Fostering Foreign Language Learning Through Game Design

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Abstract

This paper explores the effect of game design on foreign language acquisition through a French language game design project. The approach to language learning that this project explored touched on various L2 theories including the CLT approach, the multilingual approach, and the multiliteracies approach. The design aspect of the project served to create an interest-driven learning environment in which students could combine their academic and professional interests with language. This combination led to the development of a French language-learning game titled *Bonne Chance*, which is now a working product played by students at the University of Tennessee. The purpose of this paper is to explore how and to what extent the design team behind the production of *Bonne Chance* learned French through coding the game, creating game assets, and designing game mechanics. In addition to examining the design team's grammatical and lexical comprehension of French, this paper also analyzes the extent of cultural awareness that resulted from their participation in the project. Through a series of tests, surveys, and observations through process photos and videos, the team was evaluated on every language learning objective that this project encompassed as well as their cultural awareness. This paper analyzes each of these items in order to demonstrate the depth of this project, how the process can be optimized, and how it can offer an alternative to traditional L2 learning pedagogy.

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Chapter 1: Introduction and Review of Literature

Introduction: The Changing Tide of Foreign Language Pedagogy

Once again, a wind of educational reform is blowing on the world of education. In his book *Augmented Learning: Research and Design of Mobile Education Games,* Klopfer (2008) said "For as long as there has been formal education, there have been calls for education reform. Sometimes those calls arise from emerging pedagogies. Sometimes they emerge from fundamental social and political change. And sometimes they come out of necessity" (p. vii). The world of second and foreign language (L2) pedagogy is now faced with the task of reevaluating methods of teaching in order to adapt to the globalized world of foreign language acquisition and the ever increasing use of technology in the classroom. This reevaluation comes out of necessity as technological developments have transcended the need for traditional textbook learning, particularly in the realm of L2 acquisition. Such technologies include social media websites, e-books, internet databases, online journals and newspapers, among many other tools that can be used to enhance the L2 learning process to diminish the barrier of physical distance between countries when learning and teaching a foreign language. Among the many resources available to L2 educators a new realm of possibilities has opened up through the world of games and game-based learning. This paper will seek to explore the benefits of using games in the L2 classroom and how the use of learning games can enhance students' language development. By closely examining the process and application of *Bonne Chance,* a French language-learning game created by a group of undergraduate

and graduate students at the University of Tennessee, this paper will seek explore the interconnection between gameplay, game design, and language and culture learning. In particular, I will seek to answer questions pertaining to how students benefitted from playing the game and more closely discuss how the team of undergraduate students who designed and coded *Bonne Chance* learned elementary level French through participating in the production of the game.

The nature of games

In recent years the study of games and learning has become increasingly prominent due to a shift in pedagogical theories in various educational domains. In order to understand how games are beneficial to learning, it is important to first understand what games are. First and foremost, games are fun learning experiences. As Koster (2005) explains, "Games are puzzles to solve, just like everything else we encounter in life… they are about cognition and learning to analyze patterns" (p. 34-37). What makes games fun is the challenge of mastering them, of being able to solve the puzzle to gain some sort of reward within the game even if the reward is simply winning. The feeling of mastery we experience when we beat a game is a sensation of fun and it is through fun that we learn from games:

> "Fun is all about our brains feeling good—the release of endorphins into our system. Science has shown that the pleasurable chills that we get down the spine after exceptionally powerful music or a really great book are caused by the same sorts of chemicals we get when we have cocaine, an orgasm, or chocolate. Basically, our brains are on drugs pretty much all the time. One of the subtlest releases of chemicals is at that

> moment of triumph when we learn something or master a task. Fun from games arises out of mastery. It arises out of comprehension. It is the act of solving puzzles that makes games fun. In other words with games, learning is the drug" (Koster, 2005, p. 40).

It is the goal of educational game designers, then, to make learning not only fun but challenging enough to capture students' interests.

Following Koster's reasoning, games in general are learning experiences whether or not the intention of the game is educational. They create learning environments that are perceived as fun because they challenge the player and teach them game content sometimes unbeknownst to the player. Games and classrooms, therefore, share many educational qualities. For example, a classroom activity presented by a teacher to a student is typically a goal-oriented assignment that will involve problem-solving and critical thinking to achieve the goal of completing the assignment. The same can be said for games which, as Klopfer (2008) explains, games are "purposeful, goal-oriented, rule-based activities that the players perceive a fun" (p. 14). Considering the similarities between the goals of classroom activities and the goals of games, it is important to understand why learners are so much more willing to play a game then to take a test. One answer to this question lies in the realm of game design because games "are carefully constructed learning environments. They are deeply engaging for those who play them, and we can study games' educational design principles, such as orchestrating time, providing overlapping goals, constructing open-ended problems, and maintaining open social horizons" (Squire, 2011, p.13-15). All video games are designed to present goals to players which are achieved through a series of choices that emphasize decision making, critical thinking, and problem solving. They also offer practice of the material in the

actual game, which, if intended for educational purposes, makes for interesting and repetitive practice for players, a crucial aspect of foreign language acquisition in particular. However, if a game is too challenging or resembles a quiz or test the player will lose interest in playing. Therefore, in order to make a game interesting, or as Koster (2005) puts it, to make learning the drug within the game, the focus needs to be on creating moments of mastery. These moments become the learning byproduct of game play. The difficulty for educators in creating educational games is that those who specialize education do not always specialize in creating fun. This is not to say that educators are not in general fun people, rather, it indicates that transforming learning objectives into fun challenges within an educational game is a task that requires more than just a background in pedagogical theories. It also points out the necessity for educational game design to be interdisciplinary because just as educators do not always know how to make learning games fun, game designers do not always know how to incorporate fundamental learning objectives into a game. As Ru Shi (2015) points out, "Although abundant resources have been invested in game-based learning studies worldwide, how to design a game to promote effective learning remains unclear. Game designers are able to create interesting games but do not know how to maintain the quality of teaching materials in a game, whereas educators focus on effective educational materials but do not know how to create interesting games" (p. 1). It is important for educators and game designers to collaborate in order to develop the optimal educational and entertaining scenarios in games.

Following Ru Shi's rationale, it is through the collaboration of foreign language educators and game designers that the *Bonne Chance* project was born. It was our goal to create an interdisciplinary project that combined the specializations of graphic design students, art students, computer science students, and French teachers to create a language learning game that follows all of the principles of games and learning that have been mentioned up to this point. Although there is a growing body of research showing the benefits of game play on learning, especially foreign language learning (see for example the work of Sykes, Thorne, and Reinhardt among others), the remainder of this paper will focus on learning through (game) design. I have chosen specific theories of language pedagogy that I will apply to the process of learning language through game design and how these theories and practices can be specifically applied to the *Bonne Chance* project.

Communicative Language Teaching: benefits and limitations

Over the years there have been many approaches to language teaching and learning. Since the 1970s, "communicative language teaching (CLT) has been the pre-dominant approach to teaching FLs in the United States" (Paesani, Allen, & Dupuy, 2015 p. 4). CLT is a method of language teaching that focuses on communicative language competence, which Bachman and Palmer proposed has two main components: organizational knowledge and pragmatic knowledge. Organizational knowledge entails "abilities required to control the formal structures of units of discourse…Pragmatic knowledge entails lexical knowledge, functional knowledge, and sociolinguistic

knowledge" (Paesani et al., 2015 p. 5). The CLT method focuses on communicating appropriately with others. While grammar is emphasized as a tool for functional communication, CLT's main focus is to "use grammar and vocabulary to carry out meaningful language functions…CLT opened the door to implementing collaborative, interactive, and student-focused classroom practice activities due to a shift away from the teacher-fronted instruction" (Paesani et al., 2015 p. 7). There are many benefits to the CLT method, the most crucial one being the focus on student-driven communication. Rather than focusing on rote memorization of grammar and vocabulary, students practice meaningful conversations and activities in the classroom with the instructor present to act as a guide through these interactions. While there is much to be gained from the CLT method of instruction, it does have its setbacks. Paesani et al. (2015) describe two main limitations of CLT "One: its heavy focus on oral, functional language use; Two: its superficial treatment of cultural and textual content" (p. 8). Recently, CLT has become more of a generalized framework within which to situate language learning. It is a method that can be adapted to many different atmospheres of language learning. However, according to Paesani et al. (2015), there are many superficialities of language acquisition that result from this method:

> "A result of this practice is that language is used in generic contexts to achieve instrumental goals such as ordering food in a restaurant, asking for directions, or describing a memorable party one attended. Additionally, in CLT classrooms, students are encouraged to share their attitudes, opinions, and feelings; however, such sharing rarely expends beyond expression of individual viewpoints.

> Therefore, learners to not see language used in a range of contexts to express different cultural practices, values, and perspectives." (p. 7-8).

In other words, the learners are not guided to examine critically the relationship between language forms and the meaning they convey.

Although there are some limitations to the CLT approach, its emphasis on student-driven learning, collaborative communication, and meaningful interactions were incorporated into the language-learning environment of the *Bonne Chance* project. As CLT can be adapted to fit many classroom settings, it was my intention to use this method of teaching as a facet of a multiliteracies approach to language learning through a lens of game design. Throughout the rest of this section, I will discuss how the *Bonne Chance* project created a multilingual environment by combining different methods of language teaching in the context of game design and how each facet of these methods applied to the language learning features of the project.

Game Design and Multilingualism

One of the pedagogical theories of L2 education is that of multilingualism. The multilingual approach to language pedagogy involves incorporating aspects of various different languages into the learning process as a whole. This means that teachers and learners with different skill sets and levels of understanding can work in tandem in the process of language learning to achieve the ultimate goal of language acquisition. As Kramsch (2009) illustrates, "[i]n its attempts to elucidate how people learn and use various languages, second language acquisition research has traditionally given more attention to the process of acquisition than to the flesh-and-blood individuals who are

doing the learning. It has separated learners' minds, bodies, and social behaviors into separate domains of inquiry and studied ho language intersects with each of them" (p. 2). Instead of separating language acquisition from the learners' interests, learning through game design projects such as *Bonne Chance* provides a reciprocal learning environment in which game designers learn the target language by programming it into the game and language instructors working with a game design team can learn the language of game design. There are many aspects of multilingualism that can be applied to learning through game design, most notably those of language as symbolic form and the formation of the multilingual self-particularly the virtual self.

One of the most important parallels between game design language pedagogy is that both of these subjects rely on the power of symbolic form. Game design, for example, emphasizes transforming learning objectives into game mechanics, which are then transformed into computer code. Each of these steps requires planning and, when working with an entire team of designers from diverse academic backgrounds, the use of symbolic representations of key concepts throughout the design process is crucial to ensuring that each member of the team understands the entirety of the design process throughout the production of the game. In language acquisition, symbolic form works in a similar way. Language is a symbolic system in that:

> "It is made of linguistic signs that are related to one another in systematic and conventional ways. Even though for monolingual speakers linguistic signs have become so attached to their referents that they seem to be part of the object itself, for multilinguals or newcomers to a language, the fact that the same object is called tree in one language, *baum* or *arbre* in another, makes it evident that the

> linguistic sign as symbolic form is quite arbitrary, even though it is used in non-arbitrary ways" (Kramsch 2009, p. 6).

