactivity and content alignment and enhanced overall user experience. The approach both increases student engagement and facilitates meaningful educational content which leads to better tool

effectiveness in the educational process. Participants were asked to evaluate the game on three criteria such as (engagement, educational value, usability, interactivity and cultural relevance). Participants were able to inform whether they found the gameplay exciting and fun to play, if the game helps learners learn Finnish words and rules, and whether the system should let users move through its features without effort and show them easy-to-understand directions. Finally, their feedback highlighted the following that the dialogues worked well for interaction yet needed more spoken explanations and also several testers wanted a helpful section that explains difficult words (TABLE 1).

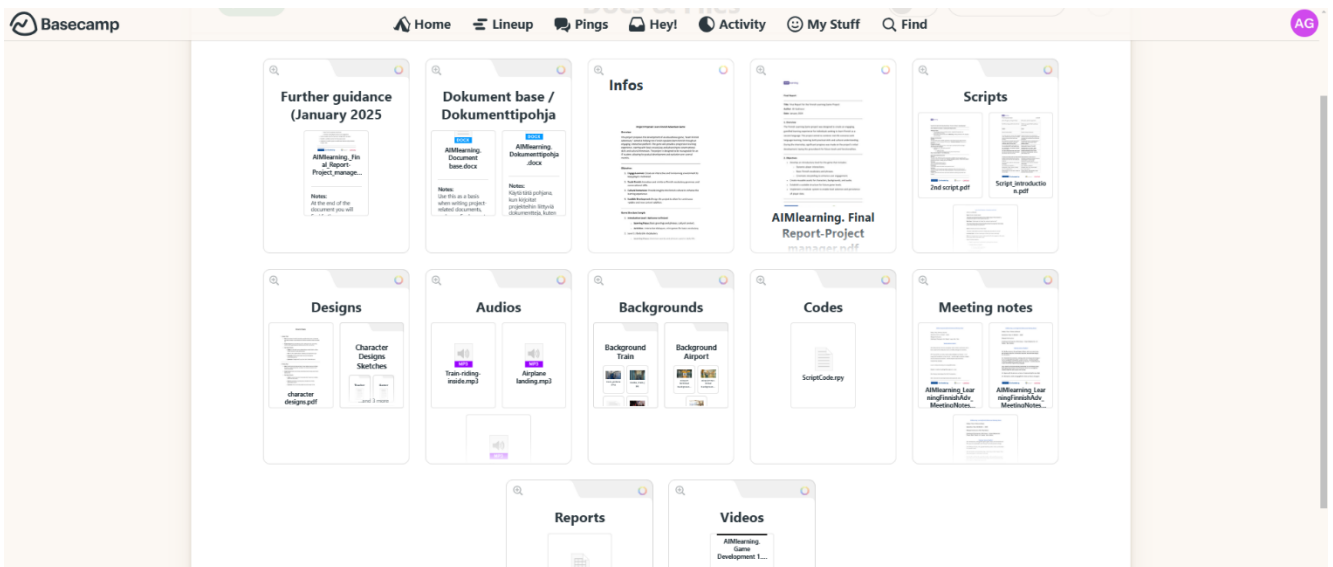
TABLE 1. Participant feedback on the Finnish language learning game prototype.

Feedback Category	Average Score (1-5)	Key Comments
Engagement	3.7	The screen displays bright and attractive visuals.
Usability	3.9	A user can find their way around, but the main menu could be easier to understand.
Educational Value	3.5	Interactive talks between characters proved most helpful in teaching us new words.
Interactivity	4.8	Learning is fun here, but having extra spoken explanations would make the study even better.
Cultural Relevance	3.5	I appreciated the story's connections to Finnish life, but I think more regular words from real life would have helped me learn better.
Motivation	4	The good comments from characters helped keeping my motivation up.

Based on the feedback, several improvements were implemented, for example enhancing the dialogue system by adding information that helps users understand their responses better, making the navigation menu easier to use for players, and adding natural sounds from Freesound to make the game more immersive and pleasant to play. Repeated improvements were made to the prototype, making sure it met both what teachers wanted to teach and what users expected to find. The enhanced design was ready to test with users for evaluation purposes. By following a planned development process the Finnish language learning game became an effective learning tool that users found enjoyable and useful for their journey into learning a new language.

3.3 Tools and Software used

The Finnish language learning game required multiple software products to build a successful gamified education design. These tools were used because of their ability of building an interactive learning that looks great for users without being complex. Additionally, Ren'Py helped building the entire game. Ren'Py's engine system assisted in creating an interactive game with talking characters and various game paths, both of which helped keeping players interested and match what language learning research says works best. As well, online tool Charat helped creating the game characters. This tool left the designs appealing for characters based on the project themes so players could better understand Finnish culture and learning. The game worked better when its characters spoke with players and made them feel more present. Moreover, Pixabay was utilized to find the pictures, an easy place to find high-quality pictures that were royalty free. The selected backgrounds helped users see realistic Finnish settings that matched the game's educational goals better. Freesound helped finding different sounds for the game which added life to both the environment and player feedback. By adding sound effects, the game turned out more absorbing and easier to interact with. Besides, Basecamp functioned as the primary project management platform, giving one place to plan tasks, keep track of deadlines, and keep all project documents organized. Basecamp kept the project on track with the planned goals and maintain its progress.



PICTURE 3. Basecamp was used to organize tasks and documentation systematically, as illustrated here.

Using these tools together created a working process that matched both the learning objectives and technical standards. This led to making a game prototype that combined educational teaching methods with interactive gameplay. But since structure and state-of-the-art mechanics were integrated; users were able to act in language acquisition. Iterative testing and refinements also improved the usability of the game so that it was a more effective and immersive educational tool. User feedback was used to fine tune the features that will improve the learning experience and considered user feedback that aided in shaping the game process. The loyalty of learners to the prototype was higher because of the combination of real-life scenarios and adaptive learning path. The game, however, had incorporated multimedia elements, such as audio cues and visual reinforcements which gave the game a richer context for retaining language. All these improvements made the platform engaging and simultaneously supports it to be a platform of independent and guided learning.

