CM2020: Agile Software Projects

Software Project Proposal, Group 6 (Tutor Group 1)

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1 Aims and Objectives

1.1 Background and Problem

Motivation to study is a scarce resource for university students and one that can easily get depleted. Any technique or tool that increases motivation might provide value to students and to the educational institutions that they partake in. In addition, students with a competitive mindset might draw additional motivation from the ability to compare themselves to peers and identify opportunities to improve their own skills.

Every module in a degree program is different and may require a tailored strategy for studying. Reflecting on a completed module provides "hindsight 20/20" notes on what worked well and what can be improved. In a collaborative environment however, students are not limited to their own experiences - they can benefit from the wisdom and experience of fellow students.

The **problem** that we aim to solve is that students normally have no way to easily compare their own grades to those of their peers, and cannot assess if their grade is within an expected range for any given module. For prospective students of a module, it is hard to judge if a certain module usually provides high grades or not, and what effort might be associated with achieving such a grade. For students who have received grades, there is little opportunity to find out whether a received grade is reasonable given the self-perceived effort and completed coursework.

1.2 Opportunity

We aim to motivate the students to be their best selves and adopt the life-long growth mindset.

To realise this long-term aim, we propose development of a **grades leaderboard** that allows students to share and compare grades, while managing their own grades for a given university program.

This report outlines how we decided to pursue this opportunity, what we aim to achieve, how we aim to achieve it and how we will measure outcomes.

1.3 Goals

With this project, we are pursuing the following goals. More detailed success criteria and KPI are defined in a later section.

Business Goals

- Launch a grades leaderboard in one program with real students
- Gain traction so that the solution becomes an established part of student life

Usability Goals

- Make entering and sharing feel extremely fast and frictionless
- Make students feel safe in sharing their grades online

Technical Goals

- Make the application easily accessible as web application
- Ensure the security of the platform to ensure integrity of the data provided

2 Market Research

Initial desk research indicates that the selected project, a grades leaderboard, does not have a direct competitor. There are some utilities which partially solve the problem we are tackling - namely, tracking grades - but none of these enable the user to compare themselves to their peers, nor aggregates grade data. As such, we must cast a wide net to analyze our place in the market and consider *alternative solutions*. We have identified utilities which overlap with our project in terms of possible user needs as well as tools which solve analogous problems in different domains in order to get a more comprehensive picture of where our product stands in the market.

2.1 Overview of Alternative Solutions

Our solution offers two mains functions: **tracking grades** and **sharing/comparing** grades. For each feature, we have documented the alternative solutions, their specific functionality and notable design choices.

2.1.1 Grade Tracking

We surveyed various existing tools that enable students to track grades. Some peer-created utilities and University of London portal were discovered through our teammates' participation in this course, while `gpacalculator.io` [1] is an example of many similar utilities that were found by searching 'grade tracking' and 'grade calculator' in a web search.

Peer student's Python command line grade calculator A peer student within the BSc Computer Science program at University of London developed a command line grades calculator [2]. Users record their grades in a JSON file and run the script from the command line to see their grades and other relevant information, as shown in Figure 1.

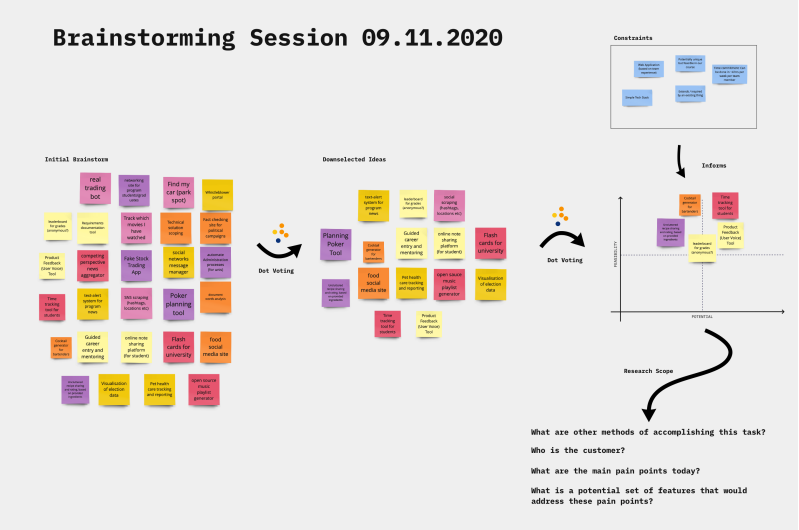

Figure 1. *Python Calculator Sample Output*

Notable Features The tool allows tracking course-level and cumulative grades and converts to ECTS (Europe) and US scales. It also support conversion from US to UK GPA scores and determines which classification your grades fall into. Further, it allows tracking how many credits out of 360 were completed.

Notable Design Choices The design is lightweight as it can be installed locally and run from a command line. The input is provided via a JSON file, which also allows easily storing, versioning and sharing a set of grades.

Peer's Google Sheets Degree Planner Another student (and co-author of this paper) has published a spreadsheet-based tool to track and calculate grades [3]. Users records their grades in a Google sheet to track their credits and grades, as shown in Figure 2.

Module	Weighting	Weighted Credits	Status	Grade	Weighted Grade	% of Final Grade
Introduction to Programming I	1	15	Done	100%	100.00%	1.41%
Introduction to Programming II	1	15	Done	87%	87.00%	1.41%
Numerical Mathematics	1	15	Done	88%	88.00%	1.41%
Discrete Mathematics	1	15	Done	97%	97.00%	1.41%
					90.31%	**100.00%**

Figure 2. *Google Sheets Degree Planner Excerpt*

Notable Features The tool allows tracking course-level and cumulative grades, allows tracking how many credits out of 360 were completed and also highlights which modules are optional. It allows planning modules across semesters in order to distribute the course load.

Notable Design Choices This tool is implemented with Google Sheets, which makes it easier to use for many people, and allows easy sharing of the tool as anyone has free access to the software without any local installation.

gpacalculator.io A publicly available website, GPA Calculator [1], allows users to enter their grades in a web form and see cumulative results, converted to various other grading standards.

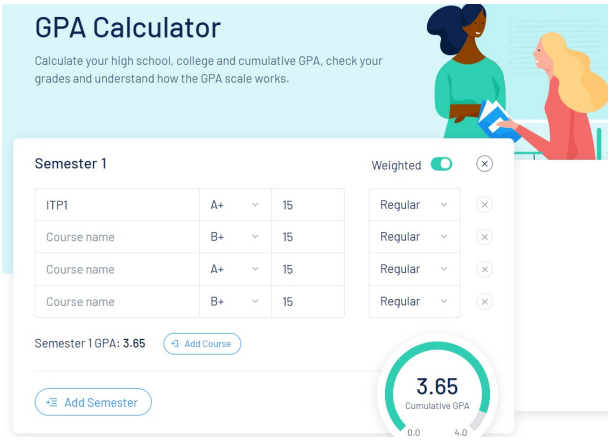

Figure 3. *Landing Page Form on gpacalculator.io*

Notable Features The tool calculates semester or total cumulative GPA from individual courses, offers different calculators for high school and college and also provides general information about GPA, grades, and different honors.

