Detailed Project Proposal

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Defining your Project

1.1 Project title

Help: *a brief statement about what you are actually going to do.*

Bagpipe Music Theory Application

1.2 Background

Help: *Provide the background to your project. This section should highlight the main topics in the area you are going to research. Essentially what is the project about, what has been done before and why is this project important? ~500 words*

This project will cover a wide range of topics within the research and creation of the application. The topics I wish to cover will include but not limited to musical theory and educational applications, how it is created and the effects that it can have on learning new skills. Other topics I wish to discuss include how efficiently people can quickly use a new application to enhance their knowledge of a certain subject, which can be familiar two other applications found on the market. Finally, to create an effective and critical learning application that would revolutionise the bagpipe industry, as currently there are no other learning applications for bagpipe users that would not only be beneficial to all age groups, but also have an effective tool that communities, individuals, and companies could benefit from.

I have already searched for articles that include keywords such as bagpipes, musical theory, learning application, and stimulation within learning new languages or music. From my results, using Google Scholar it was enlightening but also unfortunate that the information I found was not tailored to what I was expecting. There was not as much research ideas and papers I could find I could eventually help me when I am too research into this project. In relation to this application idea, most users can download applications for the music industry or education to learn new languages or learn how to play a new instrument. These applications which I have tested a few, are designed perfectly for their audience as well as being tailored to what I would like this project to eventually become. I've tried and tested around six applications, three of them which were based for learning multiple languages such as Russian and the other three where musical learning applications which included a simple yet fun way to play piano and learn its music. These applications may not work with the bagpipe industry as how there created and designed for is tailored for other means, but this is the perfect steppingstone to start researching into this project.

Within the bagpipe industry, common practise is to teach students face to face or as part of the current circumstances online via zoom calls for example, there are only websites dedicated to learning music which are not just solely focused on bagpipes and therefore, are not reaching the required attention it deserves. One desktop programme known as Bagpipe Music Writer which was created in 1999 it's still being used to this day by most bagpipers only four creating music, playing music, and sharing music. This outdated software which has been passed down for example with myself my dad passed down all his music and the application to me, as this was the only effective way since the application is too expensive and too complicated to use. This means having a mobile friendly application backed by industry would be revolutionised and therefore will effectively help users learned the hardest part about learning the bagpipes, musical theory.

1.3 Motivation

Help: *To whom is this project important? A project must address a question/problem that generates a small piece of new knowledge/solution. This new knowledge/solution must be important to a named group or to a specific client (such as a company, an academic audience, policy makers, people with disabilities) to make it worthwhile carrying out. This is the* ***motivation*** *for your project. In this section you should address who will benefit from your findings and how they will benefit. ~300 words*

Example 1: If you intend to demonstrate that a mobile application that automates class registers at RGU will be more efficient than paper-based registers - the group who would be interested in knowing/applying these findings would be both academic and administrative staff at RGU and they would benefit by time saved and a reduction in their administrative workload.

Example 2: You are demonstrating that a particular 3D model design increases realism in 3D environments. The group that would be interested would be games designers or developers of 3D virtual environment applications. The would benefit from producing more realistic environments that could increase sales of their products.

Example 3: You have designed a new network topology for IrishOil plc's new Aberdeen headquarters. The interested group would clearly be IrishOil. They would benefit from easier maintenance and improved security of their computer network.

Since my project is to create a bagpipe musical theory application, this motivation behind it would be based on both my experiences as a bagpiper and teacher, as well as the point of view from past and current students. This new application would be a pioneer for the industry as currently musical theory only gets taught 1on1 with the instructor and has been passed down through common knowledge and books, with the new trends of online learning, the bagpipe industry is far behind. For example, I teach students normally on a weekly basis, hands on in a classroom or at my own home, easy to teach musical theory as it is easier in person to describe methods and show case them. However, when the COVID pandemic hit, all classes moved online and with the limitations from Wi-Fi to not being able to send and show correct ways the number of students interested in bagpipes has decreased. I was teaching 6 students, now I am only teaching 1, that was because the lack of motivation to learn online and having no other easily accessible tool to learn from online.

However, in the mobile stores there are countless learning applications for piano, guitar, languages etc. For teaching any musical instrument there is always musical theory and teaching it to new learners especially children has been a challenge as it is not as exciting as playing an instrument. Therefore, if there was an easy to use and fun application related to the current applications on the apple store or google play store for example, then this would kickstart the industry, to help new and occurring students. I have personally asked my local band, other bagpipe instructors and students if could think of a new way to help new students learn and they said new online tools, on the go applications and learning techniques would be vital to the way instructors teach today.

1.4 Aim & Objectives

Help: *Outline what are the main things your project is going to do and what steps or milestones will be used to achieve this aim. The Aim is unlikely to change throughout your project; however, the objectives are likely to adapt to your ongoing research and development. In particular it is highly likely that you may wish to split objectives into sub-objectives as work progresses. A good clear set of objectives give you something to evaluate your final project against.*

Example : For the timetable app outlined above
Aim: To create a functioning attendance application that efficiently automates the taking of class registers.
Objective 1: study existing register system in place at RGU and identify weaknesses
Objective 2: research existing automation technology's and identify and evaluate those that may be appropriate to taking in class registers
Objective 3: Implement chosen technologies to create prototype application
Objective 4: Conduct user trials to evaluate capabilities of prototype application
Objective 5: Create a refined application incorporating feedback from user trials

The aim of this project is to create a prototype bagpipe musical theory application which will allow users to effectively learn new techniques that will help their overall learning.

