Creating a Game Development Course Using
Teaching Contextually and Situated Learning Theories

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Brandon Antonette

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Nick LeJeune, Advisor

Kathryn Stam, Second Reader
Abstract

This capstone project endeavored to create a course curriculum designed to instruct intermediate level college students on how to develop a video game. This project was built upon the idea that students have a fundamental understanding of video games and an interest in furthering their skill sets in game creation. The design and development created draws inspiration from the theories of Teaching Contextually and Situated Learning. The objectives of this project were to gain experience producing teaching materials, motivating students, creating an engaging classroom discussion, learning how to implement gamification, and refining my own career ambitions. These objectives have allowed this project to serve as a future reference when developing course materials, as well as help minimize potential challenges involving course assembly. Furthermore, this project has provided insights into the advantages and disadvantages of using a course structure based around the theories of Teaching Contextually and Situated Learning. The project can be found at this URL link below:

https://drive.google.com/drive/folders/1aJ0YNrGgNqNc7oCzpa-itjBegejh4r1S?usp=sharing

Here are the key takeaways from this project. Applying theories into the course material facilitates student learning. Contributing factors to student engagement are time, interest, and willingness. Implementing drastically new teaching methods too quickly reduces learning effectiveness. The teaching profession has many facets that influence the learning environment.
Table of Contents

1. Overview
   I. Introduction
   II. Project Objectives
   III. Project Questions
   IV. Process Summary

2. Literature Review
   I. Designing Lesson Curriculum
   II. Student Engagement and Motivation
   III. Practicality Versus Idealism
   IV. Becoming an Instructor

3. Method

4. Results

5. Discussion

6. Conclusion

7. References
Overview

Introduction

This project involved the creation of a game design course curriculum. The course objective was to teach specific aspects of game development and build awareness on effective game making decisions. Course design implementation included slides, videos, assignments, and other gamification related methods that helped with course structure assembly, as well as developing better techniques in course material presentation. The motivation behind this work stems from my intentions to be an aspiring college-level instructor. Specifically, in being able to teach students the joys of successfully developing a video game.

Project Objectives

The main goal for this work was to further my own experience in creating and teaching course material that can be applied to future job opportunities. This included developing the course material, discussing the course material, and fostering classroom engagement for students. An additional goal of this project relates to advancing my knowledge in the career progression of becoming a college-level teacher.

Project Questions

1. Are the Teaching Contextually (Crawford, 2001) and Situated Learning (Nordsby 2016) theories effective when used conjunctively?

2. Are there limits on how much gamification can be applied in current college-level education? (Murwa, 2012)

3. Are student needs and aspirations addressed in this course?
4. Is the teaching profession aligned to my personal career goals?

Process Summary

This project was created covering the different subjects involved in gamification and game development. In particular, the lessons for the course were developed by utilizing research materials, which were subsequently adapted and modified to fit the specific theme of each lesson. These materials were sequentially implemented throughout the creation process. Specifically, in order to determine what theory would be most applicable in teaching certain game development subjects. In most cases, the order in which the theories were incorporated into the lessons were Teaching Contextually (Crawford, 2001), then Situated Learning (Nordsby 2016), and finally Gamification (Wu, 2012). This order also showcased how much presence the theory had in the lessons with Teaching Contextually (Crawford, 2001) being the most abundant in the lessons and gamification (Wu, 2012) being the least abundant. There were lessons created that included information on principles of game design, effective user interface/user experience (UI/UX), breakdown of modern games successes and failures, and the three stages of game development. There can be more game development lessons created in the future based on the research gathered throughout this project. These lessons were made predominantly using powerpoint to assist with lectures.

Literature Review

This project outlined an intermediate college-level course design involved in teaching a game design course. The core objective was to create and teach lessons in awareness over effective game-making decisions. The focused topics to achieve these objectives related to student engagement, designing lesson curriculum, practical and/or idealistic teaching approaches to the
classroom, and personal objectives as an instructor. The literature review below shows the theories and methods that were used to create this project.

