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Gamification, Anxiety, & Motivation in Second Language Learners: A Qualitative Systematic Review

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Abstract

For second language learners, anxiety poses a major hurdle in the use of the second language in a myriad of contexts, including in the classroom. Teachers and schools often make use of technology in order to better serve their students in a variety of ways, and many teachers chose to use gamified educational platforms in order to enhance their classrooms; however, second language anxiety remains pervasive. Since second language anxiety is a major hurdle for students, one should expect newly developed courses and platforms to attempt to reduce negative affective states. Gamification of educational content is a flourishing industry with notable sites such as Duolingo that can be counted among those that make use of it. This systematic review aims to determine if specific gamified elements can be found to be related to student anxiety and confidence so that recommendations can be made to teachers and developers to further improve those elements. The results of this analysis show that quests, narratives, and storytelling along with more immersive gaming experiences commonly co-occur with classroom environments where students felt less anxious and more willing to communicate with their peers in their second language. Additionally, awards or points were commonly present with a decrease in anxiety and increase in confidence. Competition was not found to be connected to decreases in anxiety, and this could be a significant area for improvement among second language learning platforms as competition has been previously shown to lead to anxiety, and in second language learners, it has also been shown to lead to negative self-perception. This study posits that reducing competitive elements of gamified platforms and increasing cooperative- and narrative-based elements would lead to more equitable classrooms where second language students feel more comfortable in expressing themselves.

Keywords: Second Language Acquisition, Applied Linguistics, Foreign Language Anxiety, Gamification

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1. Introduction

Many people around the world have the desire to learn a second or additional language, and according to the official office of statistics of the European Union, in a majority of EU countries, students are learning two or more languages in school beyond their home-language (Eurostat, 2021). For a country like Luxembourg, a modern-day student could be expected to know English, French, German, and Luxembourgish. In 2018 in the United States, more than ten percent of all public-school students were English as a Second Language learners (National Center for Education Statistics, 2021). There is certainly no paucity of language learners, and the successful teaching and learning of languages is thus critical (Dehghanzadeh et al., 2019).

In recent years, there have been many websites and services that have been created to serve this growing market. Many second language classes use textbooks, and these have been in use for a significant amount of time (Binte Bahar and Zaman, 2013); however, the advent of the internet has brought a new class of educational tools, such as online learning platforms. One of the biggest platforms currently available is Duolingo. This platform in particular is one of the most used language learning sites ever created, with over two hundred million users as of 2017, and over five hundred million users as of 2020 (Lotherington, 2018; Loewen et al., 2019; Blanco, 2020; Irawan, Wilson and Sutrisno, 2020). It was first developed in 2011, and it went public in 2012, thus the website has seen now over a decade of use (Loewen et al., 2019). There have been several studies that have looked at its pedagogical effectiveness and found that it shows similar effectiveness to university level classes on an hour-by-hour comparison (Loewen et al., 2019; Jiang et al., 2020). Duolingo owes its popularity, in part, to the fact that it is free to use, while many of its competitors charge fees. As a result of its popularity among students, it has also become one of the most studied platforms by researchers as well, creating numerous studies that teachers and educators can use to inform their practice (Shortt et al., 2021).

Another well-known and liked platform goes by the name of Memrise, and it has over fifty million users (Abarghoui and Taki, 2018; Aminatun and Oktaviani, 2019; Memrise, 2021), thus putting it in the ranks of other large platforms. The website was created in 2010, and its primary focus is on vocabulary expansion (Zhang, 2019). It does this by gamifying what is essentially a flashcard application, giving users points for correctly identifying a word and making use of Spaced Repetition Software. One feature of the platform is that each word is likened to a seed that is planted, and each time it is studied it receives water. Students can watch their flowers grows as they learn new words. Finally, with respect to Memrise, another set of researchers noted that its gamified elements included points that a user can earn for each word studied (Masood and Halimi, 2019). Note that gamified elements refers to parts of an application or teaching method that create a gamified learning atmosphere. In addition to this, the platform includes a level system whereby a user must learn a set of words before being allowed to continue on to the next set of words. Most uniquely on the platform is their feature of planting and growing seeds. When a user initially encounters a word, they plant a virtual seed and water it. Subsequent correct answers for said word continue to water it and allow the user to see the plant's growth. When the word is successfully learned according to Memrise's algorithm, the plant then flowers and reaches maximum growth. As with Duolingo, Memrise also includes a leaderboard feature, but Memrise's compares one's progress to all students of a set of cards, without requiring one to become friends with other users.

Kahoot, a site used in classrooms the world over, is also extremely popular. As of 2021, the platform boasts five billion "cumulative players" (Hanoa, 2021). This platform offers many different resources to gamify in-class lessons, and it easily works with other platforms and software for ease of use. This site can not only be used in language learning classes, but also with any subject that a teacher could desire. These sites are all similar in that they all take advantage of the nascent phenomenon in education known

as gamification to drive interaction with educational content and to promote motivation (Araya et al., 2019; Dehghanzadeh et al., 2019; Manzano-León et al., 2021); gamification makes use of many features, such as points, badges, leaderboards, and many other elements. Some of these platforms also use features such as Spaced Repetition Software, which is supported by numerous studies looking at its pedagogical benefit (Huynh, Zuo and Iida, 2018; Masood and Halimi, 2019; Jiang et al., 2020; Kinkade, 2020; Manzano-León et al., 2021).

Many language learning sites also include a mobile app or mobile-ready website. Using a mobile device, such as a phone, tablet, or other highly portable device to study a language has been given the name Mobile-Assisted Language Learning, or MALL (Shortt et al., 2021). Many mobile applications used for language learning also make use of gamification, including Duolingo and Memrise. The term gamification saw a rise in usage in the 2010s, and the industry of making gamified applications is a growing industry (Dehghanzadeh et al., 2019; Purgina, Mozgovoy and Blake, 2019). The word gamification is used to talk about the addition of game-like elements to applications that are not games themselves (Araya et al., 2019). The intention of so doing is, of course, to drive user interaction (Shortt et al., 2021). There have been studies done that show that gamified learning can improve student behavior and engagement (Shortt et al., 2021). There has also been research on student perception of and effects of gamified learning in non-second language acquisition contexts, but still very little research within the SLA context (Barata et al., 2013). Barata's study found a statistically significant increase in course participation for engineering students and found that the students felt the course to be easier and more enjoyable. There was a study done on students who were using gamified learning platforms to study vocabulary, and it found that these students spent a significant amount of time out of class studying their vocabulary words (Abrams and Walsh, 2014). As a result, there seems to be a positive correlation between gamified elements and some positive affective states.