By the same token, game design assigns symbolic meaning to the form of the interface, which contributes to the overall design of the use experience.

Both in language and in game design symbolic form takes a lead role in ensuring the comprehension of either design forms or language forms or, in the case of *Bonne Chance*, both of these things combine. Games and game design provide spaces for learning through symbolic form and, according to Gee's thirty-six principles (as cited in Becker, 2010) situated meaning principle "(t)he meanings of signs (words, actions objects, artifacts, symbols, texts, etc. are situated in embodied experience" (p. 37). The creation of a language learning game, therefore, situates language learning objectives in the embodied experience of game design. Gee's multimodal principle (as cited in Becker, 2010) works in tandem with the idea of learning through situated meaning, and it is described as the way in which "Meaning and knowledge are built up through various modalities such as images, texts, symbols, interactions, abstract design, sound, etc. and not just words" (p. 37). Understanding language as a symbolic system is conducive to learning language through a project which promotes aesthetic learning such as game design. A language game can present vocabulary, grammar, and narrative texts through symbolic interaction within the game. The player learns through visuals, audio, and personal interaction with the game, and therefore by reaching goals and advancing to different levels they are mastering the learning objectives in the game. The same can be said for game designers. Meaning-making when learning a new language takes on many forms. As Kramsch (2015) explains "Semiotic theory suggests that the acquisition of a

new language includes a tension between conventional and non-conventional interpretations of signs. More than in their native language, language learners experience that tension as a struggle for meaning." (p. 44). By learning language through game design, which is a naturally symbolic and aesthetic study, learners are able to attack the tension between conventional and non-conventional interpretations of linguistic signs by taking a visual approach. Instead of learning through traditional methods, game designers working on a foreign language learning game are able to interpret their new language from behind the scenes. They see not only the "what" of the new language (i.e., the new grammatical structures and vocabulary), but also the "how", the structure and application of this language in context. All of this is done through symbolic representations of the language through either game design or game coding.

Finally, another aspect of multilingualism that applies to learning language through game design is that of the creation of the virtual self. First, what does it mean to have a "virtual self" and how does this idea apply to game play, game design, and language acquisition? Any transformation of the self is an adaptation of our personal identity. We transform ourselves through many different experiences over the course of our lives, but language in particular is one transformative factor that serves to open our minds to new perceptions of the world. However, since language acquisition can transform our perceptions of the world, it can also be considered incredibly subjective. As Kramsch (2015) explains, "[Unlike conventional uses of language, the subjective use of symbolic forms expresses a world of larger symbolic significance than the one we usually express in our day-to-day transactions-an exotic mysterious world of desire,

escape, empowerment, and transformation" (p. 43). The "exotic world" to which Kramsch is referring is, of course, the world of foreign language acquisition and the many possibilities learning a new language can present, none as important as the possibility of self-transformation which is the basis of the creation of the multilingual self. When combined with virtual immersion and video game design, the idea of transformation in language is even more palpable. Whereas Kramsch discusses the emotional and intellectual transformation that occurs through learning language, game design and game play offer the virtual transformation of the self into a character within a story, which is one way in which virtual culture is opening new doors of immersion to language learners. Players are able to create an identity through the characters in the game. Game designers, however, are able to actually incorporate their own perceptions of the world and of people within the game. The creation of characters within a game is the creation of a virtual culture itself. Designers are able to create identities through which they are able to project their own personality traits if they so choose. Identity in games is one of the ways in which the transformative properties of language acquisition and the creation of the virtual-self coincide, which can amount to an educational experience: "Deep learning requires an extended commitment and such a commitment is powerfully recruited when people take on a new identity they value and in which they become heavily invested. Good games offer players identities that trigger a deep investment on the part of the player" (Gee, 2005, p. 7). Although Gee refers specifically to how players invest themselves in identities in games, the creation of these identities requires an even larger investment. By investing in the design of identities within a game and combining

language acquisition as the main focus of a game, designers are able to create identities using a foreign language. They invest themselves in the identities being created and therefore not only transform themselves linguistically but also create virtual projections of themselves through language.

Game Design and multiliteracies

The multiliteracies approach to language pedagogy has garnered renewed attention in the last decade, in part owing to its focus on the "pedagogical tension between immersion and explicit models of teaching; the challenge of cultural and linguistic diversity; the newly prominent modes of technologies of communication; and changing text usage in restructured workplaces" (New London Group, 1996 p. 62). This approach to language pedagogy is useful in the study of language acquisition through game design, in particular its focus on four specific components of pedagogy-situated practice, overt instruction, critical framing, and transformed practice. In this section I will discuss these key factors of the multiliteracies approach and how they apply to the study language acquisition through game design. Although the multiliteracies approach to language pedagogy is meant to be applied to the formation of a curriculum and to lesson planning in a foreign language classroom, each of these components was incorporated throughout the process of designing *Bonne Chance.* I will explain in depth what each of these components mean and how they apply to learning language through game design by taking specific examples from the *Bonne Chance* project.

The multiliteracies approach: Situated Practice

Situated practice, also known as experiencing in the multiliteracies approach to language pedagogy is defined as "spontaneous, immersive, experiential learning that does not involve conscious reflection" and through situated practice "learners use the target language to participate in authentic activities related to texts from the beginning of language instruction" (Paesani et al., 2015, p. 37-38). In a typical language classroom, situated practice would be the moment at the beginning of class when students are presented with a text in the target language and they use the language they know in order to create an initial interpretation of the text. In other words, they interpret the text by using their available designs, which are the "linguistic, social, and cultural knowledge and experiences a learner brings to a text to create meaning" (Paesani et al., 2015, p. 28). Situated practice, therefore, promotes the use of previous knowledge to reinforce what students already know and combine their knowledge with that of other students to formulate opinions and interpretations about a text. It is constituted by "immersion in meaningful practices within a community of learners who are capable of playing multiple and different roles based on their backgrounds and experiences" (The New London Group, 1996 p. 85). The *Bonne Chance* project promotes the use of the situated practice component in a different way. Given the vast duration of the project, situated practice in the process of designing *Bonne Chance* did not occur within one session but rather over the course of the process of creating the game. Since each level of the game deals with different grammar and vocabulary challenges that increase in difficulty as the game progressed, the design team was constantly met with new linguistic challenges

throughout the production process. The material being introduced in the game was no different than the material being introduced in a traditional classroom, other than the context within which the material was presented was that of game design. When using the multiliteracies approach to language learning, it is important to always have specialists present during the situated practice aspect of the learning process. These specialists "can guide learners, serving as mentors and designers of their learning processes. This aspect of the curriculum (or project) needs to recruit learners' experiences, as well as their extra-school communities and discourses, as an integral part of the learning process" (The New London Group, 1996 p. 85). During the process of creating *Bonne Chance* there were always experts on hand both in the field of game design and in the field of French language acquisition to help students with questions from either of these fields. Since most of the students working on the game came from an academic background based in graphic design, much of their available design knowledge in the situated practice moments of learning dealt with how to transform French language lessons into game mechanics. It is through this type of collaboration between language learning and game design that students working on the *Bonne Chance* project were able to participate in authentic activities. Every time a new language form was learned it was in the context of creating a game mechanic, and so participation in the game design process lead to competence in the language forms being presented with guidance from specialists in both fields.

The multiliteracies approach: Overt Instruction

Overt instruction is the site in the multiliteracies approach for "explicit learning related to language use and conventions. Also understood as conceptualizing, overt instruction includes interventions from the instructor that focus learners on developing the knowledge needed to participate in communication activities" (Paesani et al., 2015 p. 38). During the game design process the team of undergraduates working on the production of *Bonne Chance* were confronted with many language learning challenges as a majority of them had never been introduced to French language before embarking on this project. Although designing game mechanics was a type of situated practice activity, there were many instances where vocabulary and grammar lessons were presented to the undergraduate team in order to ensure that they understood the language that they were creating game assets for. Overt instruction is meant to help learners see "what language forms and conventions are necessary to communicate in the headline genre and, furthermore, how these forms and conventions are connected into textual meaning." (Paesani et al., 2015, p. 38). The difference between the overt instruction presented during the production of *Bonne Chance* and a typical multiliteracies lesson is that the game itself was the text and therefore the students were creating a context within which to present a French text rather than being presented with one to interpret. In this way, the design team was gaining experience in the language by contextualizing an experience within the game. This method of presenting language lessons to the design team combines overt instruction with Gee's (2005) theory of co-design which states that "good learning requires that learners feel like active agents (producers) not just passive

recipients (consumers)" (p. 6). The overt instruction moments that occurred during the process of creating *Bonne Chance* gave the undergraduate students working on the project a chance to feel like learners and agents of learning. They not only experienced what it is like to be a learner of French, they were able to transform their learning experience into productive language lessons that later became functional game mechanics in *Bonne Chance.*

The multiliteracies approach: Critical Framing

The goal of Critical Framing in the multiliteracies approach to foreign language acquisition, also known as analyzing, is "to help learners frame their growing mastery in practice (from Situated Practice) and conscious control and understanding (from Overt Instruction) in relation to the historical, social, cultural, political, ideological, and value-centered relations of particular systems of knowledge and social practice" (The New London Group, 1996 p. 86). It is through Critical Framing that learners begin to think critically about the language that they are learning and analyze its use in various contexts. When applied to game design, this is the moment when students, having learned and understood the vocabulary and grammar lessons being presented in the game and transformed into game mechanics, begin to think about the application of this knowledge outside of the context of the game. They are able to constructively critique the language that they are learning and begin to think of how it can be applied to situations outside of the game or, in other words, in the real world. The Critical Framing of the multiliteracies approach was particularly crucial in the creation of *Bonne Chance* as the design team was

constantly trying to apply real-world examples of the language lessons being incorporated in the game and how to simulate a genuine example of French dialogue for the player to experience. This is where the story narrative begins to unfold as a key tool for teaching French language in context to the design team working on *Bonne Chance*. Not only were these students creating small games that present language lessons, they also created an overarching story narrative the presented dialogue in a cultural context. They were able to gain a distance from the grammar and vocabulary based lessons being mastered through designing game mechanics and focus on how to use language within a cultural dialogue which is how the Critical Framing aspect of the multiliteracies approach "helps learners constructively critique and evaluate their knowledge and account for its sociocultural significance" (Paesani et al., 2015 p. 39). For example, the story narrative of *Bonne Chance* takes place in Paris, and each member of the design team was assigned a specific location in the game to research and create a world for within the game. Although much of their research was done in English given their novice understanding of French at the time, they nonetheless learned much more about French Parisian culture than any elementary- or intermediate-level French language culture course would offer. They knew the history of these locations, the politics surrounding these locations at different historical periods, how these places looked at various historical points in time and why, and how social interactions took place during different historical periods as well as in the present day. All of this research allowed for a very detailed look at how to create a dialogue within the game with the help of the French specialists on the design team. In other words, the design team learned not only how to create a dialogue in present-day

French, but also understood different social variations of dialogue throughout French social history. This method of language and culture teaching presented through the Critical Framing aspect of the multiliteracies approach appeals to Gee's (2005) principle of Meaning as Action Image. Since "Humans do not usually think through general definitions and logical principles, they think through experiences they have had and imaginative reconstructions of experience" (p. 14). Along the same lines, the design team that created *Bonne Chance* created deep understandings of French culture and the social aspects of the French Language not by merely doing research, but by being able to directly apply their research to the game. In doing so, they created meaningful experiences by which to remember and understand the language and culture that they learned during the process game design.