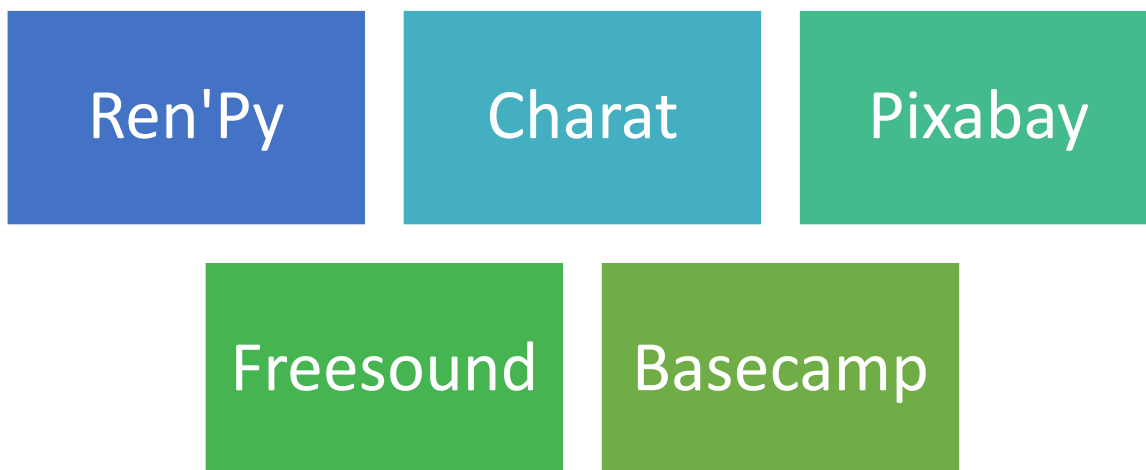


FIGURE 2. Tools used in the development of the Finnish language learning game.

3.4 Usability testing and feedback collection

The usability testing phase of the Finnish language learning game operated successfully to meet both usability requirements and educational expectations. Qualitative research methods generated player feedback to guide impactful game improvements through updates. Game development requires usability testing to detect user obstacles which leads developers to modify design elements resulting in improved user engagement and educational success. (Pietriková, Sobota, & IntechOpen 2021.) The usability tests

evaluated the game with 10 participants who included students and educators who already knew how to learn new languages. Participants used the prototype by following three task types: moving through menus, speaking with characters in the game, and finishing play activities. Each participant went through the testing alone, giving a chance to talk about their actual game experience as they played. Feedback was collected using a combination of surveys, semi-structured interviews, and observation with anonymity and ethical considerations. Users scored their interactions on three factors: how involved they were, how easy the interface was to use, and how much they learned from the experience. Rating each factor on a scale from 1 to 5. Open questions were used to understand what the participants thought about the game and how they wanted it to be improved. Above that players were observed while engaging with the game to find out where problems occurred and what was their behaviour during these moments. Finally, Anonymity-based feedback collection methods operated to secure participant privacy. Data collection did not keep track of personal information while research participants received full disclosure about their freedom to participate or not. The research adhered to ethical standards which maintained both transparency, participant confidentiality and unbiased result reporting.

Six key areas were identified based on the feedback collected in testing. The positive aspect was engagement, players enjoyed the visual design and interactive elements of the game. Additionally, the navigation menu was found to be intuitive however some felt that certain buttons need to be changed for easy accessibility. It was noted that the value of the game educationally was acknowledged, as users retained better vocabulary and understood Finnish culture better. Learning was largely based on interactivity, and tasks that involved question and answer mechanics were particularly enjoyable and productive, making learning fun but also increasing vocabulary acquisition. Strong motivation was also a point as players were motivated by the positive reinforcement game characters provided which helped build confidence and sustain learning effort. Nevertheless, there were some areas for improvement such as the background elements should be more immersed, some sound effects should be added, plus a built-in dictionary needed to help the user to understand unfamiliar words. These insights proved to be extremely helpful in refining the game and bettering the game as a language learning tool.



PICTURE 4. Interactive choice-making interface in the Finnish language learning game.

TABLE 2. Detailed participant feedback on specific features of the Finnish language learning game prototype.

Feedback Category	Average Score (1-5)	Key Comments
Engagement	3.7	The screen displays bright and attractive visuals.
Usability	3.9	A user can find their way around, but the main menu could be easier to understand.
Educational Value	3.5	Interactive talks between characters proved most helpful in teaching us new words.
Interactivity	4.8	Learning is fun here, but having extra spoken explanations would make the study even better.
Cultural Relevance	3.5	I appreciated the story's connections to Finnish life, but I think more regular words from real life would have helped me learn better.
Motivation	4	The good comments from characters helped keeping my motivation up.

The testing results indicated a successful experience from users. The game was enjoyable and good for learning, the interactive dialogue system and positive reinforcements from in game characters made participants had strong motivation to continue studying. Most importantly, as the game effectively met language learning goals, the structured conversations enabled retention of vocabulary and grammar more efficiently. At the refinement phase, based on the feedback, usability improvements were made such as simple menu UI and enhanced interactive elements to make the app more accessible. Iterative design process was key to making sure player feedback always get back into the game updates. Methods for continuous improving the learning experience of the game made it stay both engaging and educationally fruitful to users.

4 DEVELOPMENT AND IMPLEMENTATION

This chapter explains how the Finnish language learning game was built and put into action. Research knowledge and learning design principles were transformed into a practical educational game format. Connecting gamification features with language learning principles and created technical solutions to build the game. The chapter is structured into three key subchapters: game concept and design features were explained through the basic building blocks of the game, describing its plot elements and player interactions. In addition, the technical details of game creation were described like including sample code and descriptions of how the features were built. At the end, explaining all technical and design problems developers met during creation plus the solutions that were put in place. Feedback gathered from usability tests strongly influenced the game design. The testing phase revealed both positive and negative aspects of the game through participant feedback about its dialog capabilities along with user-friendly navigation. The menu design received changes based on user feedback to enhance both ease of navigation and accessibility. The observations of gameplay confusion led developers to enhance instructions and task sequences to prevent interruptions in effective learner engagement. Making sure the game did what it needed to teach without creating user problems. The game prototype shows both technical skill and learning methods which will help researchers and educationalists make better educational games. (FIGURE 3)