Of course, this is not to say that no research has been done that shows negative effects. One study on overarching negative outcomes in gamified education found that a common negative experience some students have is a decrease in performance, with one researcher stating that their results may have been influenced by unclear rules for the students to follow (Toda, Valle and Isotani, 2018). Another issue is that different students have different needs. One study found that students with lower motivation to study were more motivated by immediate feedback and rewards, such as giving the student badges or by giving them points (Manzano-León et al., 2021). These same researchers also found that using too few gamified elements within a platform could be detrimental to student motivation, thus striking a balance could be more difficult than educational content developers might initially believe.

There are many different elements that can be incorporated into an educational platform to gamify it. Some of those elements might be: having a point system, having multiple levels, allowing users to earn badges, using leaderboards to track top performers, among others (Nah et al., 2014). Researchers have identified a number of different gamified elements within Duolingo. In a paper published in 2018, researchers noted the studying streak feature as a gamified element (Huynh, Zuo and Iida, 2018; Shortt et al., 2021). This feature keeps track of the number of days one successfully logs in and completes their set number of lessons for the day, and once done, their streak goes up by one. Another game element on this website is the leaderboard, where a user can see the points that they have earned from lessons and compare against other users that they have added as friends on the site. Leaderboards, points, and badges seem to be the three most common gamified elements found in a number of different gamified educational platforms (Toda, Valle and Isotani, 2018; Manzano-León et al., 2021).

In addition to the gamified elements of the aforementioned platforms, both also make use of Spaced Repetition Software to determine the intervals at which vocabulary will be presented to the user

(Kinkade, 2020). In a way, SRS is the opposite of gamification in that one study showed that students found it to be a boring study method (Seibert-Hanson and Brown, 2019). Despite it being uninteresting to these students, their vocabulary retention was superior to groups that did not use flashcards or SRS (Webb and Nation, 2017; Seibert-Hanson and Brown, 2019). Webb and Nation also found that the speed at which students learned new words in their second language was increased if they defined the word in their native language, instead of attempting an entirely immersed method that many second language classrooms across the world attempt. Both Duolingo and Memrise define and explain the L2 using the L1 and make use of SRS.

If gamification is the making of educational content more game-like, then serious games are games which were solely developed for recreational purposes (Purgina, Mozgovoy and Blake, 2019). Although some may choose to use them as an educational tool, that is not the purpose of their creation, and their features often differ dramatically from gamified educational tools. One well known example of a serious game that is used within educational contexts is Minecraft, which boasts an educational version with additional craftable items that allows increased applicability in chemistry classes (Callaghan, 2016). Its simple mechanics and its timeless LEGO-like features allow it to be used in numerous educational contexts with relative ease. There are of course many others that can find a place within education. Indeed, video games offer many benefits to its players. Video games have been shown to have cognitive, motivational, and social benefits (Granic, Lobel and Rutger C. M. E. Engels, 2014). These games often operate within the Zone of Proximal Development by adjusting the difficulty and allowing players to play at a comfortable level (Granic, Lobel and Rutger C. M. E. Engels, 2014). This same feature is also used within many gamified educational platforms.

Lev Vygotsky, a well-known Soviet psychologist, developed the theory of the Zone of Proximal Development (Ellis, 2015). This theory lays out three levels of development in a person's educational attainment. The first level is the one where the student currently resides, i.e., the zone of what the student is currently capable of. The second level is the Zone of Proximal Development, which is the next layer of educational attainment that a student is capable of reaching. The third level is all that is outside of their grasp. To give examples, a student in the first grade would count knowing the alphabet within the first level, being able to read books at a slightly more advanced level than they are currently at would lie within the Zone of Proximal Development, and finally, being able to read this thesis would obviously lie outside of their capabilities even with support, and thus outside of the ZPD.

Students most frequently study with others, i.e., their classmates, and these classmates can help them in regards to the ZPD. Students often seek out assistance from their peers, and this touches on another concept known as Communities of Practice. In 1991, Lave and Wenger developed their theory of Communities of Practice (Lave and Wenger, 1991; Ardichvili, Page and Wentling, 2003; Roberts, 2006). A community of practice forms when a group interacts ("Mutual Engagement"), when they work together to learn and teach ("joint enterprise"), and when they share something in common ("shared repertoire"), e.g., a language. When these concepts come together, members of the group share information and learn from each other. As they get closer, the community of practice becomes stronger and increases knowledge transfer. Thus, it can be said that facilitating the development of such a community can lead to a more effective classroom environment.

In addition to working with their classmates, language students also have to study outside of class and assigned classwork to make strong progress in their L2. This means needing to be motivated enough to engage with additional content (Mkize, 2015). There are many factors relevant when discussing what causes students to study of their own volition. Firstly, it is important to mention the Self-Determination Theory (Noels et al., 2000; Ryan and Deci, 2000; Liu and Huang, 2011; Ellis, 2015). Self-Determination

Theory was brought to the fore by Ryan and Deci when they published their work in 1985 (Miller, Deci and Ryan, 1985; Manzano-León et al., 2021). This theory explains two types of motivation, namely intrinsic and extrinsic motivation. When someone enjoys doing something, this would be an example of intrinsic motivation (Ellis, 2015; Manzano-León et al., 2021). It is not hard to find the motivation to do things one enjoys. However, when someone does not enjoy the action, it is, of course, harder. Rewarding someone and giving someone a grade creates extrinsic motivation (Ellis, 2015). One study found that higher levels of intrinsic and extrinsic motivation were positively correlated with achievement in the second language (Noels et al., 2000; Ellis, 2015).

In addition to intrinsic and extrinsic motivation, there is also instrumental and integrative motivation (Cook, 2016; Zhang, Dai and Wang, 2020). Integrative motivation and instrumental motivation play a role in a student's willingness to spend time on doing homework and studying within the second language context (Cook, 2016); when a second language learner enjoys the culture of a country that speaks their target language or wishes to be in that country, this would be an example of the former (Cook, 2016). Instrumental motivation refers to learning a language for a specific purpose, such as finding a job or attending university (Cook, 2016). If a student does not have at least one type of motivation, then there is nothing pushing them to study, and they will likely not be successful in a language learning context. Thus, finding a way to cultivate motivation in one's student is an important task for every teacher. These are not the only explanations and descriptions of motivation that have been put forth. In the eighties, the Socio-Educational Model was well liked at the time, which posited that the culture one lives in can influence one's studies (Ellis, 2015). However, this model has received criticism for not taking enough causes of motivation into account.

