

Concept Proposal

Team - Lost at Sea

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Introduction

The Coronavirus pandemic has forced global experimentation and shifted education to focus on its online opportunities. This is especially geared towards the potential of online learning for High School and University students. Each teammate contributing to this project researched unique domains, and all members voted on the specific domain of online learning in the context of COVID-19 geared towards High School and University students. This project intends to try to evoke people's awareness of the potential of online social learning and the tools which community-driven education software can provide. This is a very real human issue at stake and will require considered design and technological approaches. Applying tools learnt in the DECO3500 course, a social and emotional context is required to understand the domain space. Our initial idea is to create an online system which can focus on community-driven education and competition to provide a unique learning experience for users. This will require extensive design requirements and user testing to be successful. Refer to the Plan of Work for more details.

Domain Space

COVID-19 has changed how we work and interact with the people around us. With the sudden lockdown, we suddenly find ourselves in a position where we have to work at home. This is an extremely foreign and new way of working for most of us. Very few online materials guide us on how to perform in this novel environment.

In this proposal, we will focus on the domain of online learning (more specifically, coding/programming) and would like to find out how effective online learning is compared to someone who studied in person in a school or university. Our target audience for this proposal is geared toward High School Graduates and University Students. During the 2020-2021 global COVID-19 lockdown, many students' first encounters with coding/programming are done online.

From the paper published by Ada S. Kim [1], online coding platforms are becoming very popular in recent years, and there is little knowledge of their quality and effectiveness in teaching core programming principles. After analysing 30 platforms, the result suggests that most online coding platforms are still immature and do not achieve some key principles in learning the topic. Several developments are needed to show evidence that it achieves proper learning outcomes. The main problem with these online platforms is that there is very little feedback given to students. Moreover, the main structure for many of these learning platforms is to teach concepts in multiple series of checkpoints. Not much evidence shows that students fully grasp the material after these checkpoints.

Universities started to roll out dedicated platforms similar to some of the platforms discussed in the paper [1], retrofitting them with more traditional university teaching methods adapted to be delivered online. In this case, University lecturers and teaching staff help students with the learning process, filling up the problems outlined earlier by online learning platforms. However, the issues now shift towards the learning experience of fully remote and internal on-campus students. Internal students have access to a wide range of university infrastructure, including but not exclusive to face-to-face learning with lecturers and teaching staff, study bubbles with fellow peers and generally a richer learning environment.

Design Opportunity

There are a couple of design opportunities we can explore with this project. Moving forward, we intend to work on enhancing the remote learning experience for students who study primarily online. We would focus on several social shortcomings of remote learning to achieve this. Our intention with this concept is to function in two contexts; A self-taught student is learning coding online; A university student is studying remotely. Most online learning platforms are typically not social and get students to solve programming problems on their own (more specifically: actual hands-on coding exercises).

Pulling from the paper by D. Coetzee, the data shows some benefits in a group discussion when solving difficult problems. The research indicates that people in groups score higher than an individual effort using the methods found in the paper. [2] To further enhance cross-collaboration and knowledge sharing, we could teach students methods of sharing programming strategies from the paper by Maryam Arab. [3]. With the concepts from these two papers, the idea for our concept is to create an online platform. Instead of a series of coding checkpoints where students work alone to solve coding challenges, we intentionally make questions hard to solve alone. We would bring students together to discuss and share specific programming strategies.

This would serve as a backbone for our eventual concept/prototypes after a research round outlining user requirements and specific pain points.

Plan of Work

In the first couple of weeks we will be doing the first phase of our project, which starts with research on the domain space and how to best approach the problems and solutions that will come up. Then, it will be continued by defining the design requirements and creating user stories that are relevant to the project. After the user stories have been made we will then continue by making the wireframe for our prototype.

The next phase is prototyping and initial evaluation of our work. It will take place just before the break, we will conduct user testing for the wireframe that we have created and make adjustments according to the feedback if necessary. With the feedback that we have received and the wireframe that we have created, we will continue the work by making the prototype for the product.