**Definitions**

Applying – Gaining knowledge by using ideas in practice (Crawford, 2001, page 3).

Conditions- The circumstances under which the performance can take place (Marzano, 2009).

Cooperating – Learning within the framework of exchanging, reacting, and communicating with fellow learners (Crawford, 2001, page 3).

Criterion- Establishes the criteria that describes what level of performance that the learner must do in order to be considered an acceptable level (Marzano, 2009).

Experiencing – Students bring to the classroom life experiences and prior knowledge which helps them understand the new information being taught (Crawford, 2001, page 3).

Outcome Expectations -What an individual thinks will happen because of a personal action (Kwee, 2020).

Performance- An objective states what it expects a learner to accomplish, sometimes describing the result in doing so (Marzano, 2009).

Relating – Learning is shaped based on life experiences or existing knowledge (Crawford, 2001).

Self-Efficacy – The belief that an individual can accomplish their goal successfully (Kwee, 2020).
Socialization – Interacting with others which can be used with games-based learning initiatives to further incentivize our players to keep playing and learning (Kwee, 2020).

Transferring – Utilizing information in an entirely new or unique scenario, one that hasn't been previously discussed in the class (Crawford, 2001, page 3).

Theories

The theories implemented throughout the creation of this project are Teaching Contextually which is a systematic procedure that involves exploring research, providing a rationale, and employing techniques to enhance student motivation and achievement (Crawford, 2001), and Situated Learning which states learning is encouraged and facilitated through active participation in a community of practice with shared content, goals, and mutual engagement (Nordsby, 2013, page 3). Teaching Contextually in particular included the Constructivism theory as a component which stems from the idea that individuals form new knowledge and comprehension by building upon their existing beliefs and understanding (Crawford, 2001, page 8). These theories were used in this project due to their ability to engage students, stimulate learning, and most importantly help students turn their prior experiences into new knowledge towards creating video games. Gamification is another premise used which conveys the use of common features found in games applied to different domains of activity, specifically in this context, within the field of education (Wu, 2012).

The other two theories that were researched were Fuller’s Concern Stage Theory and Social Cognitive Career Theory. Fuller’s Concern Stage Theory helps us understand the gradual and unchanging worries of new teachers as they progress in their careers (Kwee, 2020, page 3). Social Cognitive Career Theory emphasizes how self-efficacy, outcome expectations, and
personal goals influence career behavior (Kwee, 2020, page 6). While not applied directly to the project, these theories assisted in fostering awareness as an instructor. To be more precise, these are applied toward familiarizing oneself with common troubles among teachers.

**Designing Lesson Curriculum**

Examining the complexities of crafting a lesson curriculum was crucial for effectively instructing students and ensuring their comprehension of the material. The lesson curriculum segment of the project was developed with a focus on maintaining and upholding performance, conditions, and criteria. The fundamental concepts guiding the initiation of this project encompassed Contextual Teaching, Situated Learning, and Gamification, as outlined below.

One previously established teaching method that has shown success and has been applied throughout this project is Teaching Contextually (Crawford, 2001). The method primarily enhances student success and learning, with an added benefit of increased engagement. This method includes using ideas such as Constructivism, Relating, Experiencing, Applying, Cooperating, and Transferring (Crawford, 2001). All of these have been used with the course curriculum created. Constructivism was applied to how the students interact and learn from each other. Relating was applied to how students comprehend the information presented to them through examples. Experiencing was applied to how they take notice of this information learned while playing video games freely. Applying appertains to the homework assignments that require a demonstration of this knowledge with something students can enjoy doing. Cooperating relates to the class discussions and debates. Finally, Transferring takes more time then the others as it refers to when a student creates their own game that improves upon a previous video game. These ideas were incorporated in a systemic way working from prototype lessons, each based
around certain game development subjects. Essentially, after making a lesson and adding the key information, the ideas of Constructivism, Relating, Experiencing, Applying, Cooperating, and Transferring explained above were incorporated into the lessons (Crawford, 2001).