Motivation can also be influenced by other emotions that the student is experiencing. Anxiety is an extremely salient topic to be brought up, as a result, because many students experience anxiety when attempting to use their second language (Guiora et al., 1972; Horwitz, 2010; Guo, Ma and Wang, 2018). Although there is some disagreement in regards to the exact effects anxiety has on the language learning process, there is a general agreement that high anxiety in learners is detrimental (Ellis, 2015; Moran, 2015; Guo, Ma and Wang, 2018). There are a number of possible sources of this language anxiety, including tests, speaking, writing, and listening (Saito, Garza and Horwitz, 1999; Horwitz, 2010; Hewitt and Stephenson, 2011; Zhang, 2013; Ellis, 2015; Tsiriotakis et al., 2017; Yang, Lin and Chen, 2018; Alnuzaili and Uddin, 2020). Researchers in 2016 found that anxiety can have an impact on a student's motivation to continue studying and learning (Sun, Syu and Lin, 2016). It seems that anxiety can negatively impact performance in all the major categories of second language acquisition (i.e., speaking, reading, writing, listening), and as a result anxiety, motivation, and student affect deserve attention in order to find ways to decrease these negative effects.

Krashen's well known Monitor Model also touches on anxiety, among other affective states a student might experience (Zafar, 2011; Naser Oteir and Nijr Al-Otaibi, 2019). His hypotheses have been critiqued for being ostensibly untestable, and thus perhaps not the most scientifically sound; however, Krashen is a household-name, as-it-were, within the field of SLA, and it is important to talk about his Affective Filter Hypothesis. In this hypothesis, Krashen explains that there is a type of mental filter within each person which is influenced by negative affects such as anxiety. He posits that these negative emotions prevent the successful acquisition of input. Krashen believed that there were ways to reduce these negative emotions, such as having second language students go through a period where they begin learning the second language without speaking at all (Zafar, 2011; Naser Oteir and Nijr Al-Otaibi, 2019). It should be noted that language anxiety and other related mental health conditions, such as Social Anxiety and Generalized Anxiety Disorder are discrete conditions. Despite this, many of the symptoms are similar and treatments may overlap, but ultimately language anxiety has its own unique attributes that must be

considered in their own right (Muris, 2002; Johnson et al., 2010: Moran, 2015; Zhang, 2019a; Toyama and Yamazaki, 2021).

As one can see, the need to understand gamified platforms and education systems, as well as what drives students to interact with them is an important avenue of research. With so many students across the globe interacting in second languages and with many of them reporting a fear of using said language, it is critical to understand and develop education systems to best serve students in this regard.

2. Literature Review

For many students of second languages, a fear of using the second language holds them back, even to the extent that anxiety in second language contexts has been strongly correlated with language performance (Onwuegbuzie, Bailey and Daley, 1999; Liu and Huang, 2011; Naser Oteir and Nijr Al-Otaibi, 2019; Zhang and Chen, 2021). Additionally, fear, anxiety, and confidence affect students and their desire to study and use a second language (Liu and Huang, 2011; Ellis, 2015). Students must spend their time studying grammar, vocabulary, pronunciation, and other second language skills in order to be successful users of their target language, and a negative affect will hinder progress; this is especially due to the fact that learning a second language requires a significant amount of time and intentional usage (Seliger, 1977; Fukuda and Yoshida, 2012; Ellis, 2015; Cook, 2016; Lin, 2016; Seibert-Hanson and Brown, 2019; Martin, 2020; Shortt et al., 2021). Students with lower anxiety levels will be more likely to use their second language and thus gain more experience using said language (Liu and Huang, 2011; Alrabai, 2014; Ellis, 2015).

Anxiety disorders are a very common mental health issue, and an understanding of the implications it has on education is certainly needed (Moran, 2015). Sources of anxiety in the classroom are many, but researchers have found some of the causes. (Alnuzaili and Uddin, 2020). Alnuzaili and Uddin noted that tests and fear of being criticized or negatively evaluated were two factors leading to anxiety in the foreign language classroom.

In past studies, games have been shown to reduce anxiety levels in non-educational contexts (Pallavicini and Pepe, 2019; Sakızcı Uyar et al., 2020; Sajeev et al., 2021; Abd-alrazaq et al., 2022); and there have also been studies that show that games can reduce anxiety in educational contexts outside of language learning, as well (Alanazi, 2020). Alanzi (2020) not only showed that games reduced anxiety for math students, but also that they increased student performance.

Gamification has been shown to be able to increase motivation and engagement of content, and it can even improve student behavior (Araya et al., 2019; Dehghanzadeh et al., 2019; Shortt et al., 2021). There have been studies that show both positive and negative effects on anxiety in students; however, according to the current literature, it is not clear why this is so (Reinders and Wattana, 2014; Shatz, 2015; Reitz, Sohny and Lochmann, 2016; Hwang et al., 2017; Araya et al., 2019; Cho and Castañeda, 2019; Chen and Hsu, 2020; Rueckert et al., 2020; Xiangming, Liu and Zhang, 2020; Yang et al., 2020; Yavuz, Ozdemir and Celik, 2020; Zhang and Chen, 2021).

Aside from educational games and platforms, serious games can also have various psychological effects on their players. In fact, serious games are able to create an environment that enhances risk taking among players (Rama et al., 2012; Reinders and Wattana, 2014; Shatz, 2015). However, once again, it is not clear what specific components are leading to these effects.

A study done in 2019 attempted to find out which specific type of gamified elements were having positive impacts on students in general, but the researcher felt their results were inconclusive (Dehghanzadeh et al., 2019). In 2014, a group of researchers synthesized a table of current studies on gamification in education and cross-referenced the outcomes with the gamified elements involved; this study showed that points earned on gamified platforms were positively correlated with improved test scores (Nah et al., 2014). These two systematic reviews by Nah et al. (2014) and Dehghanzadeh et al. (2019) only looked at motivation, interest, and class scores. Some studies have also found that badges can be a source of motivation for students (Gibson et al., 2013; Santos et al., 2013; Nah et al., 2014); thus, it can be seen that individual gamified elements are capable of having an impact on student affective states.

If second language anxiety represents such a major hurdle for students, then its research must be prioritized, and with the state of the literature being as it is, there is a paucity of research examining anxiety and gamification together. As a result, it is not clear how anxiety is affected by these platforms and their gamified features. Within the context of second language acquisition, there has been research into how gamification can alter student affect, but there has yet to be research that aims to determine gamified elements that may be implicated in student anxiety (Reinders and Wattana, 2014; Reitz, Sohny and Lochmann, 2016; Rueckert et al., 2020; Xiangming, Liu and Zhang, 2020; Yavuz, Ozdemir and Celik, 2020; Zhang and Chen, 2021). Thus, there is a gap in the literature. Determining which gamified elements specifically may be involved in the results previous studies have found may then help teachers and course developers to better create educational resources that have positive impacts on their students and users. In order to determine if such relationships may exist, the following is the research question that was explored in this study:

- In what ways do gamified elements of language learning platforms affect students in the second language learning context?

