Teaching French as a Second Language to Primary Students Online:

Implementing a Gamified Routine System

Fanny Langin

Department of Integrated Studies in Education

McGill University, Montréal

January 2022

A thesis submitted to McGill University in partial fulfillment of the requirements of the degree of Master of Arts in Educational Leadership.

ACKNOWLEDGEMENTS

The development of this thesis would not have been possible without the support of the people presented below.

I am thankful to my supervisor Dr. Mindy Carter for believing in this project when I presented it to her. I am grateful for her support and guidance throughout this long process, and for answering the millions of questions I have had for this thesis. Additionally, I am thankful to McGill University, which allowed me to pursue this project and to my advisor Dr. Jim Howden for guiding me in the early stages of this thesis.

I would like to acknowledge the participants of this study for taking part in this project for eight weeks and for their thoughtful insights which directed the findings of this work.

Thank you to my friends for their support.

Lastly, I am profoundly grateful to my family for believing in me, as well as for their encouragements and endless support, which made this thesis possible. Papa, Maman, Juliette, Pauline, Gabriel et Aurélien, merci.

Abstract

Gamification is “the use of game design elements in non-game contexts” (Deterding et al., 2011, p.2). Gamification has gained exponential interest within the research world in the past few years, probably due to the increased use of technology in various fields. Gamification has been found to increase the motivation and engagement of the targeted audience. Given the rise of emergency online instruction due to the COVID-19 pandemic that has seen schools closed to accommodate sanitary measures, this study looked at the potential benefit of gamification in an online teaching setting. This interventional comparative study was conducted using mixed methods and focused on the implementation of a gamified system in an online teaching setting for primary French as a Second Language (FSL) students. Through the analysis of class observations, satisfaction surveys, individual interviews, and knowledge tests, the study concluded that there was no significant difference in student satisfaction and knowledge retention between the control and the experimental (gamification) group. The notion of challenge appeared to be an important factor for student satisfaction in both groups. The researcher provided insights on the implementation of the gamified system and its evolution. The gamification components used in this study were: storyline, coins, and badges. It was concluded that the badges were the participants’ favorite component and that the storyline had potential for increased vocabulary acquisition. Lastly, findings regarding online teaching were presented such as the use of relaxation activities as well as students’ need for social interaction.

Keywords: Gamification, Online education, French as a second language, Primary level

Résumé

La gamification (ou ludification) est l'utilisation d'éléments de jeux dans un contexte qui n'est pas le jeu (Deterding et al., 2011). L'intérêt pour la gamification dans le secteur de recherche a augmenté exponentiellement dans les dernières années, probablement dû au développement de l'utilisation de la technologie dans des secteurs variés. Les recherches démontrent que la gamification augmente la motivation et l'engagement de l'audience ciblée. Étant donné la hausse de l'éducation en ligne d'urgence due à la pandémie du Covid-19 qui a vu les écoles fermées urgemment pour respecter les mesures sanitaires, cette étude porte sur les bénéfices potentiels de la gamification dans un contexte d'enseignement en ligne, spécifiquement pour la satisfaction des élèves et la retenue de connaissances. Cette étude d'intervention comparative a été menée en utilisant des méthodes de recherches mixtes et se focalise sur l'implémentation d'un système de gamification pour l'enseignement du français langue seconde (FSL) en ligne à des élèves de primaire. À travers l'analyse d'observations de classes, d'études de satisfaction, d'interviews individuelles et de tests de connaissances, l'étude a conclu qu'il n'y avait pas de différence significative par rapport à la satisfaction des élèves et la retenue de connaissances entre le groupe de contrôle et le groupe expérimental (gamification). La notion de défi apparait comme un facteur important pour la satisfaction des élèves dans les deux groupes. La chercheuse a détaillé l'implémentation du système de gamification et son évolution. Les éléments de gamification utilisés dans cette étude étaient le scénario, les pièces et les badges. Il a été conclu que les badges étaient l'élément favoris des participants, et que le scenario avait un potentiel pour augmenter l'acquisition de vocabulaire. Pour finir, des résultats par rapport à l'enseignement en ligne ont été présentés, notamment l'implémentation d'activités de relaxation et le besoin d'interaction sociale des élèves.

Mots clef : Gamification, ludification, enseignement en ligne, français langue seconde, niveau primaire

TABLE OF CONTENT

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

Background

This interventional comparative study focused on three general topics that are interconnected to provide a closer look into our current educational reality: second language education, online teaching, and gamification, presented below.

Second language education is of paramount importance in Quebec. Whilst French is the only official language, many people are bilingual in Quebec. Being bilingual is an enormous asset in life, such as access to more school and employment opportunities. This thesis focused on French as a second language (FSL), as it is a mandatory subject in Quebec's anglophone schools. I chose second language education because of my background as a FSL and English as a second language (ESL) teacher and tutor. Moreover, as a multilingual individual myself, I believe it is extremely important for children to learn a second language in school.

Online teaching is being used now more than ever because of the COVID-19 pandemic. Online teaching is very specific and demands of teachers to reinvent the way they are used to teaching. For example, in online education, students have usually less synchronous time with the teacher, connecting to the students or as a group is more challenging, students can get distracted more easily and their motivation and engagement may be lower than in face-to-face teaching.

The years 2020 and 2021 have marked an obvious shift in teaching practices worldwide. Education systems have had to adapt urgently to the COVID-19 pandemic to provide students with an educational structure. Whilst a multitude of systems have been implemented throughout the world, this thesis is set within Canada, and more specifically Quebec, because of my background working in Quebec's education system. When the school closure was announced, my field experience ended early. In March 2020, I developed a tutoring company, and I started teaching

French as a second language online to small groups of students from grade 1 to grade 6. I had very little experience with online teaching, and it was a new way of learning for most of my students as well. We learned together how to produce a meaningful learning experience through online teaching. We often used game-based learning and gamification at the request of the students. This work experience fuelled my interest in gamification and ultimately my desire to pursue research in this topic.

Gamification has been defined in multiple ways but the definition that I will follow in this research is Deterding et al.'s: "the use of game design elements in non-game contexts" (2011, p.2). Research on gamification has been extremely popular within the past few years, especially in an online context, probably due to the never-ending development of technology and the growth of its place within society. The development of techno-pedagogical tools also paved the way for the implementation of gamification in the classroom.

Study

Given the potential of gamification for online teaching, I decided to conduct a comparative interventional study with two groups, a group taught with regular teaching and a group taught using gamification elements such as a storyline, coins, and badges. The study lasted eight weeks and was conducted entirely online. Specifically, this study looked at the influence of gamification on student satisfaction and knowledge retention, as well as the implementation of a gamified system for online teaching. The research questions are as follows:

(RQ1) Does gamification influence knowledge retention and student satisfaction in an online teaching setting?

(RQ2) How to create and implement an effective gamified system for online education?

Organization of the Thesis

The study starts with an overview of the thesis that presents a contextualization of the setting and themes chosen, followed by the objectives of the study, the gaps in literature that are addressed, an overview of the methodology and a presentation of the researcher's motivation to conduct the study. The second chapter moves to a review of relevant literature which describes the elements of this thesis by giving a detailed explanation of second language education in Quebec, the evolution of online teaching and an in-depth summary of gamification and how it relates to this thesis. The third chapter of the thesis is the methodology that outlines the structures of the experiment, information about the participants and the material used to collect data. The fourth chapter of the thesis is the results chapter. It presents the results of the study after careful analysis of the data. Last, the results are discussed, and conclusions, limitations, and implications are drawn.

CHAPTER 1: OVERVIEW OF THE STUDY

Contextualization and Rationale of the Study

Kentnor (2015) defines distance education as "a method of teaching where the student and teacher are physically separated" (p.22), online education is the latest form of distance education. Through a careful analysis, Kentnor (2015) retraces the evolution of distance education through the United Stated, which started around the 1800s, with Isaac Pitman teaching shorthand by correspondence (postcards). In the early 1900s, universities started using radios as a form of distance learning, closely followed by educational television programs in the 1930s, and lastly the use of internet for online learning and teaching emerged in the 1980s. Kentnor argues that "online education is the fastest growing form of distance education" (p.30). Online education offers new advantages for education systems, such as increased accessibility to educational resources, Goodyear et al. (2001) refer to online education as "borderless education" (p.67), as well as a potential economical advantage (Goodyear et al., 2001; Guichon, 2009; Kentnor, 2015). The teaching setting chosen for this study is online education because of its rapid expansion in the world of education, due to the development of technologies (Kentnor, 2015), and more recently, the COVID-19 pandemic, that redefined the need for alternative methods of instruction due to the closure of schools during lockdowns. Research about online education seems to start in the 1990s, in concordance with the development of online education through internet, and has grown in interest ever since, from a "theoretical and practical perspective" (Van Gorp et al., 2019, p.374).

This study was conducted entirely online in June and July 2021, in the midst of the COVID-19 global pandemic. In "Policy Brief: Education During COVID-19 and Beyond" (2020), the United Nations found that:

> The COVID-19 pandemic has created the largest disruption of education systems in history, affecting nearly 1.6 billion learners in more than 190 countries and all continents.

> Closures of schools and other learning spaces have impacted 94 per cent of the world's student population, up to 99 per cent in low and lower-middle income countries. (p.2)

The Policy Brief shows that the pandemic has impacted school systems worldwide, and that countries' responses to the pandemic were heterogeneous. The impact of the pandemic on education goes beyond the closure of schools. The Brief mentions a *ripple effect* from the school closure impacting "food insecurity, economic instability, and violence against women and girls" (p.10).

The impact the pandemic has had on education has forced instructors to look at different methods for instructions. To reflect the educational reality during the pandemic lockdowns, as well as to further develop my skills and understanding of the online domain, I chose to develop the study experiment for the online teaching setting. Online teaching encompasses several modes of instruction such as *synchronous*, teachers and learners are not in the same place but are learning at the same time such as through videoconference, *asynchronous*, teachers and learners are not in the same place and learning does not occur at the same time, for example courses can be pre-recorded, *blended* or *hybrid learning*, students participate in both in-person and online instruction (The Glossary of Education Reform, 2013). Another definition of hybrid instruction is having students in-person and online at the same time, such as joining the classroom through a videoconference platform. Prior to the pandemic, online education had become more prominent because of the development of technologies and the space it had taken within our society. Cheung (2021) writes that the use of videoconferencing tools for synchronous teaching has increased. Guichon (2009) advances that more language courses are being offered online and that: "one can imagine that such technology-enhanced teaching practices that are both economical and potentially promising for language learning will become widespread in the years to come" (p.167). In recent years, we have

seen the development of several language apps such as Duolingo and Babbel as well as online tutoring companies that offer students around the world to connect with verified teachers and tutors and promote flexibility and affordability, such as Verbling and Preply. The development of technology worldwide offers increased accessibility to languages, in a world where being multilingual is a huge asset.

This study was conducted online with French as a second language (FSL) students living in Quebec. While French is the only official language in Quebec, second language education stands in a special place there, as the province holds over half of Canada's French-English bilingual population (Statistics Canada, 2017). Montreal is a multilingual city, where several languages can be heard throughout the day. Statistics Canada (2016) found that the most common mother tongues in Montreal besides French and English are Arabic (4.5%), Spanish (3.2%), Italian (2.7%), Creole (1.5%), and Mandarin (1.0%). Students in Quebec's schools are learning more than one language. Students in French primary schools are learning English as a second language (ESL) and students in English primary schools are learning FSL. Who can attend English schools in the province is limited based on parents' education in French or English schools as per Quebec's Bill 101, later explained in the literature review. I chose to recruit participants living in Montreal or Montreal adjacent because I have completed my teacher training in Quebec, therefore my knowledge of the curriculum requirements and the education system have guided my choices while developing the experiment.

In this study, I focus on online synchronous instruction for second language learning, but other methods were used to deliver instruction during the lockdowns such as paper-based instruction, the use of radio and television programs, and a variety of online models (United Nations, 2020). The pandemic has seen the rise of emergency online instruction as opposed to

regular online instruction. Teaching or attending online lessons that were planned to be online is different than emergency online teaching as the content that was planned for in-person instruction needs to be adapted to the new setting but it was not originally created for it. Kentnor (2015) advances that online education requires an adapted pedagogy.

Pokhrel & Chhetri (2021) write "transitioning from traditional face-to-face learning to online learning can be an entirely different experience for the learners and the educators, which they must adapt to with little or no other alternatives available" (p.134). The need for assistance and training in educational technologies is important for a successful transition. As colleagues and peers often commented, I am from a generation "that was born with a smartphone in their hand", meaning I learnt how to use technology at an early age. This statement is particularly appropriate for current primary students in Canada. They are sometimes more comfortable using technology than their teachers. Technology is fast evolving and requires continuous learning to keep up with the latest trends. Teachers may not have the skills needed for online teaching, producing online instruction of poor quality. Pokhrel & Chhetri (2021) write: "The use of suitable and relevant pedagogy for online education may depend on the expertise and exposure to information and communications technology (ICT) for both educators and the learners." (p.135). Compton (2009), writes that technological training should be integrated early in teacher training programs, through a mandatory course or integrated in other courses. As a requirement for my Bachelor of Education (B.Ed.), I took an educational technology class in the second year of my four-year degree where we were taught how to include technology in the classroom, but we did not learn what to do in case the classroom itself was moved online, as it was not yet part of our reality. Compton (2009), advances that the minimal efforts that are being implemented to train teachers for online teaching do not correspond to the rapid growth of the field. Steiner and Woo (2021) reported that more

support could be provided to teachers engaged in remote learning due to the lack of prior training. An emphasis should be made on professional development (PD) regarding educational technologies to correspond with the reality teachers are facing. In 2019, Quebec's government presented the Digital Competency Framework as part of the Digital Action Plan for Education and Higher Education to be developed from 2018 to 2023 (MEES, 2019), which emphasizes the need for technological instructions through 12 dimensions, with ethical citizenship and technological skills at its core. Instructors are responsible for assimilating the competencies and accompanying learners from preschool to higher education to develop those competencies. The new Reference Framework for Professional Competencies (MEES, 2021) sees competency 12 "Mobilize digital technologies" (p.43) as a cross-curricular competency, therefore it should be integrated through other competencies. It is obvious that an effort is being made in Quebec to integrate technology in the curriculum, but one can wonder if teachers are receiving sufficient training to implement it. As a result of Quebec's Bill 40 (chapter E-9.1), private school teachers are required to complete 30 hours of professional development continuously over two-year cycles, starting in 2021, each cycle starting on July 1st of an odd year. Professional development encompasses several components such as conferences, workshops, courses, relevant readings, etc. (Act Respecting Private Education article 54.12, 2021). It would be advisable to provide teachers with the opportunity to acquire new skills in techno-pedological tools, as well as online instruction skills. However, Cheung (2021) writes: "when teachers are burdened with a heavy workload, it is challenging to take the time and effort to become proficient in using the technical tools available for better student-centred learning" (p.12). Through their research report that surveyed k-12 teachers in the US, Steiner and Woo (2021) found that teachers are more likely to leave the profession than before the pandemic: "nearly one in four teachers said that they were likely to leave their jobs by the end of the 2020–

2021 school year, compared with the one in six teachers who were likely to leave, on average, prior to the pandemic" (p.2). They also found that teachers were more likely to experience job-related stress (78%), symptoms of depression (27%), and feeling of burnout (54%) due to the pandemic's work conditions. The findings identify stress as a potential threat to the overall teacher supply. A balance must be found between teachers' pre-existing workload and acquiring the essential skills to provide students with quality online instruction.