Notable Design Choices Placement of the input form is very prominent and users are immediately confronted with it when visiting the page. There is no login or data persistence available, and the tool is US-specific.

University of London Portal The University of London itself provides access to grades for viewing [4]. Users can view grades from each semester, broken down by source (coursework vs. exam), as shown in Figure 4

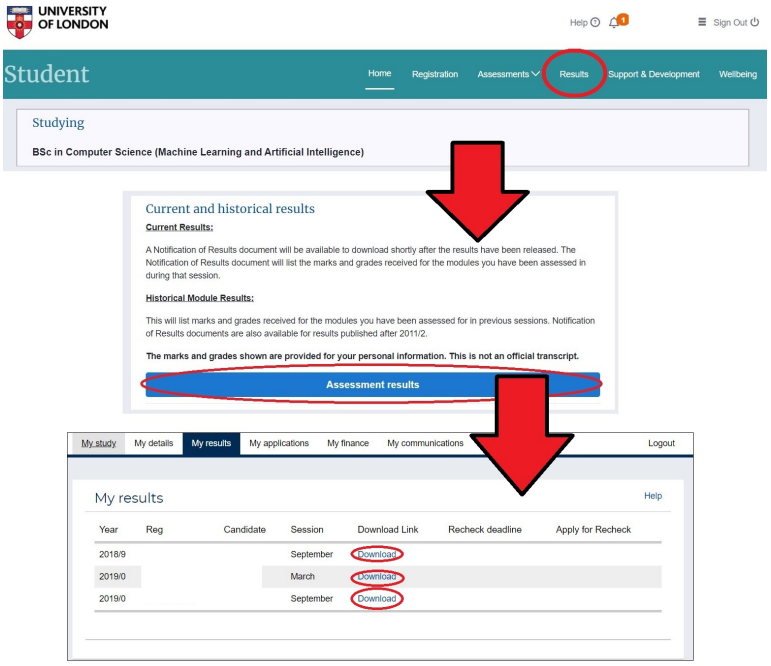

Figure 4. *Path to find grade download links on University portal*

Notable Features The student portal displays official grade results for each semester and shows granular grades for each exam portion separately.

Notable Design Choices Grades are not accessible easily, as they are buried in menus, and there is no centralized display of all grades or cumulative grades. A PDF download is required for all but the most recent grades. The results have the highest level of trustworthiness since they are official.

2.1.2 Grade Sharing

We searched the web for 'grade sharing,' 'grade comparing,' 'compare grades to other students,' and other derivatives but found no relevant tools. Glassdoor was suggested as an analogous tool during a brainstorming session and the University of London Slack workspace is known to us through our participation in the degree program.

University of London Slack workspace Students at the University of London's online BSc in Computer Science degree use a Slack workspace to collaborate [5]. Within this workspace, students enthusiastically share and query grade information following release of results, as shown in Figure 5. This workspace is not publicly available.

Figure 5. *Students sharing midterm results on Slack*

This is the Slack space open to all University of London online CS students. There are channels for each course. Grades are sometimes shared in threads after they are released.

Notable Features Slack allows very quick impromptu sharing of grades, however on an irregular basis in bursts during grades season, and the grades are not solicited. Other students can weigh in and react or respond to grades and associated grade queries.

Notable Design Choices Grades reported are usually biased towards students with high grades, or people with low grades who suspect an error in their results.

glassdoor.com Glassdoor is a review and reporting website for employers [6]. It collects textual reviews and salary data from users. Salary reports are analogous to grade reports in that they are personal information about professional/academic performance that have a similar level of sensitivity.

Figure 6. *Example of data and graph shown on glassdoor*

Notable Features The site allows users to anonymously submit company reviews and salary information (including job title, locations of position, and years of experience). It contains job postings and company profiles with generic information. Users can also submit and collect job interview questions, and the site displays aggregate salary information for specific job titles.

Notable Design Choices Users must submit a salary entry in order to view detailed salary information from other users. The salary collection form is not very prominent and not highlighted on the main site. Users can define their job title, often creating close duplicates of job titles.

2.2 Comparison of Alternative Solutions

We abstracted a common set of functionality across these solutions as shown in Table 1 for grade tracking solutions, and Table 2 for grade sharing solutions.

	Python Grade Calc.	Degree Planner	gpacalculator.io	UoL Portal
Track Course Grades	✓	✓	✓	✓
Calculate Cumulative Grades	✓	✓	✓	
Track Credits	✓	✓	✓	✓
Granular Grades				✓
Convert Scales	✓			
Determine Honors Level	✓			
Persistence	✓	✓		✓
Shareable		✓		

Table 1. *Grades Tracking Comparison*

	UoL Slack	glassdoor.com
Incentivized to submit data		✓
Can compare to others	✓	
Easy to reference		✓
Aggregates data		✓
Includes profile on data source		✓

Table 2. *Grades Sharing Comparison*

2.3 Market Positioning

In order to understand our solution's place in the market we need to examine the external factors which might affect the growth and performance of our application.

In the following section we perform both a STEEPLE [7] analysis as well as a SWOT [8] analysis to support identifying the correct market position.

2.3.1 STEEPLE Analysis

The STEEPLE analysis will allow us to analyse our problem space based on environmental factors and outlines some of the contextual consequences of our proposal.

Social

- People tend to be competitive [9]
- People may be hesitant to share if their grades are low or they feel they are unfairly graded

Technological

- Student's participation in the course ensures they will have the hardware necessary to access the website (computer or mobile and internet)

Economic

- Global audience means any potential efforts to monetize users would be subject to currency risk and local purchasing power
- Usage costs and any potential revenue would be related to enrollment in University of London program and size of other Universities

Environmental

- Server has energy requirements that will grow with usage
  - An increasing number of cloud providers offer solutions that use green energy

Political

- Regulation of data handing is increasing everywhere. This continued trend is exemplified by recent regulations enacted over the past two years:
  - Califonia, USA's CCPA
  - EU's GDPR
  - Canada's PIPEDA
  - Japan's APPI
  - Brazil LGPD

  Given the global nature of this degree program our application is sensitive to all of these policies and future data protection measures implemented worldwide

Legal

- Must comply with local data protection regulations listed above

Ethical

- Must handle sensitive data responsibly and transparently
- Obligated to maintain a healthy sense of competition and steer away from toxicity and envy

2.3.2 SWOT Analysis

The SWOT analysis supports the identification of our solution's underlying potential and associated risks.

Strengths

- Knowing you have a relatively high grade could be motivating / encouraging / validating.
- Validation if your grade was low but many people report similar grades.
- Highlights which courses may be more difficult and require additional focus.
- Helps students understand when their grades may be unjustifiably low, which may help in organizing a more detailed and thoughtful request to the institution to review the grades or rubric.
- Comparison aspect provides motivation for maintaining one's standing at or above a certain percentile.
- The leaderboard aspect "gamifies" grades and gives incentive to submit grades.
- Ability to see module "reviews" and retrospectives might be an additional motivator for students

Weaknesses

- Data reliability. We have no good way to validate data so we must dis-incentivize dishonesty and not assume 100% accuracy. This might be solved with a voluntary "random check" participation where students need to prove that they actually received these grades
- A small sample size of participants will limit usefulness of averages.
- Those with poor marks or marks they feel are unjustified will likely be less willing to share.
- Those who fail or drop out may be unable (depending on integration) or unwilling to participate, which could impact grade averages.
- Without a representative sample of students the averaged data, graphs, etc will be skewed and could lead to reduced acceptance or usage of the tool.
- If we report anonymously, do we also store anonymously? If so then do we provide for the ability to remove data on request?