3. Methodology

3.1. Qualitative Systematic Reviews

When doing research, researchers traditionally start with a literature review. In doing this, they not only describe the current state of the literature for their field, but they also often find new information that the researcher had not known before. However, traditional literature reviews can often lack a certain systematicity that would help to reduce the likelihood of bias in addition to it then being reproducible (Aromataris and Pearson, 2014; Aromataris and Riitano, 2014; Riesenberg and Justice, 2014a; Riesenberg and Justice, 2014b; Butler, Hall and Copnell, 2016). This is where systematic reviews become exceptionally important for many fields, as such reviews are based on a comprehensive and reproducible search with clearly stated criteria (Aromataris and Pearson, 2014; Riesenberg and Justice, 2014a; Riesenberg and Justice, 2014b; Butler, Hall and Copnell, 2016). Each step in the review process must be thoroughly detailed and appropriately noted, and many systematic reviews are based on publicly available guides, such as Cochrane's handbook for performing Randomized Control Trials (Aromataris and Pearson, 2014; Riesenberg and Justice, 2014a; Riesenberg and Justice, 2014b). There can be many types of systematic reviews; however, two of the most common are qualitative systematic reviews and quantitative systematic reviews. The former synthesizes primary studies using qualitative methods, and the latter does the same but with quantitative methods (Aromataris and Pearson, 2014; Aromataris and Riitano, 2014; Riesenberg and Justice, 2014a; Riesenberg and Justice, 2014b).

For this study, I am aiming to understand in what ways various gamified platforms affect students, and the data I will be using is other studies published by other researchers. As a result, my methodology will be qualitative so that I can capture emotions, written responses, and other text-based data.

As with all research methodologies, there are best practices and methodologies that fit better to specific circumstances, and a qualitative systematic review is no exception. Dixon-Woods et al. (2006) argues that because research is fallible, those aiming to inform policy through a body of research must be careful not to overgeneralize (Dixon-Woods et al., 2006). While this paper is written in the context of medicine, the idea can still apply outside of this domain. Many of the criticisms from within this paper stem from the field's hyper-focus on only allowing experimental epidemiological studies, at least at the time of its writing; however, the study being described here did not include such a restriction.

3.2. PRISMA

PRISMA is a well-accepted and commonly used set of guidelines for qualitative systematic reviews. It stands for the Preferred Reporting Items for Systematic Reviews and Meta-Analyses, and the guidelines were updated in 2020. This systematic review makes use of the most recent version of the document to guide the researcher into making and writing well documented and high-quality research (Moher et al., 2015; Page et al., 2021; Shortt et al., 2021). According to Shortt (2021), the PRISMA guidelines are better suited for research within linguistics than other guidelines such as the Consolidated Standards of Reporting Trials (CONSORT) (Shortt et al., 2021), so PRISMA was chosen over others that were available.

3.3. Search Strategy & Information Sources

In keeping in line with the previous research, a set of search terms were developed around this question. This is to ensure that the results of the searches to be performed will be relevant without returning too many that are not (Aromataris and Riitano, 2014). Note that all the following research was performed without the aid of other researchers or reviewers. On the fourteenth of December 2021, I searched multiple journal databases, and those were ERIC, Sage Journals, ScienceDirect, and the University of Sunderland's own journal database. These were chosen based on their popularity and their coverage of many journals and papers. There were others I considered using, such as Web of Science; however, I did not have access to this one (and others) though my university, so I did not use these.

Next, I devised a search strategy that I modified several times using keywords such as "gamification", "second language", "vocabulary", "university", etc. Additionally, I used search operators such as "AND" and "OR" in order to more precisely pin down the studies I needed to find. A full list of the search terms is shown in Appendix 2 I limited the search to 2012 to 2022 because many of the gamified platforms used within the field of language acquisition only first launched in 2012. Memrise, Duolingo, and Kahoot all were launched or made public around this time.

Once the search results proved relevant based on a cursory read through of the titles on the main search page, I then exported the search results to either an RIS or BibTex file, which I then imported into a citation manager, specifically Zotero. Apart from these automated searches, I also read studies relevant to my research topic in order to find additional ones that were applicable and that otherwise did not show up

in my searches; this type of searching is known as hand searching. By doing this, I was able to expand the number of studies I was able to include in the final tally.

3.4. Inclusion & Exclusion Criteria

Within Zotero, I was able to aggregate all of these studies, and I then reviewed the results of my searches and applied my inclusion and exclusion criteria. The inclusion and exclusion criteria I used are such that the study must be:

1. peer reviewed
2. not grey literature
3. within the timeframe of 2012 to 2022
4. about gamification and second language learning
5. about the effects on students that gamification has
6. in English