Compton (2009) writes that "online language teachers need to acquire skills beyond technological competence in order to teach effectively in this online environment" (p.95). The following paragraph presents different frameworks for instructors to effectively teach online by presenting the required skills for online education. Guichon (2009) proposes three necessary competencies for the online synchronous teaching context. The first competency is *socio-affective regulation*, meaning the instructor's capacity to form a relationship with the students. The second competency is *pedagogical regulation,* the instructor is knowledgeable about the subject taught. The last competency is *multimedia regulation,* the instructor uses the communication tools (online teaching tools) appropriately in various contexts (synchronous, asynchronous, etc.). Additionally, Compton (2009) writes that best-practices for teaching online do not necessarily translate to teaching languages online and proposes the following framework for online language teaching skills: *technology in online language teaching, pedagogy of online language teaching,* and *evaluation of online language teaching,* each skill is divided in three distinct levels of expertise, *novice, proficient,* and *expert,* that teachers acquire throughout their training. The level needed for each skill depends on the need they have for those competencies. For example, using technology for the regular classroom or teaching a full course online does not require the same level of expertise. Based on Compton's framework, Van Gorp et al. (2019) propose an updated version by

adding the level of expertise *limited*, as well as identifying eleven competencies divided in the three domains: technology (ex: *course design, accessibility*), pedagogy (ex: *presence strategies*) and evaluation (ex: *conducting online task and course evaluations*) (p.376). The three frameworks presented in this paragraph place knowledge of technology, pedagogy, evaluation, course content, and social interaction as essential skills for online instruction. Having taught French as a second language online for over a year before conducting this experiment, I believe I have the required competencies to conduct an effective online language course.

As demonstrated above in the different frameworks, having sufficient knowledge of the technology used for online teaching is required of teachers to produce quality instruction. Beyond knowing how to use videoconferencing platforms, such as Zoom, Google Meet or Teams, integrating online tools to the lessons is important. For example, tools for student engagement such as Jamboard and Padlet that offer an interactive board for students to write their thoughts, or tools for evaluation such as Socrative, that presents online tests that teachers can send to their students, are appropriate for the online classroom. Pokhrel & Chhetri (2021) express that online learning gives the opportunity for *innovation* in teaching (p.138). Given that online education calls for adapted teaching methods, I decided to study the use of gamification in this teaching context. Gamification is “the use of game design elements in non-game contexts” (Deterding et al., 2011, p.2). Gamification is not necessarily used online (Papp, 2017), but it seems to be the most common use of this method and will be what I will focus on in this thesis. Gamification has gained recognition in various fields in recent years and research has been done on a variety of age groups and contexts. I decided to look at the effects of gamification for online instruction, given its impact on motivation and student engagement (De la Torre & Berbegal-Mirabent, 2020; Yildirim, 2017). Pokhrel & Chhetri (2021) emphasize that "there is no one size-fits-all pedagogy for online learning.

There are a variety of subjects with varying needs." (p.135). The potential of gamification for individualized instruction (Bai, et al., 2020) is another aspect that could benefit the online context. Papp (2017) found that the participants were having fun while learning with gamification. I argue that having fun while learning can contribute to student satisfaction and forming a relationship as a group. I have been using gamification and game-based learning for in-person and online classes for over a year, as well as attended regular PD to further my knowledge of the subject, which enabled me to acquire the skills and resources needed for this study.

As mentioned previously, online education demands adapted lessons to provide students with a meaningful learning experience. To develop engaging and tailored lessons for students in both the control and the experimental group, I incorporated several theories: Gardner's multiple intelligences theory (Gardner, 1983), self-determination theory (Deci & Ryan, 1985), self-efficacy theory (Bandura, 1997), flow theory (Csikszentmihalyi, 1990), and Landers' theory of gamified learning (Landers, 2015) which are often associated with gamification in literature. The theories and the topic of gamification are detailed in the literature review. The specificity of this thesis is what makes for its uniqueness in the fields of gamification, online education and second language education. The goals of the study, as well as the research questions observed through the experiment, are explained in the following paragraphs.

Objectives and Research Questions

The first objective of this study is to observe the impact of gamification in an online teaching setting, specifically looking at student satisfaction and knowledge retention. Students that attend online classes can experience certain feelings such as boredom and anxiety (Artino & Jones, 2012), which could impact their motivation. Gamification seems to have a positive impact on student motivation (De la Torre & Berbegal-Mirabent, 2020), and is widely used through

technology, therefore I wondered if gamification could be beneficial for an online synchronous teaching setting. My first research question is as follows:

(RQ1) Does gamification influence knowledge retention and student satisfaction in an online teaching setting?

The second objective of this study is focused on the format of tools used for the gamified group. Whilst gamification has become more popular in educational settings, it is sometimes implemented without the prior knowledge to do so effectively (Yaşar et al., 2020). A gamified system needs to be well thought-out before its implementation, as gamification can have detrimental effects on learning. Toda et al (2018) present four 4 negative effects of gamification for the education setting: "Indifference, Loss of performance, Undesired behavior and Declining effects" (p.6). Similarly, it was demonstrated earlier in this chapter that knowledge of the technology and the pedagogy are primordial for online teachers. In preparation for the literature review of this study, I read many articles pertaining to the creation of gamified systems that enabled me to create an effective system for this study's experimental group. Gamification systems can be implemented for different goals, such as classroom management or encouraging certain skills like reading or writing. This study specifically looked at the implementation of a gamification system to build a routine for the online classroom. The system had an integrated reward system in form of coins and achievement badges. The second research question is:

(RQ2) How to create and implement an effective gamified system for online education?

The following paragraph briefly describes the methodology used in this study to respond to the research questions.

Methodology

To reach these goals, I conducted a two-month long interventional comparative study, using mixed methods. The participants of this study are two groups of six grade four and five primary students studying FSL in school. The participants are living in Montreal or nearby. The experiment consists of me teaching FSL to students online, one group using gamification and the other using traditional methods of teaching. As online education calls for innovation in terms of teaching methods to produce effective instruction, I decided to use gamification given its potential for this setting. By teaching both groups myself, I ensure some homogeneity to how the lessons are delivered and am able to conduct my own observations in the virtual classroom. The data collections tools are knowledge tests, satisfaction surveys, individual interviews, and classroom observations. The tools are similar to one part of the study conducted by Papp (2017). They focused on primary students and the use of gamification to improve the students' learning of multiplication tables in mathematics: the participants had a pre-test and a post-test, a survey, a focus group to talk about their experience with gamification and its impact on their learning experience as well as classroom observations. Papp (2017) wrote: "the consensus for both groups implied they found the gamified approach to be engaging, motivating and a preferred method to learn" (p.3199). The following paragraph explores the gaps in literature regarding teaching languages online and gamification and how this thesis begins to answer them.

Addressing the Gap in Literature

Blake (2008), writes about the necessity of showing the interest of distance learning (DL) for second language education and the reluctance of teachers regarding this form of instruction: "Demonstrating to the profession at large that the DL format has a significant contribution to make to the L2 curriculum will persist as a research priority, especially given many teachers' entrenched

resistance to technology or even their fears that computers might replace them." (p.373). Similarly, Kentnor (2015), discusses the doubts of teachers regarding online education and their fear of providing instruction of lesser quality to the students for university programs to be more cost-efficient. However, the need for online education has increased due to COVID-19 and teachers are faced with the necessity of learning new methods. Compton (2009) writes "there is a dearth of resources on how to prepare teachers for online language teaching and the skills needed for this new teaching environment." (p.74). I believe this thesis will be an important resource for teachers looking to implement gamified systems in their in-person or online classrooms, as both gamification and online teaching require specific skills to produce quality instruction that is beneficial for students. Cheung (2021) proposes a direction for future research regarding how ESL learners use digital tools and distance education to continue their language development when schools are closed, such as during a pandemic: research could look at the ways to develop language learning outside of the classroom. This thesis proposes gamification as a tool to enhance second language development, specifically FSL, for online education. Seaborn and Fels (2014) address a gap in gamification research linking theory to practice. This study is hands-on as the theories researched for the development of lessons are directly applied to the field. Regarding research on gamification, Dichev and Dicheva (2017) find that "the majority of studies target college students" (p.25), the present study has been conducted with primary students.

In addition to three main themes, three components are studied through the research questions: student satisfaction, knowledge retention, and the implementation of a gamified routine system. Whilst gamification in regard to knowledge retention, acquisition and performance has been widely done, I find that student satisfaction is not often looked at. Putz et al. (2020) wrote about the potential benefits of using qualitative interviews to study gamification for motivation

and the learning effect over time, which I integrated in this study. I believe that student satisfaction plays a considerable part in determining if a gamified system is successful. Lastly, Papp (2017) advances that "much more investigation on the introduction of gaming elements into the classroom needs to take place to determine what the impact is on learning" (p.3199). Using interviews, students in the experimental group were specifically asked about the gamification components used in the system to better understand the benefits and detriments of the elements, individually or combined. Moreover, the process of creation, implementation, and evolution of the elements are carefully explained in the methodology and results chapters.

Motivation

The motivation for this study comes from my interest in online education, gamification and second language education. I decided to research online education because of the place it has taken in the educational setting as well as provide the reader with a setting that reflects our reality. As a substitute teacher, I lost my job when the schools closed in 2020, and I started teaching online as an FSL tutor. I find it interesting to research this setting of planned online education as opposed to the emergency instruction we have seen. My background as a second language teacher influenced my choice to conduct a study in a second language setting. As a second language learner myself, I understand the struggles of learning a second language at the primary level. I believe gamification can have a positive impact on second language learners and that this method has potential benefits for synchronous online teaching. Lastly, gaming and education in the general sense (i.e serious games, game-based learning, and gamification) have been an interest of mine long before I started my official teaching training. My first experience with teaching and games was teaching ESL in Summer camps through sports, manual arts and games. Since then, I have incorporated

gamification, game-based learning and/or serious games in most of my lesson plans during my B.Ed. and continue to incorporate it in my teaching today.

Conclusion

The literature presents a growth in the development of online teaching, as well as an increased need for teacher professional development in technological skills. It is demonstrated that an effort is being made in Quebec to implement technology, but that teachers may lack training and knowledge to do so effectively. While PD could benefit teachers, their pre-existing workload and the deteriorating mental health of teachers due to COVID-19 may render the acquisition of new skills difficult. Frameworks of required skills for the online teaching setting were presented. They emphasized the need for technological skills as well as pedagogical skills, knowledge of the content and evaluation techniques and the importance of forming a relationship with the students. The need for renewed teaching methods for the online setting has inspired this thesis which proposes gamification as being potentially beneficial for the online teaching context. The study was situated based on the gaps in literature and this study attempts to respond to those gaps. This thesis aims to be a reference document for teachers looking to learn about gamification and how it can be implemented for online teaching. The main themes observed within this thesis are online education, second language education, and gamification. These themes were carefully chosen in adequacy with my skills as a teacher, as well as with the educational shift we experienced during the COVID-19 pandemic. These themes were used to conduct this research and develop the lessons used for data collection. The research questions are:

(RQ1) Does gamification influence knowledge retention and student satisfaction in an online teaching setting?

(RQ2) How to create and implement an effective gamified system for online education?

CHAPTER 2: LITERATURE REVIEW

Second Language Education

The terms French as a Second Language (FSL) and French as a Foreign Language (FLE) have been used interchangeably until the 70/80s (Ngalasso, 1992). However, the need to differentiate between the two is important when the second language is an integral part of the country (i.e., French is an official language in Canada). Learning French as a second language in Quebec is one of the core mandatory subjects of anglophone schools. The development of language programs may be due to the proven benefits of being bilingual or multilingual both for cognitive skills as well as social skills. In the paper "The Importance of Students' Learning French as a Second Language", McDonald (2013) finds (from Roitman, 2013; Marian & Shook, 2012; Luo, Craik, Moreno, & Bialystok, 2012; Craik, Bialystok, & Freedman, 2010; The Conference Board of Canada, 2013) that learning a second language is essential for the future of children as it can develop the creative thought process, positively alters the mind and brain, enriches communication skills and executive functions, delays the onset of Alzheimer's disease and benefits the Canadian economy.

Bilingualism is an important asset in life, as it opens more opportunities, notably for work. Whilst French is the official language in Quebec, bilingualism in French and English is common, Quebec geographically being in an English-speaking country. In 2016, 44.5% of Quebec's population was bilingual in French and English, representing 57.7% of the French-English bilingual population in Canada in 2016 (Statistics Canada, 2017). In French schools, students are learning English as a second language. Similarly, in English schools, students are learning French as a second language, which is the subject I will be focusing on in this thesis. It is important to note that students learning French in Quebec may be at an advantage compared to students learning FSL in other parts of Canada because of (a) the importance of French culture in Quebec and how

it is promoted in schools, (b) an easier access to meaningful interactions with French native speakers which enhances their opportunity to practice the language.

Second language education in Canada encompasses different ways of delivering instruction, notably through the "Core Programs" (CP) and the "Immersion Programs" (IP) (Quebec Education Program) (MEES, 2001). Schools have different ways of sorting who has access to which program, but it is common that students are automatically in the CP and can apply to enroll in the IP. "Across the country the types of FSL programs offered, the points at which students may enrol in them, and mandatory periods of French instruction differ by province/territory, by school district and in some cases, by school" (Canadian Parents for French, 2017a, p.2). In the school year 2016-2017, 46% of students in Canada were enrolled in FSL programs, of which 11.3% were in IP and 34.3% in CP (Canadian Parents for French, 2017b). In Quebec, there are also "Welcome Classes" (Classe d'accueil) for immigrant children. These classes are part of the French service centers, as immigrants have to enroll in French schools as per Quebec's bill 101 (Peters, 2005), whereas enrolling in a public English school demands a permit. The most common requirement for the permit is having at least one parent who attended English School in Quebec. This law prohibits immigrant families from choosing the language of instruction of their children and impacts the cultures of minorities in Quebec.

Due to the increased need for online education presented in the overview and the importance of FSL in Quebec, I have decided to focus on teaching FSL in an online setting for this study. An overview of online education as well as its main challenges are presented below.

Online Education

Overview

Yildirim (2017) writes: “The concept of distance learning has become increasingly prominent due to the dissemination of the internet and the availability of technology while the educational process has traditionally been carried out in a face-to-face manner” (p.86). Moreover, Castle and McGuire (2010) present some explanation for the expansion of online education for higher education programs such as the flexibility of the programs and the access of content anytime and anywhere, as well as the cost-effectiveness for the schools. However, as mentioned previously, online learning has become more prevalent in our society than it ever was before due to the COVID-19 pandemic and the closure of schools in 2020. Online teaching was implemented shortly after the pandemic began, leaving staff very little time to prepare for this way of delivering instruction. The implementation of online teaching in a time of crisis is a challenge for both students and teachers. This type of instruction is different from traditional teaching in various ways such as less time with students in groups or individually, dealing with technological issues, using different class material, etc. and should benefit from teaching methods tailored for this specific setting. For example, online teachers rarely see their students and most of the communication is done through online tools (Essential Principles, 2003). It is harder to keep in touch with the students and make sure they are thriving emotionally and academically. Online teaching calls for ingenuity regarding the lessons and activities presented to the students in order to keep them engaged and focused, especially during the COVID-19 pandemic, as students are forced to stay home and did not choose this method of instruction. Schools can be considered a safe space in the eyes of the students and losing this could be hard on their morale and motivation. “Learners' emotions in this sense, can greatly impact learning in e-learning and blended environments, such

as motivation, self-regulation, and academic achievement" (Rienties & Rivers, 2014, as cited in Ananga, 2020, p.315). Students attending online schools are more responsible for their individual learning than in regular classrooms as they spend less time with their teachers. The feeling of isolation can be present and have a negative impact on students' learning: "the social isolation of "attending class" online often result in anxiety, frustration, and boredom" (Artino & Jones, 2012, p.170).