Phase three will be focused on testing and evaluating the prototype, we will start the user testing on the prototype that we have done. While doing that we will also start writing the documentation of the project on GitHub, while also reiterating and adjusting our prototype from the feedback that we have received from the user testing. This phase will end by finalising our prototype.

The last phase will be focused on finalising everything and preparing the documentation and the presentation that we will be doing at the exhibition. This phase has some overlap with the previous phase since the iteration and finalisation of the prototype will still be happening while we are preparing for the presentation. We will also make the poster that will be presented at the exhibition in this phase.

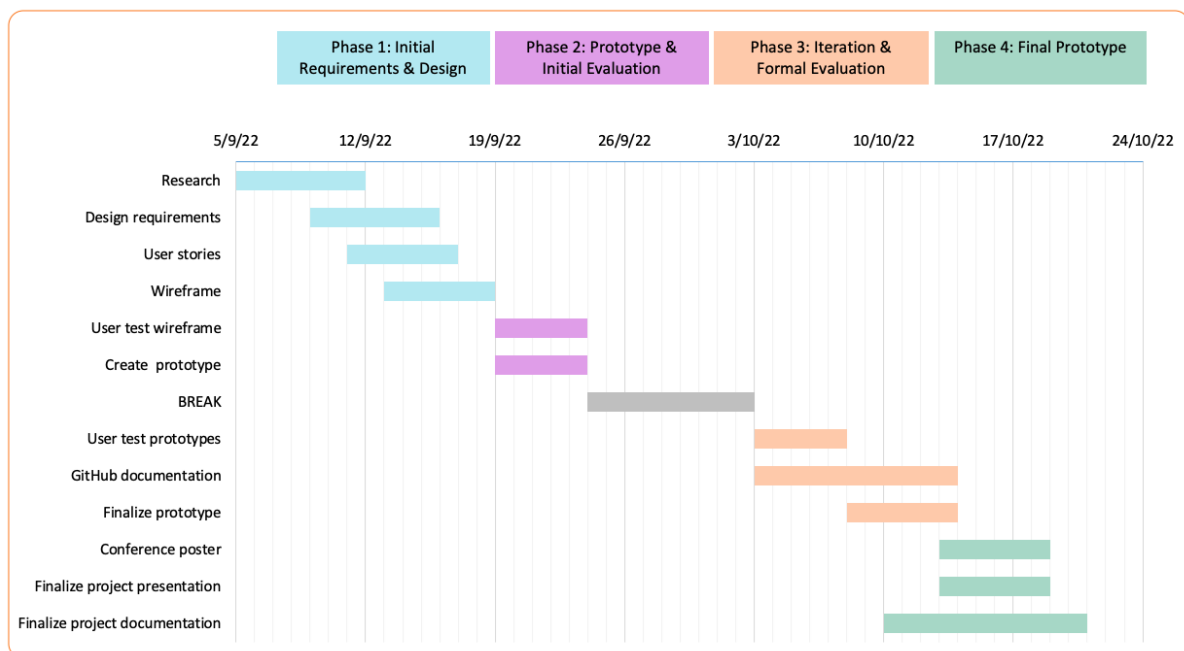


Figure 1: A Gantt Chart representing the divided work process involved with the project.

Team Challenges

Our project team consists of different academic and cultural backgrounds. This could prove to be incredibly beneficial to the project as it will give the project breadth through different perspectives. A potential challenge that was identified was the difference in cultural backgrounds of each team member which could lead to inefficient communication within the team. This obstacle will be overcome through reflective analysis on the team communication each week during the studios and meetings. If a team member is missing or not present for more than a week, steps will be taken to solve the problem. See more in the Team Charter. Other team challenges have been identified in the team charter with potential solutions to each problem. The most significant and final solution to problems with team communication is to rely on the experience and professionalism of the tutors in DECO3500. Another significant team challenge identified was the limited amount of time available on research into the domain. A substantial amount of research is needed to provide depth to the problem space and solution. Each team member has limited time to work on the project and must allocate a time to complete the weekly tasks given. As shown in the team charter, a weekly meeting with compulsory attendance will force each member to contribute equally and fairly to the project. Regarding the time efficiency, the goal of the project is to complete everything a week before the due date which will give time for any error correction, drafting and in-depth reflection.