Opportunities

- This project has few real competitors. There are some student created utilities but grade sharing/comparing is outside the scope of those utilities.
- The program size will continue to grow for a long time. We haven't reached the maximum number of cohorts and the recent cohorts have grown. The need exists, there just wasn't a reason to make it until now.
- If we are the first to make this, we can capture the interested user-base which should be a large moat.
- Slack integration allows us to naturally link to the community of students that already exists, leveraging the University's policing of that population to being actual students.
- Retrospective tips can be used by future cohorts to gain a studying advantage for the course
- Average grades per course, per semester, etc can similarly help future students know what to expect and perhaps how much they need to prepare

Threats

- Time. Other student utilities show recognition of value for this type of product. Probably only a matter of time until someone else extends the grade idea in a similar fashion.
- Leak or theft of personally identifiable grade and contact information.
- People could poison the data with dishonest grade reporting.
- Insecure design could compromise data integrity and give people access to sensitive information.
- Loss of integration / changes to any APIs we're using (such as Slack).
- Data loss.

3 Planning and Requirements Gathering

3.1 Methodology

Planning and requirements gathering for this project are based on a classical "double diamond" approach. In order to create this proposal, the project team has iterated once internally to gather a potential set of very high-level critical functionality to inform further data gathering. We explored potential topics of interest, narrowed it down to the topic of creating a grade comparison tool for university students, and then explored the problem space.

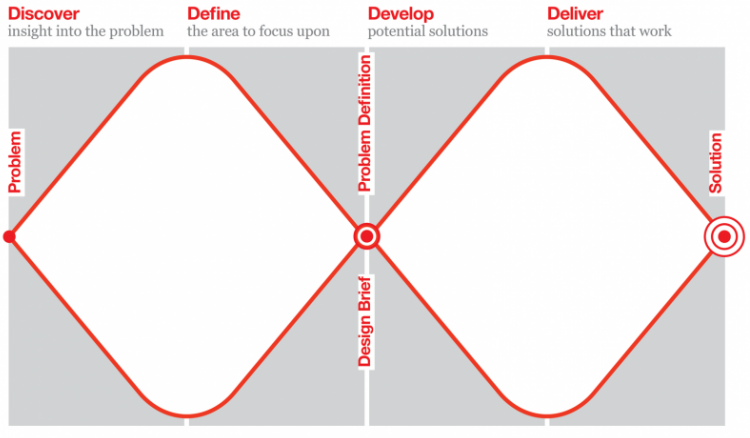

Figure 7. *Double Diamond Design Approach*

The reason why we chose the double diamond method is because it is widely used in Design Thinking [**?**] approaches when project ambiguity is high. The team felt this approach would lead to the highest level of clarity quickly, and would fit into the given timelines by the course schedule and the available capacities of the team.

We considered alternatives such as the Google Design Sprint, but eventually decided not to pursue this as we were not in the need of a 5-day, rapid iteration approach for our solution. We might use it partially during more concrete stages of the project to accelerate progress. We also considered "Research in the wild" (RITW) to find disruptive behaviour-changing ideas, however this approach felt inappropriate as our problem space did not indicate a fundamental challenge to existing technology, but much rather the fulfilment of a basic need of university students often not provided by universities.

3.2 Discovery

As background for how we arrived at our final idea, we initially conducted a number of broader exercises to discover potential problem spaces. The team conducted a "Crazy 8" exercise in which each team member developed at least 8 new ideas in a time span of a minute for each idea. This laid out a large space of potential ideas the team could work on.

Figure 8. *Illustration of initial discovery exercise*

Next, we used dot-based voting to narrow down the ideas to those with the highest assumed potential for success and highest interest for the group to further explore.

Once we had narrowed the ideas down from over 40 to just 5, we decided to explore the potential problem space for each via mind maps, exploring the potential competitive landscape, possible functionality and target users.

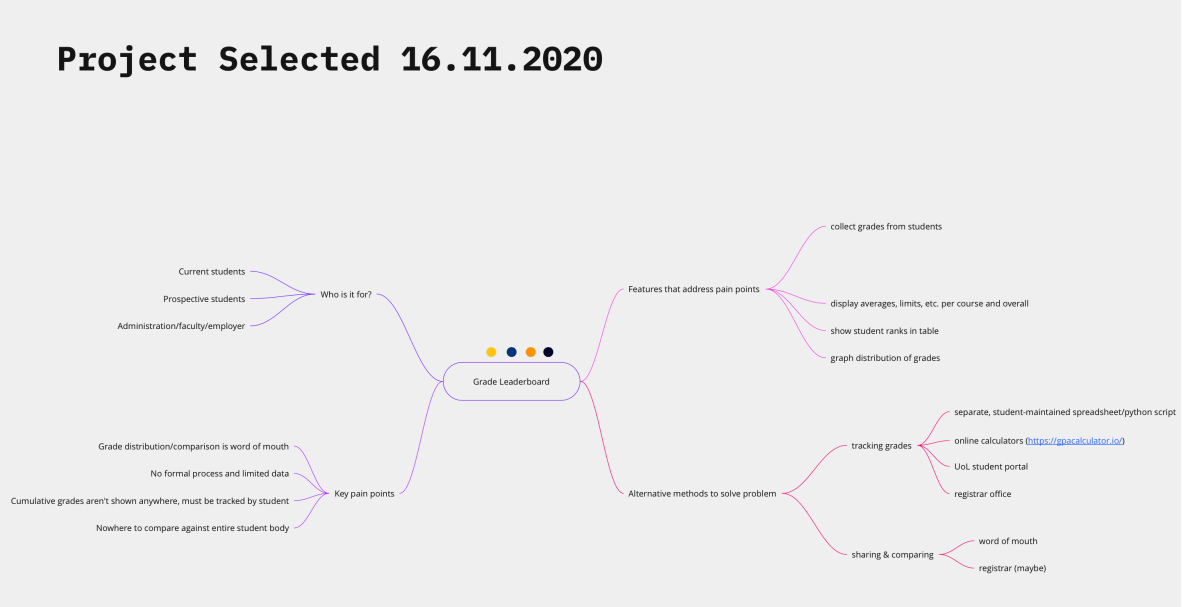

Figure 9. *Mindmap for the winning idea*

To further explore the problem space of student grading, we began by brainstorming potential functionality.

3.3 High-Level Requirements Funnel

Our approach to gathering requirements will follow these phases, based on the approach for data gathering and requirements analysis described in [**?**].

1. **Data Gathering**: We first use two methods for data recording, namely *questionnaires* and *interviews*. These will serve as initial data input for the project. This will be aided by further desk research to inform the problem space, such as academic papers in the area.