Gacs et al. (2020) emphasize the difference between planned online education and a rapid forced switch to remote instruction. The methods used in either case are different, mainly because of the lack of time to plan and the potential lack of training for teachers in educational technologies. I would argue that online instruction for primary students that did continuous online school this year is similar to planned online education which provides students with a more adequate delivery of instruction. However, the "forced switched" instruction is present in the case of classes occasionally going online throughout the year because of COVID-19 cases in the school, which would take away the benefits of online instruction. For example, "It has also been suggested that online learning can enhance the quality of learning experiences and outcomes by allowing for a complex and varied community of learners" (Castle & McGuire, 2010, p.36). In Quebec, schools and higher education institutions closed in March 2020. The implementation of remote learning was urgent and differed from one school to the other. Online teaching and learning, remote instruction, blended learning, hybrid models… Our new reality sheds light on an underdeveloped aspect of education, online teaching. Schools adapted the way they could and have continued to adapt throughout the year 2021. Not all students have access to the appropriate technology for remote learning, and we have heard stories of teachers driving to students' houses to deliver material for them to work on. We have come a long way from urgent remote learning, but the

situation is still not ideal. Most schools in Montreal are practicing hybrid teaching, which means that teachers have to plan twice as much: for physical as well as online instruction. However, we can ask ourselves if teachers were prepared for online teaching, as it is considerably different than face-to-face education. Chapter one argues that teachers may be unprepared to teach online and that an emphasis on PD in educational technologies is needed. Three frameworks for online teaching were presented and identified knowledge of technology, pedagogy, evaluation, the content taught and the socio-emotional need as essential skills for online teachers.

Challenges of Online Education

Online education has been proven to have beneficial effects as demonstrated in the previous section. It has enabled more students to have access to education during the pandemic, but it does have several challenges that have to be taken into consideration to produce an effective learning experience for the instructors and the students. Gacs et al. (2020) write:

> A community atmosphere and personal connections have to be carefully crafted in online environments, where gestures, body language, a common physical experience, and often even facial expressions are missing (p.382).

While the classes in this study were conducted solely synchronously, the sense of community was an important factor for the well-being of the participants in both the control and the experimental groups. Similarly, Gray and DiLoreto (2016) write: “One of the challenges of online learning relates to students feeling disconnected to their classmates and instructor.” (p.3). Schrum and Hong (2002), identified seven dimensions of student success in online education through their study conducted on post-secondary online programs. The seven dimensions are: tools, technology experience, learning preferences, study habits and skills, goals and purposes, lifestyle factors, personality traits and characteristics (Schrum & Hong, 2002). It is important to look at these

dimensions when preparing material to be delivered online. Piccoli et al. (2001, as cited in Eom et al., 2006) "refer to human and design factors as antecedents of learning effectiveness. Human factors are concerned with students and instructors, while design factors characterize such variables as technology, learner control, course content, and interaction" (p.216). Therefore, for online education to be effective, there is a need to look at the human factors (participant and researcher) and the design factors (structure and content). For example, an online lesson designed for a certain group of people may not work with another group because of their overall level, their interests, their behavior, etc. Similarly, a lesson designed by one instructor may not have the same impact if taught by someone else. The gamified system presented in this study was created for a specific group and designed for me to teach it, these are variables that need to be taken into consideration when looking at the system. Eom et al. (2006) write: "Course structure is seen as a crucial variable that affects the success of distance education along interaction" (p.221). As I will demonstrate later in this review, if gamification is implanted effectively, it can bring the structure needed to palliate this challenge in online education. Gamification of the structure and the content of the lessons can enhance the design factor of this study and therefore positively impact the learning effectiveness discussed by Piccoli et al. (2001, as cited in Eom et al., 2006).

I believe that given the main challenges of online teaching such as a decrease in motivation, a feeling of isolation and being disconnected, and the challenge of designing and implementing online instruction; it is interesting to look at gamification as a teaching tool or method to deliver online instruction because of its advantages outlined below.

Gamification

Overview

According to Folmar (2015, p.5, as cited in Ofosu-Ampong, 2020), gamification is not only "making a game, which imparts a lesson; it is applying game thinking to how we impart that lesson and continuing to develop it based on the feedback from the players" (p.116). The use of gamification was first documented in 2008 but it was popularized in 2010 (Deterding et al., 2011). Deterding et al. define gamification as "the use of game design elements in non-game contexts" (2011, p.2). According to Seaborn and Fels (2014), "Although digital games are a relatively new development, games have existed in human cultures since the dawn of recorded culture as tools for entertainment, relationship-building, training, and arguably survival" (p.14). Gamification has been a rapidly emergent topic of research given the advancement of new technologies. Gamification is not only used in teaching but is developing in countless sectors. Implementation and research on gamification have been done in various fields: "Gameful learning has gathered increased attention from the education sector, as well as academia and industry, since it promises novel opportunities to foster skills and increase knowledge" (Putz et al., 2020, p.1). This developing interest for gamification may explain the expansion of this topic in the research community. According to Toda et al. (2019a), gamification "caught the attention of education professionals, since the field of education still struggles with motivating and engaging students" (p.47). Studies about gamification within an educational setting have been conducted in regard to students from kindergarten to higher education, and teachers' perspectives. Studies have focused on motivation, student engagement, academic performance, player types, game elements, and implementation. In "The Shift to Gamification in Education: A review on Dominant Issues" (2020), Ofosu-Ampong writes:

> Research under the impact of gamification is categorized into seven identified themes (dominantly raised in the review), namely, cognitive belief and behavior, attitude, performance, learning, interpersonal relationship, motivation, and engagement. (p.128)

Studies suggest that gamification has a positive impact on motivation (De la Torre & Berbegal-Mirabent, 2020), and student attitude towards lessons (Yildirim, 2017). It appears that gamification is beneficial for students' learning performance (Yildirim, 2017; Bai et al., 2020), but due to the diversity of research conducted (elements used, participant size, duration, etc.), gamification is not widely accepted. Lastly, gamification seems to be a prime method for individualized learning as it *promotes goal setting, fulfills a need for recognition*, and *feedback on performance* (Bai, et al., 2020, p.14).

This widespread interest for gamification is probably why research about gamification has become so prevalent in recent years. Nacke and Deterding (2017) write about the maturing of gamification research and advance that there are two waves in research on gamification. The first wave focuses on "what" and "why" whereas the second wave focuses on "how" and "when" and "How and when not to". The presented thesis falls in the second wave of gamification research.

In the article "Gamification in theory and action: A survey" (2014), Seaborn and Fels present "conceptual and practical findings from a systematic survey of the rapidly emerging academic literature on gamification" (p.15). They found four major issues in research about gamification. Seaborn and Fels (2014) wrote:

> 1) There is a lack of adherence to the emerging standard definition of the term "gamification".
>
> 2) Theoretical foundations are inconsistently referenced and interpreted.

> 3) There is a gap between theory and practice – where theory is empirically unexamined and applied work lacks reference to theory – which serves to limit the growth of the field as a whole.
>
> 4) There is a pressing need for empirical studies that employ comparative and/or longitudinal designs to validate what effect, and the extent of the effect, gamification features have on participants' performance and enjoyment as well as to identify best practices. (p.27)

Research on gamification has been conducted in regard to several topics. I will focus on the implementation of gamification and gamification elements, detailed below.

Implementation. Considerations taken for the creation and implementation of gamified systems in education are central to its success. Since gamification has become a very popular construct with verified benefits for the target audience, educators have been implementing it for teaching, but might not have sufficient prior knowledge to do so effectively. As demonstrated in "The Views and Adoption Levels of Primary School Teachers on Gamification, Problems and Possible Solutions" (Yaşar et al., 2020), teachers were in fact using gamification in their classroom but very few knew what gamification entailed. Most participants associated gamification with educational games (8 out of 12 participants) or with games (2 out of 12 participants). Gamification is often confused with game-based learning and serious games. According to Moore-Russo et al. (2018), teachers often implement gamification in their teaching "regardless of personal experiences with implementing alternative pedagogies or game design, each of which play a role in successful gamification" (p.3). From my personal experience, gamification was rarely mentioned in teacher education programs, but, in recent years, I have seen an increase of PD

workshops within the gaming area at teacher conferences. Implementing gamification without proper consideration can have a negative impact.

In the article: “Integration of Gamification Into Course Design: A noble Endeavor With Potential Pitfalls”, Moore-Russo et al. (2018) identify four pitfalls to the implementation of gamification which are detailed below.

Game elements not tied to learning objectives (p.3). Adding gamified components to instruction without considering how it ties in with the learning objectives or having a game context that is not connected to the learning objectives

Student unfamiliarity or discomfort (p.4). High-performing students can fail to see the benefits of game elements in instruction, whereas low-achieving students can be confused by the added rules and instructions.

No real change (p.4). Adding gamified elements to essentially produce “a different wrapping around the same gift” (p.5). For example, simply adding points to the classes is gamification, but is not necessarily effective. Gamification calls for a combination of elements to be effective, as demonstrated below in Gamification elements.

Diminished returns on time investment (p.4). Creating gamified tasks takes a long time, especially for someone who does not have the required skills and prior knowledge to do so. Teachers can feel overwhelmed by this task and fail to see the benefits of gamification once properly implemented.

These pitfalls clearly show the importance of proper training and/or research before implementing gamification with students. Lastly, Ofosu-Ampong (2020) found that: “generalizing game elements for learners without understanding the context of the educational institutions or user background is a recipe for gamification failure” (p.130).

Gamification elements. "The main objective in gamification indeed is to effectively implement the positive effects of game components to non-game environments" (Yaşar et al., 2020, p.266). Due to a lack of clarity and consensus regarding gamification elements, Toda et al. (2019a) developed the Taxonomy of Gamification. The taxonomy encompasses 21 gamification elements, grouped in five main categories: Performance, Ecological, Social, Personal, and Fictional. Each category is important to provide learners with effective gamified content. For example, the lack of either of these elements could have negative impacts on the learner, such as "the lack of Personal elements can make the user feel demotivated since the system does not provide meaning for the student" (Toda et al., 2019b, p.7). However, each of these elements can be misused and have a negative impact as well. For example, Reputation "must be designed with care or learners might feel demotivated due to not acquiring a certain status" (Toda et al., 2019b, p.11). Moreover, two major dislikes from students about gamification have been identified: "(a) gamification does not bring additional utility and (b) gamification can cause anxiety or jealousy" (Bai et al., 2020, p.12). These potential downsides can be avoided by adapting the game elements used with the students. The taxonomy is presented as a means to analyze and evaluate gamified systems. Using this taxonomy to design gamified systems can prove to be a useful tool for game designers, especially those with little to no experience in gamification. The taxonomy brings clarity to the terms used for gamification elements and enables the designer to have a document to lean on for the creation process. It is important to include elements of the five categories to have a successful gamified system, however, the connection between each element needs to be well thought-out. Lastly, the use of gamification can have benefits for life outside of the educational setting. For example, Moore-Russo et al. (2018) write: "instructors also use game elements such

as competition and shared goals to enhance social dynamics and provide experiences that will benefit students when they enter the workforce" (p.3).

Gamification can be used to increase specific behavior (Yaşar et al., 2020). Each game element may have different impacts on learners such as motivation, engagement, time management, social skills. For example, Khaleel et al. (2016) conducted a study using mixed methods research, that aimed to identify and verify game elements that can be used for learning based on three measurements: 1) *Fun and entertainments*, 2) *Motivation to challenge among students*, 3) *Improve the skills of gaming and learning.* They gathered data from experts through an interview, as well as data from gamers, and students through a survey. Based on the results, their recommendations are as follows:

> Gamers suggested using Points, Scoring system, and Stars to increase the level of fun and entertainment;
>
> Students suggested using Badges, Top 10, and a Leaderboard to increase motivation to for students to challenge each other;
>
> Finally, both perspectives suggested the rest of the elements such as Result, Report, Dashboard, Percentage of competency, Progress Bar, Stage, Level, Countdown, profile Information, Pictures, and Avatars, to improve gaming and learning skills (Khaleel et al., 2016, p.872).

Specific elements were chosen for this study based on the students' age group, the subject taught, and the online setting with the guidance of the findings presented in the literature review. Several theories are observed in concordance with the potential impact of gamification for each one.

Gamification and Motivation

"Motivation is an essential personality factor that students need to obtain a L2" (Alzaid, 2018, p.28) for this reason, teaching designs that enhance motivation are beneficial for L2 learners. As mentioned previously, gamification has been proven to enhance student engagement and motivation. The main theories that support the benefits of gamification in regard to motivation are self-determination theory (Deci & Ryan, 1985), self-efficacy theory (Bandura, 1997), and the flow theory (Csikszentmihalyi, 1990), as demonstrated in Fulton (2019) and Alzaid (2018), which are defined below.

Self-Determination Theory

In Chapter 4 of "Development of Self-Determination Through the Life-Course", Adams et al (2017) extensively explain self-determination theory (SDT), which was theorized by Deci and Ryan over time, originating from research on extrinsic and intrinsic motivations, defined below:

- Extrinsic motivation: "Doing something because it leads to a separable outcome" (Ryan & Deci, 2000, p.55).
- Intrinsic motivation: "Doing something because it is inherently interesting or enjoyable" (Ryan & Deci, 2000, p.55).

SDT is a motivational theory based on the notion that humans are motivated to learn because of a psychological need to grow. The three main factors of motivation are the need for competence, autonomy, and relatedness (Ryan & Deci, 2000). Lastly, "social contextual conditions that support one's feelings of competence, autonomy, and relatedness are the basis for one maintaining intrinsic motivation and becoming more self-determined with respect to extrinsic motivation" (Ryan & Deci, 2000, p.65). Therefore, while intrinsic motivation is essential to learn, extrinsic motivation can become internalized depending on how it is used. For example, the use of badges in a gamified

activity represents extrinsic motivation. Students may want to complete an activity solely to obtain the badge. However, the badges can become intrinsic motivation if students are motivated to do the activity to learn and have an added feeling of reward by obtaining a completion badge, validating their need for "competence". The merit badges in this gamified system are also enhanced by the self-efficacy theory outlined below.

Self-Efficacy Theory

Developed by Bandura (1997), the self-efficacy theory advances that a person's actions are influenced by their perception of what they can do, rather than what they can actually do. "Bandura argues that individual's level of 'motivation, affective states, and actions are based more on what they believe than on what is objectively true'" (Bandura, 1997, p.2, as cited in Tandon, 2017, p.92). Self-efficacy theory can have mixed effects on one's completion of tasks. If an individual believes in themselves, self-efficacy is positive, but if someone has low self-esteem for example, self-efficacy would be negative. Teachers can have an important impact towards helping students develop their sense of efficacy (Fulton, 2019). The badges may influence students' perception of what they can do in our sessions as they choose the badge according to what they have accomplished in the session, such as the "reader badge" or "writer badge". Another aspect of gamification observed in this study is the flexibility it provides to the instructor. I believe gamification may help students to achieve their state of "Flow", detailed below.

Flow Theory

Flow is a state of consciousness that allows a person to be completely absorbed in an activity, and therefore be more satisfied (Csikszentmihalyi, 1990). Some of the characteristics of flow are clear goals, focus, and control (Csikszentmihalyi, 1990). Therefore, we can hypothesize that gamification could be a prime method to reach Flow because of its flexibility and engaging

features. Ofosu-Ampong (2020) writes: "Motivational affordances and flow experience are vital to the potential of gamification in education" (p.120). However, in their systematic literature review, Oliveira et al. (2021), find that there is a growing interest in gamification as a means to reach the state of flow for learners, especially in the fields of education, but there is no consensus yet on which gamification methods and elements should be used. Additionally, they state that the effects of gamification on flow are mixed.

Lastly, two learning theories have influenced this research, Landers' theory of gamified learning and Gardner's multiple intelligences theory. They were used to design the lessons of this study.

