PRODUCTION PROJECT: REPORT

The impact of mainstream social media on student's academic performance

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1. Abstract

The purpose of this report is to explore the effects of mainstream social media and the impact that it has on student's academic performance evaluating how it could be better used as an educational tool. A critical analysis of current solutions and academic literature will be analysed to develop an appropriate product. An industry standard methodology will be chosen to convey a professional approach to project management and the development stages. Finally, an evaluation of the project and its effectiveness will take place. The report will then conclude with a summary and final thoughts.

2. Introduction

Social media is an everyday part of many people's lives and some can't imagine a world without it as it has become such a huge part of their character in society. This report aims to assess the pros and cons towards social media's effects on students and the ways in which it could be used to benefit student's as an educational tool. Current solutions proposed by educational institutes generally build upon a virtual learning environment with few taking advantage of the reach of mainstream social media. Students are forced to make their own path with informal and collaborative learning within groups on websites such as Facebook and Twitter. The problem with doing this is that it is easy to become addicted to the scrolling nature of Facebook and lose track of time due to the overwhelming amount of distractions. Work and market related organisations have already begun to take advantage of social media in a positive way. This poses the question as to why the education system are waiting so long to develop a popular and successful implementation for social media in these ever-progressing technological times. The objective of this project is to develop and implement a more appropriate solution to these issues effecting students. This will include looking at relevant literature, other solutions and evaluating choices made in the project specification for the proposed product's development.

The structure of the report and content will highlight the importance of each stage in the development of the project. This will begin with a critical literature and technological view of current solutions, appropriate literature and potential tools and technologies that could be used to develop the final product. The next section will state a choice of methodology to carry out the project management part of product development. Within this section the report will go into further detail of the product design stage of the chosen methodology showing relevant evidence of material to support decisions made in this process. Implementation and testing of the final product will take place to demonstrate the main features implemented and the effectiveness of the product. The next section involves the evaluation of the product and it's uses/limitations. Evaluation of the project management used to develop the product will then be reviewed to see how the process could have been improved. Finally, summary and conclusions will be drawn to determine the importance of the findings from the project making recommendations to improve the process and clearly outlining future work.

3. Review of Literature

This section of the report will identify a wide range of academic literature to form a critical review and analysis of what is known about the issue of social media's effects on students. Links will be drawn back to this project taking into consideration current solutions to the issue and the need for such a product to exist.

Social media has been present on the web since as early as 1997 with the first notable implementation of this being known as Six Degrees. However, the popularity of this iteration was nothing in comparison to the popularity of platforms such as Facebook and Twitter today. Within the last decade websites such as Facebook and Twitter have seen exponential growth in their userbases. It is almost confusing for people to comprehend people not having a social media account on either website (Evans, 2014). The substantial numbers of accounts on these websites could be thanks to the increased affordability and availability of computer systems in the modern day as opposed to in the 1990's where access to the internet was much scarcer. Understanding the roots of social media is important to the project as it helps establish the trends and patterns as to what made these website's a success.

With the introduction of social media platforms, there comes both positives and negatives towards its use for educational purposes. In cases such as Facebook, naturally motivated scholars can thrive academically by using collaborative learning techniques with each other. On the other hand, for less motivated student's it can be a true hinderance to their productivity due to ease of distraction and even addiction. Students can be consumed by social media to the extent where their attention is focused on their phones and thinking about social media over focusing on the educational benefits that others might experience (Al-Rahmi et al., 2014). Linking back to the project aims, it is important to adapt a middle ground that inspires structured learning while also giving the student's the social outlet they require. Using this research, it is important to reduce the possible distractions that are present in mainstream social media to create a successful implementation.

Mainstream social media is being embraced in a variety of working sectors and educational facilities as the growth of the world wide web means access to knowledge is more accessible than in the past. Virtual learning environments are becoming a new method of teaching in higher education due to the access that students have to the web. Personal learning environments and community groups driven by students give motivated students access to informal learning much like collaborative learning (See Yin Lim et al., 2014). The research shows that there is a demand for a suitable product such as the one proposed by this project. The above research supports the project purpose as it proves that there is potential for academic advantage for students.