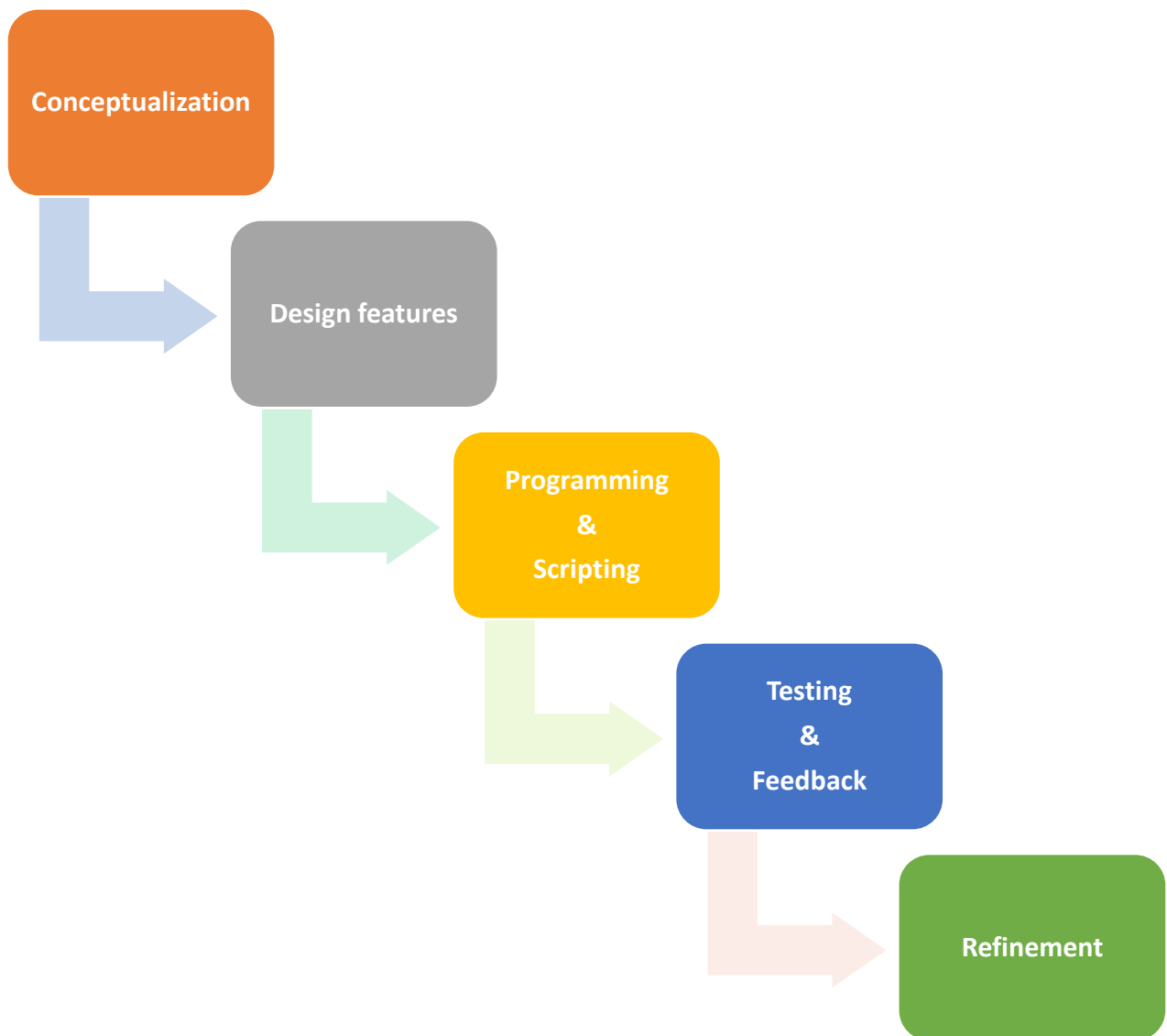


FIGURE 3. Workflow for game development and implementation

4.1 Game concept and design features

The Finnish language learning game combines user-centered design with language learning research and gaming principles to create its foundation. The main goal was to make a learning tool that helps players practice their vocabulary while improving grammar skills through interactive activities that teach Finnish culture. This subchapter describes how the game contains its main parts including: story setup, game characters, learning tools, and educational goals. The game opens by making players assume the role of a student who experiences different life situations through Finnish environments

(FIGURE 4). The story helps students learn language by showing them situations where they can apply their knowledge. The game starts with teaching basic talk skills before advancing to advanced lessons about buying things or daily use vocabulary. The game uses different response options to create decision-making situations that help users learn better. Players select one of several choices when speaking with others which produces distinct results. The method builds student interest and strengthens language understanding by letting them practice it repeatedly within real-world contexts (Hwang et al. 2023).

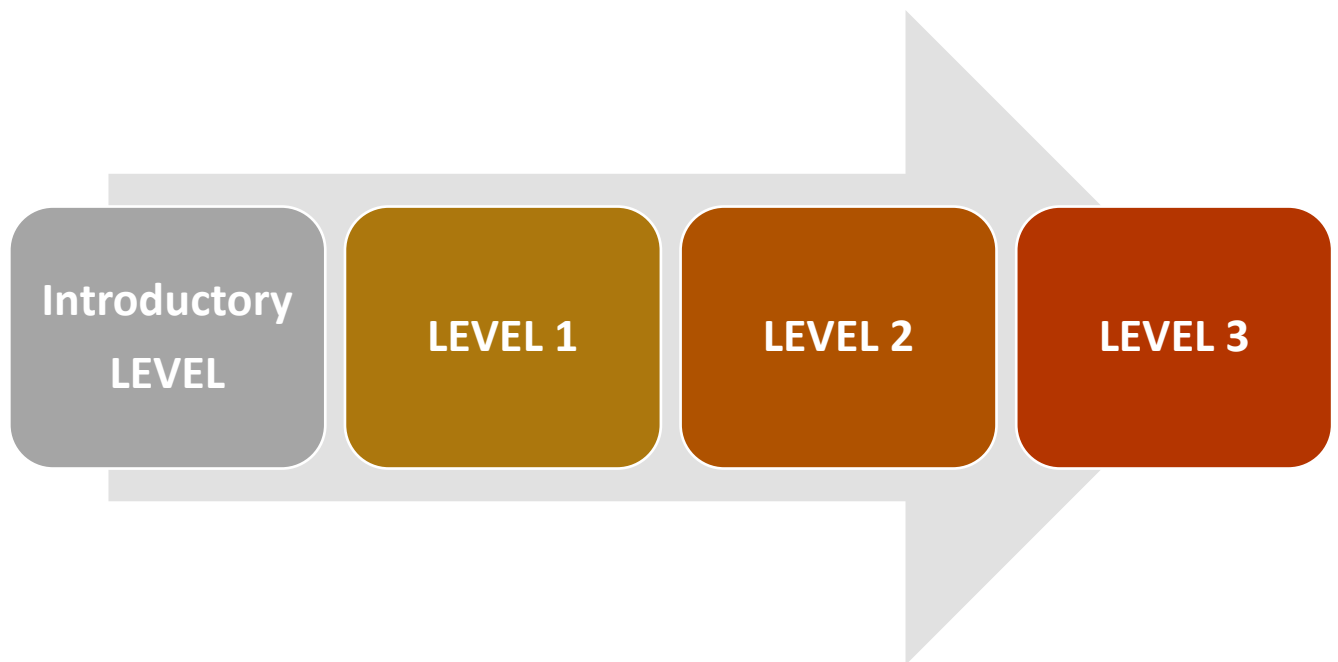


FIGURE 4. Progressive structure of the Finnish language learning game.

Charat was used to build the game characters because this tool creates appealing designs that are free and easy to connect to. Each game character was created to reflect Finnish cultural elements so players would have a more realistic experience. Game characters both guide and talk to players while giving them positive reinforcement to stay focused in the game. Key gamification features were integrated to enhance motivation and engagement, players were able to interact in natural dialogs that affect which parts of the story will play out next. On the other hand, game characters reacted right away to show if a player answered correctly or made an error. Moreover, the game builds vocabulary skills first then move players to more complex language topics. Players are motivated by their relationships with characters and by the pleasure of learning new language skills (Thurairasu 2022). The game teaching method matches with language learning principles including ZPD and self-regulated learning. Learners encounter challenges just beyond their skills, so the system offers help and step-by-step guidance.

(Rohman & Fauziati, 2022.) The educational program combines training in cultural settings to prepare students for effective interactions in everyday life.