Another theory that also added upon Teaching Contextually (Crawford, 2001), as well as designing the lesson curriculum in general was Situated Learning (Nordsby 2016). One of the prevailing questions was how to maximize student learning from the material when creating this course. The solution was to encourage them to learn from each other through collaboration (Nordsby 2016). This enabled students to grasp the lesson content from both the teacher and their peers during interactions. It may also assist in clarifying any student questions or concerns. For this project, there were aspects of Situated Learning included within every lecture. Especially with illustrative topics, students are asked to reflect upon the content presented to them and expand on examples that deepen their understanding and facilitate peer learning.

The final theory used when creating this curriculum was Gamification (Wu, 2012). According to this study, most successful and significant gamification overhauls are created in game engines or self-made, as well as only seeing significant success when it comes to teaching programming among the topics shown in the study (Wu, 2012). With this knowledge, the idea was to implement this theory to teach gamification progressively. To accomplish this the creation of all the homework assignments promoted playing a game or simulating a gaming experience. Furthermore, this theory will progressively have a bigger presence in the lessons once students become familiar with learning through gamification.
**Student Engagement and Motivation**

In an educational setting (online and in person), ensuring sustained student engagement and motivation is essential for effective teaching. This section is dedicated on how to teach in a way that keeps the students engaged to the class discussions and motivated to learn. There are many existing and effective methods to keep student engagement and motivation high, however these methods (while applicable and still useful) are generalized and not specifically tailored to any group of people. This is elaborated further in [Designing Lesson Curriculum](#) above.

Ensuring that students are engaged and motivated is a challenge for any teacher... The research I found pointed towards time being an important factor in doing so. Teachers only retain students’ full attention for the first 10 minutes of the lecture and then it starts to steadily decline. (Bradbury, 2016, page 2) There are some exceptions to this that are dependent on the teaching style but for this project it cannot be assumed as an exception since it is untested. With this being the case, these lessons will keep around the 10-minute timeframes to increase the chances of maximum theoretical engagement from students.

A method to increase motivation and engagement is to apply previously established game concepts that can be modified and applied to the classroom environment. These can include leaderboards, countdowns, achievements, and most prevalent to this project game-based socialization (Tshudy, 2020). By applying the Situated Learning theory, the plan was to create a learning environment for the class that allows students to interact with each other more freely by establishing shared interests and similarities. “Simplified” means that class discussions engage students by inciting the passion of those who enjoy video games, which considering this is a game development course should cover the majority of students. This helps identify student interest as an important factor in maintaining student engagement and motivation.
Student engagement and motivation is directly tied to the willingness to learn by the student. One way to do so is by creating a personalized way of teaching. One of the advantages of this project is that the terminology and methodology of a videogame can be accessed to teach and help create relatable and personalized experiences for the students (Oliveira, 2022). For example, specific games, experiences, troubles, solutions, and more can all be applied to further student understanding. This also pairs quite well with the Situated Learning theory (Nordsby 2016) as even if the teacher of the class has not experienced something in a specific game, there are other students in the class who can contribute. Furthermore, this also utilizes the Constructivism theory which provides students with new experiences and ideas that improve their insight (Crawford, 2001). In context, this theory will use students’ existing knowledge of video games, and build upon it by relating lessons to any experiences they may have had while playing a game. This creates a classroom environment that allows personalized catering to each student as well as cooperative learning among all students and the teacher. This assists teachers to learn from student experiences that can be used to tailor future course material.

**Practicality Versus Idealism**

This research project explored the theories and experiences of other teachers that were applied and modified to suit the situations where relevant. With the abundance of information and studies specifically relating to Gamification, there are limits to what can be implemented without compromising effectiveness. Thus, the section that follows describes compromises that this project needed to take to maximize educational gains and minimize confusion for the students.