A recent study was carried out to analyse the pros and cons of using social media as a tool for educational purposes. It was found that 70% of students that had access to a social networking account rarely used it for educational purposes (Tess, 2013). One recommendation made by the student's using the institutional educational website was to have a more intuitive design like websites such as Myspace. A more intuitive design would in turn make the product more accessible to a wider range of users with ranging levels of technological expertise fulfilling the usability requirements necessary when creating a website. The two most important factors in the usability of a website is the time to learn and speed of performance (Shneiderman and Plaisant, 2010). In relation to academic achievement it was found that interactive blogs had a significant effect on allowing students to achieve better academically within higher education. As opposed to this it was also said that college students who used websites such as Facebook were negatively impacted

academically due to spending too much time on the website (Al-Rahmi and Zeki, 2017).Most students are equipped with some sort of mobile computing device such as a laptop or a mobile phone. In higher education it was found that 67% of students felt that a degree of their academic success was owed to the use of academic activities accessible on their mobile devices (Gikas and Grant, 2013).

Many educational institutes have a group on current social media websites such as Facebook and Twitter. These are more so based towards announcements to students as they are aware that there is a higher chance a student seeing an announcement from their school when scrolling through their activity feed rather than specifically going to the website of the school. Most educational based pages created by schools, colleges and universities lack the appropriate interaction with their students to create a beneficial study environment (West, 2019).

Virtual learning environments are the main solution to the lack of a specific social media website based around education. Most educational institutes have their own developed environments that they use. Perhaps a good example of the success of these solutions are places like the Open University. This is a form of education for people who cannot afford or simply do not have the time to travel and live at university campuses the ability to get a degree (Panda and Mishra, 2007). This takes place completely online. The problem with things such as this is that the user must be a very self-motivated individual to prosper from the use of this.

In summary, the above results in correlation with this information it makes sense and is obvious that there is a need to implement a product to suit the needs of students. By combining accessibility between devices and usability factors it is possible to make a product that can truly benefit educational institutes. Many student's see the potential of online learning environments and are willing to use them providing that a suitable implementation of the idea was available to them. This literature supports the plans for the project as it shows the need for a product to serve educational purposes to aid the studies of students. Benefits have already been found in collaborative learning in informal environments such as Facebook have already been stated above. The creation of a product focused around giving students an academic advantage is sure to increase their performance and productivity providing the correct user interface designs are carried out. The main issue expressed with current solutions in the way of VLE environments is their interface design. The solution to making a more appropriate product is to combine the visual aspects of appealing websites such as Facebook and Instagram with an educational focus for the users.

4. Review of Technologies

In this section of the report a discussion of appropriate tools and technologies for the development of the product will take place. This will consider any practical work and testing of such approaches to development that have already taken place to form a critical review and justification of the chosen tools and technologies.

To first decide on a web framework to use to develop in, it is important to understand the main differences between a library and a framework. A good way to think of this is that the library is accessed from the framework by being called within the code written. This allows the user to attach modules to the framework chosen via the use of a library so choosing a framework ultimately comes down to the user's preference (Porebski et al., 2011).

CakePHP is a rapid PHP based framework and is used by many other developers for large scale applications due to the ease of CRUD (Create, Read, Update, Delete). It takes the approach of Model View Controller (MVC) which can support object-oriented programming reasonably with ease. It also contains other useful features like support for popular languages such as Ajax, JavaScript and helpers for fast HTML form creation. It uses the same technology as Laravel does with its ability to provide seamless security between user sessions and request handling with very useful error messages displayed for development (Hustinawati et al., 2014). This would make CakePHP a reasonably appropriate technology to use for the project as it is so like Laravel that little new knowledge would need to be learnt to use it. However, it also produces a similar output to Laravel so there is no need to complicate things by using CakePHP when Laravel has been used prior to this project.

Another popular web development framework is one known as Ruby on Rails. Many recent frameworks such as Symphony and CakePHP took inspiration from it during their development. The great thing about Ruby on Rails is the efficiency that is possesses with agile development. Like many frameworks the codebase is somewhat of a skeleton to begin with, but the framework makes use of coding more in Ruby rather than PHP like many other frameworks. By coding within Ruby this makes it easy for developers to express a lot of information for the application in just a few lines of code. The concept of Don't Repeat Yourself or otherwise known as DRY is emphasised greatly in this language. DRY coding is very important when creating clean applications as it makes the process run faster and easier for other people to read code when working in larger groups (Ruby, 2020).

Figure 1 – Object Oriented forms with Vue

Figure 1 is an example of using a component known as Vue to make applications more responsive. The potential of Vue is very high as it can be used to create reusable components such as forms for both large and small applications. Vue is easily imported into Laravel making it a great tool to use for creating a sustainable product.

A clear understanding of how databases work is very important to the project even though if it is not directly required to write the underlying SQL for the database. Oracle is the pinnacle of database technologies as it has many useful tools for displaying analytic data in the form of dashboards. Oracle takes advantage of PL/SQL when inserting data into the database and performing actions such as queries, packages etc on the databases. Performing SQL queries on databases through php code is technical knowledge that is vital to the success of the project. It is important to know how SQL databases work in case something goes wrong and it needs manual attention to get it to work with the framework (Greenwald et al., 2013).