The multilteracies approach: Transformed Practice

The ultimate goal of any language acquisition project is for learners to be able to transform the lessons that they have learned from activities into productive uses of language that promote meaningful interaction in the target language. This is the basis of the Transformed Practice component of the multiliteracies approach. In order to ensure that transformed practice occurs:

> "We need always to return to where we began, to Situated Practice, but now a re-practice, where theory becomes reflective practice. They (learners) should be able to demonstrate how they can design and carry out, in a reflective manner, new practices embedded in their own goals and values. Learners should be able to show that they can implement understandings acquired through Overt

> Instruction and Critical Framing in practices that help them simultaneously to apply and revise what they have learned" (The New London Group, 1996 p. 87).

There are two main ways to describe transformed practice activities. They can either take the form of applying language experiences appropriately, which involves the "application of knowledge and understandings to the complex diversity of real world situations and testing their validity" (Paesani et a., 2015 p. 39) or applying language experiences creatively, which entails "making and intervention in the world which is truly innovative and creative and which brings to bear the learner's interests, experiences and aspirations" (Paesani et al., 2015 p. 39). In regards to game design and the *Bonne Chance* project, transformed practice came in the form of applying language creatively. The students working on the project were able to experience all four components of the multiliteracies approach and apply what they learned creatively which resulted in the creation of a working product in the form of a video game. Students' prior experiences and knowledge helped guide them through the process of learning the necessary language skills that they needed in order to meet the end goal of video game development. More importantly, this project appealed to their professional and academic interests, which drove them to transform their working knowledge of language and game design into the French language video game now known as *Bonne Chance.* One of the main attractions of thinking of game design through a multiliteracies approach to language learning is that none of the four components are mutually exclusive. They also do not occur in any specific order. Each component, although important in the language learning process, occurs organically throughout the process of designing a game. This coincides with Gee's principle of learning information "just in time." As Gee (2005) explains, "Human beings

are quite poor at using verbal information when given lots of it out of context and before they can see how it applies in actual situations. They use verbal information best when it is given "just in time" (when they can put it to use) and "on demand" (when they feel they need it)" (p. 11). Throughout the development of *Bonne Chance,* the designers were given much of the information they needed-whether through situated practice, overt instruction, critical framing, or transformed practice-precisely at the time that they needed it and could directly apply it to what they were currently working on. This creates a productive mentality amongst learners who can physically see the progress that they are making in the project and why the language skills that they learned were so important to the design of the game. In other words, all of the skills that they learned through the process of creating *Bonne Chance* were directly transformed into a working product, which created motivation to learn the skills necessary to complete the production of the game.

Interest-Driven learning

As has been discussed thus far, there are many aspects of foreign language pedagogy that can directly applied to the theories and practice of learning through game design. Thus, game design offers many contexts through which to learn foreign language and that this study, although nascent in the field of second language acquisition, offers many benefits to teachers and learners. One of the main benefits, however, is that of interest-driven learning: "There is ample evidence that people do not learn anything well unless they are both motivated to learn and believe that they will be able to use and

function with what they are learning in some way that is in their interest" (The New London Group, 1996 p. 85). Since language is not and should not be isolated to a classroom, it makes sense that educators would cater language learning to students' interests rather than try to force an interest in language through traditional contexts of learning, which often results in unmotivated learners. As Sykes and Reinhardt (2013) explain:

> "It is not uncommon to hear educators, administrators, and parents lament students' lack of motivation toward studying. These complaints are sometimes accompanied by a comment or to about the hours students "waste" playing digital games or using popular media such as social networking sites and mobile applications…As an alternative to considering all uses (of the aforementioned technologies) wasteful, we propose that a more thorough understanding of motivation in L2TL and digital games will lead to informed decisions about their use and, as a result, allow educators to tap into their motivational power" (p. 91).

While it is clear that these authors are speaking more directly about students of a younger age than the undergraduate students that worked on the *Bonne Chance* project, the underlying notion, here, is the motivational power of technologies such as video games and digital media. Education is starting to take a dramatic shift in the direction of technological advancements in the classroom, which will call for a reevaluation of how students learn. It is imperative that educators begin to take into account how students are interested in learning instead of trying to get students to bend to the will of how an educator is interested in teaching. A project such as *Bonne Chance* offers students the opportunity to learn language in an interdisciplinary collaborative atmosphere that

models the types of projects that game designers and computer coders would encounter in the professional world. They are able to produce a working product that appeals to their areas of interests both academically and professionally. By catering to the students' interests and motivating them with the prospect of creating a viable product, the *Bonne Chance* project presented language learning in a way that promoted a multilingual environment. By modeling language learning moments throughout the design process after the multiliteracies approach and incorporating the collaborative student-driven learning components emphasized by the CLT method of language teaching, the *Bonne Chance* project created a new and innovative approach to language learning by combining these two methods of language teaching in order to promote an interest-driven project set in a multilingual environment.

Chapter 2: Methods

Introduction to Methods

In this portion of the thesis I will discuss the methodology behind the *Bonne Chance* project including Research Questions to be answered, information regarding participants, details of the design process, and the data-collection process.

Research Questions

The purpose of the study is to investigate game design as a way to teach French language and culture. More specifically, this study is guided by three overarching research questions:

1) How can language pedagogy be informed by game design?
2) How is French culture and history learned through the game design process and how does a project such as *Bonne Chance* influence language learning?
3) To what extent are gains in language and culture learning influenced by the role students play on the design team (and consequently how might the language instruction throughout the process of game design be reimagined to cater to all aspects of the design process to produce better results)?

In order to answer these questions, I, along with a fellow graduate student in the French department Rachel Floyd, and two professors at the University of Tennessee, assembled a group of undergraduate students whose major areas of study varied from graphic design, 4D studio art, and computer science to work on the production of a French language learning game that would be used as a curricular ancillary in introductory language classes. These students were each assigned different roles within the framework of

designing the game. The roles were divided amongst a team of nine students, who were then split into two groups: the asset team and the game coders. The asset team was in charge of creating all visual game mechanics and all aesthetic visuals for the game while the game coders were in charge of creating and writing the computer code that would make the game function. Through this collaborative environment the design team was taught an introductory level French language curriculum outside of a traditional classroom environment.

This project covered two introductory level curriculums over the course of one year during which two iterations of the game were developed. The bulk of the man hours that were devoted to the initial development of the game occurred during the summer of 2015, when the design team dedicated five days a week to asset development and game coding. Initially, the students were encouraged to create a minimum viable product (MVP) of the game in order to produce a workable product that could be implemented into the French 111 courses in the upcoming fall semester. The objective behind the creation of an MVP is to arrive rather rapidly at a proof of concept so as to be able to allow play testing and support the iterative development process. The MVP consisted of six mini games that targeted on specific language forms that were part of the learning objectives presented in the French 111 curriculum. By the end of the summer the design team had successfully developed a working series of mini games that targeted specific vocabulary and grammar concepts. Each level of this series of mini games increased in difficulty modeling the increasing difficulty in language concepts learned throughout a semester of introductory French. Once the fall semester began, the design team was

tasked with taking what they had already created and building upon it to make a more complex game that could be used in two consecutive introductory French language courses. This meant using what they had already learned in terms of French language, game coding, and asset design, and creating a new iteration of *Bonne Chance.* This new iteration would include another set of six mini games that followed the French 112 curriculum as well as a completely new feature of the game in the form of an interactive narrative storyline. The second iteration of the game, which is currently still in production, involves time traveling throughout various locations in Paris, and so creating a narrative involves detailed research on the part of the design team in order to create environments in the game that reflected the cultural history of France throughout different historical periods. In doing so, they not only built upon their language skills through designing *Bonne Chance*, but also their cultural awareness.

Throughout the process of creating *Bonne Chance* my role as a member of the design team was to act as a language guide for the undergraduate students working on asset development and game coding. Along with a fellow graduate student working on the project, I acted as one of the primary content author, helped to create game mechanics, and designed the implementation of the foreign language aspect of the game. Since we started with the French 111 curriculum, I was able to teach the game designers basic French language skills and scaffold the learning experience by having the team incorporate the language that they learned into the game. In other words, the team applied what they were learning into the game as they were learning it. So, much of the language instruction that occurred during the production of *Bonne Chance* was given “just in time”

or “on demand” (Gee, 2005 p. 11). There were also overt instruction moments during the design process that helped the undergraduate students grasp grammar concepts such as sentence structure and adjective agreement and placement. This allowed students to understand facets of French language by contextualizing them through game design. It also helped that during the summer, the team met four to five days a week for several hours, giving them multiple opportunities to familiarize themselves with the language learning objectives that they were designing and coding and also to ask questions as often as possible.

Participants

Seven student participants collaborated to create *Bonne Chance*. I will present their academic backgrounds and their involvement in the project to explain how these factors were instrumental in creating an interdisciplinary environment that helped to promote language learning through the context of game design. First, I will address the group of students who worked together to create visual assets for the game. Sophie and Amanda are both seniors who major in graphic design. Kevin is a junior who also majors in graphic design. Aaron, a senior, majors in 4D studio art. Each of these students participated in the creation of visual assets, story narratives, and character designs. They were each assigned levels of the game and were responsible for creating culturally accurate backgrounds and, in some cases, characters, for their respective levels in *Bonne Chance*. The two students who worked on coding the game, Tim and Blake, are both seniors majoring in graphic design but decided to work on the *Bonne Chance* project as a

way to explore their interests in computer coding. Tim and Blake also helped to create visual assets at some points during the production process of the game. Indeed, this diversity of academic backgrounds created a professional atmosphere that modeled a real-world example of what game development looks like. Given the iterative nature of this project and its continual development spanning over a year of work, there have been some members of the design team who are no longer working on the project. For this reason, I will focus on these six students who began working on *Bonne Chance* in the spring semester of 2015 and are still currently actively developing the game. I will separate the design team into two groups: (1) the asset developers, who make up a majority of the design team; (2) the game coders, which consists of two main members. Both of these groups were invaluable in the production process of *Bonne Chance*, and the willingness of the team to work collaboratively and combine resources and ideas made the game a unique language and culture learning tool.

Design

The game is divided into 12 levels, the first six levels of which are intended for a French 111 class (first-semester French course) and the second six designated for a French 112 class (second-semester French course). Each of these levels presents a new grammar and/or vocabulary exercise through a mini game. The mini games must be beaten before the player can move on to the next level of the game. The levels take place in various locations around Paris, so, each member of the design team had to not only understand the language concepts being designed as game mechanics in the mini games,

but also what the backgrounds of these locations would look like. The combination of these design aspects gave the team not only a linguistic understanding of the material being presented in their level but also a cultural context within which to implement them.