3.5. Search Results

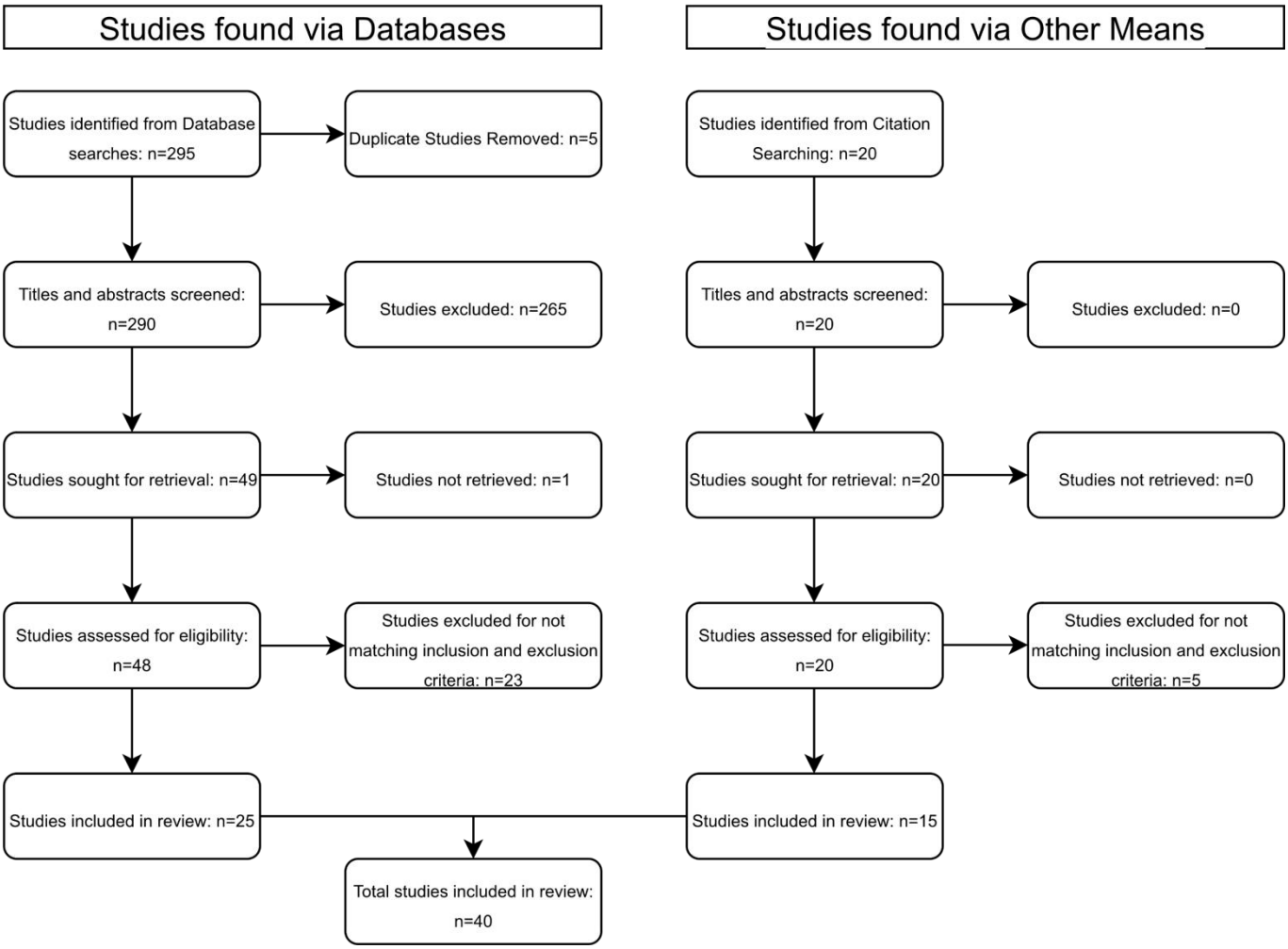
With the aforementioned criteria, I was able to reduce the number of studies from an initial three hundred and fifteen imported to forty studies for final inclusion. The chart below shows, in a visual manner, the following content. Twenty-two of the three hundred and fifteen were manually found by reading other studies and scanning their citations, and five studies were duplicates that were filtered out. Two hundred and seventy studies were excluded from analysis based on the inclusion and exclusion criteria. Next, I set to acquiring copies of the studies. First, I downloaded as many as I already had access to through the University of Sunderland. The remaining studies, I had to request access to. I was unable to gain access to five of the three hundred and fifteen; thus, they were excluded from the final set.

3.6. Selection Process

After importing all of the studies that had been found into Zotero, I then began reading titles and abstracts to determine if the studies would meet the inclusion and exclusion criteria. For this study, there was one reviewer, myself. In order to ensure consistency, I wrote down the keywords I would look for in the titles and abstracts, and if the study contain those keywords, then it would be transferred to the next round. It should be noted that for this study, critical appraisal was not used, and if a study met the inclusion criteria, it would be included without further deliberation. For studies that passed this round, a subfolder was created to store them. Another review round was completed by gaining copies of the studies and then reading them in full to determine if the studies still matched the criteria. No automated tools were used for this process, and all studies were manually read to determine eligibility. The full list of studies that were determined to match the inclusion criteria are listed in Appendix 1.

Table 1

Study Selection Process



3.7. Data Collection Process

In order to extract the data from these studies for analysis, I first had to design a series of questions that would serve to systematically explore each study. The initial data capture form had fifteen questions, and after using it with several papers and making notes, the number of questions increased to twenty-one. I was then able to take this form and apply it to each study to systematically retrieve the information necessary. As with the selection process, this process was also done solely by myself, and no automation tools were used in this process either. Appendix 3 shows the list of questions I used in order to extract data, which was then stored in a spreadsheet. If data for a specific question could not be found in a study, then a dash was placed in the cell. In a few select cases, minor assumptions were made; for example, in one study that took place in Spain, it was not mentioned what the students' native language was, but for the purposes of this study, the assumption was that they were native Spanish speakers.

In order to find out what affects anxiety might be having on students, it seemed likely that location would be relevant, thus a question that aimed to extract data on where the student was while studying was made. If the student were in a class with their classmates, information on anxiety would be immensely helpful to teachers. If the students were at home, there would be little the teacher could do to better their practice.

Other types of data extracted included what gamified elements existed in the study, which language students were studying and which their native language was, and also what their level was, as this seemed as if it could be relevant too.

3.8. Synthesis Procedures & Thematic Analysis

This qualitative research chose to use thematic coding to synthesize the data that was extracted from the studies that met the inclusion criteria. Thematic coding in this context consists of extracting findings from a study, and then creating codes based on the extracted data (Braun and Clarke, 2006; Thomas and Harden, 2008). According to Thomas and Harden, by creating codes, a researcher is able to relate findings from one study to another. These first steps of thematic coding then allow the researcher to go further and make inferences based on this data, thus adding to the understanding of the chosen topic (Braun and Clarke, 2006; Thomas and Harden, 2008).

The data extraction process is followed by the coding process, so after the data was extracted, it was then searched for themes and then grouped by said themes, some inductively and others deductively. Deductive themes are those which are stated from the beginning and then searched for explicitly by the researcher, and inductive themes are those that present themselves organically during the coding process (Braun and Clarke, 2006). For a print-friendly version of this data, see the following chart. It does not contain the paragraphs used for thematic analysis, due to space constraints; however, their content is summarized in the second and third columns.

Table 2

Thematic Analysis of Studies on Anxiety

Anxiety	Decreased Anxiety	No Affect	Q	C	T	S	P	L	Gamified elements	Game
(Chen and Hsu, 2020)		✔		✔					challenge, competition	proprietary app developed by the researchers
(Cho and Castañeda, 2019)		✔		✔	✔				teams, collaboration, challenge	Conjugation Nation
(Hwang et al., 2017)		✔		✔		✔		✔	Story, questions, levels, challenge	proprietary app developed by the researchers
(Reinders and Wattana, 2014)	✔		✔	✔		✔	✔		Quests, story, points, challenge	Ragnorok Online
(Reitz, Sohny and Lochmann, 2016)	✔		✔	✔	✔	✔			Quests, story, challenge, cooperation	Haunted, a story based game
(Rueckert et al., 2020)	✔		✔	✔		✔	✔		Quests, story, points, challenge	Gamified course instruction
(Xiangming, Liu and Zhang, 2020)	✔								–	Rain Classroom
(Yang et al., 2020)		✔		✔		✔		✔	Story, questions, levels, challenge	proprietary app developed by the researchers
(Yavuz, Ozdemir and Celik, 2020)	✔						✔		rewards, points, competition, badges	Edomo
(Zhang and Chen, 2021)	✔			✔	✔	✔	✔		Narrative, Point, Badge, Random Rewards, Avatar, Teammate, and Leaderboard	Gamified course instruction

The following chart serves as a key for the shorthand used.