Gamification can provide benefits to a classroom by stimulating engagement among students and being more effective in student learning than traditional teaching methods (Murwa, 2014).
However, in order to gain these results some compromises needed to be made. One compromise this project took into account was using traditional PowerPoint slides which are aligned with the traditional teaching standards of recent years (Teaching with PowerPoint, 2020). This approach was taken as something drastically different from the teaching norm would prove to be ineffective (Murwa, 2014, page 3). The other compromise was how much gamified course material could be included without confusing students from their traditional learning standards. Gauging the willingness to accept change for both the methods of teaching and learning also plays a contributing factor as many educational facilities refuse to gamify curriculum even with the capability to do so (Murwa, 2014). A slow transition over time with incentives is more effective than the immediate gamification overhaul of the course curriculum (Murwa, 2014). Simply put, it would require a multitude of changes to workforce, budget, and/or time for education facilities.

**Becoming an Instructor**

The idea of this project was to familiarize myself with the responsibilities of a teacher, specifically in terms of crafting courses, effectively communicating information, and readying myself for post-college employment. To support these objectives, I conducted research on career studies pertaining to professors. These insights directly aligned with my concerns and aspirations.

To prepare myself for instructional employment in the future, I needed to understand the career cycle of a teacher, as well as any commonly recurring problems that they encounter throughout their career. By using Fuller’s Concern Stage Theory, the information I found pointed toward, “Teachers’ professional development is a complex interplay between personal and
environmental factors, and there are no one-size-fits-all solutions to teachers’ retention.” (Kwee, 2020, page 9). It also made it clear that while some problems are unavoidable, they can be contained and/or minimized. The problems that have been minimized on this project were the impact of advancing technology on lesson material and relatability to students as time progresses. This is why many of the assignments are open-ended and provide choices to the students making the content more adaptable.

In addition to looking at the career cycle stages as explained above and in Fuller’s Concern Stage Theory (Kwee, 2020), I needed to establish what would be my own personal goals or expectations in relation to being a teacher. The process used to help determine these goals can be more detailed in the Social Cognitive Career Theory (Kwee, 2020). However, the main points that could be used and directly applied to my projects were Self-Efficacy and Outcome Expectations (Kwee, 2020). Self-Efficacy applies to the mentality when creating this assignment, as well as what I believed would be effective in teaching. This was applied to how I formatted slides, used examples, and created discussion among students. Outcome Expectations involve the confidence that students will be able to comprehend my course material. This confidence stemmed from personal experiences, comparisons with other instructors' materials, and the research gathered.

**Method**

**Project Design**

The approach to researching this topic was a multi-step process. First, I gathered information about methods that have been proven to be successful while teaching students. Extending upon this, my research entailed methods of information design and game development topics. Then, I
created a checklist that outlined the basis behind the creation of each lesson. There were two main theories that have been applied in the creation of these lessons which are Teaching Contextually (Crawford, 2001) and Situated Learning (Nordsby 2016) which were highlighted within the slides, discussions, and in-class work. These theories accomplish connecting experiences between the students and the lesson material, which allows them to further their knowledge both inside and outside the classroom. These principles allow teaching and experiencing to mesh with each other creating further opportunities for students to learn. There are also elements of the Gamification theory (Wu, 2012) present in certain components of the lessons. This theory is reflected in course components like the homework assignments. The idea behind this theory is to introduce gamified course material so that eventually more gamification can occur. As mentioned prior, a proper and successful gamification requires a consistent and gradual implementation to succeed. The quality of each lesson was tested with the The SUNY Online Course Quality Review Rubric (OSCQR). Most of the quality assurance test standards have been met by section, however the assessment and feedback criteria requires teacher resources and student presence to be tested.

**Data Collection**

The information used in the creation of this course, as well as the teaching methods learned come from scholarly sources found online. The specifics of these sources will vary, however all of them are primarily related to helping myself become a better teacher through learning effective teaching methods and creating a course that fosters student learning and engagement. These sources of information are mostly surveys and observational data studies.
Ethical Considerations

There seems to be no ethical concerns in the creation of this project. The sources have been cited throughout this paper and are referenced below according to APA style formatting. This project will be available for reference, however keep in mind the lessons will be tailored for my future students. To ensure the integrity and capability of the lessons, thorough understanding and modification may be required.