Objective 1: study existing applications within the music learning sector and study its strengths and weaknesses

Objective 2: research new techniques to revolutionise learning through an application, and evaluate these findings

Objective 3: Create a prototype design of the application based on current design trends

Objective 4: Implement prototype design by creating the application through Unity

Objective 5: Test the application prototype to evaluate strengths and weakness, improve accordingly. Using Black Box and White Box users.

Objective 6: Update application from feedback where necessary

Objective 7: Document any changes necessary or upgrades of application that could not be completed during project timeline if any.

1.5 Key Techniques

Help: *Perform some initial research into the area and outline what techniques you my research in further detail here. The techniques you cover here should include references to the papers where you have sourced the information. The techniques mentioned here are very likely to become the section headers in your literature review.*

When researching bagpipe musical theory techniques this was limited as not much research has been explored within the side of bagpipe and musical theory as it is quite common to learn musical theory in conjunction to learning it through normal music classes. However, some students won't be fortunate to have both, therefore I will be using the techniques I have personally learnt throughout my time teaching as well as basic techniques for learning musical theory from the following:

Mind training and Ear Training - Rogers, M. R. (2004) Teaching approaches in Music Theory [Online] Southern Illinois University Press, Carbondale. Available at: https://books.google.co.uk/books?hl=en&lr=&id=juFwS5HI0hsC&oi=fnd&pg=PA3&dq=key+techniques+to+learning+musical+theory&ots=sbrppo9cYV&sig=sod_Bzmeac3SVAicICGdjJlaQeE&redir_esc=y#v=onepage&q=key%20techniques%20to%20learning%20musical%20theory&f=false [Accessed: 8th October 2021]

Computer Assisted Music Analysis - Gross, D. (1984) Computer Applications to Music Theory: A Retrospective [Online] The MIT Press. Available at: https://www.jstor.org/stable/3679774 (Accessed: 8th October 2021)

Mathematical Music Theory - Aceff-Sanchez, F. Agustin-Aquino, O. A. Plessis, J. D. Lluis-Puebla, E. Montiel, M. (2012) *An Introduction to Group Theory with applications to Mathematical Music Theory* Available at: https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.359.3934&rep=rep1&type=pdf (Accessed: 8th October 2021)

Recalling and performing/writing - Hess, L. M. (2011) Learning in a musical key [Online] Eugene, OR:Pickwick Productions. Available at: https://books.google.co.uk/books?hl=en&lr=&id=oLRMAwAAQBAJ&oi=fnd&pg=PR9&dq=key+techniques+to+learning+musical+theory&ots=hGe5-Elee5&sig=jCv2up8Sk7agiqBylgaDYM6Eaq0&redir_esc=y#v=onepage&q&f=false (Accessed: 8th October 2021)

1.6 Legal, Social, Ethical, Professional and Security issues

Help: *Here you should discuss any legal, social, profession and security issues that you believe may occur during the course of your project. It is not acceptable to write none in this box, all projects, regardless of focus will have to address issues in one, or more, of these categories. This is an extremely important part of your honours project to which there is no correct answer, this section must be fully discussed with your Honours Supervisor.*

Example 1 : In the class register example above – there would be a Legal and Security issue with the gathering and storage of student data. There may be a social constraint as you may be relying on a user to have access to a specific technology. There will need to be consideration of user accessibility.

Example 2 : A 3D model design may have ethical considerations in its evaluation. What if your model made users feel nauseous. Social constrains may again be access to technology or accessibility issues.

Example 3 : You network design need to adhere to specific company policies. You would need to consider the possibility that your design could be wrong, compromising the company's security.

With this project, there may be some issues regarding professional and security issues as well as social issues. Regarding using the application with all age's groups, the content must be acceptable and accessible to the age groups when creating and maintaining the application since the youngest can be 8 years old who could potentially use the app. The prototype will come with a sign in feature either using google or alternative sign in feature. Therefore, measure will need to be in place to stop children from using the applications without a parent's permission. For testing purposes consent forms will be created. Other issues could involve using the application with other companies and bagpipe bands who wish to use it for their own teaching. Policies will need to be made and designs are compatible with the current bagpipe design trends and not clash with already on-going applications or bands.

1.7 Project Plan

Help: *This is the project plan as to how you will go about achieving the objectives of the project.*

Example: In the class register example above the research plan may involve:
Collecting and analysing paper-based registers in a given class on five occasions.
Identifying the error rate average on these occasions
Researching existing automation techniques
Designing and implementing a mobile application that automatically records attendance in class.
Deploying the application in the class on five occasions.
Identifying the error rate average of the mobile application on these occasions.
Comparison of data and summary of findings.

Collect data on learning applications and create a document on comparing its weaknesses and strengths to incorporate into the project.

Identify new techniques in creating applications for learning and study current design trends.

Create multiple designs and prototypes to create a well-suited design for the application based on leading market research. Using Adobe XD.

Create all key elements needed to create the application including sound, logos, music notation etc

Research current techniques used to create learning applications and teach a user.

Implement designs for the application using Unity 2D

Test the application with real users, then analyse and document findings

Create documentation based on finding of the overall project, noting what happened, results and evaluation.

1.8 Ethics Form

You must include in your signed ethics form in this submission or you will not be able to continue the project.