Step 1: Understanding the learning objective

Every level of *Bonne Chance* began with a learning objective mapped out by myself and the other collaborating graduate student working on the game. Together, we would go through the course curricula for both the French 111 and 112 courses and plan out what specific language functions each level would present. Considering that we only had five levels per curricula in which to incorporate key language learning objectives, we chose to incorporate the language features that we saw as key tools to building an understanding of French language. Those key features were: identifying masculine and feminine nouns, understanding sentence structure, conjugating regular and irregular verbs, being able to tell time, phrase structure with regular and irregular adjectives, understanding numbers above one hundred, understanding past tense with the verb "avoir", identifying food vocabulary, understanding past tense with "être", and creating dialogues with direct object pronouns. Overall there are ten major language learning objectives that were incorporated into the game. In order to scaffold the learning experience within the game, some of these objectives were incorporated into more than one of the mini games so as to reinforce the iterative nature of L2 development. There are twelve mini games total within *Bonne Chance* that present the ten overarching language learning objectives, and each level is associated with a location in Paris, and so each

student working on the production of the game was assigned a location. Through that location, they were required to create a game environment and help design game mechanics that would become the mini game for that location. In order for the design team to be able to create game assets and code these language-learning objectives into the game, they had to first be taught the language features being incorporated into their level. This meant that Rachel and I had to overtly instruct each member of the team in the language objective being incorporated into their respective levels. These overt instruction learning moments were documented through photographs and videos of the design team being taught by either myself or Rachel (see appendix A). The overt instruction for the first levels of the game occurred for the most part over the summer, while the fall semester was reserved for learning the language objectives for the second half of the game. Considering the cumulative nature of language learning, it was important for those students working on later levels of the game to understand the earlier language functions being incorporated into the game. For example, the student who was in charge of creating level ten of the game would not be able to understand the learning objective of said game-phrase structure-without understanding French nouns, adjectives, sentence structure, and verb conjugation. For this reason, it was important for every member of the team to participate in the overt instruction moments for every level of the game as they occurred in order to be able to scaffold their experience and build upon the language skills being incorporated into each level.

Step Two: Creating game mechanics

Once the design students began to grasp the language learning objectives that were being incorporated into their respective levels of the game, they worked with Rachel and I to create game mechanics that were challenging enough to keep a player's interest but not so challenging that the player would give up before finishing the level. Considering that the language learning aspect of the games would be challenging for any French language learner playing the game, it was important to make the game mechanics fun so as to avoid the feeling of taking a quiz while playing. This resulted in an initial focus on creating a minimum viable product, which is a design term that indicates a proof of concept. Creating a minimum viable product meant setting a basic foundational goal for the first iteration of *Bonne Chance* which resulted in initial ten "mini games" that are now working products being used by French 111 and French 112 students. These first mini games focused heavily on the language learning aspect of the game rather than the aesthetic features or "fun factors" of the game. There were many factors that contributed to creating the ideal game mechanics for the language learning objectives being introduced in the game. For example, in the first level of the game, which focuses on identifying masculine and feminine nouns, the team decided that a clickable multiple choice-style response system would work better than a fill in the blank-style response system since the choice of noun gender is a fifty/fifty chance. In contrast, for the verb conjugation game, which comes two levels later and involves conjugated verbs sliding across the screen to reach the correct subject, the team thought a bigger challenge to the player would be more rewarding and so instead of creating a response system that

identifies the correct subject/verb conjugation the player must choose all of the wrong verbs to clear the way for the right verb to reach the subject. These decisions in the process of designing game mechanics reflected how the design team was able to identify not only how to best present the grammar and vocabulary lessons of their levels through game mechanics but also how to make the game levels increasingly challenging to reflect the cumulative nature of language learning. After these ten "mini games" were created, the team had a product by which to begin thinking of how to expand on the story narrative. The first ten games, therefore, acted as a framework on which to base the second iteration of the game. Since the game mechanics of the mini-games are simpler than those of the narrative part of the game, building these mini-games also allowed the coding team to become more proficient in the software and, thus, scaffolded the code-learning process.

Step 3: Coding the game mechanics

This step specifically involves Tim and Blake, the two primary game coders of *Bonne Chance.* The salient aspect of this process of this aspect of the game development is that neither of these two coders had an abundant knowledge of game coding when they first became involved in the *Bonne Chance* project. Much of their summer work, therefore, was spent learning the language of computer coding, which ended up in many small trial and error games. The first game that they learned to code was *Pong,* which involves simple game mechanics but set a good example for a trial and error coding project because in-game behavior is highly predictive and the outcome is known.

Consequently, they were able to quickly refine the code to make the game behave as it should. While the rest of the design team worked on creating the language objectives and mechanics of *Bonne Chance*, Tim and Blake worked on learning C++, the low level language code of computer programming (Gunther, 2011). C++ can be considered itself a second language, and what is remarkable about the computer coders working on *Bonne Chance* is that they began to learn French not only through helping with asset design, which was necessary due to the limited number of people on the project, but also through the language of code. After they had learned to code Pong and developed a tutorial to allow other team members to learn the code, Tim and Blake not only prepared themselves for the task of coding the game mechanics of *Bonne Chance* but also acquainted themselves with the practice of second language acquisition. The development then proceeded as a dialogical process between the two teams because we had to reconcile game mechanics and language mechanics with what we could reasonably expect to be able to code. Once the game mechanics were designed by the asset team, Tim and Blake took on the task of digitally coding these mechanics into the *Unreal Engine* using C++. Each question, response, correct answer, wrong answer, instruction, menu, etc. This meant that the coders, who were also involved in the overt instruction aspects of the project, also received detailed knowledge of the French language learning objectives in the game having created computer code for each level of the game.

Step 4: Creating a story narrative

Once the initial ten levels of *Bonne Chance* were created and coded as mini games, the next goal was to create an interesting story narrative that would attract the players' attention and give the game a context within which the mini games would serve not as the focal point of the game, but as a means to get to the next level of the game. A story narrative had already been discussed during the summer, and the main theme of the game that was decided upon was that of some sort of mission. This would allow the mini games to serve as portals to the next levels of the game once the mission for the previous level had been completed. In other words, the mini games were a means by which to complete a level's task and proceed to the next level in order to accomplish the overarching mission of the game. The design team decided that the player would act as an exchange student in the game who was recruited by the French government to follow a thief throughout Paris who is stealing historical artifacts. This later evolved into a time travel game, meaning that the player actually travels throughout different time periods and locations throughout Paris in order to catch the artifact thief. By incorporating the idea of time travel the design team was required to do extensive research on their assigned locations – and associate time period – in the game. Appendix B shows the outline of the game by locations, levels, artifacts, and the students responsible for designing each level. Rachel and I chose the artifacts that would be stolen and misplaced in the game. We decided that these artifacts would be literary texts with the exception of the *Appel du 18 juin* which is incorporated at the very end of the game as a radio/listening exercise. These artifacts serve to challenge the players' ability to read French texts and

each text presents challenges appropriate for the level in which they are incorporated. As for the design team, it was up to them to understand why these artifacts are important to the game and time period and how they contribute to French culture and history. The types of research conducted by each member of the design team varied based on their individual approaches to learning about how to create their levels stylistically while staying true to the culture and history of their time period.

Overall, creating a story narrative gave each member of the design team an extensive knowledge of French culture and history by focusing the group's research on specific locations and time periods within Paris. The environments that were created by each of these students reflected the important visual aspects of their locations as well as socio-cultural interactions that were appropriate for the time periods within which they were creating their game levels. Engaging in detailed research in order to create the optimal player experience in the game encouraged the team to explore aspects of French culture and history that they may not have had to chance to explore in the context of a traditional classroom. Moreover, each student was able to contribute their own stylistic approach to these environments, thereby forming a personal connection with the French culture and history of the game world they designed.

Data Sources

I collected three sets of data pertaining respectively to the design process and language learning. The latter consisted of a repeated measure assessment in the form of a language test targeting the language structures present in the game. This started with a

pre-test to measure participants' knowledge of French going into the project and their knowledge of French after spending a summer and a semester creating the game. Later in the project the students took a post-test that covered all of the learning objectives within the game including the materials from the pre-test. The pre-test covered basic foundations of French language such as noun gender agreement, sentence structure, numbers and time-telling, subject/verb agreement, and adjective placement and agreement in phrases. Since the design team had little to no L2 experience in French, I only measured these basic foundational building blocks of French and did not initially include past tense or heavy vocabulary identifications. During the spring semester of 2016, I distributed a post test that included the same materials as the pre-test as well as past tense with both auxiliary verbs and, more difficult number identifications, food vocabulary, and direct object pronouns. In designing the post test, I used materials directly from the game so that the test would model in exact order the design of the game and the learning objectives presented in each level of the game. I also color coded the test, so that each section of the test was associated with the color designated for the level that the materials were taken from. The design of the test, then, not only gave them a chronological memory of the order of the materials being presented but a visual representation to aid test taking. Both of these tests offered quantifiable data to measure the team's grammatical and lexical knowledge of French from the beginning of the project through the second iteration of the game. It is also important to note that some of the team's language acquisition was observed and captured during the actual production of the

game. Through these tests I measured how well the students did on a writing exam compared to how well they do playing the game which both test the same materials.

Along with these tests I also distributed a survey to each member of the design team in order to measure what types of research they did in order to familiarize themselves with French culture and history while they were designing their individual levels of the game. The survey also functioned as a medium by which to measure which aspects of the design process-coding and asset development-best supported language learning and culture learning. I have also collected a series of photos and videos to document the design process which capture the learning moments that occurred during the design process.

The first set of data that I collected during the summer session of the *Bonne Chance* was through the scores of the pre-test that measured the design team's initial knowledge of the French language concepts that are covered in the game. The second set of data that I collected was through the post-test which measured the team's knowledge of all of the language concepts that they were initially tested on as well as the new concepts that were introduced in the second iteration of the game. Through photographs and videos I was able to document the team's participation and language practice throughout the design process of *Bonne Chance.* The team demonstrated proficiency in French when practicing the mini games during the production process of the game. In order to test for glitches in the mini games the team had to play through them and get answers both right and wrong to test the game's responses. So, when practicing the game, they had to know the correct and incorrect answers to the materials presented in the

game. In this way, their language learning was reinforced with meaningful practice of the mini games.

Although the pre and post-tests offered measurable data, gauging the team's cultural knowledge proved to be more subjective to the individual member's experiences. In order to measure the team's cultural knowledge, I recorded observations of the team's discussions during the summer session of *Bonne Chance* and then in the Spring semester of 2016 I sent out a survey to the team that required them to describe what type of research they did to learn about French culture in order to incorporate it into the game. Surveying the students on the research that they conducted while participating in the *Bonne Chance* project produced subjective results. Overall, the combination of the pre and post-test scores with the survey, the process photos, and the process videos provided a foundation for measuring the students' success in learning language and culture through game design and helped to lay the groundwork for the next chapter of the *Bonne Chance* project.

Data Analysis

In order to analyze the data that I collected throughout the production process of the first two iterations of the *Bonne Chance* project, I first looked at the quantifiable data that the pre and post-tests provided as a way to measure the design team's language acquisition throughout the design process. I did this by averaging the team's scores on the pre and post-tests by test section. Since the first five sections of the post-test measured the same material as the entire pre-test, I juxtaposed the averages on these sections of the tests in a bar graph to show the team's improvement or decline of language skills

throughout the production process (see figure 1). I also created a table to compare the averages of these sections which shows the percent change of average test scores for these two tests (see table 1). For the remaining sections of the post test, I created a separate bar graph to show the team's average scores (see figure 2). Both of these graphs show the average scores by percentage on all ten sections of the pre and post-tests. By averaging the test scores by section I was able to gather quantifiable data which helped to determine areas in which the team was stronger or weaker in language skills by the spring semester of 2016. After analyzing these results, it was clear which areas of the project were favorable to language learning and which areas of the project could be more developed.