As oppose to only considering web application technologies and tools it would be foolish to not consider the use of mobile apps. The literature review showed that many students have access to

social media accounts and generally find that using mobile devices benefited them in their studies. As a result, it would make sense to consider the option of creating the product within mobile programming languages for either android or apple. Some of the issues faced by doing this is that it would alienate students by their choice of platform. This is because an application created for phones can only really be accessed and used on the mobile devices unless using some form of third-party phone emulator on computer devices. Therefore, the best solution to the problem is creating a web-application that is both responsive on a desktop view and a mobile one (Firtman, 2013). Another issue faced by developing an application for mobile devices only is that it would need to be ported to all platforms. This is particularly difficult with apple as they require developers to code in their native language of swift to do this. Unfortunately, this requires access to resources not available within this project as it must be programmed on Mac using systems exclusively.

Within the project specification it was originally stated that the product would be developed through the Laravel framework. It is with great consideration of other web development tools and technologies as stated above that this remains the language of choice going forward with the project. Personal experience of using Laravel to develop past projects means that it would be much easier to learn the technical skills required to create a full product. The project is not hindered by doing this either as it shares the same MVC and Object-oriented form of programming that CakePHP and Symphony do (He, 2015). The use of an SQL database also needs to be considered for any application that is intended of storing user data. Laravel makes use of an eloquent ORM to avoid using a database constructed purely from raw SQL (Jound and Halimi, 2016). Models and database migrations can be used to create the skeleton for the database and so information can be passed using this data layout right to a database connected in the 'env' file. This will in turn save much time and effort in the database creation side of stuff along with the benefit of Laravel easily being able to call straight from the database in an SQL query style statement. The negative of doing this however is that Laravel does not mix well with database software such as Oracle Apex meaning that it is more difficult to express data within analytic dashboards outside of the web applications.

5. Methodology and Product Design

This section of the report will explore choices of methodologies appropriate to track the progress of the project development stages. Once the methodology is justified the design stage of the product will refer to research gathered from similar products and various other design artefacts to demonstrate the use of design techniques.

In the world of project management there are only really two main methodologies to consider and these are the waterfall method and the agile method. The waterfall methodology is the more traditional approach to project development and follows a top down approach.

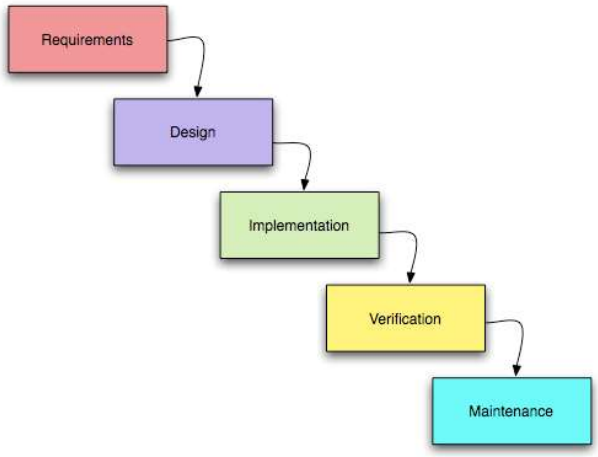

Figure 2 – (The Waterfall Development Methodology, 2006)

As shown in figure 2, the process of waterfall begins by gathering the requirements from the client. Then the requirements can be analysed, and a blueprint/design can be developed for the project. Once the design is complete the implementation stage can begin which involves the programming of the product. Verification is the stage in which the product is tested involving things such as testing with the client and unit-tests. During the maintenance phase of production any performance issues are addressed and monitored (Bassil, 2012).

Figure 3- (Experfy, 2020)

The agile methodology is like the waterfall method in some ways with similar development stages. However as stated in the name agile emphasizes agility in production. This makes it appropriate for complex projects as it focuses on adaptiveness, flexibility and improvement over time (Muslihat, 2018).

As shown in figure 3, the agile methodology works by building on each iteration of the product over time. Generally, the product will have some core features in mind for development within the requirements stage. It will then go through the design process which includes things such as wireframes and entity relationship diagrams. In the development stage the product is coded to bring

the features from the requirement into working order. The product is then tested for bugs and deployed. At the review stage the product is given feedback from the end user or client and from the feedback the above process is carried out again and again until the client is satisfied with the output (Highsmith, 2009).