2. **Data Analysis**: Analysis of data recorded in this manner will occur based on the analytic framework of *content analysis* and *grounded theory*. We will both develop quantitative and qualitative analysis based on the recorded data. We aim to formulate our **core hypotheses** around this analysis. At the point of writing this paper, only quantitative data had been gathered, with more input following in early 2021.

3. **Formulate requirements**: Finally, we develop requirements in the form of epics and user stories. To aid this process, we decided to use the frameworks of *contextual inquiry*, which allows us to discover requirements that inspire *joy of use* and *joy of life*, and the 7 product dimensions (Gottesdiener & Gorman), which allow us to ensure broad coverage of important product attributes.

3.3.1 Key Research Questions

As of this report, the team has designed the high-level questions that should be answered by data recording. Our key research questions are listed below. Note that these are not the actual survey questions, but rather the questions we aim to answer through our data recording and analysis.

- How do students currently keep track of grades?
- How comfortable are students with sharing their grades?
- How honest will people be with reporting their grades, anonymously or not?
- Why would students want to compare their grades with other students?
- Why would students want to see retrospective tips left by other students?
- Why is this different from just getting the (presumably anonymized) values from the University? Why is this better?
- Would there be value in providing automated conversion of grades from the UK standard to standards from other countries?
- Does anonymity encourage or hinder contribution to the leaderboards? Does it affect accuracy of reporting?

Data gathering will be conducted via an online survey among university students, and interviews will be conducted via online video calls with selected university students.

3.3.2 Online Survey - Design Choices

We used the online survey to gather quantitative data. Not all of our key research questions can easily be answered quantitatively so we will seek to answer these in the student interviews.

We created the survey by converting key research question to a survey question designed to elicit the required answers where able. We did not require any questions to submit the survey because we felt it was important to ensure reliable answers and wanted to ensure the highest possible response rate. The survey was only 8 questions and took approximately 2 minutes to fill out in order to encourage a higher response rate. We provided context of our project before asking the following questions.

We posted the survey in this course's *general* slack channel. The survey respondents are the potential users so the responses can be considered representative of our real users.

3.3.3 Online Survey - Questions and Results

Here are the questions we asked to start collecting data on our key research questions, followed by the results.

1. Key Research Question: How do students currently keep track of grades?

1a. Survey Question: What tools do you use to keep track of grades?

Results:

	Responses
University of London Portal	68.4%
Outside Tool	47.3%
None	15.8

Table 3. *What tools do you use to keep track of grades?*

2. Key Research Question: How comfortable are students with sharing their grades?

2a. Survey Question: Have you ever shared your overall course or individual assessment grades in slack?

	Responses
Yes	52.6%
No	47.4%

Table 4. *Have you ever shared your overall course or individual assessment grades in slack?*

This question helps us establish a behavioral baseline for student comfort in sharing grades. We ask about past behavior to get the most objective answers possible. We also surveyed students for their sentiment on this key research question.

2b. Survey Question: How comfortable are you with sharing grades with other students?

	Responses
At least somewhat comfortable	79.9%
Not comfortable	21.1%

Table 5. *How comfortable are you with sharing grades with other students?*

2c. Survey Question: What would make you more comfortable sharing grades?

Results:

	Responses
Anonymity	73.7%
Evidence of Privacy Protections	52.6%
Seeing other students using tool	47.4%
Knowing grades can only be viewed by students	36.8%
Open source with transparent developers	31.6%
University endorsement	21.1%

Table 6. *What would make you more comfortable sharing grades?*

3. Key Research Question: How honest will people be with reporting their grades, anonymously or not?

3a. Survey Question: How would you feel about submitting a low grade anonymously?

	Responses
Indifferent	73.7%
Good	26.3%

Table 7. *How would you feel about submitting a low grade anonymously?*

3b. Survey Question: How would you feel about submitting a low grade publicly?

	Responses
Indifferent	78.9%
Bad	21.1%

Table 8. *How would you feel about submitting a low grade publicly?*

4. Key Research Question: Why would students want to compare their grades with other students?

4a. Survey Question: Please rate to what degree each of the following are important reasons for contributing grades. 1 is not important, 5 is very important.

Results: To determine the most important reasons, we consider a 4 or 5 an "endorsement." The endorsements ranked from high to low:

	Endorsements
See Where I Rank Against Other Students	13
Track Grades	10
Keep University Grading Curve Transparent	9
Help Upcoming Cohorts	6
Recognize High Achievers	5

Table 9. *Most important reasons for contributing grades*

5. Key Research Question: Why would students want to see retrospective tips left by other students?

5a. Survey Question: Please rate to what degree each of the following are important reasons for leaving retrospective tips for courses. 1 is not important, 5 is very important.

Results: Like the previous question, we considered a 4 or 5 an "endorsement." The endorsements ranked from high to low:

	Endorsements
Learn from wisdom of others	15
Assessing course expectations	15
Assessing effort course	13
Give back to community	12
Choosing courses to take	12

Table 10. *Most important reasons for leaving retrospective tips for courses*

3.3.4 Online Survey Insights

Table 4 shows a majority of respondents (52.6%) have shared their grades in slack. Slack is not anonymous and there is no explicit place to share so these students who shared can be considered highly motivated to do so. In addition, a large majority (79.9%) report feeling comfortable sharing their grades in an unqualified manner (neither anonymous or public specified), as shown in Table 5. In addition, Table 3 shows nearly 50% of respondents already use an external tool to calculate their grades. These responses strongly confirm that there is demand for a tool that allows people to share and compare grades.

Responses also reveal that anonymity is key. We see in Table 6 that a large majority (73.7%) of respondents said anonymity would make them more comfortable sharing grades. This was the single largest factor for making students more comfortable in sharing grades. In addition, 73.7% of respond-

ents said they felt indifferent about sharing low grades anonymously and 0% reported feeling bad about it in Table 7. Whereas 78.9% reported that they would feel bad about sharing a low grade publicly and only 21.1% said they would feel indifferent in Table 8. Therefor anonymity is crucial for increasing participation and integrity of grades.

3.4 Initial Epics

Based on the survey results and research to date, we have identified initial epics, formulated in story format with acceptance criteria. The acceptance criteria would be further broken down into user stories that fulfill those criteria.

Capture Grades As a student, I want to enter a module grade, so that I can contribute to the data-base and help other students.

Acceptance Criteria

- Only authenticated users can provide a grade
- Grades can be submitted anonymously
- Capturing a grade is fast and requires little input
- One student can only capture one grade per module
- Students can update a previously captured grade

View Grades As a student, I want to view all the grades for a specific module, so that I can see how I compare with other students.

Acceptance Criteria

- Students can see their position on a leaderboard for the entire program
- Students can see their position on a leaderboard for a single module
- Students can see the distribution of grades for the entire program
- Students can see the distribution of grades for a single module

Manage Personal Grades As a student, I want to to capture and manage all my grades in my program, so that I can see my program progress and calculate my final grade

Acceptance Criteria

- Students can view all their program grades in a single overview
- Students can assign modules to semesters that they plan to take

- Grades are used to calculate a program average using the correct weighting and credits
- Students can see their program progress as a percentage

3.5 Implementation Approach

We chose an iterative implementation approach that fits multiple cycles of design, development and user testing from the start of the year until submission of the project by mid-March. This approach envisions that based on completed initial requirements analysis by the end of the year, we can start with short, 2-week cycles of developing the solution. This phase will be closer to a Google Design Sprint in which the team spends focused, full days in developing solutions, implementing prototypes and iterating on the product.

