

Initial Plan

Teaching Cyber Security and Forensic Concepts Through
Game-Based Learning

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Module Title: One Semester Individual Project

Module Code: CM3203

Project Description

Through this project, I will be creating games to teach concepts about Cyber Security and Forensics to children of a certain age group. [1] A problem for some pupils is they can lack interest in things and this can affect their ability to concentrate which itself will affect their ability to take in information. This project will try to solve this problem by making learning as fun and interesting as possible by applying game-based learning theory using interactive games.

[2] Hands on learning is very important for a pupil to take on board what they are being taught. With this in mind, I will be developing these games to be very interactive for pupils to engage with and also put their knowledge to the test. The games will be aimed at a particular age group, which will be decided through research, and will accompany classroom resources such as PowerPoints, schemes of work and lesson plans. The main aim for the games will be to give information and also challenge the pupils on that information. As hands on learning is an important way for children to learn, this will be a key focus during the planning and development stages for the games.

Initially I will spend time researching to gather information about the different Security and Forensic concepts as well as the current Welsh school curriculum. This will give me an understanding of what pupils currently learn about and if there are any links to be made with concepts. This will also help select an appropriate age group to aim the games at ensuring they are in line with their current curriculum. Research into game based learning will help give an understanding about what is currently being used and will also show what methods and features are popular to use in the games. I will spend time researching the constraints this project will face and take time to identify any solutions to these.

From the initially research I will derive the requirements for the games and what I need to cover and include. I will use storyboarding and brainstorming to form part of the design for the games and their layout. During this time I will also decide what approach is most appropriate, such as if the games should be all separate focusing on different concepts or if it should be a single run through game that contains different levels and concepts. This stage will also involve the development of characters that will be included in the games and the role they will play. The building of the game will be based on the ideas and the plan developed and will involve a lot of testing and problem solving to ensure the games are of a high standard. A constraint during this stage will be the game platform used and if it allows all the features I require. Researching alternative game creation platforms will give me a choice of various platforms to use and I can use my game plan to select the most appropriate.

I plan to use a focus group to test the games and to check if it meets the goal of the project. To test this I will decide on a method, such as a questionnaire, before and after playing the games to identify if the understanding of the covered concepts has been reached.

Ethics

After a discussion with my supervisor, I will be undertaking the ethics training. As I will be requiring participation from pupils through a focus group and possibly questionnaires, I will be applying for ethics approval.

Aims and Objectives

The main aim of the project is:

- To produce interactive and informative games to get pupils engaged and enjoy learning different Security and Forensic concepts.
 - The games will target an age group of school age
 - Will relate to sections of the Welsh school curriculum
 - Will be supported with learning resources
 - Will teach children about the concepts and test their understanding

To achieve this aim, I will complete the following objectives:

- Research concepts and the Welsh school curriculum to identify any linked topics to the concepts.
 - To be done before any game development takes place
 - Create a detailed collection of researched material to rely on during the follow stages of the project
 - Keep detailed and accurate records of where information has come from
 - Create links between Security and Forensic concepts and the Welsh school curriculum
 - Identify an age group to create the games for
- Identify constraints which I will face and research appropriate solutions to overcome these.
- Develop a storyboard to visualize a start to finish of how the games will run and to link with character development.
 - Storyboard will highlight when each concept is utilized
 - Will show format of the games
 - Clear characters developed
 - Map game design to curriculum goals
- Research and select the best appropriate game platform that allows me to create the games with the features and content I have planned without constraints.
 - Based on features highlighted during storyboarding
 - Platform will allow restriction free game development
- Develop the working games on the chosen platform
 - Should link in closely with the storyboard and research
 - All features should work as expected
- Develop classroom resources to accompany the games.
 - Produce a PowerPoint for classroom use and text documents
 - These documents will be clear and informative
- Use a focus group to test the games meet the aim
 - Age of the focus group will be decided during the research stage

- Their understanding of the concepts will be tested before and after playing the games
- Research a method to use that will test the success of the focus groups understanding of the Security and Forensic concepts through game-based learning
 - Method will have been researched and developed
 - Questions will be clear and allow analysis of results
- Meet with my supervisor regularly to keep them up to date and ensure I am on schedule
 - A weekly meeting to go over that week's objectives
 - Discuss objectives for the following week

Work Plan

I will separate the stages of the project and assign them to selected weeks. During those weeks, I will focus on the assigned stage and aim to meet the objectives I have set myself. In the table below, it outlines the weeks and what the objectives are for those weeks. The table is followed by a Gantt Chart highlighting the main objectives and the weeks for their completion.