When comparing the two methodologies above, it is heavily dependent on the type of product being developed on which will be more effective. As stated in the specification for the project it was decided that the agile methodology would be used. Due to having meetings with the client over the duration of the project it made more sense to choose this methodology. The agile methodology has increased customer involvement during the stages of the project allowing for a better-quality product and lesser risk of dissatisfaction for the customer. Because of how the waterfall method is implemented there is a higher risk of a dissatisfied customer as the process is time consuming and requires very little client input in-between the start and the end of the cycle (McCormick, 2012).

After deciding to use an agile approach for the project it was necessary to link these design stages to the requirements of the project plan. The project specification gave a clear insight into the core functionality and purpose of the product. The Gantt chart was created in excel and acts at the main tool to represent the structure of project management. The point in the Gantt chart remains the same and shows a clear outline of what is to be done through each of the agile design processes. The purpose of each section has already been explained in the explanation of the agile methodology above so an understanding of this combined with looking at the initial Gantt chart will give clear details of each process for the project. The Gantt chart can be found in section C of the Appendices for reference.

In this section, more details will be given specifically based on the design process tasks of product development within agile. The design stage is very important because it sets the foundation that the rest of the project will work from and can be hard to envision adjustments past this point. Below are some tasks set within this stage

Wireframe sketches are a low fidelity design of products made by developers generally to establish a point to work from when programming webpages and applications. Wireframes create a rough idea for the vison of the product allowing it to be much easier to get started bringing the product to life. To view the wireframes please refer to section A of the Appendices. By gathering research on similar products this helps to shape the sketch for the correct audience. Please refer to section A of the Appendices to view examples of user-interfaces gathered. It is acceptable to create wireframes on both paper and through software as they are simply something to influence production. The benefit to creating them on paper is that it is much faster to sketch them and there is less risk involved when getting feedback on the design from the client as it is not as time consuming to make changes. Wireframes are appropriate for the project as it helps plan out all the potential pages for large scale applications such as this website.

The next stage of the design process was the construction of an entity relationship diagram as shown in the ERD section. The purpose of doing this is to create a layout and show potential fields for tables within the database. By showing the relationship between tables this makes it easier to understand where forum keys are necessary to connect the tables in production and what fields are necessary to describe the contents of each table. Please refer to section A of the Appendices to view the ERD. With the Laravel framework, database migrations are created with models so knowing what fields are needed to describe a model is useful as once done a migration can be created to output the

generated SQL to the database. An ERD is needed in any project that involves a large-scale database because it can be very confusing where things belong without having an idea of it beforehand.

An acceptance criterion is another design technique that can be very good for laying out functions for a product. They are efficient because they able to clearly lay out all the expected functionality and then address the most important functions as the main priority and then more quality of life things as lower priority. An acceptance criterion works well with the agile methodology and working in teams as the product is reiterated after each meeting with the client, so it is easy to keep adding to the product over time. However, for this project it turned out not to be necessary to create one as the product was undertaken individually and the core functionality was already chosen in the proposed product specification. A design technique such as this would be more appropriate in a more user-driven environment where they dictate most of the needs of the product.

Another design technique that could have been used was a sitemap. Sitemaps are used to set out a topology of all pages included within the website or application. It would have been useful to use a tool such as this prior to sketching the wireframes as it would be clear what pages were required to fulfil the needs of the product. However, from meetings with the client and the project specification proposed it was already clear what pages were needed to be designed. A sitemap would be beneficial when working in large groups as each developer could undertake a section of the website for more efficient time usage.

6. Product Implementation and Testing

In this section of the report there will be a description of the product that has been developed as part of the project specification. Methods in which the product was then tested will then be explored.

The product developed was a web application developed using the Laravel framework for the purpose of creating an educational oriented social media website for students to use. The purpose of the product is to connect students with each other and encourage online learning with the aims and objectives of overall increasing academic performance. By using the research and design artefacts from the development stages before it was possible to begin making the product.

To implement the product there are three main sections of functionality that needed to be added to appropriately tackle the issue based off the project proposal. This included a forums page for students to post their thoughts on, a chat system allowing them to interact with each other peer to peer and an events page for organising activities.

Firstly, the forums were the first part of the product to be implemented. This is because the forums were to be the core of the website to begin with, so it was the highest priority for this to be in working order by the end of the project life cycle. Laravel comes with a nice feature that allows the developer to bring in a standard login and register form through an authentication plugin. By doing this, users could quickly be generated by using generic information such as name, email and passwords. This is important because the forums and other core features should only be able to be used by signed in users for the sake of having a stable database. By having signed in users this meant that they could be attached to the actions that they do. This means that users can see who posted,

commented on the forums and allow the user to filter to see the most popular posts/ their own. Other users were able to filter to see posts made by others and select each other's names to direct themselves to the user's dashboard. The user's dashboard consists of an activity feed showing the date of activity and the name of activity. Some basic information of the user is also shown such as their name and email.