Landers' Theory of Gamified Learning

In "Developing a Theory of Gamified Learning: Linking Serious Games and Gamification of Learning" (2015), Landers presents his theory of gamified learning. This theory advances that there are two possible processes for gamification to influence learning. Gamification can influence learning via moderation or mediation. "Gamification affects learning via moderation when an instructional designer intends to encourage a behavior or attitude that will increase learning outcomes by making pre-existing instruction better in some way" (p.12) whereas "Gamification affects learning via mediation when an instructional designer intends to encourage a behavior or attitude that will itself improve learning outcomes" (p.12). This study focused on gamification implemented through the moderation process, as traditional content was modified to hypothetically increase students' knowledge retention and satisfaction.

Gardner's Multiple Intelligences Theory

This theory was first described in "Frames of Mind: The Theory of Multiple Intelligences" (Gardner, 1983) and is based on the belief that people learn through different intelligences. This theory began with seven intelligences and now counts eight (visual-spatial, verbal-linguistic, musical-rhythmic, logical-mathematical, interpersonal, intrapersonal, naturalistic, and bodily-kinesthetic), although Gardner (2011) stated that there could be more intelligences, such as existential and pedagogical. Whilst Gardner (2011) did not foresee the interest of educators in this theory, it is now widespread in the educational field. Eom et al. (2006) state:

> The basic premise of learning style research is that different students learn differently and students experience higher level of satisfaction and learning outcomes when there is a fit between a learner's learning style and a teaching style. (p.218)

I believe that differentiating my lessons plans according to the MI theory will enable my students to thrive in our sessions, thus impacting their satisfaction and knowledge retention.

Gamification in Regard to Knowledge Retention and Student Satisfaction

I have decided to focus on two specific components in regard to experimenting with gamification: knowledge retention and student satisfaction. Both components are detailed below.

Knowledge Retention

Teaching does not only mean delivering material and expecting students to retain all the information, looking at what students retain or not after a session is revealing about what methods should be used to teach different aspects of the curriculum. Teaching a second language can be difficult as very simple tasks can be misunderstood by students due to their limited knowledge of the language of instruction.

Knowledge retention means knowledge that is retained. Knowledge must first be acquired to be retained. Putz et al. (2020) write "The classic forgetting curve of Ebbinghaus (1913) has been the benchmark for knowledge retention research for decades" (p.3). The forgetting curve or retention curve is showing the decay of retained knowledge over time. The curve usually decreases considerably closer to the end of the task, the decay slows over time.

Farr (1987) presents six variables that can influence long-term knowledge retention: the degree of original learning, task characteristics (type and complexity of organization), retention interval, instructional strategies/ conditions of learning, methods for testing retention/ conditions of retrieval, and individual differences. Given the variables that influence knowledge retention, the particularities of gamification could have a positive effect. For example, Gray and DiLoreto (2016) state that "active learning and student engagement is imperative for increased student learning and ultimately retention" (p.2), and it was demonstrated above that gamification has benefits towards an increase in student engagement.

In "Can Gamification Help to Improve Education? Findings From Longitudinal Study", Putz et al. (2020) look into the potential of gamification for knowledge retention, while considering the participant's gender and age, using an action research design. They compared groups that were taught through workshops that did or did not use gamification. The study lasted two years, included 617 secondary and tertiary level students and was conducted through three rounds of workshops. After each round, the workshops were redesigned to fit the needs of the participants. They found that gamification had a positive effect on student knowledge retention, and that gender and age did not significantly impact the results.

Student Satisfaction

The definition of satisfaction is "fulfillment of a need or want" (Merriam-Webster). As a teacher, one of my main objectives with students is to help them develop their love of learning. Learning a second language is difficult and can be threatening. Students have to feel comfortable in the classroom to be able to express themselves in another language, because they are often afraid of making mistakes while using a second language, or worse, not being understood by the person there are talking to. The pandemic has been very hard for students, and I wanted to design an experiment that allowed me to gather input from the participants about their experience of learning online, both using traditional methods and using gamification because of the potential benefits of gamification in an online teaching setting.

Through a quantitative survey completed by students at the university level, Eom et al. (2006) tested for six factors potentially affecting student satisfaction in asynchronous online courses: course structure, self-motivation, learning styles, instructor knowledge, and facilitation, interaction, and instructor feedback. The study revealed that the six factors had a significant impact on student satisfaction.

Summary

In this literature review, I provide an overview of the three main fields approached in this research: second language education, online education, and gamification. Given its impact on student motivation, engagement, and learning performance, as well as its potential for individualized instruction, the question as to whether gamification can be beneficial for synchronous online second language teaching is paramount. I present the main theories that influence this research given their overall impact on students and their potential benefits working through gamification: self-determination theory, self-efficacy theory, flow-theory, gamified

learning theory, and multiple intelligences theory. Lastly, I present the two components that were tested in this research, knowledge retention and student satisfaction, and explain how gamification could have a positive impact on them. Following this summary, I will detail the methodology used for this research.

CHAPTER 3: METHODOLOGY

Introduction

This study is an interventional comparative study conducted using a mixed methods approach. The main goal is to observe the impacts of gamification on online teaching, specifically in regard to knowledge retention and student satisfaction. To reach this goal, I pose the research question (RQ1) Does gamification influence knowledge retention and student satisfaction in an online teaching setting? The second goal of this study is to explore how to implement an effective gamified system to implement a class routine. The research question is (RQ2) How to create and implement an effective gamified system for online education? In this chapter, you will find a detailed explanation of the methodological approach, the environment of the study, the participants, the material used to collect data, and the data analysis methods.

Methodological Approach

The study is an interventional comparative study. It was conducted using mixed methods. In "Study Designs: Part 4 – Interventional Studies", Aggarwal and Raganathan (2019) define interventional studies as ones in which: "the researcher actively interferes with nature – by performing an intervention in some or all study participants – to determine the effect of exposure to the intervention on the natural course of events" (p.137). Determining the effect of gamification in an online teaching context was what I aimed to do by introducing gamification to an experimental group to study its effect on students' satisfaction and knowledge retention. I compared the results of groups that have received the intervention and the ones that have not. The quantitative component of this study is similar to the one conducted by Yildirim (2017) and presented in "The Effects of Gamification-Based Teaching Practices on Student Achievement and

Students' Attitudes Toward Lessons". He used a true experiment, using randomized groups. A pre-test and post-test were administered to both the treatment and control groups.

Tashakkori and Teddlie (2010) discuss the similarities of the "researcher" and the "human problem solvers" as they state that "everyday problem solvers use multiple approaches (similar to qualitative and quantitative pathways) concurrently or closely in sequence and examine a variety of sources of evidence in decision making (and in forming impressions)" (p. 273). I believe this approach was beneficial to this research because it enabled me to have a deeper understanding of the results that are studied thanks to the variety of the data gathered. The qualitative data allowed the researcher to gather a multitude of observational data and allowed the participants to have a greater opportunity to express their opinions and feelings throughout the study. "The multidimensional nature of many, if not most, social and behavioral phenomena is the reason why mixed methods are often required in research addressing those phenomena" (Tashakkori & Teddlie, 2010, p.274). Hence, I believe using mixed methods consolidated the authenticity and relevance of this research and was the best framework to conduct this study. Lastly, whilst this study was not an ethnography, the methods I chose to conduct my research are apparent to the ones used for ethnography. "Immersion in the site as a participant observer is the primary method of data collection" (Merriam & Tisdell, 2016, p.30). When I taught my lessons, I observed the reactions of my students according to their knowledge retention and satisfaction of the activities to collect authentic data. Interviews are also a common method for ethnography.

Positionality

Milner IV (2007) emphasizes the importance of being aware of your positionality to conduct research. My positionality in regard to this research is that I am used to teaching FSL online while using gamification as well as traditional methods. However, I am aware that I have a

preference for teaching using gamification, and I was conscious of this while conducting the experiment. Moreover, there was a power dynamic between the participants and myself as I was their teacher. I made sure to clearly explain that I had no influence on their school achievement, such as specifying that the grades they received on their knowledge tests will not impact their grades in schools. Some of the participants were former or current tutoring students of mine. This existing relationship could have impacted the way students have behaved in class and the way they received information. Lastly, I am also a second language learner/ bilingual individual, therefore, I understood the challenges of learning a new language. This close insight into the experience of the participants enabled me to create relevant lesson plans to help them develop their skills in French.

Research Environment and Participants

This research was conducted entirely online, using the video-conferencing platform Zoom as well as email as a form of communication. This consideration was put in place for the safety of the participants and the researcher due to the Covid-19 pandemic, as well as being an opportunity to research this method of delivering instruction, for which the demand has increased in the past year as demonstrated in the literature review. I looked at how the online setting influenced the way students received information and if gamification could impact this setting.

Recruitment

Participants were recruited using a snowball approach. I emailed the parents of my former students and invited them to potentially have their child participate as well as reach out to their network. Parents of potential participants then emailed me, and I responded using the information email. Parents were asked to sign a consent form (See Appendix A) for their child to participate in the study. The study began with an individual interview of each student to explain the study and

answer any questions they might have. Students then chose whether or not to sign the child assent form after this interview (see Appendix B). Once all the individual interviews were conducted, each group participated in one hour of instruction per week over eight weeks.

Table 1

Timeline of the study

Recruitment / pre-study I.	L1	L2	L3	L4	Mid-Study I.	L5	L6	L7	L8	Post-study I.
April 12th to May 13th	May 25th	June 1st	June 8th	June 15th	June 16th to 21st	June 22nd	June 29th	July 6th	July 13th	July 14th to 19th

Note: L=Lesson, I.=Interview

Participants

The study lasted eight weeks. Originally, the study was supposed to be conducted with four groups of five students from grade four and grade five, with two experimental groups and two control groups. One of each experimental and control groups would be composed of students that have witnessed to a varying degree, gamification in an online teaching setting before, and the other groups will not have had. The students representing the group that had witnessed gamification were to be recruited from former and current tutoring students of mine as I had been using gamification with them. This consideration was put in place to palliate the hypothesis that gamification might benefit students on a short-term basis because of the novelty effect (Bai et al., 2020). However, I was unable to recruit the original number of participants. Therefore, the study was conducted with two groups of six students, one experimental and one control group. Students that have witnessed gamification in an online teaching setting and students that have not were mixed into both groups. Two groups were formed according to the participants' availability for the sessions. Once the groups were set, I used the website "Flunky" to randomly select which

group would be the experimental group to have an impartial draw between both groups. The control group had sessions on Tuesdays at 4:15 pm EST and the experimental group had sessions on Tuesdays at 6 pm EST. Students were taught French as a second language in accordance with the Quebec Education Program (QEP), core and immersion programs, using gamification or traditional teaching methods (control group) during a unit that consisted of eight lessons that I created and taught. The main topic of the unit was food.

For my research, the participants lived near or in Montreal (QC). These students were used to living in a multilingual city. Their common culture came from the fact that they were all enrolled in an English primary school at similar grade levels and were all learning French as a second language. Moreover, they were about the same age, which means that they were generally exposed to the same trends, slang, schooling, etc. "The factor that unites all forms of ethnography is its focus on human society and culture" (Merriam & Tisdell, 2016, p.29). For my study, I chose to recruit anglophone students enrolled in an English school in Montreal. The anglophone community in Montreal is considerable; this pool of participants influenced the way I taught my lessons. The participants were divided as follows:

Table 2

Information about participants in regard to their group.

Group	Number of students	Grade 4	Grade 5	Former students	New students
Control	6	5	1	2	4
Experimental	6	5	1	3	3

Procedure

I began recruiting the participants by sending an email to my network of parents from my tutoring company (see Appendix C). They were encouraged to share the information about the study with their network. When potential parents/participants contacted me (see Appendix D), I would answer their questions and send them the consent form once their questions had been answered. Once I received the consent form, I scheduled an individual interview with the potential participant, after which they decided whether or not to sign the child assent form.

Once the recruitment process was over, the study procedure was as follows. At the beginning of the first session, students took a 15-minute pre-test in order to record their initial knowledge of the topic. I wrote observations during the lessons about students' knowledge retention and participation, but the lessons were not recorded. After each lesson, the students were asked to fill out (1) a test to assess their knowledge that would take approximately 15 minutes to complete. Parents received the test answer sheet to print prior to the session, it did not have the questions on it. The test with the questions was sent to students as a word document in the zoom chatbox at the end of the lesson, as well as screened shared on Zoom, and was completed under my supervision on the printed answer sheet by hand. (2) A 5 to 10 minutes survey about their satisfaction regarding the class structure and content, which was to be completed on their own time within 24 hours of the class, although I usually received the surveys later than 24 hours after the sessions. The survey was the same throughout the study, students had access to this word document through an email sent at the beginning of the study. All communications were done through the parent/ legal tutor email. The survey had questions designed using a 5-point Likert Scale (quantitative), as well as open-ended questions (qualitative). Both these documents were sent to me via email once completed. Additionally, students were given a small amount of homework to

ease the learning process in an asynchronous way. The homework was designed not to exceed 30 minutes of work per week. The completed homework was sent to me by email a maximum of 24 hours before the following session. Mid and final interviews were conducted during week 4 and week 8 in order to assess student satisfaction with the lessons. All interviews and surveys were conducted in English to facilitate comprehension. The pre, mid, and post-interviews were not recorded, only notes were taken to collect data. Each interview lasted a maximum of 30 minutes. The knowledge tests were conducted in French and were explained in class before taking the test.

Table 3

Email for parents

Who	1h Session	15 minutes test	Satisfaction Survey	Homework
Fanny	Fanny teaches the sessions	Fanny sends the test in the zoom chat box	Fanny sends it at the beginning of the study via email to the parents	Fanny will explain it in class and send it via email to the parents after the sessions
Participants	Participants attend the sessions	Participants answer the questions of the test on the printed answer sheet under Fanny's supervision	Participant answers the survey on the word document within 24h	Participants complete the homework maximum 24h before the following session
Parents	Parents print the answer sheet for the test before the sessions (please let me know if you do not have a printer)	Parents send the test back to Fanny via email as soon as possible after the session	Parents send it back via email to Fanny within 24h hours	Parents send it back via email maximum 24h before the following session

Note: This table was sent to parents prior to the start of the study to explain the weekly routine for all the documents.

Material

Lesson Material

In an attempt to answer my research question, I created two unit plans, one that used gamification and the other that used traditional teaching methods. In both cases, I created the lessons through the lens of Gardner's MI theory. The long-term teaching plan topic (i.e.: Food) and individual lessons were the same for the control and experimental groups, but game elements were added to the experimental group's lessons. The control group participants received French second language classes about the same topics and aiming for the same language developments as the students in the experimental group. Students were aware of which groups they were in; they were informed of this after the pre-test on the first session of the study. It was explained to them that they were learning the same things but in a different way. Within this study, I wished to show the natural implementation of gamification within an online teaching context as part of the class routine and teaching methods, as well as some of its benefits or disadvantages. The lessons were designed similarly each week, with some additions to the routine for the experimental group.

The control groups' routine was as follows: the lesson began with an informal talk about the weekend, then the introduction of the theme of the week, followed by two to three main activities. The homework for the week was explained to the students. The lesson ended in a 5-minute relaxation activity such as yoga, mindful thinking, or breathing exercises. Once the lesson was over, students would take the knowledge test under my supervision. The control group was taught using PowerPoint presentations that used the same text and images used in the experimental group. The overall level of the lesson increased over the course of the study to provide challenge for the participants.

Figure 1

Caption of the PowerPoint introduction page used with the control group

.

For the experimental group, I used a combination of classic game elements (ex: points, storyline, leaderboard, levels…). Yaşar et al. (2020) present Kapp's (2012) classification as having two groups in gamification: structural and content, and that according to Kapp, using both kinds of gamification is essential for more effective results. Structural gamification means that the structure of the lesson is gamified, in this case I used a main board to structure our lessons throughout the unit. Content gamification is adding gamified elements to the activities, in this case I added the coins to win for each activity when completed. I implemented both structural and content gamification in this study. The storyline that was designed around the lessons (detailed below) served as structural gamification, as it did not change the content. The riddles used within that storyline on specific instances were gamified content as students would learn new words through a gamified activity. Moreover, I designed the gamified system using the gamification taxonomy (Toda, 2019a) presented in the literature review. I used at least one element of each category, detailed below, to provide a rich gamified experience.