Week	Objectives
1	<ul style="list-style-type: none"> ● Create initial plan ● Submit initial plan ● Meet with supervisor
2 – 3	<ul style="list-style-type: none"> ● Research the key areas: <ul style="list-style-type: none"> ○ Game based learning theory ○ Security and Forensic concepts ○ Targeted age group ○ Requirements for the games ○ Welsh school curriculum ● Ensure research is complete to be used in next stage ● Complete and submit ethics form with documentation for approval ● Meet with supervisor in week 2 and discuss research goals ● Meet with supervisor in week 3 and show research results and conclusions
4	<ul style="list-style-type: none"> ● Focus on planning the games themselves ● Develop a storyboard ● Identify features for the games ● Decide how the user will interact ● Decide on the layout of the games and levels ● Character development ● Research game creation platforms ● Map game design to curriculum goals ● Develop way of analysing if games successfully put concepts across (e.g. questionnaire) ● Start to organise the focus group

	<ul style="list-style-type: none"> Meet with supervisor to show storyboard and game layout and also discuss focus group analysis method
5 - 8	<ul style="list-style-type: none"> Develop the games Refer to plan Test games after each major stage is completed Create the classroom resources Meet with supervisor in weeks 5, 6 and 7 to discuss and show progress Meet with supervisor in week 8 to go over plan for Easter break and what I aim to have completed by week 9
Easter Break (3 weeks)	<ul style="list-style-type: none"> Continue with game development Towards the end of Easter have a complete working games Finish testing and complete a full run through of the games with supporting documentation
9	<ul style="list-style-type: none"> Test the games with a focus group Meet with supervisor to discuss results from the focus group
10	<ul style="list-style-type: none"> Analyse the feedback Make appropriate changes Meet with supervisor to review final games and resources and any final details or features needed
11 – 12	<ul style="list-style-type: none"> Write final report Submit final report Meet with supervisor during these two weeks to discuss progress of final report

Gantt Chart

	Week 1 01/02/2021	Week 2 08/02/2021	Week 3 15/02/2021	Week 4 22/02/2021	Week 5 01/03/2021	Week 6 08/03/2021	Week 7 15/03/2021	Week 8 22/03/2021	Easter 29/03/2021	Easter 05/04/2021	Easter 12/04/2021	Week 9 19/04/2021	Week 10 26/04/2021	Week 11 03/05/2021	Week 12 10/05/2021
Tasks															
Write and submit initial report	█														
Research key areas		█	█												
Complete and submit ethics approval form			█												
Develop focus group analysis method				█											
Decide on game layout				█											
Research game creation platforms				█											
Game storyboarding and brainstorming				█											
Character development				█											
Start to organise the focus group				█	█										
Develop the game				█	█	█	█	█	█	█	█	█	█		
Regular testing of the game				█	█	█	█	█	█	█	█	█	█		
Develop classroom resources				█	█	█	█	█	█	█	█	█	█		
Focus group game testing													█		
Analyse focus group feedback														█	
Implement game improvements from feedback														█	
Write and submit final report															█

Risk Assessment and Mitigation

Description of Risk	Impact on Project	Probability of Occurring	Mitigation Strategies
Covid-19 – Affect on working arrangements	High	High	Keep up to date with latest news but I will work towards everything being

			online such as the focus group and supervisor meetings.
Covid-19 - Illness	High	Low	To avoid illness, I will ensure I continue to keep following government guidelines and social distancing rules. If I do become unwell during the project, I will inform my supervisor as soon as I can.
Declining mental health – becoming mentally drained from stress and limited ability to leave the house due to Covid-19	Medium	Medium	I will take breaks regularly and use time during the Easter break to reduce stress and relax.
Loss of work due to computer system issues	High	Low	All documents created on my computer are automatically uploaded to my OneDrive that can be recovered on another system. I will also save documents to an external hard drive.
Running out of time to complete the project	High	Low	My work plan has been set out to allow enough time for each task. I will stick to the work plan and review tasks to be completed daily to make sure I don't fall behind.
Focus group issues – unable to gather a group of pupils	High	Medium	I will start to arrange the focus group early on and look into any contacts I have made from my placement last year. I will also ask my supervisor if they have any contacts.

References

[1] Accessed on 06/02/2021

What are the Reasons for Concentration Problem in a Child. FirstCry Parenting. M. (2020, December 2). <https://parenting.firstcry.com/articles/what-are-the-reasons-of-concentration-problem-in-a-child/>

[2] Accessed on 06/02/2021

The importance of hands-on learning in education. Building 4 Education. (2018, February 1). <https://b4ed.com/Article/the-importance-of-hands-on-learning-in-education-1517310607>