The second set of data that I collected during the *Bonne Chance* project was a survey that was taken by the design team in order to measure their cultural knowledge after having worked on the project. In this survey I asked the students to describe what types of research they did in order to create their individual levels. I also asked what each member's university standing was and what their major was, which helped to determine if any of these factors played a role in the detail of their research. The survey produced mixed results and was not as easy to analyze as the pre and post-tests, but it would seem that each member of the team did in fact participate in cultural research which is evidenced through both their creation of game assets for *Bonne Chance* and their participation in weekly team meetings during which we discussed their progress and their goals for the coming week, which brings me to the final set of data I collected which is a series of process photos and videos that document the team's progress throughout the

summer and fall semesters of 2015, and the beginning of the spring semester of 2016. I transcribed two videos that document the game coders playing through the tenth mini game of *Bonne Chance* in which they are translating the text in the game from French to English in order to play through the game to test for correct responses (See appendix F). The photos show the learning processes that took place throughout the project such as overt instruction moments and the group's development of story narratives and characters for the game. These visuals provide data that show both the design team's cultural and linguistic knowledge throughout the production process and serve to demonstrate the evolution of the project and of the team.

Chapter 3: Results and Discussion

Results

To answer the research questions that I posed at the beginning of this project, I analyzed the three sets of data that were collected throughout the production process of *Bonne Chance.* The pre and post-tests provided quantifiable data to show how language pedagogy can be informed by game design, the survey and process photos provided qualitative data to show the influence of game design on both culture and language learning. The first two questions, which address how language pedagogy can be informed by game design and how French culture and history are learned through game design can be addressed by looking at the pre and post-tests, the survey, and reflecting on my own observations as a participant in the project. The responses to the research questions posed in this project will be further explained according to the data sets that support them.

Pre and post-tests

Through the pre-test and post-test that covered the language learning objectives that were incorporated into the game, I was able to measure the design team's grammatical and lexical understanding of French throughout the process of game production and these results responded to my first research question of how language pedagogy can be informed by game design. These tests also responded to my third research question of if any group of students within the design team learned language or culture at a higher rate than others. The pre-test was split into five sections and measured the team's knowledge of the learning objectives in the first half of the game whereas the

post test was split into ten sections in order to measure their knowledge of all of the learning objectives within the game.

Figure 1 shows the averages from each of the sections in both the pre and post-tests. Series one indicates the average scores of the pre-test that was distributed over the summer at the beginning of the game production process.

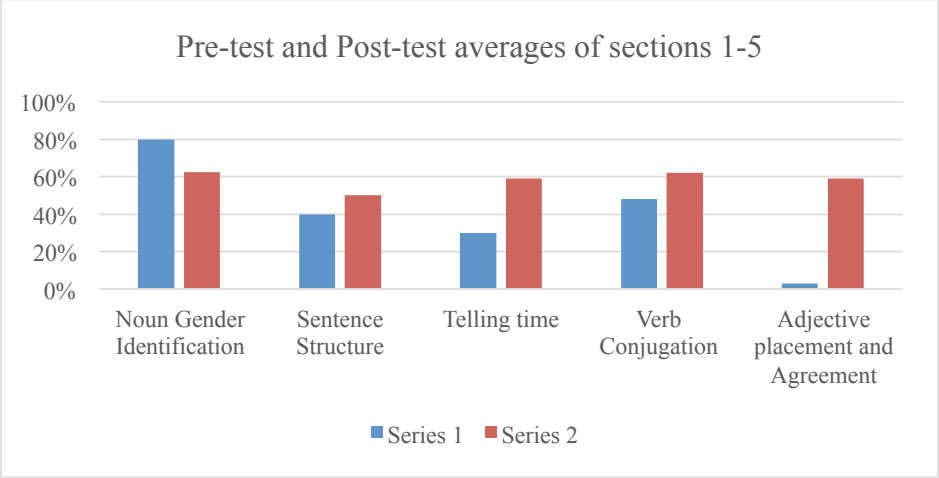


Figure 1: Pre-test and Post-test averages of sections 1-5.

This graph shows the test averages for the materials included in both the pre and post-tests. Series one indicates the averages for the pre-test and series two indicates the averages for the post-test. Here you can see improvements in the average scores from the pre-test and the post-test in every test area except for noun gender identification. Table one shows these average scores numerically.

Subject	Pre-test average	Post-test Average	Point increase or decrease	Average Δ
Noun Gender Identification	80%	62%	18 point decrease	-22.5%
Sentence Structure	40%	50%	10 point increase	25%
Telling Time	30%	59%	29 point increase	96.7%
Verb Conjugation	48%	62%	14 point increase	29.2%
Phrase structure/adjective placement	3%	59%	56 point increase	1,866%

Figure 2: Test averages and percent change.

This table shows the averages for each section of the pre-test and for the first five sections of the post-test and the average change between the two tests in both point increase and average delta. In addition to calculating the percent change from the pre-test to the post-test I also conducted a paired sample t-test and determined that the change is statistically significant ($p = .018$), which means that overall, the students scored significantly higher on the post-test than they did on the pre-test. The remaining results of the post-test encompass the students' average scores on sections that were not included in the pre-test. These subjects include numbers above one hundred, past tense with "avoir," food vocabulary, past tense with être, and phrase structure using direct object pronouns. Figure 3 shows the average scores of these subjects on the post test.

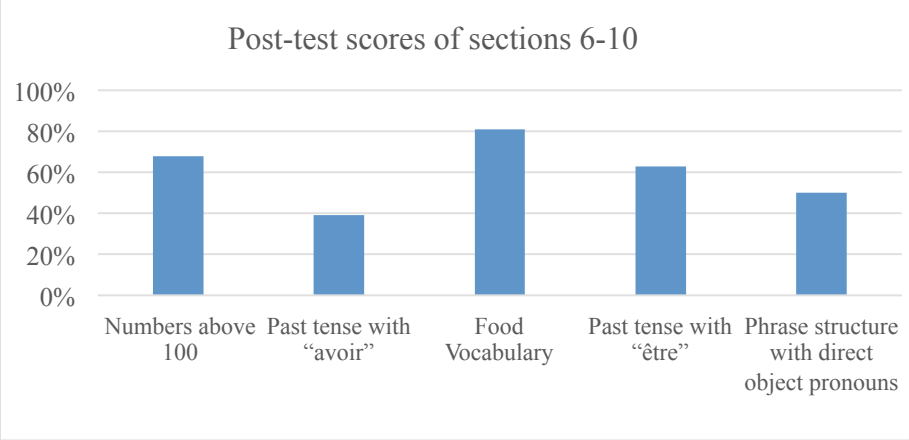


Figure 3: Post-test scores of sections 6-10.

Here you can see that sections six through ten of the post-test yielded average scores ranging from 60-80% accuracy in most test areas. The learning objectives in sections six through ten of the post-test were not included on the pre-test and thus cannot be juxtaposed with any previous scores. The post-test scores varied amongst the members of the design team, although it seems as if the past tense sections and the phrase structure section were the most difficult. The past tense with "avoir" section yielded a 39% average, the past tense with "être" section a 63% average, and the phrase structure section a 50% average. The pre and post-test scores showed an average increase in comprehension of lexical and grammatical concepts that were designed and coded into the *Bonne Chance* game.

Survey and Student Research

As has been previously mentioned, the members of the design team engaged in various forms of research in order to gain a better understanding of French culture and

history and also to ensure the authenticity of user experience while playing *Bonne Chance.* Given the nature of the game as a time traveling experience throughout history in Paris, it was important for the team to understand the relevance of the historical events being incorporated into various locations and time periods throughout the story narrative. In order to measure the amount and types of research that the design team conducted, I distributed a survey and also recorded personal observations from discussions with the team. These two sets of data responded to my second research question of how French culture and history is learned through the game design process and also to my third research question of if any students learned French language or culture at a higher rate than others. Since each member was assigned a level to design (some of them were assigned two levels), it was up to them to create an environment within the game that culturally and historically represented their time period and location. Most of the research that they conducted was done online and each week during our team meetings the team would discuss their ideas about how certain cultural and historical aspects from their time periods should be incorporated into their levels. For the most part the entire team contributed to the cultural and historical settings within the game, however, some members did much more detailed research than others. For example, Aaron, who was responsible for the design of the Gardens of Luxembourg in the game, described his research experience as mainly focused on the aesthetic properties of the park throughout various time periods. He described that the two most important aspects of creating his level of the game were 1) Having the optimal vantage point to immerse the player in the game and 2) making the gardens historically accurate by developing the level as it would

look in the 1620s and not how it looks today. Aaron explained that in order to ensure that these two factors were achieved, he first developed a mental image of the gardens via virtual tours in order to get 360 degree images so as to be able to decide what the best visual angles of the park were. Then, he researched documents, photos, and paintings of the gardens from the Renaissance era and made sure to incorporate into his images only what was in the gardens at that time. Visuals appeared to be one of the guiding factors of Aaron's research throughout his participation in the project. For example, the first level that Aaron was assigned was at Notre Dame Cathedral, for which he discussed the possibility of the mechanics for this level's mini game mimicking either the verticality of the cathedral itself or the complexity of the bell tower's carpentry work. Although this level was later assigned to another student, Aaron's detailed research directly impacted the direction of game development since it served as a basis for creating game mechanics and his later work laid the foundation for including the Treaty of Versailles as a cultural artifact for the story narrative in the second iteration of the game.

Aaron was not the only student who conducted intensive research that guided game development and cultivated an understanding of French culture and history. Another notable student is Sophie, whose main focus in this project was on user experience within the game. Her main goal was to ensure optimal user experience within the game by informing the team about different ways of interacting with environments within games. By bringing this knowledge to the table, Sophie was able to conduct research on her level of the game, Père Lachaise cemetery, through a lens of game style and usability. She researched the history and culture of Père Lachaise in order to gain a

working knowledge of how to create the game level to reflect the time period in which her level takes place all while making sure that interactions within the game would match the devices on which the game was being played and that the player would be aesthetically attracted to the environment of the game.