Table 4

The gamified system used through Toda's Gamification Taxonomy lens (2019a).

Taxonomy category	Performance	Ecological	Social	Personal	Fictional
Subcategory	Acknowledgment	Economy	Cooperation	Novelty	Narrative
Example of elements used	Badge system	Coins	Group work to find clues and passwords	New material every week	Market storyline

Lastly, Ofosu-Ampong (2020) found that "developers need to consider user preferences rather than assume the one-size-fit-all approach that pushes popular elements (e.g., badges and point systems) on learners" (p.121). Whilst player types and user preferences were not the focus of this study, taking them into consideration was important for optimal results. Similarly to using Gardner's MI theory, I presented a differentiated system to the students, which I adapted throughout the study to better fit their needs.

Figure 2

Caption of the main board in the gamified system used with the experimental group

Students also provided me feedback through the satisfaction surveys and the interviews which I integrated right away by modifying the system. Specifically, the lessons were integrated onto an interactive “map” of a market and each shop represented one lesson. This platform was created from scratch using the website Genial.ly as its primary resource. This website is used to create interactive presentations and several templates for gamification are available to the users such as interactive quizzes and escape games.

The students collectively won coins each time an activity was completed. They used these coins to buy badges at the end of the sessions. Students had three choices of badges representing achievements completed during the class and had to collectively decide which badge they wanted to buy. Based on students’ feedback after the mid-study interviews, the badge system was adapted to provide a more challenging experience.

Figure 3

Caption of the badge choice for week 6

The experimental group's routine is similar to the control group's, but after the informal talk, students would solve a riddle to find which store they would visit on the map for the day as well as discover the password to access it. Moreover, before the relaxation activity, they would decide which badge they would buy. The gamified system created for the experimental group titled "Bienvenue au Marché" can be found using this link and the password "FRUITS": https://view.genial.ly/6097ef11a1a40c0d1e62b958/interactive-content-market-place. Select the shopping cart to find the riddles and passwords for each day.

Homework

The homework was designed as two different models. Some of the homework assignments were used to enable children to practice what we had learned in class and some were designed as research activities to actively involve the students in the lessons. They would present the results of their research at the beginning of the following class which would trigger class discussions (See Appendix E).

Knowledge Tests

The knowledge tests were designed according to what the students had been working on during that lesson. They included different types of questions such as short-answer, long-answer, fill-in the blanks, re-order, etc. In concordance with the increased difficulty of the lessons, the tests' difficulty was increased as well (see appendix F).

Pre-Test. The pre-test was designed to assess the overall knowledge of the students regarding the subject and enable me to adapt my lesson plans to fit their needs.

Post-Test. The post-test was longer than the other tests and was composed of one question per past lesson, in order to test the students' knowledge retention. Students were provided with a study sheet one week before the test in lieu of homework to prepare themselves for the test. The

last lesson also served as a review session. I pinpointed the areas where students had had the most difficulties to review them during this lesson.

Satisfaction Survey

For the "student satisfaction" component of my research, students were asked to fill out a satisfaction survey after each session. The survey was in English for participants to have the opportunity to fully express themselves. Some participants filled-out questions in French, but it was not required. The survey remained the same throughout the study and was composed of two Likert-scale questions and seven open-ended questions (see appendix G).

Interviews

The interviews were conducted in English to facilitate communication for the participants. The three individual interviews in this experiment served different purposes (see appendix H).

Pre-Study Interview. The pre-study interview was designed to present myself and explain the study to the potential participants, sometimes the parents were present as well for the child to be more comfortable. We read the child assent form together, and students had the opportunity to ask me questions about the study in order to make an informed decision when choosing whether or not to sign the child assent form and participate in the study.

Mid-Study Interview. The mid-study interview was designed to gather data regarding participants' overall satisfaction and information about how to ameliorate the experience for them. They also had the opportunity to ask questions or raise concerns, which enable me to check in with them to make sure they were feeling comfortable.

Post-Study Interview. The post-study interview was designed to gather data regarding participants' overall satisfaction throughout the study as well as get input from the participants on how the experience could have been better for them.

Methods of Analysis

Once the data was collected, I analyzed the quantitative results from the surveys and the knowledge tests by entering all the coded results on Excel sheets. I created graphs to clearly show the general results for the two groups for their satisfaction and enjoyment of the lessons, as well as the evolution of the knowledge tests grades. Once this was completed, I compared the qualitative results and drew conclusions based on the data gathered during the interviews, open-ended questions in the satisfaction surveys, as well as during the live sessions, through a thematic analysis. The main themes were student satisfaction, knowledge retention, gamification and additional findings. The quantitative and qualitative results from both groups were compared, and I drew final conclusions based on all the factors studied during this experiment.

CHAPTER 4: RESULTS

The main components that were tested with this study were student satisfaction and knowledge retention. Findings regarding the gamification components tested in this study are also presented. Lastly, additional findings regarding online teaching are drawn for further consideration. For direct quotes, a code was used to protect the participants' anonymity. The code will show C for control group and E for experimental group, followed by a letter.

Student Satisfaction

In order to assess student satisfaction during the study, data was collected through the satisfaction surveys, the mid and post-study interviews, as well as classroom observations.

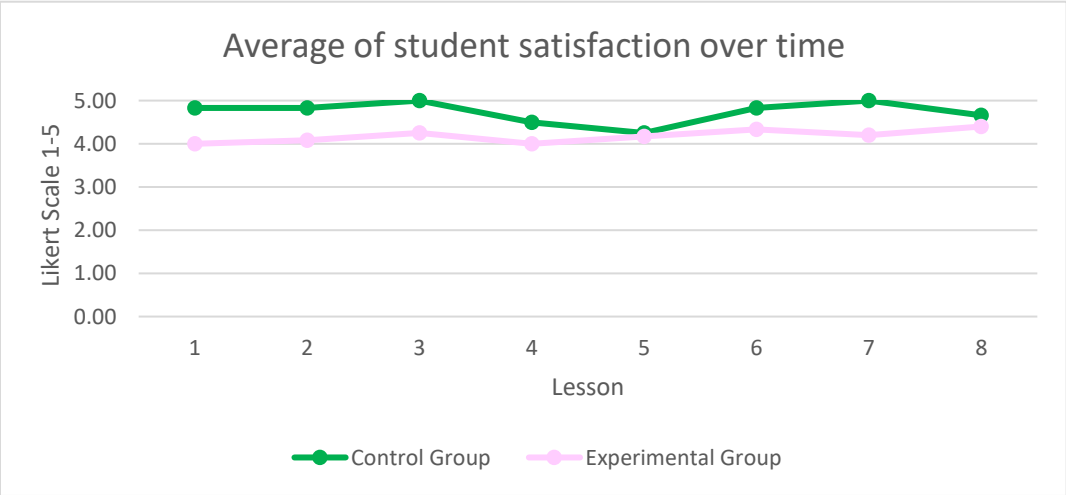
Quantitative Data

The survey included two 5-point Likert scale questions, from which the results are presented below. The results were rounded to two decimal numbers.

To the question: "Overall, are you satisfied with today's lesson?", students could respond from "very unsatisfied", which represented one on the Likert Scale to "very satisfied", which represented five. Below is a graph representing the average out of five of both groups over time.

Figure 4

Average of student satisfaction over time

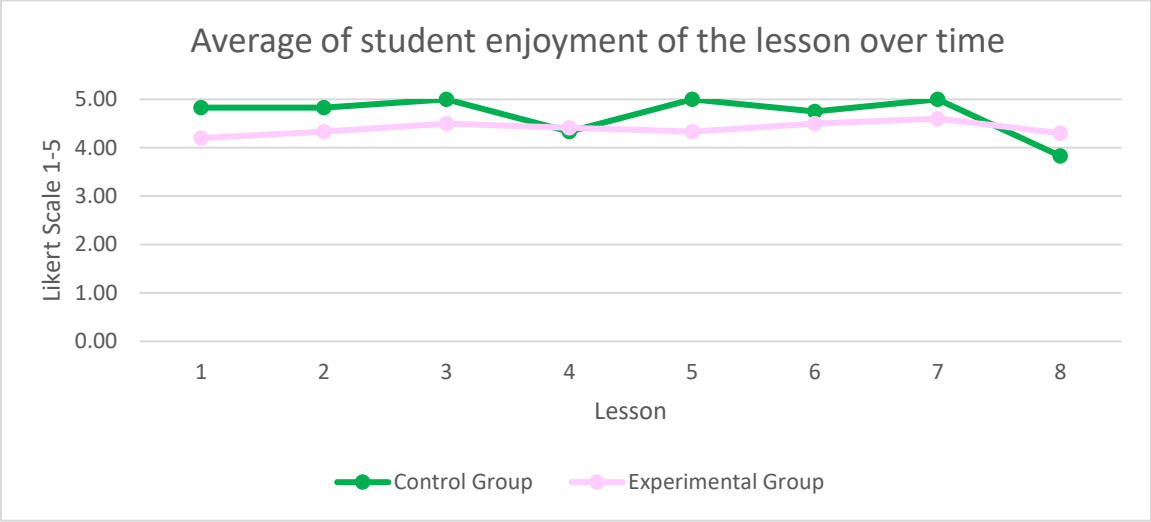


The overall average of the control group was 4,75 out of five and the experimental group's was 4.17. The difference in the total average over time is 0.58. Both groups were satisfied by the lessons, but the control group was slightly more satisfied.

The second Likert-Scale question was: "Overall, how would you grade your enjoyment of the lesson?", participants could respond from "terrible", which represented one point, to "great", which represented five points. The results are presented in the graph below:

Figure 5

Average of student enjoyment of the lesson over time



The overall average of student enjoyment in the control group was 4.68 out of five and 4.39 in the experimental group. The overall difference is 0.29 out of five over time. As shown in the graph, students in the control group enjoyed the lessons slightly more than in the experimental group. Both groups enjoyed the lessons, but the control group enjoyed them slightly more. Therefore, whilst the results of both these questions did not show a significant difference between the control and experimental group, the control group did have slightly higher results.

Qualitative Data

The qualitative results of the satisfaction survey enabled me to have a clearer understanding of student satisfaction throughout the study.

During the interviews, students generally said they liked the lessons. The main qualities of the lessons were that they were fun and interesting, and that it felt different than regular schooling. Students appreciated that there was a new subject every week. However, one student mentioned not liking having class during the summer, as the study overlapped with the participants' end of the school year. Several students mentioned not liking having homework, as well as tests at the end of each session because they could be stressful. It is important to note that many students in both the control and experimental group often wrote comments such as "I don't have one" or "I don't know" to answer the question about their least favorite thing in the study. Both groups employed the same words when asked about how they found the study overall: fun, good, and great. Students were asked to use one word to describe the study, the results are presented below:

Table 5

One word answer to describe the study

Words answered (in alphabetical order)	Number control group	Number experimental group	Total number of times the word was used
Cool	0	1	1
Exciting	1	0	1
Fun	1	2	3
Good	2	0	2
Interesting	1	0	1
Learning	0	1	1
New	1	0	1
Simple	0	1	1

In the interviews, students were asked if they felt they were learning a lot and if they felt challenged by the lessons. The comments from the experimental and control groups were quite similar. Generally, students in the control group felt like they learned a good amount during the lessons as per the data collected from their answer to the question: “Do you think you learnt a lot during the lesson?”. They felt like they were learning new things, but several students had already learnt some things regarding the food topic in French or in English. A student pointed out that they felt we were not learning as much in our sessions as they were in school. Overall, students seemed to feel like they learnt a lot of vocabulary in our sessions compared to other parts of the lessons such as grammar. Students in the experimental group also mentioned the important amount of vocabulary learnt during the study. One student said they did not feel like they were learning a lot as they already knew a lot about our topics from school and from home, similarly, a participant mentioned that they felt they were reviewing a lot, rather than learning. As such, a participant mentioned that the lessons were less fun when they already knew the material. Lastly, one student said that they would get distracted easily while being on Zoom so it was harder to learn but when they paid attention they would learn. Students in both groups felt somewhat challenged by the lessons. It was said that some of the lessons were too easy, and some were too challenging. While some students said they were not necessarily feeling challenged by the lessons, they also said the lessons were not too easy. Several students said they felt challenged by the tests. Therefore, it would be important to review some of the lessons from the study to re-adjust the level.

A multitude of times, participants of the control and experimental groups referred to activities as “games”. They wrote comments such as:

CA: “I loved all the games and overall, it was very fun”

CC: “it was fun even though it was a test we did games to review things”

EB: “Its fun to learn about food with games”

However, in an effort to avoid confusion between gamification and games, I specifically refrained from using games in the lessons. Some students were unsure of which group they were in and were reminded during the mid-study interview. Moreover, within the first half of the study, one participant for the experimental group suggested several times to use online educational games in the last question of the survey. The difference between gamification and games was clearer for students after the mid-study interview where they had the opportunity to ask questions. I refrained from using online educational games as to only focus on one gamified system to test its efficacity. Maybe the fact that the study was outside the school context and that the lessons were presented in a way students may not be used to with the use of a lot of visuals, may have led students to identify activities as games. Another hypothesis I would provide would be the placebo effect of being part of a study on gamification which makes students think they are playing games. However, the participants knew which groups they were in. The word “fun” was written several times by both groups. Students often qualified the activities as fun or said they had a lot of fun during the lessons. They wrote comments such as:

CD: “It was fun sharing ideas with others”

EC: “Everything was fun”

When designing the lessons for both the control and the experimental group, one of my goals was to make fun lessons for students to enjoy learning a second language, as I understand the challenges students may face towards learning a second language online. To create a fun environment conducive to learning, I conducted short and varied activities so that students would not get bored. I used many visuals, such as pineapple characters that students seemed to have enjoyed, and most importantly, I fostered a safe space for students to thrive in. I believe that the

fact that the lessons were presented differently than what the students are used to is an important factor. Facing something new is challenging and students seem to enjoy that. Overall, both groups seemed to have enjoyed the lessons, as shown in the quantitative results of the surveys.

Students provided some suggestions regarding the study. Students from the control group suggested that we write down the vocabulary that we learnt, to practice more, and to introduce a new special food at the beginning of each lesson that students may have never heard of. A student mentioned that completing the satisfaction survey every week was somewhat annoying because their answers were very similar, therefore it would have been more enjoyable to do it every other week. Some of the tests were rather long and students would have enjoyed more time to complete them, or a participant suggested sending the test within 24 hours of the lesson like the satisfaction survey. A participant suggested having longer tests instead of the homework. Students from the experimental group suggested having more writing activities and to make some of the activities we had already done harder.

Knowledge Retention

Pre-Test

The second component analyzed in this study was students' knowledge retention. From the pre-test results, the control group seemed stronger in French. The test indicated they were more comfortable with the concepts to be studied in the lessons such as food, eating healthy, the present tense, and the passé composé tense. For example, in the control group, all students said they had already worked on food in their French classes versus only three in the experimental group, the three other students answered that they did not know. Moreover, the control group's writing skills seemed stronger than the experimental group's according to questions 6 and 7, which demanded a constructed response.

Tests

The tests were graded using rubrics created for each test to ensure homogenous grading. As this study was situated within a second language learning lens, the rubrics reflect this specificity. The participants may have answered the questions correctly, but not gotten all the points because of errors in grammar or spelling. While students would not lose all the marks for misspelled answers, it is an important component of learning a language. Moreover, the order in which participants' tests were graded changed each week. I corrected all the copies from the control and experimental group and then went back to the first few copies to make sure they were graded similarly, as teachers adapt their grading to the overall work of the students. For example, if I noticed a question had been a struggle for all the students, I graded the question with leniency.