Our timeline plan is shown in Figure 10 illustrating the cycle-based approach until March of 2021.

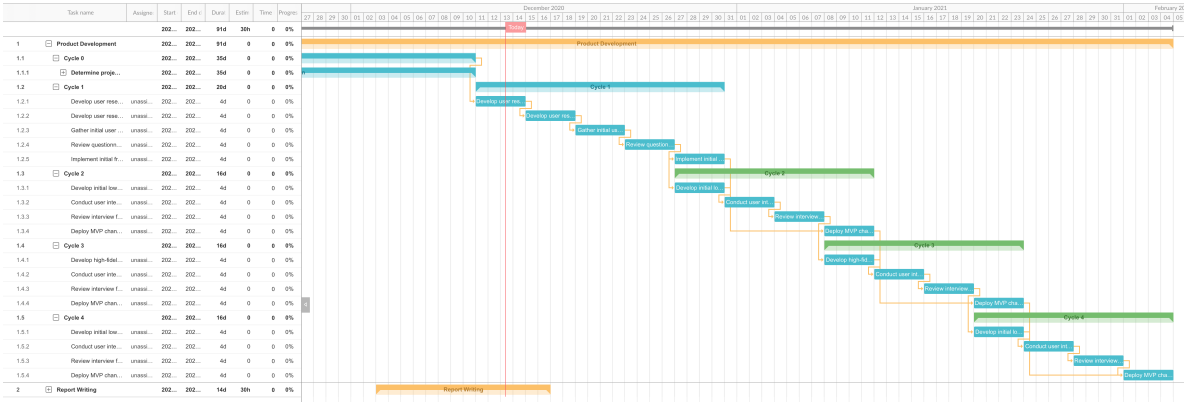

Figure 10. *Illustration of the cycle-based project plan*

4 Formative Testing and Evaluation

4.1 Identifying Users

In order to identify users, we employ the technique of personas to help identify the right kind of user. We also employ *scenarios* and user fiction to describe the kind of experience we envision for end users.

The underlying hypothesis for our personas is that some users will be more interested in such a tool than others, and do so for different purposes. Our hypothesis is based on the observation that among our own cohort of students in the program, there is a smaller subset of users that are highly active in the student community, generally reporting better grades and mentoring other students, and appreciate some competition. We derive that there must also exist a majority of more casual users who are not as active, but still interested in aspects of grade comparison.

- **Competitive Topper**: Students who are generally top-of-the-class, who enjoy competition and are eager to hit the top of the leader board.

- **Casual Checker**: Students who are not very interested in competitive aspects, but would still like to know where they stand and if they are within the expected range of grades.

In order to actually identify users that match these personas, we are including specific questions in this regard in our survey to validate the underlying hypothesis.

4.2 Testing & Evaluation Methods

4.2.1 Evaluation Type

The team decided that the most appropriate evaluation type is in a **controlled settings directly involving users**. This means having users peruse the product under observation, describing their experience and providing live feedback. This will be the most efficient approach from a planning perspective.

A further reason this is more appropriate as opposed to *natural settings* is that grades are not something students submit and engage with on a daily basis, hence the opportunities to observe students in this process are rare. This will result in certain downsides of the controlled setting taking precedence, specifically not being able to identify behaviours of users that may occur when unsupervised, which may be central to the grades process. A future iteration may employ screen recording (such as Hotjar) or A/B testing to identify more hidden behaviours. A further method for evaluating usability will be employed based on [**?**].

4.2.2 Evaluation Approach

We will test the produced application at the end of each cycle with 1-3 real student users, recording the outcomes and discussing the results along four categories:

1. **Likes**: What did users enjoy about the product?
2. **Problems**: What problems did users encounter while using the product?
3. **Ideas**: What are new impulses that users provided while using the product?
4. **Questions**: What questions did users ask while using the product?

5 Prototyping Techniques

5.1 Techniques

Our strategy towards prototyping will focus on creating a number of low-fidelity prototypes to quickly iterate on, while high-fidelity prototypes will consist of actual software that we can test. We will not create detailed up-front designs or clickable prototypes for the reason that our application's core functionality can easily be communicated with low-fidelity prototypes.

The reasoning for this approach lies in the economic principle of prototyping, which states that the best prototype is one that can demonstrate the possibilities and limitations of a solution in the most efficient manner.

5.2 Storyboards & Sketching

The team developed initial storyboards to illustrate the user journey and make the value proposition tangible. A series of sketches is embedded for the identified personas in Figure 11 and Figure 12. Based on these storyboards, we learned the following:

- The main motivation to log on is likely the need to track grades in a central, easily accessible location that also calculates averages automatically
- There are peak times during the year that the tool will see higher usage (e.g. when grades are released)
- Students are interested in the distribution of grades on a curve

The team will consider these factors in the development of the solution.