Personal observations, process photos, and process videos

The remainder of the data that was collected throughout the production process of *Bonne Chance* is a series of process photos and videos that document the creation of game mechanics, overt instruction moments, and tests of game play (See appendices B-E). The photos, videos, and personal observations that were collected in this data set respond to all three of my research questions as they show the evolution of the entire project and the impact of the project on the language and culture acquisition that occurred as a product of the design team's participation in *Bonne Chance* and also how some of the team learned at different rates than others. These photos show the process of designing *Bonne Chance* and the many factors that influenced how the team learned language and culture throughout the production of the game. Appendix B shows overt instruction moments that were captured during the design process. In these photos either Rachel or I are teaching French grammar lessons to members of the design team so that they were able to understand the learning objectives that they were designing and coding into the game. The photos in appendix C show examples of the game coders playing the game in order to check the computer's response to both correct (win sates) and incorrect (failure states) answers within the game. Appendix C also shows an example of how

game mechanics were built. The third photo in this appendix shows a paper version of the battleship game, which appears in levels seven and nine. This paper model was created by the game coders as a visual representation of the language learning objectives that needed to be coded digitally into the game. Appendix D shows a few images captured of team meetings and the creation of the storyboard as well as a white board with language lessons on it. It was in these meetings that the design team gathered to discuss their research and progress during the production of *Bonne Chance* and were much of the culture learning aspects of the project occurred. Finally, appendix E shows the complete storyboard for levels one through ten of *Bonne Chance.* These photos capture the beginning of character development and how the design team created a visual representation of each level demonstrating each level's location, time period, artifact, and learning objective. Each photo series presents a different level of the dynamic and multi-faceted environment that is the *Bonne Chance* project. The survey and the process photos served to answer my second research question of How French culture and history is learned through the game design process and how a project such as *Bonne Chance* can influence language and culture learning. Whereas the pre and post-tests provided quantifiable data to show how language pedagogy can be informed by game design, the survey and process photos provided qualitative data to show the influence of game design on both culture and language learning.

Along with the process photos there were also a series of process videos taken throughout the production of the game. I have included a transcription of two videos which can be found in appendix F. In the first video Blake and Tim were building the

game and as they were getting prompts from the AI (the game), they were building the sentences that would be grammatically accurate and semantically correct sentences in response to these prompts. Tim obviously knew the answer as he was translating simultaneously into English, thereby demonstrating his understanding of the language presented in this mini-game. In the second video, Blake is describing what is going on in the same game and says the French response that was coded into the game out loud in an effort to describe the conversational nature of that particular game. In this instance, it is clear that Blake knew how to respond to the game in French demonstrating his understanding of the language presented in this game. All of the process photos and videos help to create a visual representation of the process of creating the first two iterations of *Bonne Chance,* the evolution of the language and design aspects of creating the game, and how learning moments occurred throughout the design process.

Discussion

The results of the pre and post-tests, the survey, and the personal observations as presented through photos and videos collected throughout the production process of *Bonne chance* indicate that the students learned some French language by participating in the project, which is evidenced through the results of the pre and post-tests, and a great deal of French culture which is evidenced through their responses to the survey and through the process photos and videos. The greatest testament to the students' language and culture development, however, is the working product which is now the *Bonne Chance* game. The team's motivation to create a viable working product led to their

knowledge of aspects of French language and their understanding and appreciation of French culture. Their time and commitment to the project was a large indicator of their ability to learn the language and culture necessary to design the game, which has now been tested by both the team and by French 111 and 112 students. All of the results of the data that were collected from this project show that the interdisciplinary setting of a project such as *Bonne Chance* is conducive to a language learning atmosphere. One of the main contributing factors to *Bonne Chance's* success is the goal oriented and interest-driven environment that the project created. By catering language learning to the students' interests, this game design project resulted in the design team learning language and culture as a byproduct of their participation in a program that promoted their academic and professional interests rather than trying to spark students' interests through overt language instruction. The design team's time commitment to the project speaks volumes to their motivation to learn and design the game. Having worked through the summer, the fall semester, and much of the spring semester, the design team dedicated a tremendous amount of time to *Bonne Chance* which is indicative of the power of interest-driven learning.

Research Question 1: How can language pedagogy be informed by game design?

The results of the pre and post-tests that were distributed to the design team responded to my first research question of how language pedagogy can be informed by game design. These tests specifically offered quantifiable data in regards to the design team's grammatical and lexical understanding of French throughout the process of

creating *Bonne Chance.* In regards to the pre-test and the juxtaposition of its average scores with the first five sections of the post-test, the team's scores on average increased after having been exposed to the learning materials from these sections through the creation of the second iteration of the game. The pre-test yielded low results as the team members had little to no experience with French language before their participation in the *Bonne Chance* project. The team showed improvement in all test areas that were covered on both tests except for noun gender identification. In this area, their scores declined. This can be attributed to the fact that I distributed the pre-test during the time that the team was beginning to design game mechanics for the noun gender identification mini game when the material was very fresh on their mind. Of all the game assets, the team spent the most time creating the first mini game since they were just beginning to learn both French and game design. The heavy emphasis on the material of this game combined with the time the team spent creating this game resulted in a high average on the pre-test for this section. When the team took the post-test, then, the material was not as fresh and had not been reinforced throughout the production process and, as a result, the scores declined. The results from the gender identification section of these tests are indicative of the importance of scaffolding the learning process in such a way that grammatical and lexical concepts are reinforced throughout the design process. Considering all of this, it would seem that even without much emphasis on the overt teaching of the materials being developed and coded into the game, the team was able to learn some French language.

Aside from the results of the noun gender identification sections of the pre and post-tests, the rest of the team's average scores showed an overall improvement in comprehension of French language learning objectives, most notably the subject of sentence structure with adjectives which registered the largest increase over the course of the production of *Bonne Chance.* At the beginning of the design process, the team was hardly able to produce correct sentences using adjectives and by the time they took the post-test the average score for this section of the test increased from three percent to fifty-nine percent, a difference of fifty-six points. On the sentence structure section of the post-test that modeled the materials in mini game ten of *Bonne Chance,* the average score was a fifty percent, only ten points lower than the average score of the sentence structure section of the pre-test. The remaining subjects on the post-test which were not included on the pre-test showed average scores in the mid-range, around a 60-80% rate of comprehension. These improvements are indicative of the positive impact of catering L2 learning to students' interests. By presenting these learning materials through a design format and through game coding, the students were able to practice more with these grammatical forms through a lens of design which catered to their professional and academic interests while strengthening their arsenal of grammatical and lexical tools.

Considering the lack of an organized L2 curriculum these results show that all of the language learned throughout the process of designing *Bonne Chance* occurred organically through the motivation of the team to learn language in order to be able to correctly design and code it into the game. While there were overt instruction moments during the design process, these moments occurred on demand, meaning that the students

were learning grammatical and lexical concepts just in time to be able to correctly create assets and code. This led to a low to mid-range retention rate of these concepts and indicates that there were many areas which could have been better taught and better reinforced throughout the production process of the game. However, the mid-range scores that resulted just from the team's participation in the project through asset development and game coding showed that learning language concepts can occur through many forums, such as designing a video game. Since the design team's average scores for the most part improved throughout the production process of *Bonne Chance* mostly as a result of the design team's enthusiasm towards creating a viable product rather than through a detailed L2 curriculum, it would appear that language pedagogy can indeed be informed by game design by providing an interest-driven learning model that functions off of student motivated projects.

Research Question 2: How is French culture and history learned through the game design process and how does a project such as Bonne Chance influence language learning?

The survey and the research conducted by the design team responded to my second research question of how French culture and history can be learned through game design. Each member of the design team conducted individual research to create the environments for their assigned levels of *Bonne Chance.* The responses to the survey that I distributed varied making the cultural acquisition part of this project subjective to the research styles of each individual team member. Every member of the design team

gained an understanding of French culture and history through either individual research, participation in weekly meetings, or through a combination of both. Most of the team said that they conducted online research to gain an understanding of the historical and cultural setting of their assigned level. In addition to individual research, weekly meetings were held during the production process to discuss the direction that the team wanted to take in designing their levels and how their research applied to the environments that they were creating within the game. Overall, their culture learning proved invaluable to the project as it created a personal connection for each of the team members with the French history and culture that was incorporated into the game. This personal attachment to French language and culture that the team formed is evidenced through the detail of their research which is also reflected in the rich cultural and historical details within the game. For example, Aaron's detailed research on his levels which are at the Notre Dame, The Gardens of Luxembourg, and Versailles locations within *Bonne Chance,* directly affected both the direction of the story narrative and how the team thought about the creation of game mechanics. Through detailed Aaron was able to gain a knowledge and understanding of French culture and history that many introductory-level students in L2 do not receive until their final semester of study. This is evidenced through the second location in the game that Aaron was responsible for creating, Versailles during WWI. While creating the story narrative for the second iteration of the game, Aaron had suggested that we change some of the locations in Paris. Once the desired time periods were chosen, Aaron was told to research Paris during WWI in order to get ideas for the second level that he would be creating. So, all he had to go off of was a time, not

necessarily a location. Through his research, he began to read about the treaty of Versailles and decided that this document is important for people to know about. This document also gave us a location for this part of the game. In other words, through researching Paris during WWI, Aaron was able to conduct substantial research that influenced the development of the game. It was through his working knowledge of French culture and history that the Versailles level of the game with the treaty of Versailles as an artifact was created. Aaron indicated that his research in French culture and history was always done through a lens of design as he was always looking for ways to create a culturally and historically accurate environment to ensure an enjoyable user experience once other people started playing the game. One of his most impressive suggestions was that of the Notre Dame game, in which he suggested modeling the mini-game mechanics either visually by mimicking the cathedrals height or by mimicking the mechanics of the bells. In this way, Aaron was directly relating his experience as a designer to his knowledge of French culture. This suggests that culture and history can indeed be learned through a lens of game design and projects such as *Bonne Chance* can actually act as a foundation for the direction of a students' research.

Of course, Aaron was not the only student to come up with innovative ideas in regards to French culture and history and their direct relationship to the design of *Bonne Chance.* Sophie also took on the task of researching French culture in order to create a positive user experience. Her knowledge of user experience proved to be incredibly helpful to this project as it provided a framework within which to create viable interactive environments without losing the cultural-historical essence of the game levels. Kevin, the

graphic design student responsible for creating most of the characters within the game, had to educate himself in how people looked and talked within each of the time periods in the game. Some characters in the game are actual historic figures, so Kevin was tasked with not only creating characters that were unique to the game and true to their time periods within the game, but also understanding the cultural significance of historic figures in the game such as Marie de Medici, Vincent Van Gogh, and Gustave Eiffel. Every character that was created for the game exhibits Kevin's personal stylistic approach, and they also exhibit traits of their respective eras within the game. For example, in order to create environments with characters that are socio-culturally appropriate, it was important to know everything from the clothing styles, speech patterns and customs, and historical demographics. By studying these aspects of French society, Kevin learned not only facts about certain famous historical figure but gained an overarching knowledge of the make-up of French society throughout history.

All of these research approaches were discussed by the design team in their surveys and in weekly team meetings. Each of their approaches indicates that culture and history learning can occur through many different mediums. The commonality between each approach to culture and history research was the fact that each member of the design team approached their research through a lens of game design. Creating environments meant ensuring a culturally and historically accurate user experience, and in order to design their levels the team had to first familiarize themselves with the culture and history of their assigned locations and time periods. Furthermore, weekly team meetings reinforced this research and opened the team members' individual research up to

everyone giving the designers an understanding of every historical and cultural concept being incorporated into the game. Since the research that was conducted by the design team was done in English it did not affect their language learning. However, it did highly impact their cultural awareness and so it is safe to say that creating story narrative the invoked French culture and history, particularly one that involves time travel, positively affected the team's French cultural and historical knowledge.

Research Question 3: To what extent are gains in language and culture learning influenced by the role students play on the design team (and consequently how might the language instruction throughout the process of game design be reimagined to cater to all aspects of the design process to produce better results)?