Also, the next feature that was introduced to the product was the chat system. The chat system allows users to communicate with each other privately on the website. To fulfil the aims and objectives for the project a messenger application had to be implemented such as this because communicating through the forums is not peer to peer because it is in the public domain for more than two people to see. To develop this tool a standard layout used by many chat systems such as the one shown in the user interface's research in Appendix A had to be developed. To make a responsive chat system, pusher and ajax were needed to develop an environment that could update to each of the user's when a message was sent. This removed the need for refreshing the page making the process more seamless. Pusher is a third-party application that can be specified within the 'env' file and is very useful for sending updates to the web application.

Next, there was the addition of the events and activities page. The events page was the final bit of functionality to be added to complete the aims set out by the project specification. The event's page allows students to join events listed by other students. By attaching a button that worked in the same way as the like button for the forums, it was easy to create a joinable function. The joinable function could be selected and deselected by the user by changing the output of the option available based off if the user has already joined the event or not. By adding an events page this would emphasize the social aspect of the website to students to encourage them to go out and socialize. Socializing with people on each other's courses is important to build stronger bonds than simply through the internet.

There were a variety of useful ways in which the product could be tested such as validation testing, unit-testing, feature testing and manual end user testing.

The risk of only manual testing a function as the developer expects it to work means that bugs can be overlooked. This can have a negative and dangerous effect on the website if the system was in production. Therefore, it is important to make sure that there is underlying code ensuring that validation is enforced instead of relying on the HTML required function to protect the database. The required tag can be easily removed from a website using the inspect element option so this should be avoided and only used as a way of extra protection. Thankfully, Laravel has the need for a csrf token field meaning that without its data cannot be sent from the form to the database. Another layer of protection is found in the model where the developer can define fields as fillable and guarded.

For end user testing for the final product, the users only had access to the frontend of the website. This meant that they were only primarily able to test the security of the product by entering information into the forms. The below figures show an example of a scenario of an end user trying to break the validation put in place. The validation is crucial for a successful test as without it the user will be able to enter whatever they want into each of the fields.

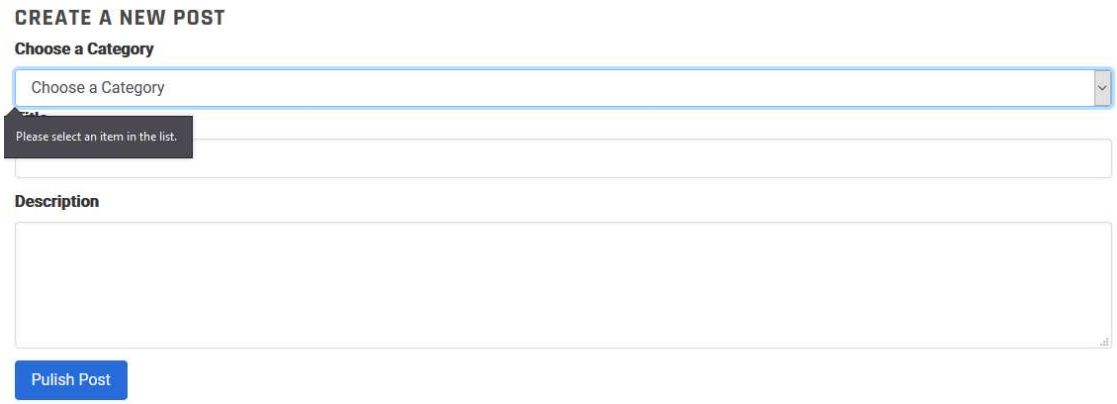

Figure 4 – Form testing

When the user attempts to press the publish button, instead of being redirected to a new page and the request being processed they are prompted to select an input first. This is because any null data sent to the database can cause a problem so until all these requirements are set the process will not be sent.

```
protected function validData() {

    return request()->validate([
     'title' => ['required', 'min:4','max:50'],
    'description' => ['required', 'min:10','max:255'],
    'channel_id' => 'required|exists:channels,id'
    ]);

}
```

Figure 5 – Validation of post form

```
public function store(Post $post)
{

    auth()->user()->posts()->create($attributes= $this->validData());


    return redirect('/posts');
}
```