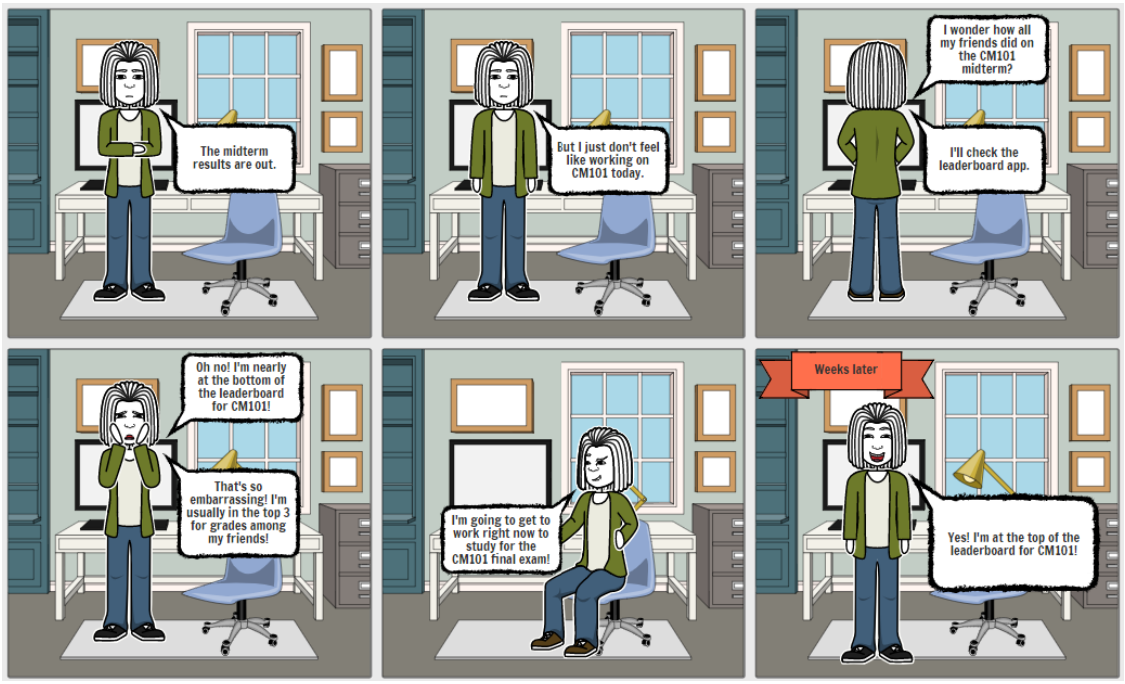

Figure 11. *Initial storyboard for the persona "Competitive Topper"*

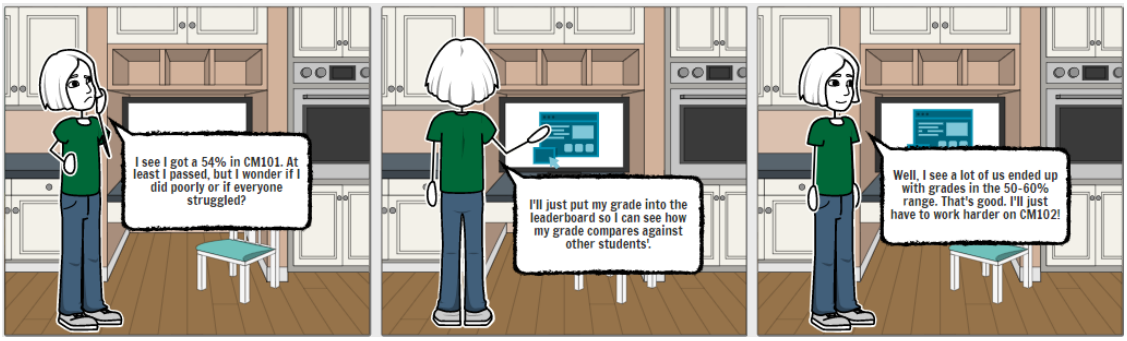

Figure 12. *Initial storyboard for the persona "Casual Checker"*

5.3 Wireframes

To further illustrate how the application will work, an initial wireframe was created to show how an entry page to capture grades might look like. This wireframe was built using a wireframing tool (Balsamiq)[**?**] and will be iterated on as we move towards building the solution.

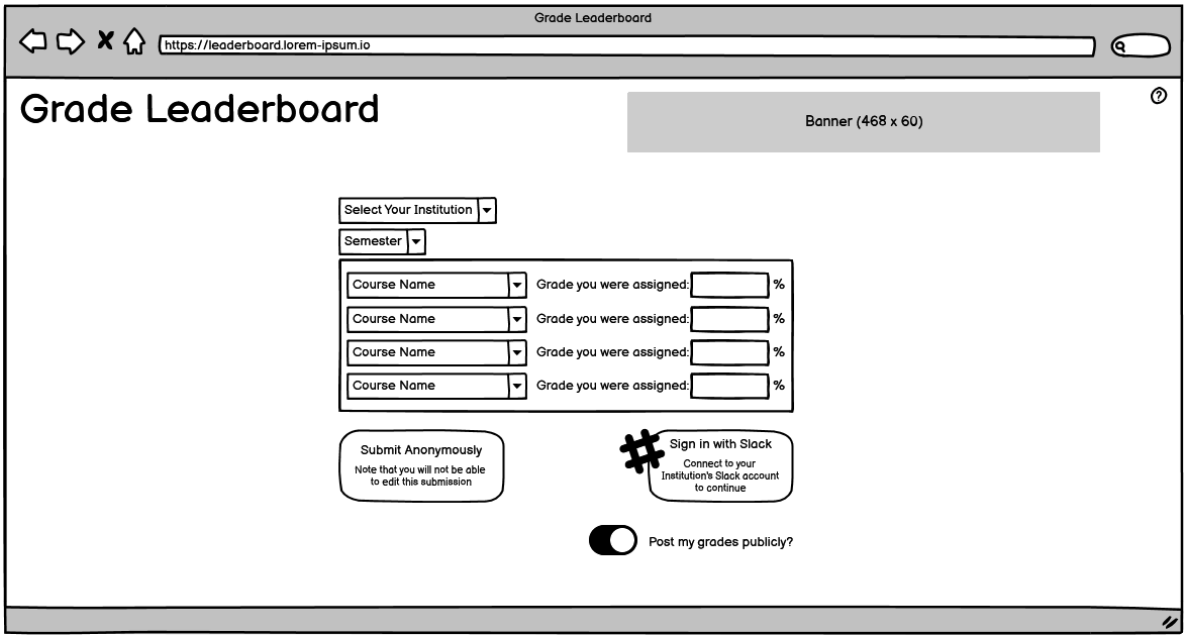

Figure 13. *Early wireframe sketch*

Based on this very early wireframe, the team identified important questions to consider for further iteration.

- Should users enter to see their own overview of grades, or an aggregate?
- How might users authenticate into the system?
- How does an aggregated view look?
- What other information might we need to collect from users?

As a result of these questions and collaboration further iterations were made to the early wireframe. As well, initial versions of a login page, a report view, and a grade leaderboard were developed by the group.