The third research question that I posed at the beginning of this project is much more complex than the first two. However, upon my first interactions with the design team and seeing the division of labor that took place amongst them such as the separation of asset developers from game coders and the diversity of experience in the design field, I was curious to see if any group of students within the entirety of the design team learned language and/or culture at a higher rate than others. Each set of data that I collected helped in responding to this inquiry, however it is the second two sets that were truly indicative of the differences in language and culture acquisition between the asset developers and the game coders. For example, the survey that I distributed to the team indicated that the game coders did not conduct nearly as much cultural or historical research as the asset developers as their job was not to create environments or characters

but to take what the asset developers created and code it into the virtual setting of the game. Therefore, the coders were not exposed to as much French culture and history as the asset team. On the contrary, the asset team was not exposed to as much lexical and grammatical material throughout the production process as the coders were since their work on game mechanics was usually limited to one level of the game and therefore to one language concept. The coders, on the other hand, were responsible for ensuring the accuracy of all of the materials of the mini games including the game's responses to correct and incorrect answers which is evidenced through videos like the one transcribed in appendix F. Thus, the coders were exposed to all of the lexical and grammatical concepts that went into the mini games for each level of *Bonne Chance.*

The division of the design team into a group of asset developers and a group of game coders resulted in these two groups being exposed to French language, culture, and history in different ways and in different increments throughout the production process of *Bonne Chance.* Although it is not clear that the method of learning for either group was better or worse than the other, it would seem that certain learning processes associated with each group encouraged different levels of either language or culture acquisition. What this difference in culture and language acquisition between these two groups does indicate, however, is the need for a more equal distribution of labor amongst the design team so that each member is exposed to both group's method of language and culture learning. This way, each member of the design team would be exposed to an equal amount of lexical, grammatical, cultural, and historical material so as to eliminate the possibility of one group learning more or less of one set of materials than the other. That

being said, it would appear that environment also played a role in the team's language and culture acquisition. For example, Aaron and Amanda seemed to do well on the post-test even though they did not participate in coding the game. However, these two students worked in the same room as the coders and probably listened to much of the conversations and saw some of the test-runs of the mini games, so it is possible that they picked up some of their lexical and grammatical skills by working in this environment. In addition, the collaborative atmosphere of the *Bonne Chance* project encouraged each team member to learn French language, culture, and history. The weekly team meetings that were documented through process photos and videos promoted the allocation of everyone's language and culture knowledge and thus every member of the team was exposed, to some degree, to French language and culture through their participation in the project.

Final Discussion

Although this project yielded impressive results in regards to the design team's language and culture learning, there some areas where the project can be further developed. One of the main areas of concern is the retention rate of grammatical and lexical concepts. As we have seen from the juxtaposition of the materials tested in both the pre and post-test, some of the learning objectives have a higher retention rate with the design team than others. Culture and history research is also an area which can be further developed since some members of the design team conducted far more research than others. However, research by nature can be subjective to the interests and styles of an individual, and so in this respect the collaborative and interdisciplinary nature of the

Bonne Chance project helped to bring together all of the team's ideas about the direction of the story narrative and the mini games, which put everyone on the team in contact with language and culture in some form or fashion throughout the production process. While this aspect of the project helped to guide the production process and expose the team to a variety of French language, culture, and history, it does seem as if the division of the team into two distinct groups promoted a disparity between how much of each of these subjects the groups were exposed to. Regardless of this variation in learning between the two groups, they each learned language and culture in some form even if through different means.

Chapter 4: Conclusion and Further Research

Conclusion

The *Bonne Chance* project presented many challenges to the students and to the instructors who worked together to create a French language learning game that could be used both as a supplement to French language courses and as a model for game design projects at the university level. All those involved on the project committed their time and energy to laying the groundwork for the future of the *Bonne Chance* project. There are many positive results that came of the initial project, the most exciting of which is a functional game that has been tested by students at the University of Tennessee. One of the greatest outcomes of this game design project was watching a team of people from diverse backgrounds come together to work in an interdisciplinary atmosphere to create from scratch a new example of how to approach language pedagogy. The students involved in the project learned French language with a non-existing curriculum. The lack of a solid curriculum indicates that all of the French language and culture that was learned on the part of the design team was done through sheer motivation to work on the project. Thus, this project acts as a model to show the power of interest-driven learning in a collaborative atmosphere. Not only did the design team gain experience in French language and culture, but they also were able to participate in a project that models a real-world example of professional game design. Their motivation throughout the project stemmed from being able to experience what the world of game design is like, meaning that French language and culture learning occurred organically through this as a product

of the multilingual an multicultural atmosphere that materialized through the diversity of the team creating *Bonne Chance.*

The nascent nature of the study of language learning through game design made this project new and exciting to all of those involved. Although I began this project with questions and goals in mind, the dearth of similar studies in the field of second language acquisition helped to make this project a groundbreaking step for the entire team in both the fields of game design and foreign language pedagogy. By looking at the framework of the *Bonne Chance* project and the positive results it yielded, we can begin to rethink L2 education. One of the main reasons for the design team's success in language and culture learning even without the framework of an organized curriculum is the fact that the team was motivated throughout the process of creating the game. Rather than trying to derive interest out of students through L2 learning, we can try to make L2 learning a product of students' interests. In this way, the students can create a personal connection with L2 just as the design team behind the *Bonne Chance* project created personal connections with French language and culture through participating in the initial iterations of game design.

Further Research

Looking ahead for this project, there are many ways in which the aspects of L2 pedagogy and design can be improved. There are three main areas of improvement that can be addressed in order to ameliorate the pedagogical benefits of the *Bonne Chance* project: 1) the distribution of production responsibilities, 2) the emphasis on overt

instruction and spoken French during the design process, and 3) the overall organization of the project as a course that combines game design and L2. The initial *Bonne Chance* project served to create a foundation upon which to build a curriculum that promotes both gamed design education and L2. However, there is certainly room for improvement through each of these three factors.

During the first phase of production of *Bonne Chance*, the initial proposal in regards to game design and coding was to share the responsibilities equally amongst all of the members of the design team. In this way, there would be no subdivisions of labor during the creation of the game. Every team member would learn coding and design. It appears as if of all of the members of the design team, the game coders were exposed to much more French language than the asset designers. The coders, being responsible for the digital production and function of all of the game assets, had to know and understand the language and grammar concepts being presented in each of the games within *Bonne Chance.* Coding, therefore, acted as a means by which to learn and understand language concepts. On the other hand, the coders were not exposed to as much culture learning as the design team, so much of the language that they learned was only through the context of game code. They did not have the personal connection with the language that the asset developers had in creating their game levels. Without this personal connection to the content that the coders were learning, much of the language concepts that they learned did not have a high retention rate. When the coders did learn and understand vocabulary and grammar concepts it was only in order to ensure that they correctly coded into the game. Once they correctly coded the vocabulary and grammar assets for a mini game

they did not retain the information they learned as well as some of the asset developers. The asset developers were engaged in much more research in French culture and history and, by creating personal connections with the game and directly incorporating what they learned into the game world, they created a personal connection with French that the game coders did not. However, this connection with French usually was only in regards to the language learning objectives that were specific to their individual levels. So, while the coders were exposed to a wider span of French language concepts, they did not retain as much as the asset developers who were not exposed to every language concept in the game but were able to master the language objectives in their assigned levels. In the future, it would be best to divide the tasks of coding and asset development equally amongst every member of the production team in order to ensure optimal language and culture learning.

A second improvement to this project would be a larger emphasis on overt instruction of French during the game design process, particularly during the creation of game mechanics. Although there were overt instruction moments throughout the production of *Bonne Chance*, these moments occurred sporadically and without much planning. The bright side to the haphazard overt instruction language learning that occurred is that it promoted language learning just in time and on demand. The designers learned French grammar and vocabulary as the needed it and were able to easily contextualize the application of the language concepts being taught. However, after the initial application of the vocabulary and grammar tools were learned, much of these concepts were not further utilized. In the future, it would be better to organize structured

language lessons for the design students focused around the learning objectives that would be implemented into the game. This could happen on a weekly basis or twice a week depending on the frequency of the team meetings. There seems to be a need for organized overt instruction that can create a foundation for L2 proficiency that extends beyond intermittent lessons on demand.

The two improvements already mentioned that could further develop the *Bonne Chance* project in regards to its function as an L2 pedagogy program can be best ascertained by reorganizing the project as a course. Although the design team was able to learn the same materials that would be taught in an introductory-level language course by working on this project, the organization of the project leaves room for improvement. For example, if this project were presented as a game coding and French language course, then the instructors working on the course could design a curriculum in which the students have a balance of game coding, design, and foreign language. In order to organize this, it would probably be best to divide the number of instruction hours between these three subjects and leave at least two hours a week and homework for game production. Through a structured course with a well thought out and organized curriculum, a project like *Bonne Chance* has the potential to yield concrete pedagogical results both in the fields of game design and L2. One of the main challenges of creating *Bonne Chance* was setting plausible deadlines within the short time frame that was given to produce a functional game. During the summer, the design team met every day, so the content being learned by students - whether in coding, asset development, or French- was more frequently applied and used by the students and so the retention rate of information

being learned was more advanced than during the fall semester when the group only met three times a week. This is not to say that the fall semester did not yield positive results for the students. Rather, the summer session of production offered a strong foundation upon which to build the team's repertoire of French grammar and vocabulary as well as game coding and design. The fall and spring semesters following the summer session of *Bonne Chance* production relied heavily on meeting critical deadlines which required effective communication between the team in order to reach production goals within the semesters. Both of these frameworks of game production proved to be efficient, however, in regards to L2 acquisition meeting every day as the team did over the summer would inevitably produce more positive results. In the future, projects like *Bonne Chance* should combine the usage-based learning that occurred over the summer session of this project with the deadline-oriented structure of the fall and spring semesters in order to create an environment that efficiently combines language and design pedagogy.