PICTURE 5. Interactive dialogue scene in the Finnish language learning game.

4.2 Programming and Scripting in Ren'Py

The Finnish language learning game developed using Ren'Py a visual novel engine based on Python. The tool's coding features made it possible to build learning activities that included branching paths and allowed players to make choices plus receive feedback. The dialogue system was implemented using Ren'Py's "label" and "menu" features, enabling the creation of branching storylines and decision-making tasks. Players chose from various response options in the dialogue nodes to create different results. The system helped students learn new words by repeating them in real situations. Furthermore, conditional statements were used to make the responses to the user personalized, so learning was dynamic and adaptive. The text-based interactions in the game had the player gradually picking up vocabulary and introducing increasingly complex sentences as the user progressed.

Additionally, internal variables allow tracking player progress, and the system can make the feedback change based on that, making learning both structured and engaging. Code 1 illustrates these concepts.

```
# Finnish Lesson Scene

label finnish_lesson_scene:

    show teacher_normal_pose_closemouth at center with dissolve

    narrator "You step into the classroom, a mix of excitement and
    dread bubbling inside you. It's time for your first Finnish lesson."

    narrator "Your teacher, stands at the front of the room, radiat-
    ing a calm but authoritative presence."

    h "Hyvää huomenta kaikille!" # "Good morning, everyone!"

    narrator "Her voice is warm and cheerful, instantly putting you
    at ease."

    menu:

        "Reply confidently.":
            p "Hyvää huomenta!"

            h "Ah, confident already! I love the energy."

        "Mumble a nervous reply.":
            p "H-hyvää huomenta..."

            h "No need to be shy! You're here to learn, and mistakes
            are part of the journey."
```

Code 1. Example of a basic dialogue structure.

The game used quick response tools to help students understand the correct answers while learning. When players made wrong choices the game's characters provided them with learning support (FIGURE 5). These response tools were created to strengthen the proper usage of language by giving hints and explanations that players might reflect on their mistakes and improve. Moreover, learners received contextual feedback about different conversation scenarios so not only would users realize a mistake but also be aware of why an alternative response would have been better. These quick responses were adaptive in a sense and allowed the maintenance of engagement since learners felt supported and not discouraged which made the game more effective and encouraging learning environment. The following code demonstrates the concept.

```
# Practice the Alphabet
h "Now, let's practice! I'll say a letter, and you try to
pronounce it back. Ready?"

narrator "Helena points to the board and says:"
h "A"
$ answer = renpy.input("Type how to pronounce 'A':
").strip().lower()

if answer in ["ah", "a"]:
    h "Perfect! That's exactly how it's pronounced."
else:
    h "Close! The correct pronunciation is 'ah.'"
```

Code 2. Example of feedback system.

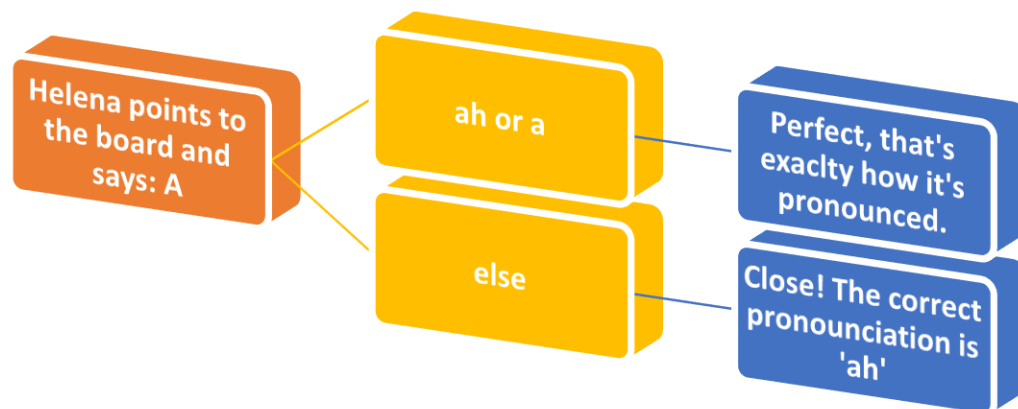


FIGURE 5. Flowchart of a Dialogue Sequence

The game used Ren'Py to make scene transitions happen smoothly between different parts of the game. The prototype used multiple background scenes to show Finnish environments which improved players' sense of immersion. To eliminate sudden jumps, fade in and fade out effects were applied to make the transition between conversations fade in. Additionally, movement on screen and changes to the environment were added to make the game more realistic. The combination of these effects was to make sure that players were immersed in the learning when playing the Finnish language in meaningful contexts. Timed delays were also used to add extra fluidity to pacing between dialogues to prevent the abrupt shift. Together, these elements kept engagement and provided a very natural learning experience. Code 3 below shows the feature.

```

# FLG_Level_2 - Scene 2

label meet_anna_school_lobby:
    # Scene: School lobby background
    scene bg school with fade

    $ gamer_name = "Anna" # Update her name dynamically
  
```

```
narrator "You step into the school lobby, the sound of distant chatter and footsteps filling the air. It's warm, lively, and already feels like a hub of possibility."
```

```
narrator "Elina walks ahead, her energetic presence practically lighting up the space."
```

```
show tutor_idle at center with dissolve
```

```
u "Welcome to your new learning grounds, [player_name]! This is where all the Finnish magic happens. Excited yet?"
```

```
p "Excited and maybe a little overwhelmed. But yes, mostly excited."
```

Code 3. Example of a scene transition.

4.3 Challenges encountered and solutions

The Finnish language learning game faced development obstacles because of restricted resources along with technical issues and independent work challenges. The project demanded creative answers and concrete methods to achieve its successful conclusion. Working independently presented one of the biggest hurdles because I had no development team to support me. The entire project management process operated autonomously to complete every stage including programming and design work as well as testing and user feedback acquisition. Working independently resulted in higher workloads while reducing chances for collaborative exchanges that traditionally help development teams during their work. A Basecamp system was deployed to create an organized workflow which helped monitor task completion. The usability tests gathered useful data from participants who helped guide multiple rounds of iterative development. A major difficulty emerged from utilizing free royalty-free content to produce images and audio effects. The platforms Pixabay and Freesound provided excellent assets, yet the resources frequently failed to deliver the exact specificity required for a fully immersive Finnish environment. The absence of genuine Finnish landmarks along with real local sounds from Finnish landscapes produced restrictions on cultural authenticity in the game. Resources were selected which matched Finnish design principles while writing dialogue that incorporated cultural elements as an offset for limited visual and audio capabilities.

The implementation phase of the game faced technical difficulties when managing branching dialogues, implementing feedback systems and guaranteeing smooth transitions between scenes in Ren'Py. Building complex dialogue trees became time-consuming because maintaining correct conditional machine logic often produced gameplay bugs or sequence failures. These system problems were tackled during multiple testing cycles enhanced by systematic error correction. Through the integration of Ren'Py's built-in debugging tools with a structured testing method, all errors were efficiently resolved. The project benefited from a complete documentation which facilitated simpler future code updates and modifications.