Table 6

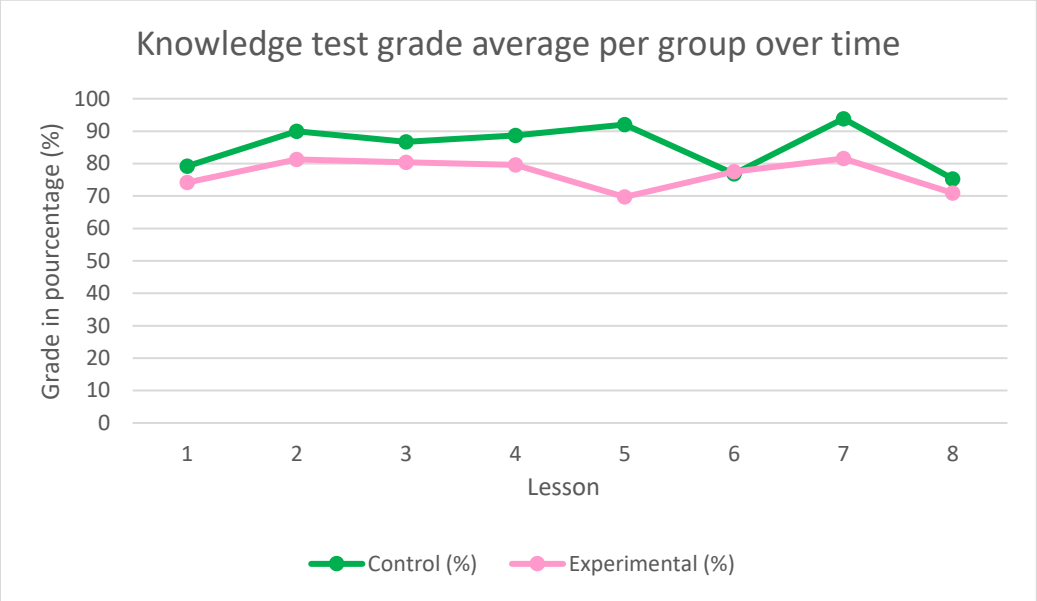
Test 1 grading rubric

Test 1 rubric /10				
Question/ Level	Very good	good	acceptable	problematic
1 (per word) /3	The word is spelled correctly 1	The word is misspelled 0.5	x	The word is missing or written in English 0
2 (per item) /7	The item is described in detail (2 or more information about it). The sentences are formed correctly, and the words are spelled correctly 3.5	The item is described in detail (2 or more information about it). Some grammatical errors are present and/or two or less words are written in English. 2.5	The items are described in detail (2 or more information about it). but the grammar is not correct, or English was used several times 1.5	The items are not described in detail (one or less information), the grammar is not correct. Or The question is answered in English Or The question is unanswered 1-0
Total Grade				
Comment				

Once each test was graded, I calculated the average for each test as well as the overall average of the tests. Some participants missed one or more lessons, in which case their test was marked as "absent". Students were still asked to complete the homework from the class they missed as to not impact the continuity of the lessons. Once again, the results were rounded to two decimal numbers. Here is a graph of group averages over time.

Figure 6

Knowledge test grade average per group over time



The graph shows that the control group constantly tested higher than the experimental group, which seems logical due to the pre-test results. Moreover, from the class observations, the experimental group had a lower level than the control group. The overall average of the control group was 84.70% whereas the experimental group was 76.86%. The difference of 7.84% is significant but not surprising. Both the evolutions of averages in the groups are somewhat steady, except for the week 5 test for the experimental group and the week 6 test for the control group, the averages were similar from week to week. The last test was designed to test students on all the

lessons of the study, to know if they remembered what we learnt. The test had one question per lesson, and students were provided with study material one week before the test. The average grades for the last test ranged from 45.93% to 94.19% in the control group and from 58.14% to 95.35% in the experimental group. Some students did not have time to finish the test in the control group in the 30 minutes allocated whereas all students from the experimental group finished the test. Therefore, while the overall average of the last test 75.29% > 70.93% was higher for the control group, the lowest grade was in the control group and the highest in the experimental group.

Gamification

Gamification was the main theme of this study. Thanks to the collection of the satisfaction surveys, as well as the mid and post-study interviews, I was able to draw substantial conclusions regarding the gamification components I selected to design this system. Participants rarely mentioned gamification elements when unprompted but seemed to have a positive attitude towards them. Students in the experimental group mentioned the gamification elements in their surveys twice in the first half of the study. In the first instance the student graded his enjoyment of the lesson as “good” and explain his response in question 4 “why?”, they wrote:

EE: “Because I really liked the lesson and the gamification”

The second instance is a student that points out the badges as their favourite part of the lesson because “we all get to choose” (EB). This comment shows that the student appreciated that gamification allowed for collaboration.

The experimental group had a specific question for gamification in their interviews, which enabled me to gather more information about the system being tested. Students from the experimental group generally seemed to enjoy the gamification components of the study. When asked about their overall experience, a student mentioned that the gamification made the lessons a

lot more fun, and they enjoyed the experience. Several students mentioned they enjoyed the gamification because it was different than regular school. Overall, participants appreciated the visuals, such as the colors, reading the instructions, and the pineapple characters, as well as the coins, the badges, and the storyline. The post-study interviews provided a more detailed insight into how students perceived the gamification component of the study, and the findings from the mid-study interviews were confirmed. Overall, students appreciated that it was not similar to how they learned in school because it felt different and offered the possibility to engage in several activities rather than following a workbook. However, a student from the control group mentioned that they thought they were learning a lot and felt rewarded even though there weren't any gamification elements in their group. Outlined below are the main findings from the experimental groups' mid-study and post-study interviews.

Storyline

A student from the experimental group identified the first lesson as their favorite because they discovered what they will be doing for eight weeks such as the supermarket storyline. A student enjoyed the passwords to go to the different places, they liked moving around on the board. They mentioned that going to the shopping cart to solve the riddle felt like walking along the aisles of the market. Several participants said that they liked the storyline and qualified it as "fun". A student said they enjoyed the main board because it made it easy to know what to do. Similarly, participants enjoyed the descriptions so that they could clearly read what we were doing. Moreover, some participants mentioned that the enigma at the beginning of the lesson to find the store of the day, as well as the descriptions, made it easier to learn vocabulary throughout the study. However, one student said that they had mixed emotions about the supermarket set-up but was unable to identify why. Additionally, a participant mentioned they thought the main board

was a bad idea at first because they believed we would change topic every week but when they understood that we would use the board every week they thought it was good and different from regular teaching. Lastly, it was suggested to make the icons of the stores less obvious to provide an extra challenge to solve the riddle.

Coins

Students had diverging ideas regarding the coin system. A student mentioned that they enjoyed getting coins because it made them feel powerful to have all these coins and another participant liked having to memorize how many coins they were gathering, as it felt like a memory game. However, a student mentioned that they did not feel like the coins meant that much because students would get them anyway, so they were not really paying attention to it. A student suggested changing the number of coins that students win after each activity so that it does not always end by 0 or 5, and another to make it harder to get the badges. After the mid-study interviews, I implemented changes to the coin/badge system to make it more challenging for students. One student did not appreciate that the number of coins per activity changed after the mid-study interviews because the numbers were no longer even. Lastly, a student suggested an evolution of the coin system such as losing coins when getting a wrong answer or being able to save up the coins for the next week.

Badges

The badges were appreciated by the students and were often qualified as fun. A participant said it was something to thrive for at the end of the lesson. They appreciated that there was one new badge every week and that they voted collectively to choose the badge. The collaboration required for choosing the badges was mentioned by several students as they had to work together to earn and choose the badges, which was enjoyed by the participants. For example, a student

mentioned that their favorite part of the lessons was when all the students picked out the badges. It was mentioned that the badges gave purpose to the coins, which was a positive thing since coins are common in videogames. However, one student felt like it was too easy to get the badges and felt like they did not have to earn them. Therefore, the challenge component was absent for them.

Riddle

A clear shift regarding the gamification components was observed in the fifth session. The shift was probably caused by the mid-study interviews and the changes made to the gamified system, mainly the added riddle to earn more coins and unlock a more expensive badge. The riddle to access more coins and ultimately the more expensive badges were widely appreciated. Students found it challenging. Two students marked the new riddle as their favorite thing in the lesson on the week 5 survey:

EA: “Doing the guessing game for the five extra gold”

EE: “Doing the star activity to earn 5 more points”

To the question “why”, they answered:

EA: “It was fun trying to figure it out”

EE: “Because I felt like it made it more fun and gave an extra challenge”

Those two students wrote similar answers on the week 7 survey:

EA: “The impossible quiz for extra coins”

EE: “Finding the extra riddle”

To the question “why”, they answered:

EA: “Cause it was hard”

EE: “Because I felt like it was challenging and unexpected”

These answers show that what students most appreciated from the gamification elements was that it was fun and challenging. A student identified getting the badges and the riddles to get extra coins as their favorite thing in the study because the badges are rewarding, which they enjoyed, and the extra riddle was an extra challenge at the end of the class. Adding extra challenges throughout the study enabled the element of surprise for students. Gamification was mentioned only once as their least favorite thing of the lesson by answering question 7 of the survey. The student EE, who pointed out that finding the riddle was their favorite thing, answered that solving the riddle was their least favorite because it was too hard. Whilst only one student made this comment, it is important to gauge the level of the gamified system correctly to avoid having negative effects because of gamification, such as the confusion it can bring to lower achieving students. The student's suggestion written in question 9 was to "make the riddle slightly easier".

Teacher Perspective

From the teacher's perspective, the gamified system took more time to be implemented than lessons in the control group. There were more instructions to follow, and given that the groups were learning FSL, the language barrier was to be considered as well. However, students in the experimental group learnt the routine faster than the control group. The gamified system enabled the class to run smoothly, and the students were quickly aware of how the classes would unfold. Therefore, gamification did take more time to be assimilated by the group, but I believe that it is beneficial for the long-term class routine. Students in both groups were motivated, and enjoyed the lessons throughout the study, as shown in the results from the post-study interviews. From the class observations notes, the control group seemed more engaged in the class in the first half of the study, whereas the experimental group seemed more engaged in the second half. It is possible

that the time it took to settle into the routine made the class more difficult for them but once the routine was assimilated, their engagement was higher.

It is important to note that creating a gamified system for the lessons takes a lot more time than planning regular lessons, especially if you are not familiar with the system you are using to create it. Gamification demands research, commitment, and time and it is important to be aware of it before deciding to implement gamification into your classroom. Whilst the creation process will be faster over time, the educator needs to ask themselves if the commitment is worth it for their classroom depending on the goals they are trying to achieve.

Additional findings were found by analyzing the satisfaction surveys, the interview notes and the classroom observations. Whilst they are not directly related to gamification, these results are interesting to look out for the implementation of online courses.

Tests and Relaxation Activities

Comments about the tests in the surveys were recurrent in both groups. The opinions on the tests were heterogeneous. Several participants identified that they were stressed by the tests. However, other participants noted that they really enjoyed taking tests. A student said that sometimes the distractions outside the online class made it harder to focus, such as a lot of background noise in their home, and they missed some of the information from the class, making the test difficult because they did not know the answers. Participants provided insightful comments about their preferences for tests. It seems like variety in the types of questions is important as well as a substantial number of questions (a student suggested a test should have at least three questions) but that the tests should not be too long in length.

A relaxation activity was done before each test in an effort to enter the test with a calm mindset. Students pointed out the advantages of performing the relaxing activity before the tests,

such as lessening their stress level and keeping them focused. Moreover, students identified the relaxation activities as calming and fun:

CC: “Favorite thing was when we did the relaxation activity before the test” “because it was calming”

CF: “It was fun and I like the relaxing video”

The novelty in these relaxing activities had a positive impact on the students. For example, a student mentioned the chair yoga activity as their favorite thing in the lesson because:

CB: “It was very relaxing and it felt different than normal (hard) yoga.”

On the other hand, some students did not like one or more relaxing activities. The activities presented were one of these three categories: mindful thinking, yoga, or breathing exercises. Participants may have related more to one type of relaxation rather than the others. For example, one student did not like yoga, therefore it did not help them relax. One student mentioned that they did not have enough space to relax. While students could get up during our sessions, maybe the online teaching setting made students sit in a certain way to stay in front of the screen. One participant noted that it made them unfocused for the test because they were so into the relaxation that they were sleepy or trying to remember the movements from the activities and not answering the questions on the tests. A student qualified a relaxation activity that consisted of watching looped animation videos as a breathing exercise as kind of boring, so they did not enjoy it and it probably did not help them relax.

Social Interaction

The last additional finding I identified was one I did not foresee being so prevalent in the study. The need for social interaction was very important for the participants, which is most likely because of the diminution of social interactions since the beginning of COVID-19. Students

appreciated the fact that everyone was involved in the activities, as well as the collaboration in the classroom. Students liked to be involved in the activities and listen to what the other students had to say. Participants wrote comments such as:

CB: “I and everyone was allowed to participate in each activity “

CD: “It was fun sharing ideas with others”

Some students already knew each other, since I used a snowball approach to recruit participants, some came from the same network of people. They were happy to see their friends in the lessons with them and identified it as the reason they enjoyed the lesson or their favorite thing in the lesson. The last few weeks of the study were during the students’ summer holiday as well, therefore they may not have been seeing their friends as often as during the school year.

Moreover, being in class online is quite special, as while you see a lot of people in the online meeting, you are physically alone, and can be easily distracted by exterior things.

CD: “It was good but I had a bit of trouble hearing as how I had background noise. So I had trouble listening to it”

I have taken online university lessons during the pandemic, and I personally found it very hard to concentrate when we were only listening to lectures. I believe hands-on activities and interactions are essential to retain student attention during the lessons. Unprompted, students mentioned listening to other people’s answers and everyone participating as some of their favorite things from the study as well as learning together. Students enjoyed getting to know each other. The participants pointed out that everyone participating, everyone having a turn and listening to each other were positive points of the lessons.

CE: “I like how Fanny lets everyone have a turn to say something so we all have a turn to be the person in the game or activity.”

EB: “We all get to choose”

Lastly, a participant pointed out enjoying the lesson on the food pyramid and the environment because of its connection to daily life.

DISCUSSION

The findings were divided in four themes: student satisfaction, knowledge retention, gamification and additional findings regarding online teaching. Each theme is discussed below.

Student Satisfaction

Whilst the quantitative data of both Likert-Scale questions suggest that the control group was slightly more satisfied and enjoyed the lessons more, the qualitative data showed that the difference was not significant. Both groups enjoyed the lessons and had similar comments throughout the study such as that the lessons were fun, they learnt new material but mostly reviewed what they had learnt previously and felt somewhat challenged by the lessons. The challenge factor seemed to be highly influential regarding student satisfaction in both groups. Challenge is one of the main factors of Csikszentmihalyi's Flow theory. Students had very few dislikes throughout the study. The participants provided thoughtful suggestions to ameliorate the lessons. Therefore, both groups were satisfied by the lessons. The gamification components did not improve nor negatively impact student satisfaction. However, the components highlighted by students for their favorite activities or part of the study differed depending on their group. Students in the experimental group provided thoughtful insight regarding the gamification components, discussed later in this chapter.

Knowledge Retention

Students' knowledge retention was assessed with the use of knowledge tests. After analysis of the students' pre-tests, it was clear that the experimental group was less proficient in French than the control group. The results of the knowledge tests showed that the control group consistently obtained a higher average than the experimental group. The difference of the overall averages was 7.84%, which is significant but in adequation with the analysis of the pre-test as well as classroom observations. The control group tested higher for the last test, which demanded knowledge of all

the prior sessions, but the lowest grade was in the control group and the highest was in the experimental group. The overall grade gap corresponds to the level of each group at the beginning of the study, in favor of the control group. Both groups had similar grade averages throughout the study. The gamification components did not have a significant impact on students' knowledge retention, neither positive nor negative.