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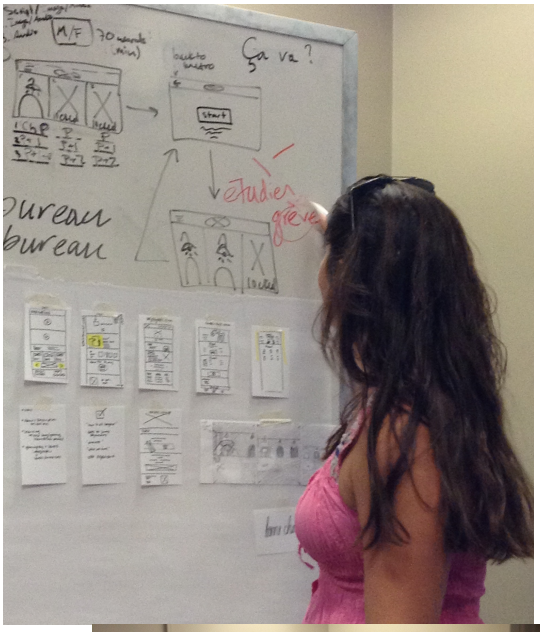
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Appendix

Appendix A

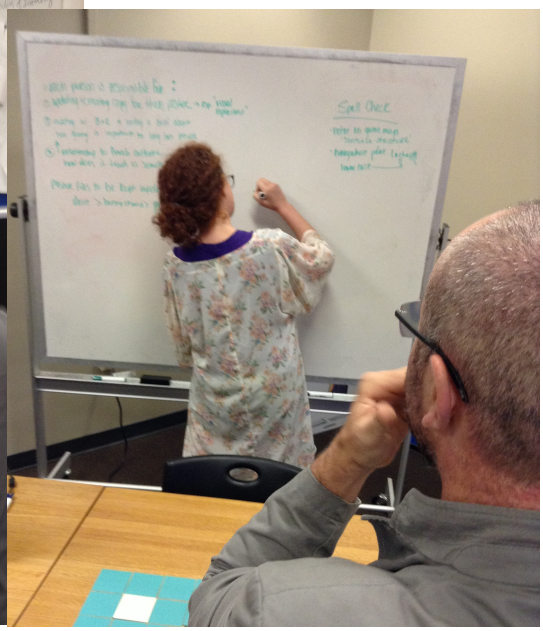
Location	Year	Artifact	Student	Intended language level:
The Louvre	3016	le ditié de Jean D'arc	Amanda	French 111
Notre Dame	1430 (Medieval)	Molière	Kevin	French 111
The Gardens of Luxembourg	1630 (Renaissance)	The Code Civile de Napoléon	Aaron	French 111
Père Lachaise Cemetary	1800s (Revolutionary period)	World's fair flier	Sophie	French 111
Eiffel Tower	1889	N/A (boss level)	Sophie/Jason/Erik	French 111
Jail (non-specific)	May '68 (student protests in Paris)	Treaty of Versailles	Erik	French 112
Versailles (Hall of Mirrors)	1918 (WWI)	Newspaper article about the construction of the Louvre pyramid	Aaron	French 112
The Louvre (outside, at the pramid)	1984	Moulin Rouge poster from the Golden age	Amanda	French 112
Moulin Rouge	1921	appel du 18 Juin de De Galle	Sophie	French 112
Notre Dame	1940	N/A (boss level, after this the player returns to the future)	Kevin	French 112
The Louvre	3016	N/A (end)	Amanda	French 112

Appendix B

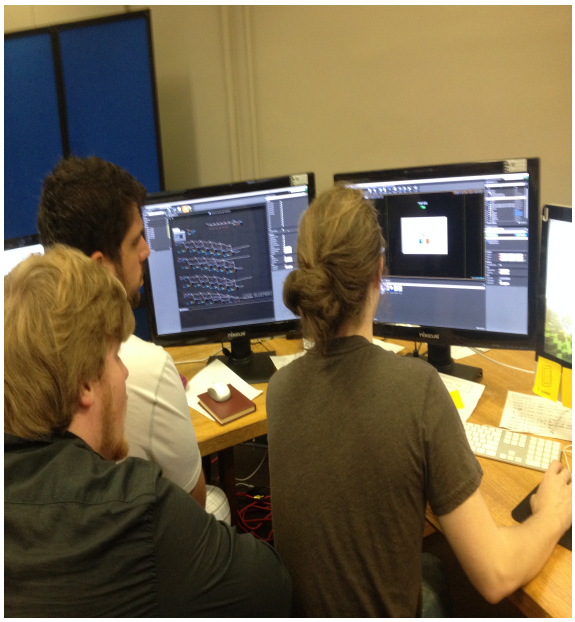

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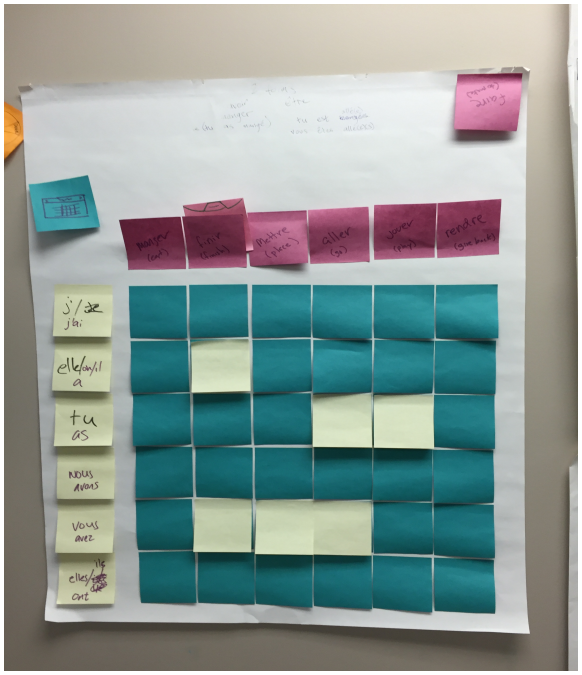

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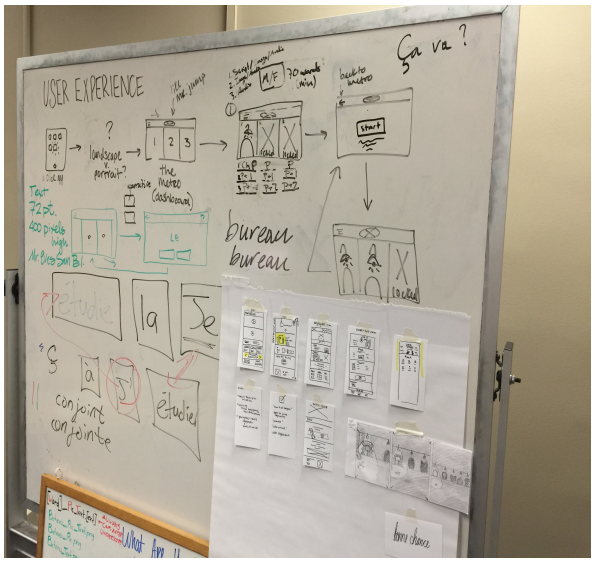
Appendix C





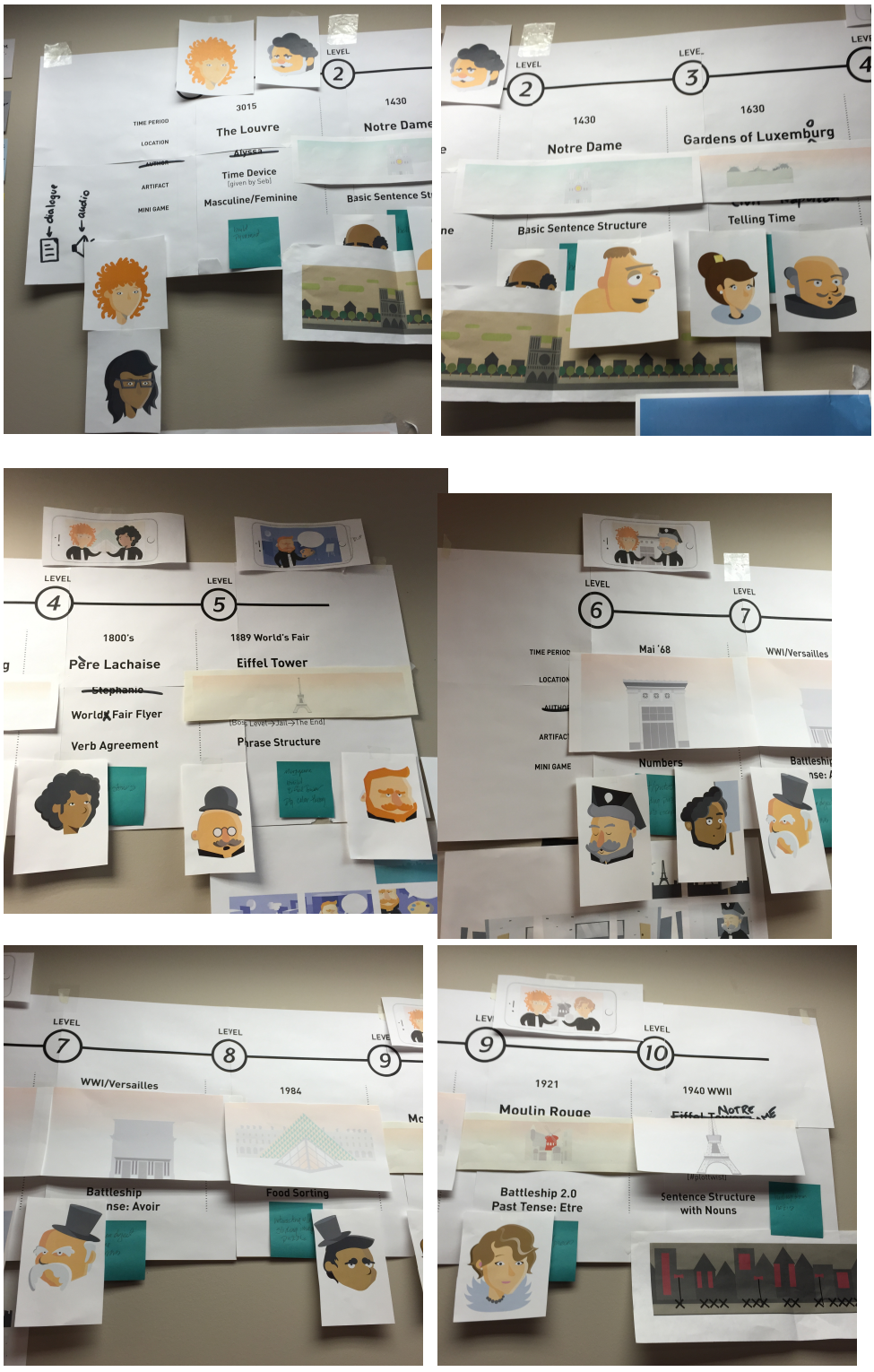


Appendix D


USER EXPERIENCE
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Appendix E


LEVEL 2
3015
The Louvre
1430
Notre Dame
Time Device
Masculine/Feminine
Basic Sentence Structure
LEVEL 3
1630
Gardens of Luxembourg
Telling Time
LEVEL 4
1800's
Père Lachaise
LEVEL 5
1889 World's Fair
Eiffel Tower
Verb Agreement
Parase Structure
LEVEL 6
Mai '68
LEVEL 7
WWI/Versailles
Numbers
LEVEL 8
1984
LEVEL 9
Battleship
nse: Avoir
Food Sorting
LEVEL 10
1921
Moulin Rouge
1940 WWII
Battleship 2.0
Past Tense: Etre
Sentence Structure
with Nouns

Appendix F

Video one:

Blake: Tim is going to build his response in French
Tim: Yes….I…..sell….them
(In this instance, Tim is clicking on the French equivalent to these words)
Blake: Yeah, he's going to exit out of it if he doesn't like it…if he said the wrong thing, so everything is back to the way it was
Blake: And then he hits send which is green…….I'm gonna murder somebody (This is Blake's response to Tim correctly responding to the game, but the game not providing the correct response for a "win" state).

Video two:
Blake: This is his response to the text message on the left, he's going to hit send, and that's his response on the right with no text in it
Blake: The person he's texting responds: Tu manges les cerises aussi? And he's building his response, and then send, and then he's going to respond again, and then there you go and that is the end of the conversation.
(The idea for this game is you are texting with someone, so this is what Blake is referring to)

Vita

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