Table 3

Key for Table 2

Q	Quest
C	Competition, Challenge, Leaderboards
T	Teamwork, Collaboration
S	Story, Narrative
P	Points, Rewards, Badges
L	Level

In order to find themes according to both of these styles, the texts were first scanned for mentions of student affect, emotion, feeling, or other descriptions of how the gamified platform affected them. These specific sentences could then be coded accordingly. One of the deductive codes was “anxiety”, and the first step was to find all mentions of anxiety, mark them, and then place those studies in a group. This then allowed the codes to be compared with the findings of the studies they came from, in addition to comparisons of their gamified elements, among other attributes. This data could then be further coded by outcome: positive, negative, or neutral. One of the inductive codes was “proprietary game”, as this one was not obvious until after some of the deductive codes had been examined. This code was also further broken down into positive and negative outcomes, while also being compared with gamified elements.

Braun and Clarke (2006) talk about semantic and latent themes. They describe that semantic themes are those that are immediately obvious at the surface level of a phrase or sentence. Thus, latent themes are those that only present themselves after thought and interpretation (Braun and Clarke, 2006). This study only made use of semantic themes and did not attempt to interpret data. Additionally, the majority of data that was extracted in this study was second order constructs, i.e., statements and interpretations from the authors of the studies being examined (Butler, Hall and Copnell, 2016).

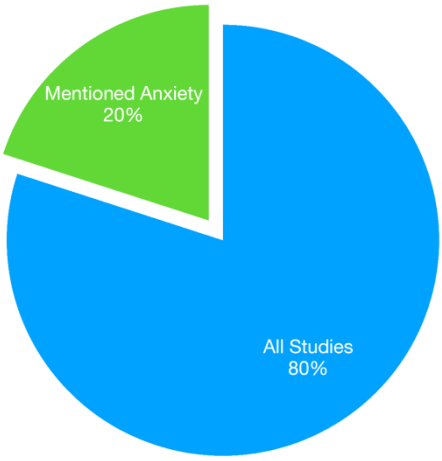
4. Results

In this study, I aimed to determine the effects that gamified elements might have on second language students. The results showed that anxiety was rarely talked about in studies on gamification, despite anxiety and motivation being related to each other and despite anxiety being a major issue for students of second languages. However, the results of the studies that did talk about it bring to light relevant data for teachers and gamified platform creators. Out of the forty studies that passed the inclusion criteria, ten talked about anxiety (Chen and Hsu, 2020; Cho and Castañeda, 2019; Hwang et al., 2017; Reinders and Wattana, 2014; Reitz, Sohny and Lochmann, 2016; Rueckert et al., 2020; Xiangming, Liu and Zhang, 2020; Yang et al., 2020; Yavuz, Ozdemir and Celik, 2020; Zhang and Chen, 2021). This left thirty studies that did not make reference to anxiety. Most studies on gamification only covered motivation and enjoyment. While these are obviously major factors in gamification’s benefit, without research detailing

all possible effects, teachers could be missing out on key information to inform their practice. With this in mind, the major themes of motivation and anxiety will be detailed further.

Figure 1

Percentage of Studies Mentioning Anxiety



4.1. Reduction in Anxiety

Of the ten that talked about anxiety, six showed a positive result, i.e., student anxiety was reduced with the addition of a gamified platform to the learning environment (Reinders and Wattana, 2014; Reitz, Sohny and Lochmann, 2016; Rueckert et al., 2020; Xiangming, Liu and Zhang, 2020; Yavuz, Ozdemir and Celik, 2020; Zhang and Chen, 2021). One theme that presented itself in regards to the studies that showed positive results was that all games involving serious games and all studies including quests or stories as a gamified element showed positive results (Reinders and Wattana, 2014; Reitz, Sohny and Lochmann, 2016; Rueckert et al., 2020). Of all the games that made use of quests as a feature, all of them showed beneficial effects on student anxiety, i.e., students had lower levels of reported anxiety (Reinders and Wattana, 2014; Reitz, Sohny and Lochmann, 2016; Rueckert et al., 2020). Three of the ten studies that looked at student anxiety made use of quests. Of these three, two of them made use of serious games (Reinders and Wattana, 2014; Reitz, Sohny and Lochmann, 2016). The other made use of gamified course instruction where the teacher incorporated gamified elements into an offline course.

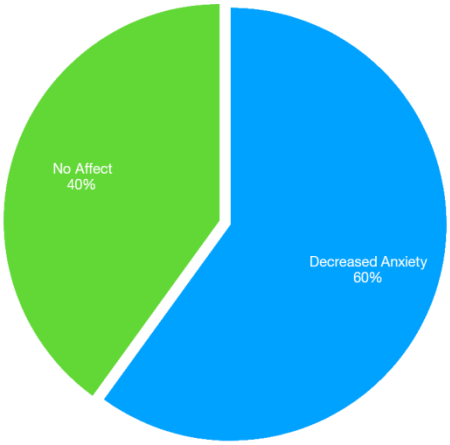
4.2. No Reduction in Anxiety

A surprising theme that was found relates to challenge- and competition-based gamified elements. Eight studies made use of these types of elements, and in fifty percent of these studies, student anxiety was not reduced (Chen and Hsu, 2020; Cho and Castañeda, 2019; Hwang et al., 2017; Reinders and Wattana, 2014; Reitz, Sohny and Lochmann, 2016; Rueckert et al., 2020; Yang et al., 2020; Zhang and Chen, 2021). Eleven studies made use of proprietary games developed by the researchers leading the studies. Three of these eleven mentioned anxiety and found positive results, but there was no reduction in anxiety (Chen and Hsu, 2020; Hwang et al., 2017; Yang et al., 2020). The positive result was that students with higher anxiety outperformed the students with lower anxiety (Hwang et al., 2017). Although the

performance of the students was higher, their anxiety was not positively affected (i.e., reduced). As a result, there seems to be an emerging trend that proprietary games developed by researchers do not have a positive effect on student anxiety. It should be noted that there were eleven total studies that used proprietary games, and outside of student anxiety, these studies did see improvements in student performance and motivation; as a result, it can be said that there were indeed benefits to motivation and performance found despite not mentioning anxiety. However, three of the forty studies concluded that gamification lowered student motivation (Chen and Hsu, 2020; Yang, Lin, and Chen, 2018; Yang et al., 2020). These studies are outliers in the literature that primarily shows benefits to motivation from gamification, but it is unclear what caused the decrease in motivation.