Gamification

Students in the experimental group made several comments about the gamification components in this study. The gamification components were appreciated by students for several reasons. The storyline provided appealing visuals for the students, it helped them learn the routine of the class and learn more vocabulary. The students found the board fun. Additionally, participants had diverging opinions regarding the coins system. The coins made them feel powerful, however it was noted that getting the coins was not challenging enough. A revision of the coin system was operated at the fifth week of the study, which some students enjoyed. The coin system should be reviewed again to fit this group of students. The badges were probably the most appreciated component for the students. The renewal of badges and their design as well as the collaboration to win and choose them was what students liked. Overall, participants pointed out the challenging component of gamification, which was sometimes not enough or too much. It seems like the most important thing for them. From the perspective of the teacher, gamification takes time to put in place with the students but is beneficial to create a routine in the long run. However, gamification took a lot more time to create and plan than regular lessons, which is an important factor to take into consideration for educators.

Additional findings

Additional findings were brought up regarding the online teaching setting. Overall, the relaxation activities seemed to have been appreciated by the students and seemed to have a positive effect on students' stress level and focus during the tests. Lastly, it seems like the type of relaxation activity impacted the effect it had on students. It could be based on personal preference, but the activities might also not translate to the online setting as well as in the physical world.

Moreover, students seemed to enjoy the lessons and enjoyed being together once a week. Students appreciated seeing their friends and being actively involved in the lessons. I believe involvement and collaboration are essential for online teaching to keep the students engaged and focused. As demonstrated by Guichon (2009), the need to create a socio-emotional connection is important for the online language teaching setting. I was surprised that social interaction played such an important role for participants' satisfaction in the lesson. Eom et al. (2006) discussed the importance of interaction for the success of online instruction, and whilst I kept it in mind when developing the lessons, I did not foresee the findings of the study to reflect this as this was not being studied specifically.

Conclusion

In conclusion, gamification was found to have no significant impact on the two factors tested in this study, student satisfaction and knowledge retention. It is in accordance with Bai et al.'s (2020) finding that gamification may not have additional utility. However, students were not necessarily satisfied by the same things in the control and experimental group. Challenge seemed to be an important factor for student satisfaction in the online teaching setting as indicated by the data collected during the interviews. Being challenged may enable students to feel more connected to the class, and therefore more engaged, as the feeling of social isolation during online instruction

has been found to be detrimental (Artino & Jones, 2012). A detailed analysis of the gamification components used in this thesis was presented which responds to the lack of research on the implementation of gamification and the specific impacts of the elements presented by Papp (2017). Badges seemed to have been the preferred factor for the participants. The storyline and board could have properties to appeal to students' multiple intelligences as well as facilitate vocabulary acquisition. Creating a gamified system is found to be an important time commitment for educators and should not be taken on lightly as a poorly designed gamification system can be detrimental to students. I would argue that in the COVID-19 context, gamification may not be suitable for teachers that do not have the required skills for online teaching and/or gamification because of the workload teachers are already taking on. Gamification was implemented in an attempt to create a class routine. The implementation was successful as the routine was quickly assimilated by the participants. Whilst the quantitative results do not show an increase in knowledge retention or student satisfaction, the insignificant difference in the results from the groups showed that the system was successful as it was not detrimental to the participants' learning experience. Last, regarding the online teaching setting, relaxation may be beneficial for online students, but some types of relaxing activities may not be appropriate for this setting. Castle and McGuire (2010) suggest looking at the instructor/student interaction with the content in an online setting and how it impacts the learning experience. The need for social interaction, mainly cooperation and involvement appeared to be important for both groups of students, and it may be due to the online setting. This study connected theory to practice to study gamification by doing extensive fieldwork in an authentic setting with participants in concordance with the gap identified by Seaborn and Fels (2004) and was conducted with primary students, as Dichev and Dicheva (2017) identified that most of the research on gamification was done with college students.

Findings from this study suggest several directions to take for future research on gamification and online teaching.

Implications

The gamified routine system presented in this study could be used with a bigger pool of participants and adapted throughout the study to better fit students.

The challenge factor seemed to be impacting student satisfaction, therefore, using a gamified system to study students' perception of challenge and its impact on satisfaction could be beneficial to the education field.

The potential of gamification for vocabulary acquisition in the online setting could be further developed, in concordance with Cheung (2021) suggesting research on methods to teach ESL when classes are closed.

Comparing the need for social interaction in both the physical teaching and online teaching setting could be insightful, as Guichon (2009) expresses the importance of a socio-emotional factor for online teaching. An analysis could be done on the impact of COVID-19 on this specific factor.

The willingness and capability of teachers to learn new methods of instruction during a pandemic as opposed to not during a pandemic could be studied as Kentnor (2015) writes about online teaching needing an adapted pedagogy.

Limitations

This study was conducted with a small sample size, therefor the results found might not be representative of the general population. Moreover, the students selected for this study were in grade four and grade five, whereas the effect of gamification may vary from one age group to the other, impacting the results. Lastly, each teacher has a philosophy of education and a way to

conduct their classes. If another person were to teach the plans I designed specifically for this study, the results might differ.

REFERENCES

Adams, N., Little, T.D, & Ryan, R. M. (2017). Self-Determination theory. In M. L. Wehmeyer, K. A. Shogren, T. D. Little, & S. J. Lopez (Eds.), *Development of self-determination through the life-course* (pp. 47–54). essay, Springer Science + Business Media B. V.

Aggarwal, R., & Ranganathan, P. (2019). Study designs: Part 4 – Interventional studies. *Perspectives in Clinical Research, 10*(3), 137-139. DOI: 10.4103/picr.picr_91_19

Alzaid, F. (2018). *The effects of gamification based formative assessment on motivation and vocabulary acquisition in ESL classroom* (Publication No. 28248416). [Master's Thesis, McGill University]. ProQuest Dissertations & Theses @McGill. https://www.proquest.com/pqdtlocal1006845/docview/2471463180/F4AB964DDE824C22PQ/1?accountid=12339

Ananga, P. (2020). Pedagogical considerations of e-learning in education for development in the face of COVID-19. *International Journal of Technology in Education and Science (IJTES), 4*(4), 310-321. ISSN: 2651-5369

Artino, A. R., Jr., & Jones, K.D., II. (2012). Exploring the complex relations between achievement emotions and self-regulated learning behaviors in online learning. *The Internet and Higher Education 15(3),* 170-175. https://doi.org/10.1016/j.iheduc.2012.01.006

Bai, S., Hew, K. F., & Huang, B. (2020). Does gamification improve student learning outcome? Evidence from a meta-analysis and synthesis of qualitative data in educational contexts. *Educational Research Review, 30.* https://doi.org/10.1016/j.edurev.2020.100322

Bandura, A. (1997). *Self-efficacy: The exercise of control.* W H Freeman/Times Books/ Henry Holt & Co.

Bill 40, *Chapter E-9.1: Act Respecting Private Education*, article 54.12, Quebec, (2021). Retrieved from http://www.legisquebec.gouv.qc.ca/en/pdf/cs/E-9.1.pdf

Blake, R. (2008). Distance learning for second and foreign language teaching. In N.H. Hornberger (Ed.), *Encyclopedia of Language and Education* (pp. 365-376). Springer, Boston, MA. https://doi.org/10.1007/978-0-387-30424-3_111

Canadian Parents for French (2017a). *An overview of French second language education in Canada*. [Submission to the Standing Senate Committee on Official Languages - Addendum]. https://sencanada.ca/content/sen/committee/412/OLLO/Briefs/2013-11-22CPFBrief_Addendum_e.pdf

Canadian Parents for French (2017b). French as a second language enrolment statistics. https://cpf.ca/wp-content/uploads/2017-Enrolement-Stats.pdf

Castle, S.R., & McGuire, C.J. (2010). An analysis of student self-assessment of online, blended, and face-to-face learning environments: Implications for sustainable education delivery. *International Education Studies, 3*(3), 36-40. DOI: 10.5539/ies.v3n3p36

Cheung, A. (2021). Language teaching during a pandemic: A case study of Zoom use by a secondary ESL teacher in Hong Kong. *RELC Journal, 00*(0), 1-16. https://doi.org/10.1177/0033688220981784

Compton, L.K.L. (2009) Preparing language teachers to teach language online: A look at skills, roles, and responsibilities. *Computer Assisted Language Learning, 22*(1), 73-99. https://doi.org/10.1080/09588220802613831

Csikszentmihalyi, M. (1990). *Flow: the psychology of optimal experience*. New York: Harper & Row.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. Springer Science+Business Media New York. https://doi.org/10.1007/978-1-4899-2271-7

De la Torre, R., & Berbegal-Mirabent, J. (2020). Using game-based principles to empower students in non-STEM academic programmes. *Innovations in Education and Teaching International*, 57(5), 511-520. https://doi.org/10.1080/14703297.2020.1727352

Deterding, S., Dixon, D., Khaled, R., & Nacke, L.E. (2011). Gamification: Toward a definition [Paper presentation]. *In Proceedings of The CHI 2011 Gamification Workshop,* Vancouver, BC, Canada, 7–12 May 2011.

Dichev, C. and Dicheva D. (2017). Gamifying education: What is known, what is believed and what remains uncertain: A critical review. *International Journal of Educational Technology in Higher Education, 14*(9), 1-36. DOI 10.1186/s41239-017-0042-5

Eom, S.B., Wen, H.J., & Ashill, N. (2006). The determinants of students' perceived learning outcomes and satisfaction in university online education: An empirical investigation. *Decision Sciences Journal of Innovative Education, 4*(2), 215-235. https://doi.org/10.1111/j.1540-4609.2006.00114.x

Essential principles of high-quality online teaching: Guidelines for evaluating K-12 online teachers. (2003). *Southern Regional Education Board, Atlanta, GA.*

Farr, M.J. (1987). *The long-term retention of knowledge and skills a cognitive and instructional perspective.* Springer Science+Business Media, LLC. DOI 10.1007/978-1-4612-1062-7

Fulton, J.N. (2019). *A theory of gamification*. [Dissertation, William Howard Taft University].

Gacs, A., Goertler, S., & Spasova, S. (2020). Planned online language education versus crisis-prompted online language teaching: Lessons for the future. *Foreign Language Annals, 53,* 380–392. DOI: 10.1111/flan.12460.

Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.

Gardner, H. (2011). The theory of multiple intelligences: As psychology, as education, as social science. *Address delivered at José Cela University on October, 29, 2011.*

Goodyear, P., Salmon, G., Spector, J. M., Steeples, C., & Tickner, S. (2001). Competences for online teaching: A special report. *Educational Technology Research and Development*, *49*(1), 65–72. http://www.jstor.org/stable/30220300

Gray, J.A., & DiLoreto, M. (2016). The effects of student engagement, student satisfaction, and perceived learning in online learning environments. *NCPEA International Journal of Educational Leadership Preparation, 11*(1). ISSN: 2155-9635

Guichon, N. (2009). Training future language teachers to develop online tutors' competence through reflective analysis. *ReCALL*. *21*(2), 166-185. DOI: 10.1017/S0958344009000214.

Kentnor, H. (2015) Distance education and the evolution of online learning in the United States. *U Denver Legal Studies Research Paper No. 15-41, Curriculum and Teaching Dialogue, 17*(1 & 2), 21-34. Available at SSRN: https://ssrn.com/abstract=2643748

Khaleel, F.L., Ashaari, N.S., Wook, T.S.M.T, Ismail, A. (2016). Gamification elements for learning applications. *International Journal on Advanced Science Engineering and Information Technology*, *6*(6), 868-874. DOI:10.18517/ijaseit.6.6.1379

Landers, R.N. (2015). Developing a theory of gamified learning: Linking serious games and gamification of learning. *Simulation & Gaming*, 1-17. DOI: 10.1177/1046878114563660

McDonald, K. (2013). The importance of students' learning French as a second language. *BU Journal of Graduate Studies in Education*, *5*(2), 21–26.

Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th edition). John Wiley & Sons, 28-31. https://mcgill.on.worldcat.org/oclc/904400178

Merriam-Webster. (n.d.). Satisfaction. In *Merriam-Webster.com dictionary*. Retrieved October 11, 2021, from https://www.merriam-webster.com/dictionary/satisfaction

Milner IV, H. R. (2007). Race, culture, and researcher positionality: Working through dangers seen, unseen, and unforeseen. *Educational Researcher, 36*(7), 388-400. https://doi-org.proxy3.library.mcgill.ca/10.3102/0013189X07309471

Ministère de l'Éducation et de l'Enseignement supérieur (2001). Quebec Education Program. ISBN 2-550-37958-6

Ministère de l'Éducation et de l'Enseignement supérieur (2019). Digital Competency Framework. ISBN 978-2-550-84858-5

Ministère de l'Éducation et de l'Enseignement supérieur (2021). Reference Framework for Professional Competencies. 78-79. ISBN 978-2-550-88382-1

Moore-Russo, D., Wiss. A., & Grabowski, J. (2018) Integration of gamification into course design: A noble endeavor with potential pitfalls. *College Teaching*, *66*(1), 3-5. https://doi.org/10.1080/87567555.2017.1295016

Nacke, L.E., & Deterding, S. (2017). The maturing of gamification research. *Computers in Human Behavior., 71*, 450-454. http://dx.doi.org/10.1016/j.chb.2016.11.062

Ngalasso, M.M. (1992). Le concept de français langue seconde. *Etudes de Linguistique Appliquée, 88*, 27-38.

Ofusu-Ampong, K. (2020). The shift to gamification in education: a review on dominant issues. *Journal of Educational Technology Systems*, *49*(1), 113-137. https://doi.org/10.1177/0047239520917629

Oliveira, W., Pastushenko, O., Rodrigues, L., Toda, A.M., Palomino, P.T., Hamari, J., & Isotani, S. (2021). Does gamification affect flow experience? A systematic literature review. *5th International GamiFIN Conference 2021*.

Papp, T.A. (2017). Gamification effects on motivation and learning: Application to primary and college students. *International Journal for Cross-Disciplinary Subjects in Education (IJCDSE)*, *8*(3), 3193-3201. DOI:10.20533/ijcdse.2042.6364.2017.0428

Peters, M. (2005). Développement des compétences en français langue seconde au Québec. *The French Review, 78*(6), 1204–1214. http://www.jstor.org/stable/25480062

Pokhrel, S., Chhetri, R. (2021). A literature review on impact of COVID-19 pandemic on teaching and learning. *Higher Education for the Future*, *8*(1), 133-141. DOI: 10.1177/2347631120983481

Putz, L. M., Hofbauer, F., & Treiblmaier, H. (2020). Can gamification help to improve education? Findings from a longitudinal study. *Computers in Human Behavior, 110*, 1-12. https://doi.org/10.1016/j.chb.2020.106392

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, *25*(1), 54–67. https://doi.org/10.1006/ceps.1999.1020

Schrum, L., & Hong, S. (2002). Dimensions and strategies for online success: voices from experiences educators. *JALN, 6*(1), 57-67. DOI: http://dx.doi.org/10.24059/olj.v6i1.1872

Seaborn, K., Fels, D.I. (2014), Gamification in theory and action: A survey. *International Journal of Human-Computer Studies, 74*, 14-31. https://doi.org/10.1016/j.ijhcs.2014.09.006

Statistics Canada. (2016). Most common mother tongue languages other than English or French, Montréal, 2016. *Focus on Geography Series, 2016 Census*. Retrieved December 7th, 2021, from https://www12.statcan.gc.ca/census-recensement/2016/as-sa/fogs-spg/Facts-cma-eng.cfm?LANG=Eng&GK=CMA&GC=462&TOPIC=5

Statistics Canada. (2017). *English–French bilingualism reaches new heights*. Retrieved October 11, 2021, from https://www12.statcan.gc.ca/census-recensement/2016/as-sa/98-200-x/2016009/98-200-x2016009-eng.cfm.

