

Initial plan

Using Minecraft for Education to Teach about the Impact of Rising Sea Levels on Welsh Coastal Regions

CM3203 – One Semester Individual project | 40 Credits

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1.1 Project Description:

Climate change has produced several changes and challenges to the environment, with rising sea levels being one of the largest problems. Wales is not exempt from this, with predictions that several areas including Cardiff, Newport, Swansea, and Port Talbot will highly likely face devastating flooding before 2050 (Climate Central 2020). Rising sea levels pose and “exacerbate flood risk and coastal erosion” (Buser 2020). It is said that in England and Wales, 28% of the coastline is undergoing erosion at more than 10cm per year (Masselink et al. 2020). Therefore, it is essential to produce sufficient coastal defences and interventions to protect these areas near the coast from the impact of rising sea levels. This can involve several techniques from “building artificial structures” to a “more sustainable and natural approach” (BBC Bitesize [no date]).

The Wales Coastal Monitoring Centre (WCMC) is a government funded organisation which looks to monitor the coastlines of Wales, focusing on flood risk, coastal erosion, and coastal defences. One of the organisation’s key focuses is on education, using tools and resources and introducing curriculum to teach young people about climate change and coastal regions. They are currently developing a lesson series to be delivered to primary schools across Wales to further share and promote the impact of rising sea levels on Welsh coastal regions. Specifically, I plan to support the lesson series by using an educational game.

Games within non-game contexts, such as education (also known as ‘gamification’/game-based learning theory), is said to be linked to “motivation”, “academic achievement and engagement” and “cognitive learning” (Krath, Schürmann, Von Korflesch 2021). The idea being that features of games can benefit and positively impact students in their learning. This includes features such as “freedom to fail”, “rapid feedback”, “progression” and “storytelling” (Stott and Neustaedter 2013), which could all be used to back up lesson series.

Specifically, I will be using the game, Minecraft for Education. The commercial game, Minecraft, was released in 2011 and gained popularity, particularly among young people. However, unlike games of its time, it continued with its popularity to the present day with its varying updates and attractive sandbox nature. Sandbox being a word to describe “big, open” worlds with a “high degree of freedom” (Ocio and Brugos 2009), in which users are freely allowed to interact with blocks and items within the game. This led to release of Minecraft for Education in 2016 (a game-based learning resource), a safe space for educators to utilise the freedom and sandbox nature of the game to develop worlds which consolidate various areas of curriculum. The popularity of the base game among young people enhances this “engagement” (Krath, Schürmann, Von Korflesch 2021).

Therefore, I plan to use Minecraft for Education to enable students to build their own coastal defences to protect a village within the game, to educate on rising sea levels, coastal erosion and coastal defences. In addition, this can be accompanied by Scheme of Works, Lesson Plans and workbooks to establish the connection between the game interaction and curriculum provided by the Welsh Coastal Monitoring Centre.

2.1 Project Aims:

- Create a resource using Minecraft Education to teach young people the impact of rising sea levels, coastal erosion and how this can be tackled with coastal defences

2.2 Project Objectives:

- Stage 1: Plan
 - Gather basic research on the impact of rising sea levels on Welsh coasts, game-based learning theory and Minecraft Education
 - Produce a Project description
 - Produce Aims and Objectives for the project
 - Produce a Work Plan and Risk Assessment
 - Produce Ethical approval statement
- Stage 2: Research:
 - Gather research on the impact of rising sea levels on Welsh coasts
 - Gather research on game-based learning theory
 - Gather research on Minecraft Education
 - Design surveys to gather preferences and suggestions regarding game-based learning and educational resources
 - Apply for ethical review using the Ethical approval form (for surveys and focus groups)
 - Write up the background section of the report using the research
- Stage 3: Design
 - Establish functional and non-functional user requirements
 - Establish minimum viable product (MVP)
 - Establish test cases
 - Distribute surveys to gather preferences and suggestions regarding game-based learning and educational resources (with ethical approval)
 - Use research to aid in the design of the Minecraft Education world
 - Use research to aid in the design of the additional education resources (scheme of works, lesson plans and workbooks)
 - Write up the design section of the report
- Stage 4: Implementation
 - Use the design to implement this Minecraft Education World within the game
 - Use the design to implement the additional education resources (scheme of works, lesson plans and workbooks)
 - Write up the implementation section of the report
- Stage 5: Results and evaluation
 - Run testing to ensure minimisation of problems and bugs
 - Using a focus group, gather opinions and test the Minecraft Education world and additional educational resources (scheme of works, lesson plans and workbooks)
 - Make changes depending on test results and focus group evaluations