Figure 6 – Passing data to database

Figure 5 and 6 show the underlying code that protects invalid data being sent any further. Figure 5 shows the parameters that are applied to each of the fields prior to sending the request data. Upon reaching the store route the code within Figure 6 ensures that the user is logged in and that the attributes given match those set by the valid Data method. This is a simple and fast test that can be applied to any other form in the code with only needing to carry out the minor adjustments of the field names they are attached to.

```
public function test_a_user_can_view_a_post() {

    $this->withoutExceptionHandling();
    $post = factory("App\Post")->create();

    $this->get("/posts/" . $post->id)
    ->assertSee($post->channel_id)
        ->assertSee($post->title)
        ->asserSee($post->description);

}
```

Figure 7 – Feature test for viewing a post

In place of unit testing, it is possible to do short feature test to check that the functionality works as intended. For something such as checking if a user can see a post on the forums a feature test would suffice as shown in the code snippet in figure 7. This is a simple test that creates a post using a factory then checks if the id exits and if it can display all the data as intended.

7. Product Evaluation

In this section of the report, there will be a critical analysis of the product that has been developed as part of the project. During the evaluation process, the limitations and potential uses of the product will be explored to determine the success of the implementation. As this is the final product it will be evaluated by student's via usability test practices such as observation and interviews.

Another useful method of evaluating the usability and purpose of websites and applications is something known as an observation test. An observation test could have presented very useful data if it were able to take place but due to current social distancing measures this is too difficult to carry out because of the inability to meet up and observe the user's actions. When conducting an observation test it is very important that conditions are controlled variables and seen as these cannot be controlled remotely the collected data could be skewed as a result. Interview's however can be carried out relatively the same because it is more so asking student's their opinions based on a walkthrough of how the website functions which is a controlled by showing each student the same screen.

It should be noted that this part of the report will heavily reference towards the requirements of the product that were proposed in the project specification. Through the development of the product both potential uses and limitations have been discovered based on the original goals set out. The original aim of the project was to create a web application along with a database that could support student's both socially and academically in the hopes of developing an academic advantage. The proposed product was aimed to be of use to all levels of university students and so during the interview section a variety of different levels were selected to ensure fair data. The product was proposed with the core features of a messenger service, forums service and an events page. As a result, the evaluation will focus on this core functionality and their effectiveness.

To evaluate the final product a usability test took place gathering the thoughts of 5 university students all studying at a variety of different levels. Within Appendix B, there will be a list of

questions asked to each student and the evaluation plan to ensure data is accurate. Each of the students were walked through a quick demonstration of the functionality of the product and then asked their thoughts on each part of the website based off the list of questions. There was no need for a consent form as the students remained anonymous.

To establish an understanding of the chosen students it was asked how often they spend studying per day on average and if they use much educational tools such as VLE services. All students spent the recommended time of 4 hours per day studying but only made use of VLE services when necessary for assignments.

When asked about the look and feel of the website, 4/5 students said that the output was generally well implemented and that the simple design made for a very user-friendly experience. However, one student stated that in some areas the website looked very bland and poor due to empty space on pages.

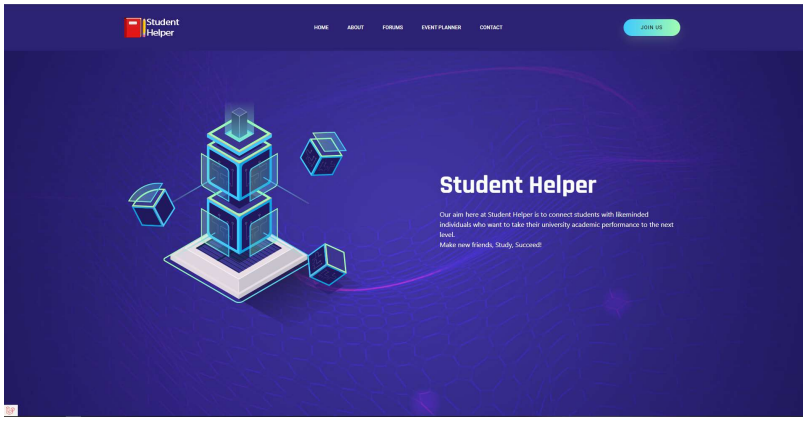

Figure 8 – Homepage of website

The next question asked was to do with the forums page. When asked what they liked about this page all students mentioned that they liked the central design and display of each post's information. However, when asked what they disliked about the page it was said that the implementation was too like those of other social media websites so gave them little excitement when looking at it.