Steiner, E.D., and Woo, A. (2021). Job-related stress threatens the teacher supply: Key findings from the 2021 State of the U.S. Teacher Survey. *Santa Monica, CA: RAND Corporation.* https://www.rand.org/pubs/research_reports/RRA1108-1.html.

Tandon, T. (2017). A Study on relationship between Self Efficacy and Flow at work among young adults. *The International Journal of Indian Psychology*, *4*(4), 87-100. DOI: 10.25215/0404.069

Tashakkori, A. & Teddlie, C. (2010). Putting the human back in "human research methodology": The researcher in mixed methods research. *Journal of Mixed Methods Research*, *4*(4), 271-277. https://doi.org/10.1177/1558689810382532

The Glossary of Education Reform (2013). Asynchronous Learning. In https://www.edglossary.org/. Retrieved from https://www.edglossary.org/asynchronous-learning/

The Glossary of Education Reform (2013). Blended Learning. In https://www.edglossary.org/. Retrieved from https://www.edglossary.org/blended-learning/

The Glossary of Education Reform (2013). Synchronous Learning. In https://www.edglossary.org/. Retrieved from https://www.edglossary.org/synchronous-learning/

Toda A.M., Valle P.H.D., Isotani S. (2018) The dark side of gamification: An overview of negative effects of gamification in education. In A. Cristea, I. Bittencourt, F. Lima (Eds.), *Higher education for all. From challenges to novel technology-enhanced Solutions* (pp. 143-156). HEFA 2017. Communications in Computer and Information Science, vol 832. Springer. https://doi.org/10.1007/978-3-319-97934-2_9

Toda, A. M., Palomino, P. T., Oliveira, W., Rodrigues, L., Klock, A. C. T., Gasparini, I., Cristea, A. I., & Isotani, S. (2019a). How to gamify learning systems? An experience report using the design sprint method and a taxonomy for gamification elements in education. *Journal of Educational Technology & Society*, *22*(3), 47–60. https://www.jstor.org/stable/26896709

Toda, A.M., Klock, A.C.T., Oliveira, W., Palomino, P.T., Rodrigues, L, Shi, L., Bittencourt, I., Gasparini, I., Isotani, S., Cristea, A.I. (2019b). Analysing gamification elements in educational environments using an existing Gamification taxonomy. *Smart Learning Environments, 6*(16), 1-14. https://doi.org/10.1186/s40561-019-0106-1

United Nations (2020). Policy Brief: Education during Covid-19 and beyond.

Van Gorp, K., Giupponi, L., Heidrich Uebel, E., Dursun, A., & Swinehart, N. (2019). Defining teachers' readiness for online language teaching: Toward a unified framework. *CALL and Complexity – Short Papers from EUROCALL 2019*, 373–378. https://doi.org/10.14705/rpnet.2019.38.1039

Yaşar, H., Kıyıcı, M. & Karatas, A. (2020). The views and adoption levels of primary school teachers on gamification, problems and possible solutions. *Participatory Educational Research, 7*(3), 265-279. http://dx.doi.org/10.17275/per.20.46.7.3

Yildirim, I. (2017). The effects of gamification-based teaching practices on student achievement and students' attitudes toward lessons. *The Internet and Higher Education, 33*, 86–92. https://doi.org/10.1016/j.iheduc.2017.02.002

Appendix A

Parent/ Legal tutor Consent Form

McGill | Faculty of Education

Parent/ Legal tutor Consent Form

Researchers:

Fanny Langin, M.A Educational Leadership

McGill University, Faculty of Education

fanny.langin@mail.mcgill.ca

514 965 9996

Supervisor:

Dr. Mindy Carter

McGill University, Faculty of Education

mindy.carter@mcgill.ca

514-686-2232

Title of Project:

Exploring the Impacts of Gamification in Online Teaching

Sponsor(s): *Not applicable.*

Purpose of the Study: This is an invitation to participate in a research study. The purpose of this study is to research the effects of gamification in online teaching on knowledge retention and student satisfaction. In this case, gamification means to add game-like elements such as levels, quests, points… to online lessons.

Study Procedures: This study will be conducted entirely online and will last eight weeks. Students will be divided in four groups. Two groups of students will have used gamification before and two won't have. In each category one group will be taught using gamification and the other using traditional method of teaching. This will be decided at random. Participants will attend three individual interviews that will last a maximum of 30 minutes and eight one-hour French second language lessons. The interviews and the

lessons will be conducted using the videoconferencing platform "Zoom". Notes will be taken during these online meetings, but no video recording will be done during the study. Participants will be asked to fill out a 15 minutes test at the beginning of the study. They will be asked to fill out a test about the lesson that will last approximately 15 minutes and a 5 to 10 minutes satisfaction survey after each lesson. Students will have a small amount of homework that will take no more 30 minutes to complete each week.

Voluntary Participation: Participation in this study is voluntary. The participants can withdraw from the study at any time, for any reason. If the participants withdraw from the study, the data collected will be destroyed unless you and your child give permission to use it in the study. Whether someone participates or not in this study will have no effect on any services or future services that you may receive from me. Data will be de-identified two weeks after the last post-study individual interview has been conducted by destroying the key of the code used when gathering data. Once de-identified, data can no longer be withdrawn.

Potential Risks: The potential risk of this study are emotional fatigue and stress as the study is time consuming. Moreover, participants can experience mild stress due to the knowledge tests. Participants will be encouraged to express their feelings of discomfort should there be any so that the lessons can be adapted

Potential Benefits: Participants may benefit from this study by deepening their knowledge of French as a

second language.

Compensation: There is no compensation for participating in this study.

Confidentiality: Given that students will be working together in groups, confidentiality between participants is not possible. However, the confidentiality of information from participants will be kept confidential. The participant's name will be coded. This code will be used on all the data gathered during the study which include: Notes on individual interviews and lesson observations, knowledge tests, satisfaction surveys and homework. The data will be kept on a password protected file on a password protected laptop. Only the principal investigator and their supervisor will have access to the key and the data (surveys, tests, homework, notes from interviews and lessons). Two weeks after the last post-study individual interview has been conducted, the key to the code will be destroyed so the data will no longer be identifiable. Privacy or confidentiality cannot be guaranteed if information that is potentially harmful to the participant or to others is disclosed to or suspected by the principal investigator. If this situation happens, the principal investigator will contact the relevant authorities (parents, social workers, police etc.). While all reasonable precautions will be taken, as with all electronic communications, such as email and videoconferencing platforms, there is the possibility of third-party interception.

Dissemination of Results: This study is part of a master's thesis. The results of this study might potentially be used in academic publications and workshops presented in conferences. The students will know their own grades for the knowledge tests and are free to disclose them to their peers if they want to.

If you have any questions or need any clarification about this study, contact Mme Fanny Langin by email at fanny.langin@mail.mcgill.ca or by phone at 514 965 9996.

If you have any ethical concerns or complaints about your participation in this study, and want to speak with someone not on the research team, please contact the Associate Director, Research Ethics at 514-398-6831 or lynda.mcneil@mcgill.ca citing REB file number ___21-01-016___

Please sign below if you have read the above information and consent for your child to participate in this study. Agreeing for your child to participate in this study does not waive any of their rights or release the researchers from their responsibilities. To ensure the study is being conducted properly, authorized individuals, such as a member of the Research Ethics Board, may have access to your (your child's) information. A copy of this consent form will be given to you and the researcher will keep a copy.

Participant's name: (please print) _____

Participant's legal tutor's Name: (please print) _____

Participant's legal tutor's Signature: _____

Appendix B

Child assent Form

McGill | Faculty of Education

Child assent form

Researchers:

Fanny Langin, M.A Educational Leadership

McGill University, Faculty of Education

fanny.langin@mail.mcgill.ca

514 965 9996

Supervisor:

Dr. Mindy Carter

McGill University, Faculty of education

mindy.carter@mcgill.ca

514-686-2232

Title of Project:

Exploring the Impacts of Gamification in Online Teaching

What is it? You are invited to participate in a research study about gamification and online teaching. Gamification is a way to teach using quests, points, levels… and the research is made to know if this a good way to do classes.

How do you do this? In this study you will be attending eight French as second language lessons and three individual interviews. Some groups will have gamification in their lessons and some will not. This will be decided at random. You will need to fill out tests about the lessons and little surveys to know if you liked the lessons. You will have some homework to do.

Why should I do it? If you participate in this study, you will work on French lessons and learn a lot of new things.

Is it dangerous? You may be tired because the lesson will be a lot of work, and you might be a little stressed to do the tests after each lessons, but you can ask questions anytime during the study and you can let me know how you feel so that everyone feels good.

What if I do it and then I want to stop? You can stop the study at any time, for any reasons. You don't have to participate in anything that you do not want to. When your parent/ guardian signs the paper to say you can participate it does not mean that you have to. You can discuss the study with your parent(s)/ guardian(s) to make the right decision for you!

You can ask me questions about the study too!

By signing this form, you agree that:

- You understood the study and all of your questions have been answered
- You talked about the study with your parent(s)/ guardian(s)
- You agree to participate in the study

_____

Your Signature Printed Name Date

_____

Name of Parent(s) or Legal Tutor(s)

_____

Principal investigator's signature Printed Name Date

Appendix C

Recruitment email

Good morning,

I hope all is well! I am currently recruiting student participants for my master's Thesis at McGill University. The purpose of this study is to research the effects of gamification in online teaching on knowledge retention and student satisfaction. In this case, gamification means to add game-like elements such as levels, quests, points… to online lessons. Here is some information about the study:

- The study will be conducted entirely online and will last two months. Students will have one hour of FSL instruction per week for eight weeks. Additionally, students will have one individual interview before, during and after the study.
- Participants will be asked to fill out knowledge tests, satisfaction surveys, as well as a small amount of homework every week.
- Some groups will be taught using gamification and some will not, this will be decided at random.
- No compensation is given to the participants for this study, but it is an opportunity to attend French lessons.

The required qualifications are as such:

- Participant is enrolled in grade 4 or grade 5 in an English primary school in Montreal.
- Participant has the relevant level of French as a second language for their school level.

Do not hesitate to contact me if you are interested in participating in this study.

If your child has had sessions with me, they have been taught using gamification before which is the qualification I am looking for in two of the four groups for this study.

Moreover, I would like to recruit students that have not been exposed to gamification. If you know of parents and their child that might be interested in participating in this study, you can ask them to contact me through this email and I will send them information about the study.

I am looking forward to hearing from you.

Have a great day!
Fanny

Researchers:
Fanny Langin, M.A Educational Leadership
McGill University, Faculty of Education
fanny.langin@mail.mcgill.ca
514 965 9996

Supervisor:
Dr. Mindy Carter
McGill University, Faculty of Education
mindy.carter@mcgill.ca
514-686-2232

If you have any ethical concerns or complaints about your participation in this study, and want to speak with someone not on the research team, please contact the Associate Director, Research Ethics at 514-398-6831 or lynda.mcneil@mcgill.ca citing REB file number ***21-01-016***

Appendix D

Recruitment email for people who contacted me

Good morning,

Thank you for contacting me regarding the study! I am currently recruiting student participants for my master's Thesis at McGill University. The purpose of this study is to research the effects of gamification in online teaching on knowledge retention and student satisfaction. In this case, gamification means to add game-like elements such as levels, quests, points… to online lessons. Here is some information about the study:

- The study will be conducted entirely online and will last two months. Students will have one hour of FSL instruction per week for eight weeks. Additionally, students will have one individual interview before, during and after the study.
- Participants will be asked to fill out knowledge tests, satisfaction surveys, as well as a small amount of homework every week.
- Some groups will be taught using gamification and some will not, this will be decided at random.
- No compensation is given to the participants for this study, but it is an opportunity to attend French lessons.

The required qualifications are as such:

- Participant is enrolled in grade 4 or grade 5 in an English primary school in Montreal.
- Participant has the relevant level of French as a second language for their school level.
- Participant has never attended a class where gamification was used.

Do not hesitate to contact me if you are interested in participating in this study.

I am looking forward to hearing from you.

Have a great day!
Fanny

Researchers:

Fanny Langin, M.A Educational Leadership

McGill University, Faculty of Education

fanny.langin@mail.mcgill.ca

514 965 9996

Supervisor:

Dr. Mindy Carter

McGill University, Faculty of Education

mindy.carter@mcgill.ca

514-686-2232

If you have any ethical concerns or complaints about your participation in this study, and want to speak with someone not on the research team, please contact the Associate Director, Research Ethics at 514-398-6831 or lynda.mcneil@mcgill.ca citing REB file number ***21-01-016***

Appendix E

Homework

•Ecris quatre phrases sur ce que tu manges à la maison.

Ex: Le matin, je mange une pomme.

Appendix F

Knowledge test

Test 3

Mardi 8 juin 2021

Question 1: Écris trois mots qu'on a vu aujourd'hui pour la recette :

1) _____

2) _____

3) _____

Question 2: Remets la recette dans l'ordre : (le numéro 1 est la première chose à faire)

Numéro	**1**	**2**	**3**	**4**	**5**	**6**
Lettre						

A) Faire 10 boules de pâtes.
B) Cuire les cookies pendant 12 minutes.
C) Prendre un bol, une cuillère en bois et tous les ingrédients.
D) Manger les cookies (attention c'est chaud…) !
E) Ajouter des brisures de chocolat.
F) Mélanger la farine, la levure, le sucre, le beurre et les œufs.

<u>Question 3:</u> Écris 4 mélanges de nourriture :

1)

2)

3)

4)

Appendix G

Satisfaction Survey

The Impacts of Gamification on Online Teaching
Satisfaction survey

Date: Click or tap here to enter text.

1) **Overall, are you satisfied with today's lesson?** Check one box to answer.

☐ Very satisfied ☐ Satisfied ☐Neutral ☐Unsatisfied ☐Very Unsatisfied





2) **Why?**
Click or tap here to enter text.

3) **Overall, how would you grade your enjoyment of the lesson?** Check one box to answer.

☐ Great ☐ Good ☐ Neutral ☐Bad ☐Terrible





4) **Why?**

Click or tap here to enter text.

5) **What was your favorite thing in today's lesson? (it can be a memory, an activity, a detail …)**

Click or tap here to enter text.

6) **Why?**

Click or tap here to enter text.

7) **What was your least favorite thing in today's lesson?**

Click or tap here to enter text.

8) **Why?**

Click or tap here to enter text.

9) **Do you have suggestions to make the lesson more enjoyable to you?**

Click or tap here to enter text.

Appendix H

Interview Questions

Pre-study interview:

1) How are you feeling today?
2) Do you know why you are here today?
3) Present myself and present the study
4) Did you discuss the study with you parent(s)/guardian(s)?
5) Do you have any questions?
6) How are you feeling about the study?

Mid-study interview:

1) How are you feeling today?
2) Do you like the lessons?
3) What is your favorite thing about them?
4) What is your least favorite thing about them?
5) Which lesson was your favorite? Why?
6) Which lesson did you like the least? Why?
7) (For test groups) What do you think about the gamification component?
8) Do you think you are learning a lot? Why?
9) Do you feel challenged? Why?
10) Do you have any suggestions for the lessons to be better for you?
11) Do you have any questions?
12) Do you have anything else you want to say?

Post-study interview:

1) How are you feeling today?
2) Did you like the lessons?
3) What was your favorite thing about the lessons?
4) What was your least favorite thing about the lessons?
5) (For test groups) How did you find the gamification component?
6) Do you think you learnt a lot of things during the study?
7) How did you find the overall experience?
8) Chose one word to describe the study for you.
9) Do you have any suggestions regarding the study? Things to add or change?
10) Do you have any questions?
11) Do you have anything else you want to say?