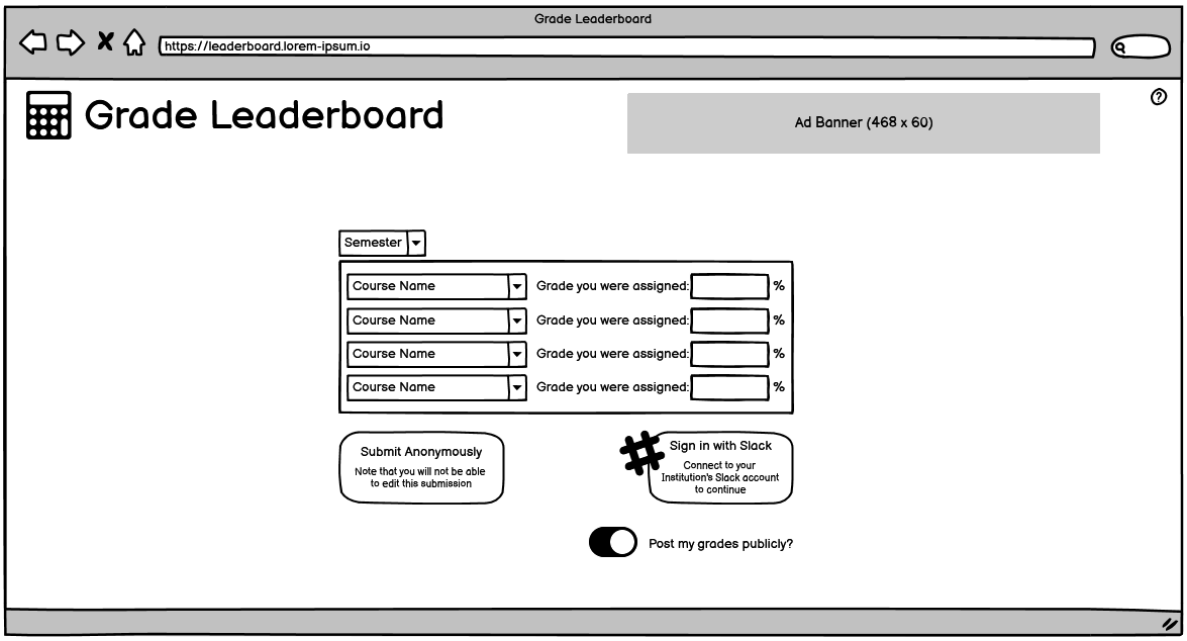

Figure 14. *Wireframe after group iteration*

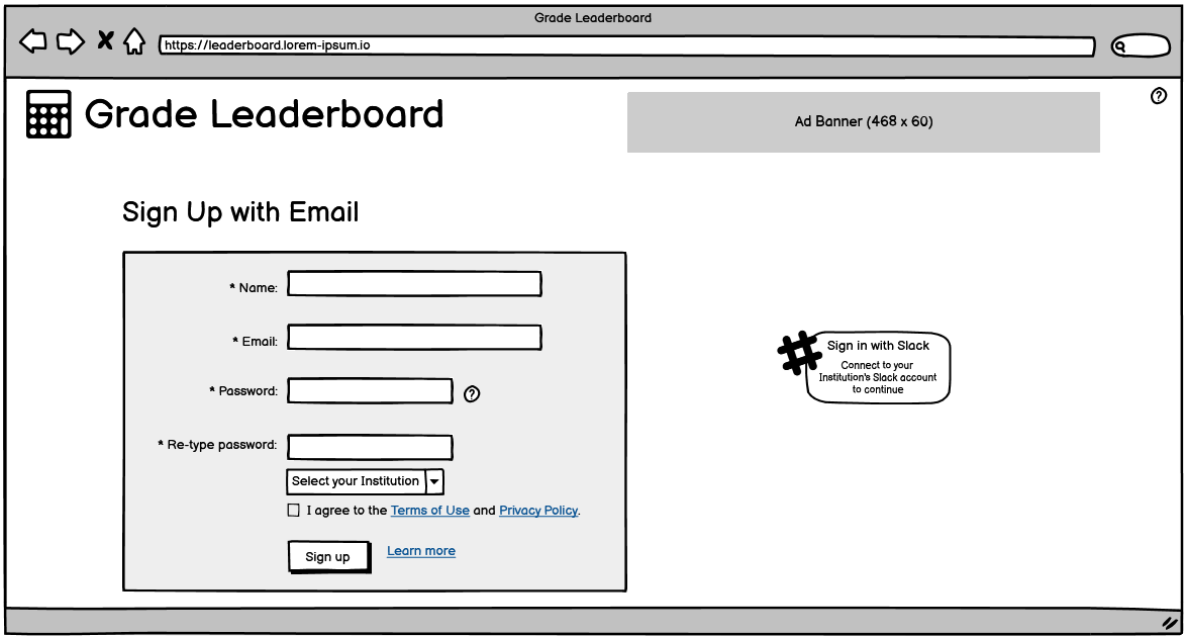

Figure 15. *Initial signin page wireframe*

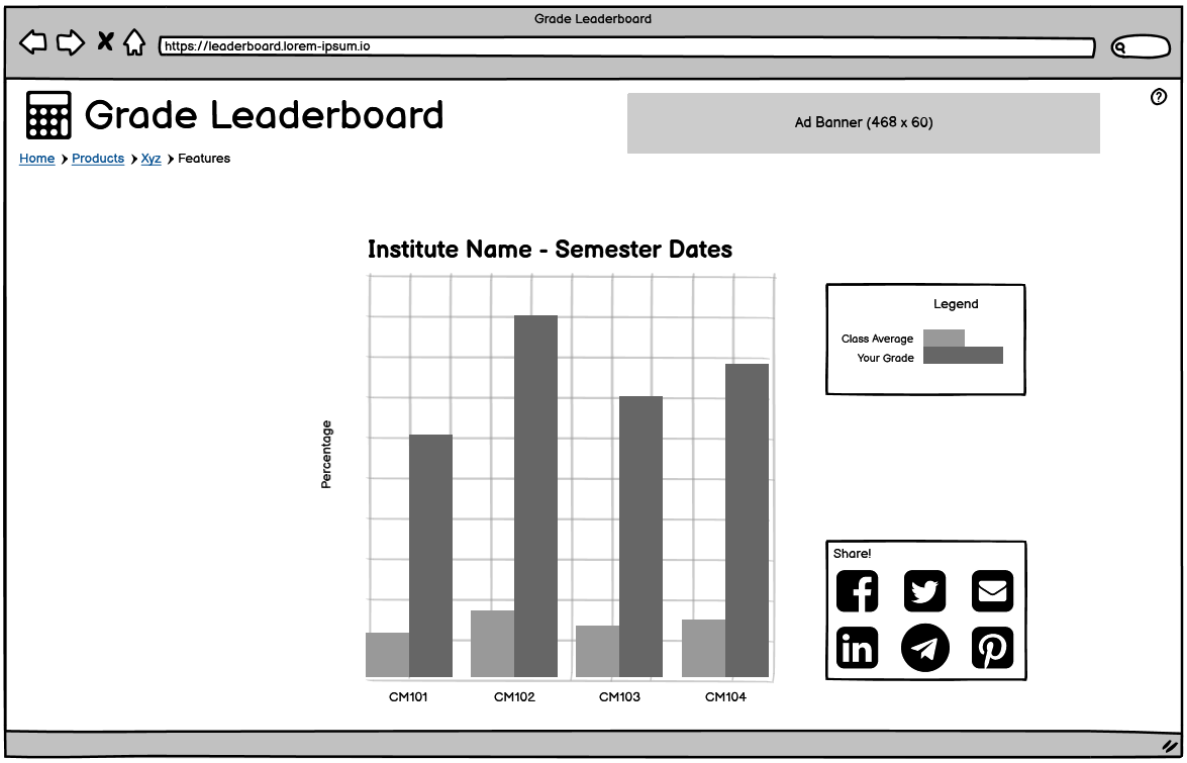

Figure 16. *Early collaboration on report wireframe*

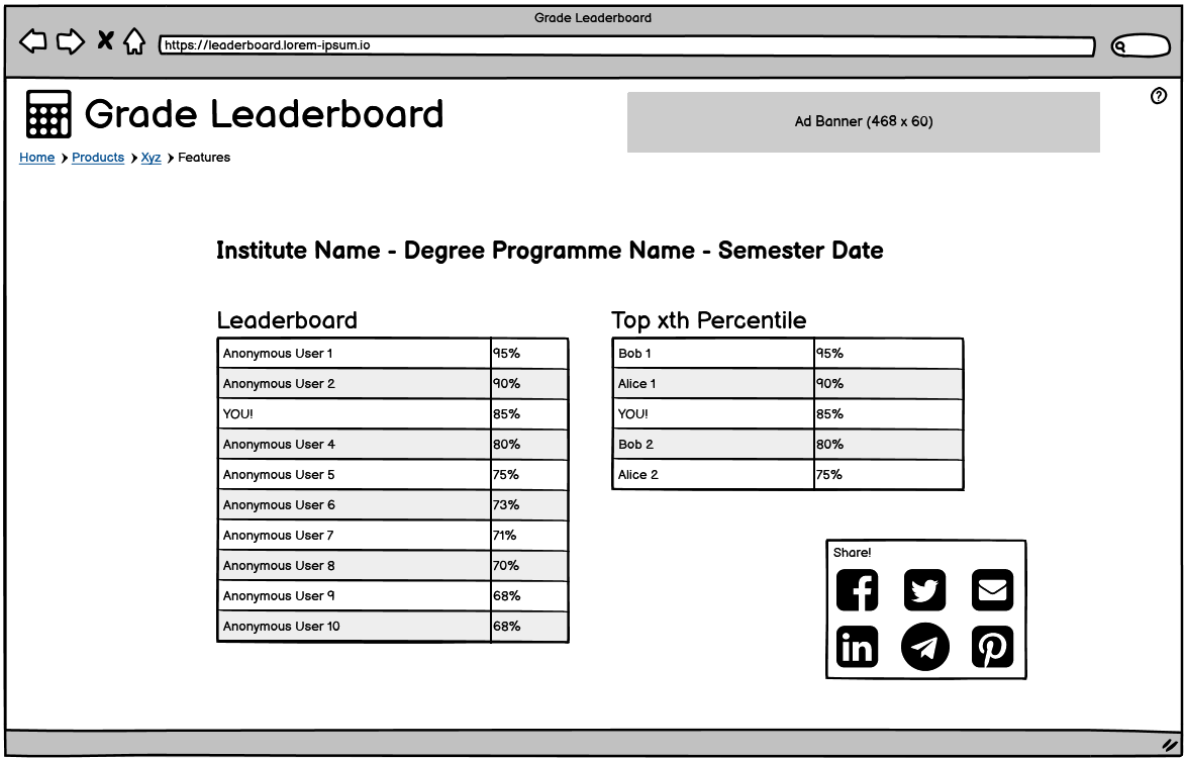

Figure 17. *Early leaderboard wireframe*

These questions will be further explored during execution of the project.

6 Post-Launch Evaluation Techniques

In order to evaluate our progress and success, we decided to select specific success factors that would indicate if the product is successful following a real-world market launch. We therefore set ourselves targets for each of these factors for both a "P0" launch, which is what we intend to build as part of this course module, and long-term goals, which are longer-term goals if this product were launched in real-world conditions.

6.1 Critical Success Factors

Through a further brainstorming exercise, combined with some research, we identified the following success factors.

- **Reach:** The number of distinct students from the overall student population that has submitted grades. The population is defined as the number of students we can observe in the `#general` channel of the student Slack.
- **Coverage:** The number of modules that have a sufficient number of grades submitted for meaningful comparison. We define "meaningful" as a minimum of 5 grade submissions for a single module.
- **Repeat:** The number of students who submitted at least two grades in two distinct terms.
- **Adoption:** The number of academic institutions and their respective student bodies that have adopted this product.
- **Rating:** The average of all user-ratings in app stores where the product is available.

6.2 Measurement of Success & Failure

As noted, we set ourselves targets for the initial launch as well as longer-term goals.

	P0 Goals	**Strategic Goals**
Reach	2%	10%
Coverage	20%	100%
Repeat	n/a	20%
Adoption	1	20
Rating	n/a	4.5

Further research, design, implementation and launch will be constantly assessed to meet these near- and long-term goals. The team hopes to measure these post-launch and verify the results with real-world data.

References

[1] "GPA Calculator." [Online]. Available: https://gpacalculator.io/

[2] S. Lavoie, "sglavoie/grades_calculator," Aug 2020. [Online]. Available: https://github.com/sglavoie/grades_calculator

[3] A. Muralidharan, "BSc Degree Planner," Jul 2019. [Online]. Available: https://docs.google.com/spreadsheets/d/1w5mFDaEB86q9zj-sdn_FZ8ivu5ALSfPsvBw8iOZ7qkY

[4] "University of London Student Portal (non-public)." [Online]. Available: https://my.london.ac.uk/group/student

[5] "Slack Student Workspace (non-public)." [Online]. Available: https://app.slack.com/client/TDT1N1BUG/C01A9AR0A4C