Each team member identified a strength and weakness the team had when solving the chosen problem space, see table 1.

Team Strengths:

- A broad **background diversity** with each team member will provide a unique perspective during the research and design process.
- A fair and reasonable **time requirement** has been agreed upon by each team member. This will lead to consistent labour and hopefully, a finished low fidelity prototype.
- The team is **flexible** with only four members and will allow for quick pivots in ideation and design process.
- A **motivated** atmosphere is present within the group with all members aiming to achieve a product ready for the exhibition.
- A clear outline of the project's requirements and design gives the team a **clear finish line** to work towards.

Team Weaknesses:

- The team can have **inefficient communication** through Facebook messenger (chosen instant messaging platform).
- The **limited time** for the project to be completed does not give much for in-depth

research.

- Clashing **schedules and busy lives** also limits the time available to work on the project.
- **Inexperience with the actual course content**, assessment and goals might lead some members to require more to catch up.
- Finding impartial data and providing effective user testing for the product.

Individual Challenges

Ida Green Heglund

Studies Computer Engineering at NTNU, is currently at UQ on exchange. Having worked in teams on big application projects before, I believe I can be an attribute in knowing what needs to be done and when. Other strengths include being organised and efficient, which can help avoid unnecessary work. Weaknesses include not having had a DECO course before, and I am therefore a bit unsure about the scope of the course, what is required and layout of the final prototype. I hope to achieve a better understanding of what technologies can help improve education. I am also hoping to make a prototype that serves its purpose, and can be seen as a functional and good solution to the problem space described.

James McAuley

Studies Software Engineering at UQ. I am extremely interested in learning the design thought process and contributing what I can to produce a product for the exhibition. My strengths include working in a software focused professional workplace already and thus having experience with the team based product process. I also have experience with UX design and machine learning code which both have been fleshed out with the recent completion of my thesis. I definitely lack experience with the design thought process and what steps are involved into creating a product from an idea. For work, I usually get given ideas, a plan and a due date to complete the product (or section of code). I hope to achieve a working initial prototype which can be clearly shown in the exhibition for DECO3500. Ideally, this prototype can contribute to my and my team's project portfolios.

Ferdi Sungkar

Studies a double degree program of Computer Science at University of Indonesia and Information Technology at UQ. Very keen to learn about the design process of creating a product and the way ideas can collaborate with each other in this course. Having worked at companies that produce various digital products have really helped my knowledge in working as a team and how to produce a product properly. Previously I have done another DECO course where we are needed to create a design of a product from scratch,

but I feel that the work that was done still has a lot of things that can be improved. Hopefully by the end of this course I can feel satisfied with my work and with the help of my team learn more from each other's knowledge and experience to get the best product for the exhibition.

Adrian Sze Yuen Low

I am currently undergoing a degree program in Bachelor's of Information Technology at the University of Queensland, majoring in Software Design. I graduated with a Diploma in Information Technology back in Malaysia, and right after that, I took a course to study full-stack web development. With my qualifications, I worked at a company that develops online web services for business clients. During my time there, I developed several computer-vision and image processing services delivered via a microservice architecture. I would say my skill sets are more geared towards the back-end systems. Studying at UQ in Software Design opened my eyes to a more human-centred approach to develop complex systems and as a result, I would like to say I am more of a well-rounded person

Works Cited

- [1] Ada S. Kim University of Washington, et al. "A Pedagogical Analysis of Online Coding Tutorials: Proceedings of the 2017 ACM SIGCSE Technical Symposium on Computer Science Education." *ACM Conferences*, 1 Mar. 2017, dl.acm.org/doi/abs/10.1145/3017680.3017728.
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- [3] Maryam Arab Department of Computer Science, et al. "An Exploratory Study of Sharing Strategic Programming Knowledge: Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems." *ACM Conferences*, 1 Apr. 2022, dl.acm.org/doi/10.1145/3491102.3502070.
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