Maintaining appropriate educational focus together with player attention demanded special attention as the core development challenge. The game suffered from two opposing issues because education priority clashed with gameplay functionality. The gameplay mechanics aligned educational theories ZPD and SRL to reach the vital balance. Each task used progressive difficulty levels to unfold with meaningful dialogue activities teaching language skills through dynamic experiences. The implemented solutions successfully maintained project objectives even though various challenges existed. Independently working and resourceful use of available materials allowed the gain of a better comprehension of development stages and proved that educational gamified tools can be developed with limited resources. The iterative development method led to consistent enhancements which produced a functional prototype that combined educational purposes with technical requirements successfully.

5 RESULTS AND DISCUSSION

This chapter features results from usability testing alongside an assessment of the educational effects produced by the Finnish language learning game. The analysis occurs within the scope of established game objectives while using the theoretical framework from the thesis. A detailed analysis explores user feedback to measure how reliably the educational objectives and learner involvement rates were achieved in the game. The analysis consists of three main sections, each of which gives a detailed evaluation of the Finnish language learning game. User testing results are the quantitative and qualitative feedback of the data collected during usability testing to evaluate the effectiveness of the game. The Feedback section provides some insights into participant responses and what is good and what is not. The analysis of educational impact finally investigates how the game helps students learn language, increases their motivation and makes them immersed in the culture. These sections go a long way in evaluating the learning potential of the game, and the user experience. The findings confirm how the game delivers educational content through gameplay that engages students effectively and the subsequent analysis shows this approach matches existing research on gamification methods for language education. The research explores limitations of the project alongside proposed enhancements for upcoming versions of the game.

5.1 User testing results

10 participants, students and educators took part in the usability testing phase for the Finnish language learning game. The game evaluation asked participants to rate its performance through six specific criteria which included engagement levels and usability aspects together with educational value and interactivity features plus motivation factors and cultural relevance aspects. Survey results and semi-structured interview data revealed a combination of successful aspects with identified room for improvement. The game produced outstanding outcomes which demonstrated that the educational and interactive targets were reached successfully. The game showed exceptional engagement potential because players found it visually pleasing and fun to experience. The combination of interactive dialogue and the branching storyline functioned as a major factor in sustaining student involvement thereby producing an educational yet fun learning experience. Study participants assigned the second highest value to motivation since characters delivered essential encouraging dialogues which sustained players' interest and confidence during gameplay. Achieving outstanding motivational outcomes resulted from replacing standard gamified elements with supportive character interactions in the game.

The data shows intrinsic motivators in gamified learning tools outperform traditional extrinsic rewards since they create a more positive environment for learning. The game demonstrates how emotional engagement alongside personal connections between learners drives both educational results and prolonged engagement.

The gaming experience showed strong academic value because players noted better retention of vocabulary and better comprehension of grammar rules. Participants commended the dialogue system for enabling practical application of new concepts that strengthened theoretical frameworks of contextual learning and reinforcement. (Hwang et al. 2023.) Participants suggested adding a glossary and cultural notes to the game framework to improve learning effectiveness. Participants highly valued usability because they found the navigation and menu system easy to use. Several testers proposed menu simplification to enhance user interface friendliness. Participants valued the cultural element while recognizing Finnish cultural settings but identified poor cultural relevance as a system weakness. Players wanted to see more concrete Finnish references throughout the simulation including landmarks together with traditional cultural elements to increase their sense of being truly immersed in the experience.

Although participants valued the cultural element, they also recognized Finnish cultural settings and acknowledged that the cultural relevance was weak in the system. More authenticity and immersion were felt by players in terms of more direct Finnish references such as landmarks, traditional customs, and spoken local expressions. There is generally positive reception to cultural relevance, as it was scored a 4.0 (based on Table 3), but also requires more enhancement of the cultural content to be in game. The student independence metrics supported the effectiveness of incorporating educational content within gameplay which usability testers had validated. Finding results demonstrate how gamification elements particularly interactivity and contextual learning substantially boost language acquisition. (Zhang et al. 2020.) Future improvements of the game will build upon the valuable information collected from this research.

TABLE 3. Key results from usability testing.

Feedback Category	Average Score (1-5)	Key Comments
Engagement	4.3	Learning stays enjoyable because of the game's visually appealing design and engaging performance.
Usability	3.8	users find menus easy to understand yet some parts require extra simplification.
Educational Value	4	Through its interactive dialogues combined with vocabulary exercises the program successfully enhanced student learning retention.
Interactivity	4.6	The interactive decision-making tasks created immersion while maintaining active student participation throughout learning activities.
Cultural Relevance	4	While Finnish culture comes across strongly in the game more detailed local content would make immersion stronger.
Motivation	4.6	The ongoing dialogues from the characters proved to be inspiring while maintaining highest motivation levels for learning activities.

5.2 Insights from feedback

The user feedback received in usability testing revealed important aspects about how well the Finnish language learning game functioned and which elements needed improvement. Participants acknowledged three key elements which made the game successful: its interactive design, educational value and motivational components. Participants brought forward constructive recommendations which identified ways to improve the game's impact. The game's interactive dialogues received strong positive feedback from users according to the gathered insights. All participants noted that these dialogues provided meaningful opportunities for Finnish vocabulary and grammar practice which made learning feel practical and attractive. The dialogue-based decision tasks received strong praise from learners because they allowed active engagement and demanded critical evaluation of language usage. The

approach follows gamification principles because interactivity serves as a key factor to both maintain participant interest and improve retention rates (Hwang et al. 2023).

The findings showed how character interactions serve to sustain student motivation throughout the learning process. Within the game's dialogue system in-game characters delivered supportive messages which helped learners feel less anxious and created a positive learning atmosphere. Motivational dialogue within the learning system delivered intrinsic reward which enhanced the personal connection and inspirational quality of the experience for participants. The findings demonstrate why educational designers should incorporate motivational features which support established language learning theories such as self-regulated learning (Zhang et al. 2020). The participants commended the game's usability, but some users suggested better navigation and menu design elements. Interface design simplification will boost accessibility while delivering enhanced learner experience. The feedback revealed chances to improve the culturally specific content of the game. The Finnish themes received positive feedback from players, but several participants wanted the game to include more specific cultural references that extended past general themes to include landmarks alongside traditional customs or locally used expressions to enhance thematic immersion. The feedback from players found that the game integrated instruction with interactive gameplay effectively. Specific areas that need improvement were revealed, including easier user interface navigation and a broader selection of cultural content. The obtained insights establish a strong framework which enables game improvements while maintaining alignment with gamification principles and educational objectives.

5.3 Analysis of educational impact

Feedback from usability testing showed that the Finnish language learning game produced substantial educational results. The game applied gamification principles together with language acquisition theories to create an educational tool that maintained both high student engagement and learning effectiveness. This portion examines the game's impact on vocabulary retention and grammar understanding and learner interest compared to the project's educational targets. Players engaged in interactive dialogue sequences which functioned as fundamental elements while practicing vocabulary along with grammar within authentic simulation contexts. Players gained active language engagement through the game by selecting their responses and viewing response outcomes. Contextual learning theory supports meaningful language practice (Hwang et al. 2023). The participants said that performing repeated tasks which provided quick feedback enhanced their ability to remember new vocabulary words.