[6] "Glassdoor." [Online]. Available: https://glassdoor.com

[7] C. Bowman, *Strategy in practice*. Prentice Hall Europe, 1998.

[8] G. Panagiotou, "Bringing swot into focus," *Business Strategy Review*, vol. 14, no. 2, p. 8–10, 2003.

[9] M. Hutson, "The Thirst for Competition," *The Atlantic*, Oct 2015. [Online]. Available: https://www.theatlantic.com/magazine/archive/2015/10/why-we-compete/403201/

Appendices

A Git History

The following output shows a log of work done on this assignment as it was committed to our private Git repository. This is generated by `git log --color --graph --oneline`.

```
* 60b1a21 (HEAD -> main, origin/main, origin/HEAD) added some wireframes to section
↪  5
* 94e4e7f Updated midterm section 6
* 48b7b4a updated wireframes
* feeeaa5 Update leaderboard_wireframes.bmpr
* 8f28ebb added the rest of 12-21 notes
* 0d09fae added my meeting notes
* 354fc35 new revision from group session
* 0cf3b52 updated overleaf as images were not visible or outdated
* 62ca2e7 new wireframes, renamed source file
* 5995e79 Added framing to SWOT/STEEPLE and added author names.
```

```
* 1a29062 Reviewed and restructured midterm LaTeX file. Edited sections 2-5 and
↪  created tables. Incorporated storyboard graphics.
* f4465f9 Create casual_checker_1.png
* de57acb Create competitive_topper_1.png
* b32c653 export of gantt used in proposal
* 41852f6 Some rough ideas for reports to the user
* b7dea47 Modified wireframe
* 9f86020 Added account log in and sign in pages
* 54bf1e4 initial attempt at wireframe prototype
* 1f79184 Amended minutes
* 39db9d6 Minutes from 2020-12-10 session
* 04fa4e1 Notes 2020-12-07
* 1dc2d5b added updated midterm report pdf
*   5f165af Merge branch 'main' of
↪  https://github.com/BlairCurrey/uol-agile-group-project into main
|\
| * f35e4a3 Added a couple of comments on the meeting
| * d70fb30 Fix date
| *   c2d0c6a Merge branch 'main' of
↪  https://github.com/BlairCurrey/uol-agile-group-project into main
| |\
| | * 273900f Updated notes 3-Dec-2020
| | * 0f60790 Uploaded summary of the book
| * | 03b91ca Capture ideation board after the meeting
| |/
| * abaac74 Update TG1_G6_GroupMeetings.md
| * a2e19a4 Updating exports of Miro
* | 51d1a3a Add STEEPLE & changed market analysis sectioning
|/
* 6424a17 added methodology for gathering competitors
* 1022228 images for market research
* e358d8f added Market Research
* 03e7384 Setup agenda for next meeting
* 0e21f30 Updated notes 27-11-2020
* effc3bd Added Tex Template for Midterm
* 23a65f7 Updated meeting outcomes November 23
* 29ab345 Update TG1_G6_GroupMeetings.md
* 347db17 2020-11-19 check-in
```

```
* 4f45b8a added 2020-11-12 meeting
* 7556267 corrected date for second meeting
* 859b63f Documentation for Weekly Working Session 2020-11-09
* 9b7188d Added Meeting Notes 2020-11-05 and updated README
* f461ecf Initial commit
```