Limitations

There were few limitations with this project. The primary limitation was the lack of in-person teaching and the knowledge that comes with that experience to test my material. My research and this course curriculum could very well contain information that is more useful to programmers (i.e. the area in game design I have the most experience with) over those who are in different disciplines of the game design field. This could contribute to course content favoring certain fields of game design. Another challenge was gauging the number of students that these lessons can reliably teach depending on class size. In exploring teaching using the theories of Teaching Contextually (Crawford, 2001) and Situated Learning (Nordsby, 2016), there may be a need for additional research to ascertain the limits and efficacy of collaborative learning within an educational framework.

Results

This project sought out to complete these four questions: Are the Teaching Contextually (Crawford, 2001) and Situated Learning (Nordsby 2016) theories effective when used conjunctively? Are there limits on how much gamification can be applied in current college-level education (Murwa, 2012)? Are student needs and aspirations addressed in this course? Is the
teaching profession aligned to my personal career goals? This project linked below showcases the findings and results of these questions.

Project URL:
https://drive.google.com/drive/folders/1aJ0YNrGgNqNc7oCzpa-itjBcgejh4r1S?usp=sharing

The answer to the first question is yes; the theories were effective in teaching when used conjunctively. This project showed effective utilization and implementation of the theories to assist with student learning, engagement, and course structure. This has been illustrated in the slides below. These slides showcased discussions planned inside the classroom, with emphasis on learning through a shared contextual topic. For example, opening students’ opinions on good games or their ideas on good UI design. These discussions promote contextual learning through shared experiences and knowledge between the students.
The answer to the second question is yes; there are limits to how much gamification can be applied. However, some elements have been applied to help transition college students into a gamified learning environment. The instruction sections of the student assignments demonstrated below reveal the amount of gamification that can be introduced to students without having negative side effects. They focus on the point of giving students a choice in how they complete their assignments. For these specific examples, it provided flexibility to the students in which games they research.

**Instructions:** Students will select a video game of their choice and conduct a thorough analysis of its User Interface (UI) and User Experience (UX) design. The goal of this project is to identify both positive and negative aspects of a specific game’s UI/UX and create a critique. It is recommended to read the assignment details completely before choosing a game.

**Instructions:** Develop an understanding of the factors that contribute to the success or failure of video games. Students will create two case studies, the first being an analysis of a successful video game (Task 1). The second case study will be the analysis of a failed video game (Task 2). The choice of both video games is up to your own discretion, as long as it meets the requirements below. Additionally, students will create a brief reflection paragraph describing what this case study has taught them in regards to their own aspirations in the game development industry.

The answer to the third question is yes; student needs and aspirations have been addressed in this course. These lessons were created with a structured outline based upon the needs of students to develop their skills in specific game development fields. This allowed them to study the discipline of their choosing and aspire to achieve proficiency in their field. As exhibited in the section below, this project offered different options that students can choose within the structured outline.
Finally, the teaching profession has aligned with my personal career goals. The research provided insights on the profession, as well as its career progression. These insights aided in obtaining skills to better prepare myself for the teaching occupation. Due to these findings, this project enabled me to more clearly define my ambitions and provided a path forward.

**Discussion**

I started this project by first researching various established teaching methods that have shown success and failures, looking at examples to understand which aspects should be adapted and/or avoided. I proceeded with searching for a theory that could become the basis that this project is built upon, as well as matching the personal objectives I sought to achieve with the creation of this project. These objectives were as follows - Does the lesson teach students what I intend to teach them? Am I gaining experience and familiarity with designing a course curriculum? Does it appeal and/or motivate students to be involved in the class? Can this project be applied later in my professional career? With these goals outlined, I started researching methods to keep students engaged, case studies on effectiveness of class length in comparison to
student interest, and course design principles. After I finished the preliminary research, I applied the Situational Learning Theory (Nordsby, 2016) to create course material starting with the UI/UX lesson. This was applied to how I incentivized classroom engagement through connecting slide information to students’ prior knowledge. After many revisions and simplifications, an obstacle occurred on how to connect students' prior knowledge to newer knowledge. This was resolved with the discovery of the Teaching Contextually Theory (Crawford, 2001) which worked symbiotically with the Situated Learning Theory (Nordsby, 2016). This helped apply prior knowledge to course work, such as lecture material, homework assignments, and classroom discussions.