Educational success of the game depended heavily on its motivational mechanisms. Instead of using conventional rewards like points or badges the game system delivered motivational content through in-game characters. Through these supportive interactions participants found that the environment created a positive learning space that helped decrease their anxiety levels and increase their confidence. Students learn more effectively when their language acquisition is supported with intrinsic motivation according to self-regulated learning theories (Zhang et al. 2020). The educational outcomes experienced unexpected improvements through incorporating cultural themes, but effectiveness reached its limits in the game. Through incorporation of Finnish cultural elements combined with local references the game deepened student language comprehension because it brought dynamically relevant content to their studies. Feedback from users indicated that the learning experience could be enhanced by including cultural elements such as landmarks along with traditional practices. While the game had its limitations the cultural components it included supported effective language learning through appropriate integration. The analysis proves that the game reached its educational objectives successfully. The educational tool achieved successful integration of theoretical concepts with hands-on applications through an engaging experience that supported meaningful Finnish language acquisition. The analytical findings provide essential direction which will help future developers improve the game, so it continues to serve as an effective educational tool.

6 CONCLUSION

The Finnish learning game developed for this thesis showed how gamification could enhance language acquisition by successfully teaching Finnish language skills. The game delivered learners a compelling learning platform through its combination of interactive dialogue systems and contextual activities and motivational components for Finnish vocabulary and grammar practice. The iterative development lifecycle which combined user feedback with theoretical foundations produced a game that met its educational targets while creating a positive user interaction. The usability testing confirmed that participants showed strong engagement together with increased motivation and valuable educational benefits. Active user involvement in interactive dialogues combined with character-based feedback systems helped students develop confidence during their learning process. The combination of gamification principles with contextual learning and self-regulated learning theories produces effective educational tools that demonstrate their success in this thesis. Users identified two main drawbacks in the system: the exclusive use of royalty-free content and the absence of cultural references. Additional aspects discussed do not diminish the game's overall impact on learning although future development strategies would benefit from their consideration.

This thesis makes an essential contribution to game-based learning development for less frequently studied languages like Finnish. This project shows how educational technology can connect conventional learning methods with contemporary learners' interactive needs. Ren'Py functions as an accessible software development engine to create gamified educational tools which individual developers can easily implement. A future version of the game would improve player immersion through the addition of authentic Finnish landmarks together with cultural traditions. Extending participant selection criteria for usability testing to represent different learning demographics will help understand how the game performs with diverse groups of learners. Researchers can create deep language-learning experiences through new technologies like augmented reality (AR) because these tools present exciting possibilities for education. The objectives of this thesis successfully led to the development of an operational prototype that merges educational techniques with gamification features to advance Finnish language education. The knowledge acquired from this work establishes strong groundwork for additional studies and advancement in gamified educational systems.

6.1 Summary of findings

This thesis analysed how educational principles together with gamification techniques were used to develop a Finnish language learning game. The central goal established the creation of an interactive educational platform that supports vocabulary acquisition along with grammar skills development and cultural exposure. A multistep development process refined the game as users provided feedback to make sure it achieved its education goals. The usability testing phase demonstrated overwhelming participant engagement since users found the interactive conversation system and multiple story branches to be extremely effective. Participants found these interactive elements increased contextual knowledge application which improved comprehension while helping retain newly learned knowledge. Players found the motivational elements of the game particularly appealing because of character provided supportive feedback which demonstrated intrinsic reinforcement's value in language education. Through an enjoyable virtual world, the game system successfully reinforced vocabulary learning along with grammar concepts preserving a satisfying educational experience.

Most feedback was positive, yet some key areas needed improvement according to participants. User interface simplification strategies were proposed by participants as a method to improve accessibility. Using additional specific Finnish cultural landmarks and traditions in the game was proposed so it would boost immersion in the experience. The game delivered its core objectives successfully while presenting new evidence about game-based learning's potential to enhance student learning of languages. The findings of this thesis confirm that language acquisition theory works effectively with gamification principles. Through its combination of motivational elements and educational content the Finnish language learning game serves as a prototype that unites standard classroom practices with contemporary interactive technology.

6.2 Recommendations for future work

The game prototype developed in this thesis shows how educational gamification holds promise for language learning specifically with Finnish as the target language. Future versions of the project should focus on developing additional opportunities to enhance and expand its capabilities. The game requires additional Finnish cultural material featuring specific landmarks together with traditional customs and local expressions. Reviews that incorporate authentic cultural references will enhance language learners' interactive experience by creating richer deep engagements which motivates more effective study habits. Future iterations of this project should enlarge participant diversity in usability testing because this will enhance the collected insights for future development. Once the game reaches broader audiences with users of various linguistic backgrounds together with young and older players at different language proficiency levels researchers can gain more comprehensive findings about game effectiveness and identify user-specific challenges. By integrating advanced gamification elements that use adaptive difficulty levels and personalized learning pathways and progress tracking systems developers can provide customized experiences which boost both learner motivation and retention rates.

Progress in emerging technologies exemplified through augmented reality (AR) and virtual reality (VR) delivers promising opportunities to transform game immersion capabilities. Augmented reality technology would display Finnish words on real objects while virtual reality would create simulated cultural encounters such a visit to Finnish markets alongside participation in traditional events. By implementing multilingual support in the game can extend the accessibility to players beyond one language zone. Native language translations within the game allows it to balance the simplicity and inclusiveness. Future work needs to focus on making the system capable of scaling. Online distribution platforms together with web-based platforms would enhance game accessibility and increase its potential impact. Educational partnerships with institutions and language learning organizations would promote the game's formal classroom adoption making it a complete educational resource. The recommendations outline a systematic approach to improve both educational content and technological components of the game which will secure its ongoing development as an effective resource for Finnish language acquisition.

6.3 Final remarks

The Finnish language learning game connects three essential elements including gamification and educational theory with technological advancement. This thesis showed how interactive learning tools create better language acquisition by leveraging contextual learning methods alongside motivation techniques to build impactful educational experiences. The development process delivered its intended objectives by creating a functional game prototype which integrates theoretical models to enhance vocabulary retention and grammar understanding as well as cultural awareness. Game development requires adaptable strategies and creative problem-solving skills because project obstacles like limited resources and individual work responsibilities became apparent. These practical experiences have enriched the quality of the final prototype in addition to precious insights for coming iteration. Feedback collected through usability testing confirmed the game's achievement of its intended goals yet generated useful recommendations for improvements.

