IMGD Graduate Project Proposal

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Overview of Thesis

The intention of the thesis is to research the underlying question of how an interactive game that provides instruction on music theory and musical concepts will perform in comparison to a more traditional method of music instruction. The goal of the thesis is to design an interactive educational quest-based game that will introduce rudimentary musical concepts and music theory principles in an interactive environment. The intention of this educational tool is to administer music instruction through a more relevant medium that will allow untrained students to understand, perform, and compose music.

While this type of project can be applied to other topics in education and instruction, music theory has been chosen due to the general common interest and familiarity of music as well as the level of natural creativity that can be expressed through it. (Webster)

Since the 1980s, technology has played a significant role in music education with the addition of computers, instructional software, and various digital technologies in the classroom. Where tape recorders and grand pianos were once a necessity for musical instruction, interactive technology has begun to replace these tools and to give the instructor and students more ability and resources in the classroom. Music notation software and virtual orchestras, for example,

have allowed students to experiment with concepts such as modality, tempo changes, new instruments, and transposition instantly and easily. The implementation of MIDI (Musical Instrument Digital Interface) and looping software has allowed students to easily create and manipulate music without a vast degree of formal training. (Rudolph)

Other non-traditional approaches to music instruction, such as the Suzuki method, provide a more natural, intuitive step-by-step process that can be easily understood and repeated by the student. Some of the main philosophies of the Suzuki method suggest that students, particularly children, can be educated if placed in a stimulating musical environment. Paired with excellent training, a student will adapt and succeed based on his or her natural rate of understanding. Other concepts that are relevant in this method include what Suzuki calls the "mother-tongue approach" of learning. This approach follows a similar procedure in which children can quickly learn the native tongue of their parents. The concepts involved in Suzuki will be applied in the proposed thesis project, and include exposure, imitation, encouragement, repetition, addition, and refinement. (Barber)

In past studies, using videogames as a means of education has not only been found to be a more preferred method of instruction among students, but it was also found to show a significant increase on the post-test in the area of instruction. It was also shown that more children paid attention in class while using a videogame tool than when not using it. (Rosas et al., 2003) Similar studies have also found that videogames can be used in a formal learning environment to learn about non-mathematical subjects such as geography. These studies showed statistically significant learning gains in students when learning about world continents and countries through a videogame. (Tüzün et al., 2009)

In addition to the development of interactive music instruction, the proposed thesis will compare this method to a traditional method of music instruction. Comparing the results of a series of benchmark drills, the thesis will analyze the data and show whether or not an

both music theory and composition knowledge as compared to traditional music instruction methods.

Statement of Audience

The intention of the thesis is to administer music instruction through a more relevant, digital, and interactive medium that will allow untrained students to better comprehend the theory of music, thus allowing them to express their creativity more quickly. By targeting an audience of untrained students, the thesis intends to test the theory that interactive music instruction may allow students to understand and internalize musical concepts just as well as students trained by traditional methods.

Design of Interactive Method

While the focus of this thesis is not the design of the application itself, but rather the research that will come out of it, the design of this interactive method is critical to the study. This game will be developed as a third-person role-playing game set in a medieval environment using the development engine Unity3D. The literary background of the game involves a world where the performance of music is forbidden, but by the few who are licensed by the Imperium. The amnesic main character begins his journey in Ionia and travels the seven provinces competing in qualifying rounds of the world's celebrated musical tournament. As the game progresses, players will complete quests where they will learn musical concepts such as scales, chords, and progressions while also unlocking instruments, methods of composition, and cooperative AI performance. As the player's skill increases, the quests will begin to integrate more advanced theoretical concepts and performance skills such as sight-reading and composition.

Musical topics covered in the interactive instruction:

❖ Theory
  ○ Notes

- Chords

❖ Listening Skills
  - Interval Identification
  - Chord Quality
  - Harmonic Progression

❖ Performance Skills
  - Sight Reading
  - Collaborative performance

Research Questions to Consider

❖ How is your method differing from traditional methods?

❖ How is your method similar to traditional methods?

❖ What are the advantages and disadvantages of your method?

❖ Will your method allow a student to pursue a future in music theory?

❖ If not, what is the general end-goal of your method?

❖ Are these skills transferrable into a physical instrument?

❖ Are these skills actually providing an education or is it a regurgitation of information?

❖ Are the advantages of using your method worth the drawbacks of it?

❖ How will the game design itself affect the student's ability to learn?

❖ How easily can this method be applied to another area of education?

Design Questions to Consider

❖ Will the controls be intuitive enough that it will ease the learning curve?

❖ Will the controls be too simple that it will hinder learning and creativity? (i.e. push button for hardcoded output)

❖ Will a more immersive storyline and gameplay provide a better learning environment?

❖ Will students not take this game seriously as an instructional method because of its non-

Evaluation of Method

The instructional method will be evaluated using a pre-test and a post-test to determine the general comprehension of musical concepts and theory. Two groups of approximately 35 students with little formal musical training will participate in the experiment. The first group will train using the interactive game method, and the second group will train using traditional music instruction materials and music keyboards. Each group will be given instructional material on the same musical concepts and skills in their respective mediums. Students will be given the materials and asked to complete all given activities and exercises. The completion time of the activities will run approximately 3 hours for both groups. At the beginning of the trial, students from both groups will be given a pre-test to assess their skills and knowledge prior to the study. At the end of the trial, a post-test for skill assessments and outcome will be administered to the two groups and used to measure their understanding of musical concepts and theory. Both the pre-test and post-test will consist of musical activities such as hearing and performing scales, chords, melodies, and chord progressions.

Preliminary Milestone Timeline

April

16th – First proposal submitted to IMGD Steering Committee for comment

23rd – Revised proposal submitted to IMGD Steering Committee for comment

May

12th – Finish all activity events and begin layout design

22nd – Finish traditional method procedures

June

1st – Implement all actions, events, and activities in interactive method

15th – Finish prototype and test all functions

22nd – Complete entire interactive method from start to finish that will be used in trials

July

1st – Revise and optimize methods for full trial

September

1st – Run trials among groups of students

8th – Finish trials and collect data

11th – Finish first draft of report

18th – Revise second draft of report

25th – Finalize written report

October

Prepare for thesis presentation

November - December

Present thesis

Works Cited

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