Figure 2

Percentage of Studies with an effect on anxiety



4.3. Anxiety Not Mentioned

Thirty of the forty studies that met the inclusion criteria did not make mention of anxiety, but these did make mention of motivation. They unanimously agreed that gamification increased student motivation, which is in line with the current understanding of gamification in the field of education (Nah et al., 2014; Dehghanzadeh et al., 2019). Six of the thirty studies used Duolingo as their gamified platform (Bustillo et al., 2017; Gafni, Achituv and Rachmani, 2017; Guaqueta and Castro-Garces, 2018; James and Mayer, 2018; Loewen et al., 2019; Ryder and Machajewski, 2017). All but one of these six studies showed positive improvements in student performance, but zero of them talked about anxiety (Loewen et al., 2019). In a way, this does make sense given that most of the studies that focused on Duolingo usage took place outside of class when the student was alone, where student anxiety is less likely to be an issue in the first place.

Nevertheless, five studies used Kahoot as the gamified platform to be studied, and Kahoot is primarily used in in-class environments, and as such, none of the five studies took place out of class; however, despite being primarily used in class, none of these researchers explored anxiety or confidence among the students. The platform did show positive effects on student motivation in all studies done using Kahoot, just as many others making use of gamification (Guaqueta and Castro-Garces, 2018; Hung, 2016; Ryder and Machajewski, 2017; Wichadee and Pattanapichet, 2018; Zarzycka-Piskorz, 2016).

Beyond anxiety, a number of studies that met the inclusion criteria mentioned that gamified platforms increased student autonomy and participation with the content in and out of class (Cruaud, 2016; Hung, 2016; Zvarych et al., 2019; Rivera-Trigueros and Sánchez-Pérez, 2020; Pham, Nguyen and Le, 2021). While learner autonomy and participation with course content fall under the umbrella of motivation, these are especially important for second language learners. Outside of these themes, however, additional themes did not present themselves, nor did other changes in student affect within this subset of studies beyond the overall positive effects on motivation and enjoyment.

5. Discussion

The results of this study indicate that discrete gamified elements each may be exerting different effects on students. Serious games, narratives, quests, cooperation, and storytelling have possible connections to reductions in anxiety for students of second languages; competition and leaderboards, on the other hand, ostensibly increase motivation, while possibly either having no effect on or having an increasing effect on anxiety. Why this may be the case will be discussed in detail.

Quest, story, and narrative elements having a positive impact on students and sense of community is not without precedent (Toyama and Yamazaki, 2021). Fernandez-Rio et al. found that narrative elements were strong motivators, and they called it "the most important element in gamification" (Fernandez-Rio et al., 2020; Manzano-León et al., 2021). Perhaps this is because storytelling is an intimate part of human culture and history, and its use dates back thousands upon thousands of years (Nash, 1990; Yılmaz, Erdem and Resuloğlu, 2018). A quest can be thought of more simply as a task to be completed, and Moran (2015) states that task-based classrooms are one way to reduce anxiety among students (Ames, 1992; Moran, 2015). Ames (1992) posits that when tasks are varied and diversified that students will be more motivated in their classrooms. Since all studies that used quests or narratives found decreases in anxiety among the students, the results are in line with studies done previously outside of the field of second language acquisition. Furthermore, Toyama and Yamazaki (2021) in their research recommend narratives as a way to reduce anxiety in the classroom (Toyama and Yamazaki, 2021). While their research did not specifically involve gamification, it no doubt gives credence to narratives as an anxiolytic device.

Challenge and competition seem to be the least likely to have positive impacts on students' anxiety, and it could even be the case that they are the elements that increase or prevent a decrease in anxiety. This means that leaderboards and competitive teams could be causing students to perform more poorly than they otherwise would if a less competitive atmosphere were implemented in the second language classroom. Dindar, Ren, and Järvenoja (2020) found that students who were in a competitive group finished their work faster, but those that were in a cooperative group felt more comfortable and connected with their classmates (Dindar, Ren and Järvenoja, 2020). This appears to be in line with the results of this study, as games that included competitive elements had a lower rate of reducing anxiety than those with story and quest elements.

Past studies outside of the field of second language acquisition have seen that competition can increase anxiety (Wilder and Shapiro, 1989; Ames, 1992; Moran, 2015; Schaefer et al., 2016; Mehrsafar et al., 2019; Palazzolo, 2019). Karl Marx is known to have critiqued it for its divisiveness and its inability to create a sense of community (Buchanan, 1982). Community is vital in Second Language Acquisition, and competition has the potential to act against the development of Communities of Practice and against

cooperation (Lave and Wenger, 1991; Ardichvili, Page and Wentling, 2003; Roberts, 2006; Moran, 2015). Owing to the fact that fear of being criticized can also lead to anxiety in the second language classroom, it follows that competition ties into this as students can see more clearly which of their classmates are performing better when they see leaderboards with their classmates being ranked (Alnuzaili and Uddin, 2020). In fact, Ames (1992) discusses how social comparison in the classroom lowers students' self-evaluations and self-worth, especially when their focus becomes winning or beating a performative goal; furthermore, it can reduce motivation and interest in the topic being studied (Ames, 1992). Thus, leaderboards act as a publicly viewable scoreboard of a student's success in the classroom, and this takes away a person's choice to share or keep private their class performance. Attempting to create an equitable classroom experience where all students feel empowered regardless of their actual performance should have superior outcomes compared to the opposite where students are competing against each other.

Five studies showed an increase in learner autonomy, and these types of results should be lauded within the education field, since cultivating a student's interest in developing their education outside of mandated classwork is a significant achievement (Cruaud, 2016; Hung, 2016; Zvarych et al., 2019; Rivera-Trigueros and Sánchez-Pérez, 2020; Pham, Nguyen and Le, 2021). Learner Autonomy is the willingness of a student to be the master of their own education, and there is research showing that the use of technology in educational environments has positive impacts on learner autonomy, as well (Lai, 2019; Tseng, Liou and Chu, 2019). The data shows that motivation and any subset of it, including learner autonomy, have been well researched and represented by the literature; gamification no doubt positively impacts students' motivation. However, it is also clear that despite anxiety being a major negative affective state experienced by students of second languages, the literature does not consider, to a sufficient extent, ways to assuage said anxiety.