The thesis adds to gamified learning knowledge by demonstrating that modern technology and creative design approaches solve traditional language educational difficulties. The findings from this thesis create a base for upcoming investigations in Finnish language education and gamified educational systems development. Educational technology projects of this nature demonstrate great potential to transform language and cultural learning experiences in our interconnected global environment. The Finnish language learning game operates as a functional application and test model for developing future learning systems. The project's success demonstrates how gaming methods transform teaching techniques while proving the crucial step of uniting education theory with real-world usage. The educational trip demonstrates the necessity for continuous educational innovation that leads to improved learning methods which include all students actively and provide meaningful results.

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APPENDIX 1/1 – Feedback Questionnaire (Final Version)

Feedback Questionnaire: Finnish Language Learning Game

Participant Information:

- Age: _____
- Occupation: _____
- Familiarity with Finnish language (Beginner/Intermediate/Advanced): _____

Instructions:

Please rate the following statements on a scale of 1 to 5, where:

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Engagement:

- The game was engaging and enjoyable to play.
- The visual design and graphics contributed to my interest in the game.
- The storyline kept me motivated to continue learning.

Usability:

- The game's navigation and menus were intuitive and easy to use.
- Instructions for completing tasks were clear and easy to follow.
- I encountered no technical issues during gameplay.

Educational value:

- The game helped me retain new Finnish vocabulary and phrases.
- The dialogue system supported my understanding of Finnish grammar.
- The cultural elements integrated into the game enhanced my learning experience.

APPENDIX 1/2 – Feedback Questionnaire (Final Version)

Interactivity:

- The interactive dialogues helped me practice language skills effectively.
- The decision-making tasks were meaningful and relevant to language learning.
- Feedback provided during the game was helpful and constructive.

Motivation:

- The characters' encouragement kept me motivated to continue playing.
- I felt a sense of accomplishment after completing each task.

Open-Ended Questions:

- What did you enjoy most about the game?
- What aspects of the game could be improved?
- How likely are you to recommend this game to others learning ?

Finnish? (Optional : Why?)

Optional Section :

Additional Comments:

APPENDIX 2/1 – User Testing sample (Initial version & Final version)

Feedback 6

Participant Information:

- **Age:** 23
- **Occupation:** University Student
- **Familiarity with Finnish language:** Beginner

Ratings:

- **Engagement:** 4
- **Usability:** 4
- **Educational Value:** 4
- **Interactivity:** 5
- **Cultural Relevance:** 4
- **Motivation:** 4

Open-Ended Questions:

15. What did you enjoy most about the game?

The visuals and dialogues were very immersive.

16. What aspects of the game could be improved?

More vocabulary-building exercises would make it even better.

17. How likely are you to recommend this game to others learning Finnish?

5 – A highly effective learning tool.

Optional Section:

Additional Comments: Very enjoyable and useful for building language skills.

APPENDIX 2/2 – User Testing sample (Initial version & Final version)

Feedback 16**Participant Information:**

- **Age:** 23
- **Occupation:** University Student
- **Familiarity with Finnish language:** Beginner

Ratings:

- **Engagement:** 5
- **Usability:** 4
- **Educational Value:** 4
- **Interactivity:** 5
- **Cultural Relevance:** 4
- **Motivation:** 4

Open-Ended Questions:

15. What did you enjoy most about the game?

The decision-making tasks were engaging and relevant to language learning.

16. What aspects of the game could be improved?

The addition of voiceovers for dialogues would be beneficial.

17. How likely are you to recommend this game to others learning Finnish?

5 – A must-try for beginners.

Optional Section:

Additional Comments: The interactive components are well-designed and intuitive.

APPENDIX 3/1 – Code Snippets from the Finnish Language Learning Game

```

# Hockey player appears
show hockey_player_idle with dissolve

narrator "Just as you're about to embrace the chaos, a figure
emerges. Tall, friendly, and wearing... hockey shirt? Really?"

h "Hei! Tarvitsetko apua?"

narrator "Ah, Finnish. A language that sounds like music and
tongue-twisters had a baby."

p "I stare at him blankly. Is he asking me something? Is this
the part where I nod and smile awkwardly?"

# Hockey player switches to English
h "Do you need help?"

narrator "Oh thank goodness. He speaks English. Crisis averted.
For now."

p "Oh, uh, yes. I think so. I'm trying to find the train sta-
tion."

# Hockey player responds
h "The train station? Sure, I can show you. But first, what's
your name?"

# Player inputs their name
$ player_name = renpy.input("Type your name: ")
$ player_name = player_name.strip()
if player_name == "":
    $ player_name = "Mysterious Stranger"
    narrator "A bold move, leaving your name a mystery. Very
dramatic. I like it."

# Player introduces themselves
p "I'm [player_name]."
h "Nice to meet you, [player_name]."
```

APPENDIX 3/2 – Code Snippets from the Finnish Language Learning Game

```

# Player's response
menu:
    "Ask his name":
        p "What's your name?"
        h "Oh, right. I'm Mikko."
        $ hockey_player_name = "Mikko"
        narrator "Ah, so the Stranger has a name. Mikko. Finnish
for 'guy who saves lost tourists,' probably."
    "Just nod and follow":
        p "I nod and decide to follow him. If he's leading me to
the train station, that's all I need to know."
        h "You're not big on small talk, huh? Bold choice. My
name is Mikko by the way."
        $ hockey_player_name = "Mikko"

# Conversation continues
    p "Thanks for helping me. I just arrived, and everything
feels... overwhelming."
    h "Don't worry. The first time is always the hardest. Finland
can be a bit of a maze, but you'll get used to it."
    narrator "[hockey_player_name] leads the way, weaving through
the airport with the confidence of someone who's done this a thou-
sand times."

# Easter Egg: If player name is "Mysterious Stranger"
if player_name == "Mysterious Stranger":
    narrator "By the way, naming yourself 'Mysterious Stranger'
is a power move. Are you planning to become Finland's next great
mystery? I'm intrigued."

```

APPENDIX 3/3 – Code Snippets from the Finnish Language Learning Game

```
label cafe_scene_music:
```

```
    show metalhead_idle at left with dissolve
```

```
    narrator "The conversation with Joni shifts naturally to his
    passion—Finnish music."
```

```
    m "So, [player_name], have you ever listened to Finnish music?
    Metal, folk, anything?"
```

```
    menu:
```

```
        "Admit you don't know much.":
```

```
            p "Honestly, not really. I know Finland is famous for
            metal, though."
```

```
            m "You're right about that! Finland is like the metal
            capital of the world. We take it seriously here."
```

```
        "Say you're a fan of Finnish bands.":
```

```
            p "Actually, I've listened to some Finnish bands.
            Nightwish, maybe? Or HIM?"
```

```
            m "Oh, solid choices! You've got decent taste,
            [player_name]. Let me introduce you to some deeper cuts."
```

```
    # Learning Opportunity: Finnish Music Vocabulary
```

```
    m "Let me teach you a couple of Finnish words related to music.
    It'll make you sound cooler, trust me."
```

```
    narrator ""
```

```
    Musiikki (Music)
```

```
    Laulu (Song)
```

```
    Soittaja (Player/Musician)
```

```
    Kitara (Guitar)
```

```
    Rummut (Drums)
```