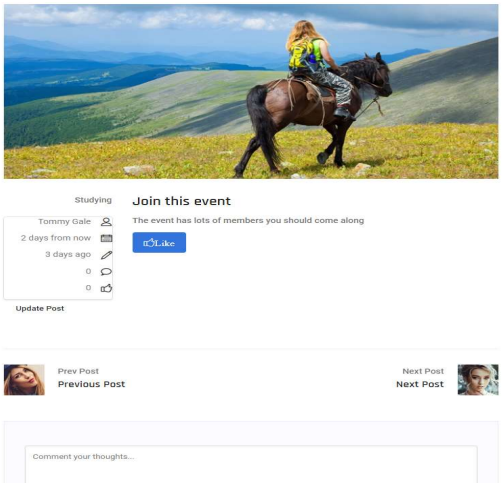

Figure 9 – Layout of a post on the forums

As for the chat system when asked what they liked about that it was stated that the quality and functionality of this part of the product was ideal. They felt this because it largely matched the chat format they were used to. The question was then asked as to what parts of the messenger page could be improved in the future. 4/5 said that a problem for them was the lack of a good implementation of a pop out chat window as seen on most social media websites such as Twitter and Facebook.

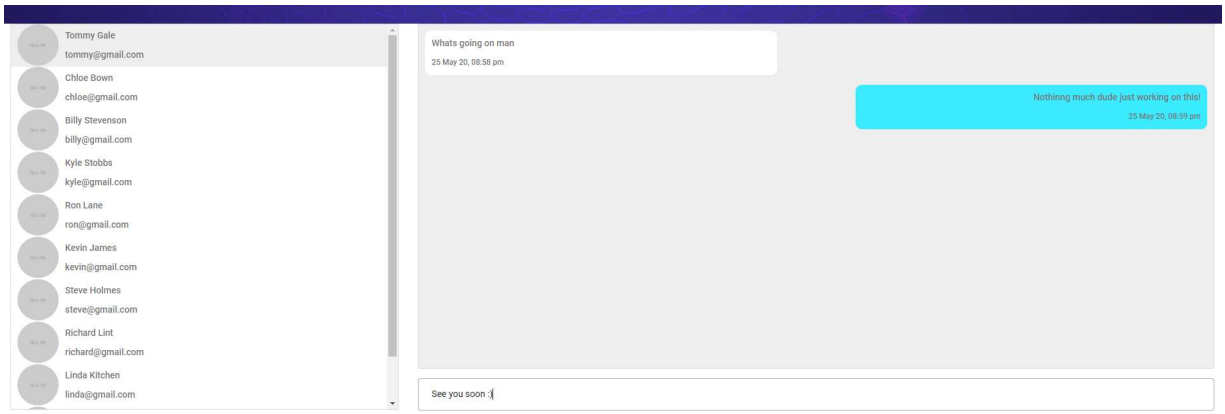

Figure 10 – The chat window

Finally, the same two questions were asked of the Events and activities page. Student's liked the simplistic layout of this page however finding it dull to use at points and poorly implemented. This is because the page simply showed a list of events and not much else leaving a lot of whitespace around the page. The join option was also said to be very linear as student's could either attend or not attend an event.