6. Conclusion

The results of this study show that there are several emergent trends relating to the effects gamified elements may be exerting on students. First is that games involving quests, storytelling, or narratives may be better suited towards reducing student anxiety, and by designing lesson plans around such games, it might be possible to drive up student participation and motivation as well; additionally, serious games often contain these elements, and offer a quick way for teachers to implement them into their class. Second, the games and gamified platforms that researchers are personally designing may be different enough from gamified platforms and serious games that exist outside of academia. As a result, these studies may be missing crucial elements that prevent their results from accurately portraying the complexity of the effects gamified learning has on students. Thirdly, serious games showed a promising beneficial effect that could lead it to being an essential element to include in classrooms. Finally, challenges and competition among students showed little ability to affect anxiety positively, and teachers should consider ways to create more cooperative and supportive learning environments for their students. Leaderboards, points, and badges seem to be the three most common gamified elements found in a number of different gamified educational platforms (Toda, Valle and Isotani, 2018; Manzano-León et al., 2021). Two of the most common elements thus do not combine well with attempts to reduce second language anxiety.

In examining how gamified elements might relate to student affect and anxiety in second language learning environments, this study offers support to the idea that individual gamified elements are likely

each discretely implicated in having an effect on students, and thus this study was timely. In finding that serious games and narratives may be correlated with stronger anxiolytic effects, I believe that second language courses could make use of many different serious games, (e.g., Minecraft), and that these games could be used within in-class environments and conversational classes in order to allow students to more freely interact in their second language. In the case of Minecraft, there already exists an educational version of the game, thus easily giving teachers a way to incorporate it into their classroom without worrying about game content.

With respect to the proprietary gamified platforms that are being developed by researchers for their experiments, although it is not clear why their games and gamified platforms had little effect on student anxiety, it could be that their platforms simply did not include the right gamified elements. One such element could be quests, as all of the platforms involving quests had positive effects on student anxiety; this element could be helping students focus on having fun, rather than their test results; thus teachers could develop non-computerized lesson plans that involve quests, such as giving students objects to find around their school while operating in their second language; or they could also make use of gamified platforms or serious games that make use of this element to have this effect as well.

6.1. Implications for Teachers

The results of this study and the discussion therein should be considered by teachers as a call to further consider their student's emotions and anxiety within the classroom. Second language anxiety affects so many students, and people the world over at some point in their life study a second language. The emerging trends shown here of decreased anxiety in the presence of quest, story, or narrative style gamified elements could be implemented in classrooms in an attempt to reduce negative affective states. The well-studied benefits of gamification would similarly be present and further bolster the classroom environment. Teachers can also gamify course content without the use of technology to achieve similar results, as evidenced by two studies meeting the inclusion criteria showing a reduction in anxiety among students who took part in gamified courses that did not make use of technology (Rueckert et al., 2020; Zhang and Chen, 2021). The downside is that such courses take much more preparation from teachers in order to properly implement these elements into their classroom, thus pre-developed online gamified platforms offer the most accessible way for teachers to offer gamified instruction. Furthermore, the second emerging trend that was found relating to competition should be taken by teachers as a call to support their students by having them work in cooperative groups rather compete against each other. Indeed, as previously mentioned, psychology research on anxiety supports task-based classroom work as a way to reduce anxiety; group-based work also has support within the literature (Moran, 2015).

7. Limitations

As a result of this study excluding all grey literature, non-peer reviewed studies, theses, and dissertations, there are likely many studies not included that could be worthy of inclusion that would otherwise not have been analyzed. A criticism against grey literature is that it may lack methodological rigor, but there is some evidence that this may not be the case (Conn et al., 2003; Pappas and Williams, 2011). Outside of this type of criticism of the inclusion of grey literature and non-peer reviewed studies, research shows that published papers are significantly more likely to "report findings that are statistically significant", and as such create "a bias against the null hypothesis" (Conn et al., 2003; Pappas and Williams, 2011). Additionally, it has been shown that studies written in English are more likely to show a statistically significant result, thus expanding the set of languages included in future studies offers a defense against the aforementioned bias. If a systematic review is meant to sum up all available literature on a topic, then

researchers should attempt to include as many studies as possible to give a valid picture of the literature on a topic. Furthermore, although critical appraisal was not used for this study, if non-peer reviewed papers are included, it does make sense to include a critical appraisal step (Hanson, Ju and Tong, 2019; Patterson and Dawson, 2017). By expanding the inclusion criteria, including non-peer reviewed studies, and performing critical appraise, the studies that are included in future research could surpass the forty in this paper and thus strengthen insights and recommendations for teachers. Finally, during the process of finishing writing this thesis, I found a paper that most likely would have fit my conclusion criteria but did not appear in any of my searches (Horowitz, 2019). This indicates that the search process used by this study could be improved to further find studies relevant to the research topic.

8. Suggestions for Further Research

Based on the themes that were found, future research should attempt to experimentally examine discrete gamified elements and their link to anxiety. While research into gamification in the field of education is flourishing, the effects it has on language anxiety remain poorly studied. Such research could lead to second language classrooms where students feel more comfortable and are more likely to participate. Future research should also attempt to find out why proprietary games explicitly designed for experiments had less of an effect on anxiety. Determining this could lead to data that benefits students.

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Appendices

Appendix 1. Studies Included for Thematic Analysis

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Appendix 2. Search Terms & Databases

ERIC	SAGE	ScienceDirect	University of Sunderland
gamification AND (language OR vocabulary)	gamification AND second language AND vocabulary	gamification AND second language AND vocabulary	gamification AND second language AND vocabulary
gamification AND (language OR vocabulary) AND anxiety	gamification AND second language AND vocabulary AND anxiety	gamification AND second language AND vocabulary AND anxiety	gamification AND second language AND vocabulary AND anxiety

Appendix 3. Data Capture Form

1. What is the bibliographic information of this study?
2. What is the geographic setting of the study?
3. How many students were observed?
4. What age were the participants?
5. What level of schooling?
6. What research questions were asked?
7. What was the data?
8. How were they collected?
9. How were they analyzed?
10. Research method used?
11. What were the findings?
12. Which platform was looked at?
13. What did students study specifically (e.g. vocabulary, pronunciation, writing, etc.)?
14. What gamified elements were used by the site/platform (e.g. badges, leaderboards, points, etc.)?
15. What device was used to access the gamified platform (e.g. phone, computer, etc.)?
16. Where was the student when using the platform?
17. How much time did the student spend studying?
18. Which language were the students learning?
19. What was their native language?
20. What level was the student's L2 (e.g. CEFR A1-C2)?
21. How did the students feel about the experience?