APPENDIX 3/43 – Code Snippets from the Finnish Language Learning Game

```
"""
```

```
narrator "He leans in, his tone enthusiastic as he shares more
about the Finnish music scene."
```

```
# Mini-Game: Guess the Band/Title
```

```
m "Alright, let's play a quick game. I'll give you a Finnish
band name or song title, and you guess the meaning. Ready?"
```

```
narrator "Joni's excitement is contagious, and you can't help
but agree."
```

```
m "Guess the meaning of 'Musta Keisari'."
```

```
menu:
```

```
  "The Black Emperor":
```

```
    p "The Black Emperor?"
```

```
      m "Correct! Musta means black, and Keisari means em-
peror. Nicely done!"
```

```
  "The Dark King":
```

```
    p "The Dark King?"
```

```
      m "Close, but not quite. Keisari is emperor, not king."
```

```
m "Guess the meaning of 'Tuulen Tytär'."
```

```
menu:
```

```
  "Daughter of the Wind":
```

```
    p "Daughter of the Wind?"
```

```
      m "Spot on! Tuuli is wind, and Tytär is daughter. You're
catching on quickly!"
```

```
  "The Wind's Song":
```

```
    p "The Wind's Song?"
```

```
      m "Not quite. It's 'Daughter of the Wind.' Still, good
effort!"
```

APPENDIX 3/4 – Code Snippets from the Finnish Language Learning Game

```
# Joni Shares Cultural Insight
```

```
m "You're pretty sharp, [player_name]. Music is such a big part  
of Finnish culture. It's not just entertainment—it's emotion, his-  
tory, and rebellion all rolled into one."
```

```
narrator "His voice takes on a serious tone for a moment, re-  
flecting his passion."
```

```
m "If you really want to dive into Finnish culture, I know a  
spot where live bands play. You should come by sometime."
```

```
menu:
```

```
"Express excitement.":
```

```
p "That sounds amazing! I'd love to."
```

```
m "Great! I'll let you know when the next gig is. It's a  
vibe you don't want to miss."
```

```
"Sound hesitant.":
```

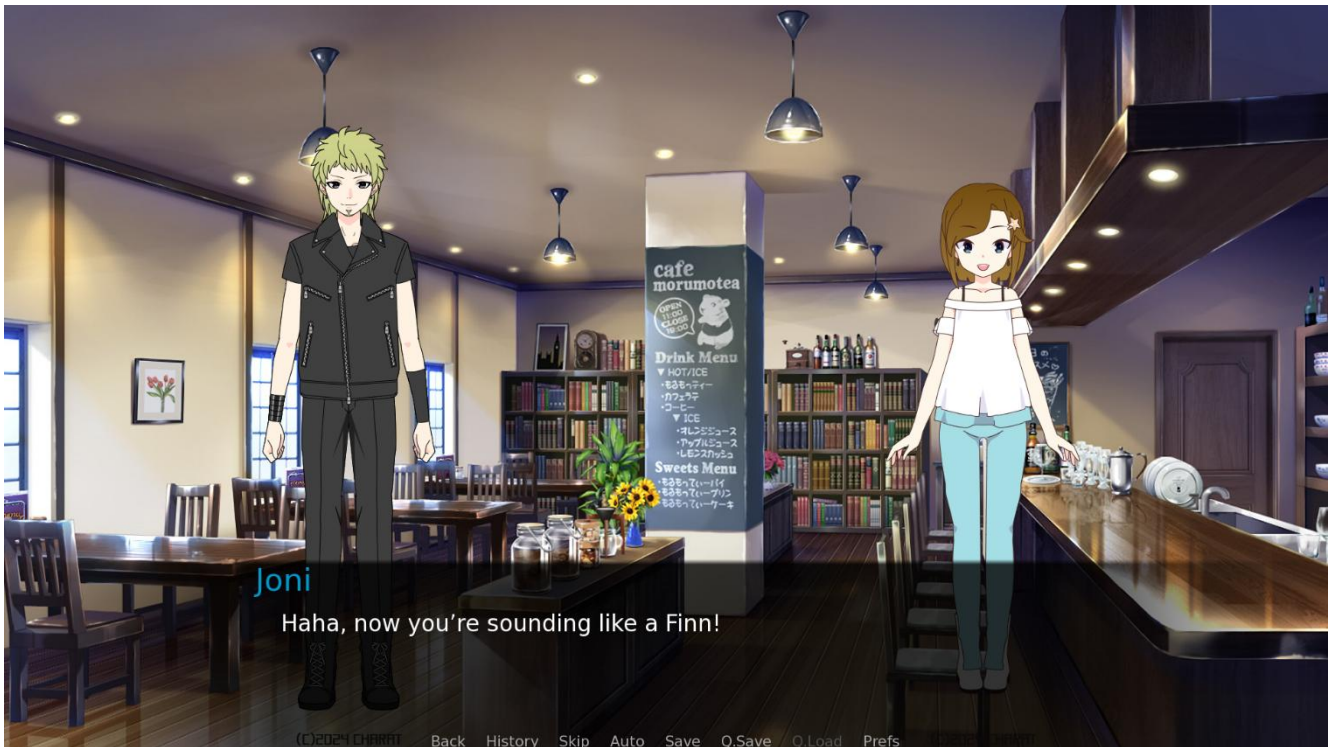
```
p "I'm not sure. Live music isn't really my thing."
```

```
m "Fair enough, but if you change your mind, let me  
know. It's worth it."
```

APPENDIX 4/1 – Screenshots of Game Interface & Testing Process



APPENDIX 4/2 – Screenshots of Game Interface & Testing Process



APPENDIX 5 – Ethical Considerations & Participant Anonymization

The fundamental requirement for ethical research work guarantees participants keep their rights alongside privacy and dignity safeguarded at each part of the research. All usability testing procedures for data collection in this project operated within ethical research boundaries by maintaining voluntary participation with informed consent and absolute confidentiality.

All testing participants were free to join or leave the study at their discretion after receiving complete information about the research aims and testing obligations and withdrawal rights. Participants received an easy-to-understand information sheet before the test which explained the research purpose and data collection types together with how their responses helped improve the Finnish language learning game.

The study maintained participant anonymity through the exclusion of personal identification elements including names and contact information together with demographic data beyond essential parameters. The collected survey data and interview feedback received codes for identification instead of personal information. The researcher documented usability test observations by concentrating on interaction patterns and avoiding any identification of individual test participants throughout the documentation process.

The collected data received secure storage through researcher-only access for academic research purposes. Every individual response in the final report remained anonymous so participants' input stayed completely confidential and impossible to trace. Aggregated findings took the place of individual cases within the presentation to ensure participant identity protection.

Ethical protocols ensured participants could provide unbiased feedback because they maintained complete privacy protection. The ethical commitment to participant anonymity both elevated research validity and demonstrated scholars' commitment toward responsible academic investigation.

APPENDIX 6 – Software and tools used

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