- Write up the results and evaluation section of the report based upon testing and focus groups
- Stage 6: Future work
 - Gather research on areas which could be developed
 - Write up the future work section of the report
- Stage 7: Conclusions
 - Write up the conclusions based upon comparisons and links between research, design, implementation, results, evaluation, and future work
- Stage 8: Reflection on learning:
 - Write up the reflection section of the report based upon the skills and knowledge developed through the project
- Stage 9: Write up
 - Write up supporting information in the report, including title, abstract, acknowledgements, contents, figures, glossary, abbreviations, appendices, references

3.1 Work Plan:

Week	Dates	Deliverables	Documentation	Milestone
1	31 st Jan – 4 th Feb	Supervisor meeting to discuss the initial plan and to consolidate understanding of aims and objectives Background research for the initial plan	Initial project plan	Initial project plan submitted
2	7 th Feb – 11 th Feb	Supervisor meeting to discuss research areas Continue background research with focus on the impact of rising sea levels on Welsh coasts, game-based learning theory and Minecraft for Education (McEdu) Submit ethical approval form for the survey and focus groups Design the surveys to obtain preferences and	Write up background research for the impact of rising sea levels on Welsh coasts, game-based learning theory and McEdu Write up ethical approval plans into the research section	Background research completed and documented Ethical approval form submitted

		suggestions related to game-based learning and educational resources		
3	14 th Feb – 18 th Feb	<p>Supervisor meeting to discuss design of the McEdu world resource, requirements, minimum viable product (MVP) and test cases</p> <p>Begin brainstorming design of the McEdu world from the research</p>	<p>Write up ideas for the design of the McEdu world</p> <p>Write up requirements, MVP, and test cases</p>	Design for Minecraft for Education world documented (including requirements, MVP, and test cases)
4	21 st Feb – 25 th Feb	<p>Supervisor meeting to discuss design of the additional education resources (scheme of works, lesson plans and workbooks) – Supervisor review of design</p> <p>Begin brainstorming design of the additional education resources (schemes of works, lesson plans and workbooks) from the research</p> <p>Release surveys made in week 2 (once gained ethical approval)</p>	<p>Write up ideas for the design of the additional educational resources</p> <p>Write up responses gained from the surveys</p>	<p>Design for additional education resources documented (including survey responses)</p> <p>Design for project completed</p>
5	28 th Feb – 4 th March	<p>Supervisor meeting to discuss implementation of the McEdu world</p> <p>Using research and documentation gained in the design section, start the implementation of the McEdu world</p>	Write up implementation progress of the McEdu world	Basic implementation of McEdu world documented

6	7 th March – 11 th March	<p>Supervisor meeting to discuss progress on the implementation of the McEdu world</p> <p>Continue developing on the implementation started in week 5</p>	Write up implementation progress of the McEdu world	Implementation of McEdu world documented
7	14 th March – 18 th March	<p>Supervisor meeting to discuss implementation of additional education resources (schemes of works, lesson plans and workbooks), based upon the research and designs</p> <p>Implement the additional educational resources (schemes of works, lesson plans and workbooks),</p>	Write up implementation progress of the additional educational resources (schemes of works, lesson plans and workbooks)	<p>Implementation of additional educational resources documented</p> <p>Implementation completed</p>
8	21 st March – 25 th March	<p>Supervisor meeting to discuss results and evaluation of the McEdu world and additional educational resources – Supervisor review of implementation</p> <p>Conduct testing based on test cases documented in week 3</p> <p>Conduct focus groups (with ethical approval) to test the game with young people</p> <p>Evaluate the results in relation the requirements and MVP</p>	Write up the results and evaluation based on test cases, focus groups, requirements, and MVP	Results and evaluation documented