Students remember essential information better when connections can be created. In reference to this project, there were components that allowed students to develop these connections. One example was a discussion topic on good user interfaces that enticed opinions and involvement among students. After they have connected with this topic through shared experiences, the lesson then segways into more advanced topics. The lesson posed an additional question further developing this understanding. One way this was showcased was to develop upon the user interface conversation by focusing specifically on what elements made the user interface good. This enabled students to learn good design aspects of user interfaces from games they have played. Using open-ended questions allowed students to debate and converse with each other which in-turn helped them create connections to the lesson.

After the completion of this project, the lesson material created was gauged using the SUNY Online Course Quality Review Rubric (OSCQR). According to this quality assurance test, the lessons have met the standard for 39 out of the 50 exercises. The 11 exercises that were not yet met relate to the class being designed for future use and its premise around the hypothetical. A
majority of these stemmed from the assessment and feedback section. Additional teaching
techniques that were improved upon related to slides, font, phrasing, picture selection, and
course structure assembly. These specific techniques were chosen and learned from research
conducted, as well as The SUNY Online Course Quality Review Rubric (OSCQR).

One unexpected challenge not considered in advance was presentation slide order, as some
concepts cannot be understood without understanding others. To overcome this, the information
presented in each slide was reorganized so that for the most part they could be taught and
understood as separate lessons. This reorganization of material was in line with The SUNY
Online Course Quality Review Rubric (OSCQR) tool mentioned earlier. Some other questions
that came to mind were about the intended formality of this class. For example, how well should
students get to know me? What is allowed in the classroom? How do you create an atmosphere
where students aren’t hesitant to contribute to discussions? On a smaller scale, this tool also
made me aware that the class should be created in a way that aligns with the resources that are
accessible to students. Many of the above questions could not be speculated upon as they require
actual teaching experience to reach an answer. At the end of this project, the outcome was a
success. I met the objectives I sought to achieve and created the lessons based on the theories and
research that were obtained. The only extra objective that I wish I had achieved prior to this
project’s submission would be teaching experience in a classroom.

Conclusion

This project has allowed me to simulate myself as an instructor to create course material,
influence student engagement, and adapt teaching methods. With the completion of this project, I
have increased my progression in becoming a teacher. These are the key takeaways.
Applying theories into the course material facilitates student learning. Using Teaching Contextually, past experiences or existing knowledge is applied to game development topics to promote further proficiency. Building upon this, Situated Learning allowed the transferring of this knowledge between students through collaboration within the classroom. These theories incentivize lessons to be designed around students’ discussions and open-ended questions. The approach to format lessons and assignments in a more adaptable way allows students to complete course material while playing to their passions. The concern about using these theories would be how to get students' involved within discussions. This is a null concern in relation to this game development course as students entering the class are already familiar with video games creating involvement in the class.

Contributing factors that influence student engagement are time, interest, and willingness. Outside of these influences, another method is the implementation of a strong stimulus that can re-engage students, such as a fun group activity. The other solution is to contain the lecture around a ten minute timeframe when the class engagement is at its highest. The opposing viewpoint is that lectures require more time to cover course material. To alleviate this concern, implement breakpoints within the lecture to include open discussion and activities.

Implementing drastically new teaching methods too quickly reduces learning effectiveness. As shown with Gamification, a slow and sequential transition is shown to be more effective. In contrast, this method contains the hurdle of embracing the willingness to change. However, once implemented successfully it can assist with the learning enrichment and interactivity of students.

The teaching profession has many facets that influence the learning environment. The research, techniques, and methods used in this project have helped develop my proficiency in teaching. This work has only reinforced my intentions to become a college-level instructor.
References


OSCQR – the SUNY Online Course Quality Review Rubric. OSCQR SUNY Online Course Quality Review Rubric. (n.d.). https://oscqr.suny.edu/


Using PowerPoint can help you, students to do something, e.g.