9	28 th March – 1 st April	<p>Supervisor meeting to discuss future work and conclusions</p> <p>Research areas which result indicated improvement needed to develop the work in the future</p> <p>Link the design, implementation, results and evaluation and future work to create a conclusion</p>	Write up future work possibilities and conclusions of the project as a whole	Future work and Conclusions documented
Easter break	4 th April – 22 nd April	-	-	-
10	25 th April – 29 th April	<p>Supervisor meeting to discuss reflection on learning</p> <p>Evaluate the skills and knowledge developed from doing the project</p>	Write up reflection on learning	Reflection on learning documented
11	2 nd May – 6 th May	<p>Supervisor meeting to discuss any missing details and design of the report (title, abstract, acknowledgements, contents, figures, glossary, abbreviations, appendices, references)</p> <p>Collate the report to be presentable</p>	Write up missing details and format the design of the report	Report finalised
12	9 th May – 13 th May	<p>Supervisor meeting to discuss submitting the project and report upon completion</p> <p>Submit the project</p>	Write up final details to submit	Report and project submitted

3.2 Risk assessment:

Risk register: Key [1 = Low risk/5 = High risk]

ID	Risk	Risk Type	Likelihood	Impact	Total (likelihood * impact)	Mitigation response
1	Illness/unforeseeable circumstances	Social	4	3	12	Apply for extenuating circumstances
2	Personal computer may stop working	Technical	2	4	8	Use library computers/ loan laptop from the university
3	Work loss	Technical	3	5	15	Ensure work is backed up onto my OneDrive cloud account to prevent work loss
4	GDPR breach with survey/focus groups	Ethical and Legal	2	5	10	Complete the research integrity course and complete ethical approval form
5	Minimal surveys responses/ members of focus group	Social	3	4	12	Widen survey/focus group target area
6	Bias/ lying on surveys/ focus groups	Social and Ethical	3	4	12	Avoid personal questions in which people are likely to be dishonest in response
7	Minecraft Education World doesn't work on some devices	Technical	2	5	10	Regular and extensive testing of the Minecraft for Education world on multiple devices

8	Minecraft Education World has a bug	Technical	2	4	8	Regular and extensive testing of the Minecraft for Education world
9	User is not interested in the resources	Social	2	5	10	Make use of the surveys and focus groups to ensure the project fulfils the user and client's requirements

4.1 Ethics:

When undertaking a project, ethic approval is essential to consider. Ethical review is required for proposals involving human participation. In relation to my project, I intend to undertake surveys to gather preferences and desired characteristics for the Minecraft for Education world and additional teaching resources. I also intend to utilise focus groups for the testing of the Minecraft for Education world and additional teaching resources. Since both surveys and focus groups require human participation, I will need ethical approval. I have already undertaken the Research Integrity Online Training

Programme (shown in Figure 1). Therefore, I intend to complete the Ethical approval forms for the surveys and focus groups of data collection involving humans. This is to ensure the project is undertaken in an ethically sound manner.

Research and Innovation Services

This is to certify that

Chilli Goodman

has successfully completed

Research Integrity Training (Student)

on

19 October 2020

Figure 1 - Research Integrity Online Training Programme completion certificate

5.1 References:

- BBC Bitesize. [No date]. *Coastal Management – Hard engineering strategies – advantages and disadvantages*. Available at: <https://www.bbc.co.uk/bitesize/guides/z2234j6/revision/1> [Accessed: 04/02/2022]
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