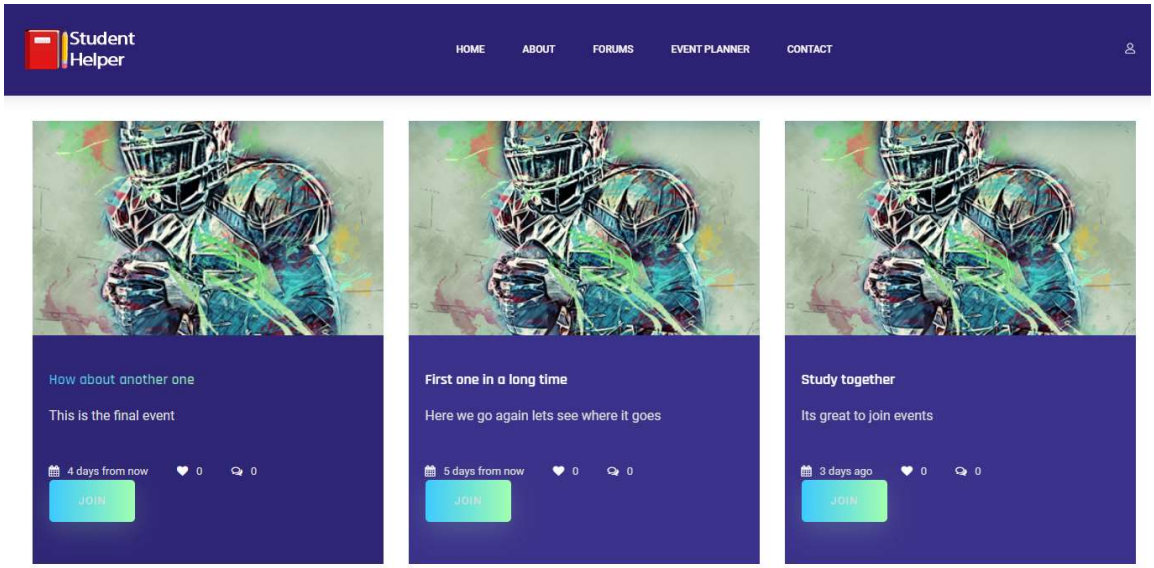

Figure 11 – The events page

The final question asked was less structured as it was asked how they felt about the product as an educational tool. 3/5 students said they could see the potential of the product and would be interested in using the website for studying. However, 2/5 students said that the output in areas was too simplistic and so they showed little interest in using it after this point.

Using the above data collected from the interview process with students it is possible to evaluate effectiveness of the product with its potential and limitations. The main limitations found of the product was within the events page and this could be due to the least amount of time being spent on this feature in the development stages. The potential use of this feature was there but the output could have benefited from more time spent perfecting the layout and functionality of the page. The choice of a joinable event with only a join function meant that there was a very linear approach taken to whether a student could or could not go to an event. To increase the potential use of this page it would be a good idea to add multiple options for the user to select ranging from yes, maybe or no. Not all people know what they will be available at the time of release so adding a function such as this would remove this limitation and make it a more usable feature as part of the website. Another issue with the events page is that there were a lot of whitespace and this is because it was one of the last features to be added to the website so there was little time left to improve the aesthetics. Overall, it is safe to assume that the events page had the least relevant use to students due to the poor implementation but was able to serve some purpose as the project specification requirements stated.

The potential use of the messenger application was received well considering what was expected. It brought the end user a sense of familiarity when using it making it a positive experience for them to use and understand how it works clearly. The limitations of the chat app were due to a poor or no real implementation of a pop out chat window for the user to access when browsing other pages of the website. This is a function that was not specifically stated in the project specification however clearly would have been a much more user-friendly experience if it were included properly in the final product.

Next, the forums were the most well received functionality of the website and it was not too much surprise as the most time was focused on improving this area. The potential use was seen in this implementation to the product as it was a feature that was mostly well received by students. The only issue that was addressed is that the style of the forums was almost too like other social media websites therefore lacking the defining character that would make this a unique feature to the product.

When addressing the layout of the website it was clear that there were major issues with the use of HTML and CSS to create a more appealing looking product. Student's generally found the website bland with a lot of left-over white space. In the future to address this issue more time really should be spent focusing on the look and feel of the website as oppose to taking on too much complex functions of the website. To increase the quality of the product the events page could be integrated with the forums page as they are kind of like create a greater quality output.

In conclusion, after carrying out interview's with students and then reflecting on this to evaluate the product, it is clear there are positives and negatives to the output. Generally, the product can match what was expected from the aims of the project specification to an okay/ mediocre quality. As a result, the product does not really exceed expectations in any of these areas more so just capable of carrying out the standard expectation of the product. To improve the quality of the product in the

future and hopefully make it a more successful educational tool some features should be removed or simplified. The product was only able to perform okay in each area whereas more dedicated time allocated for specific things could have meant for a much better solution to the issue's faced by this project. Thus, a substantial product was implemented matching most of what it was set out to achieve but had fallen shorts in some areas effecting the overall effectiveness of the product.

8. Project Management and Evaluation

This section of the report will reflect on the project by evaluating the effectiveness of the use of methodology within project management, management techniques and research sources.

Earlier within the report there was an analysis of literature, technologies and methodologies surround the project. The literature helped support the purpose of the product by demonstrating the need for a more appropriate educational tool for students to use. The technology review demonstrated that Laravel was among a wide range of other tools that could have been used to develop the project in a similar way making it a great choice none the less. And finally, the agile methodology was shown to be far more appropriate for the purpose of this project than the waterfall method. Continuous engagement with the client means that the waterfall method would not be appropriate because requirements are collected, and the client is not involved till the end.

The choice of project management methodology followed the steps of an agile method. As shown in Appendix C, a Gantt chart was developed to track the tasks for each section of the development cycle. This Gantt chart provided a clear layout for tasks that needed to be done in aims of completing the requirements of the project specification. An issue with the use of a Gantt chart for the agile methodology meant that it was more difficult to adapt the contents and tasks within after the point of creation. As a result, tasks had to be vague and not as specific as they could have been named on something such as a task board. Part of the Gantt chart planning that did not go as well was the time allocation of tasks. When creating this, tasks were given such a short amount of time to be completed and so this led to running behind on the estimated timeline for project completion. This is evident within the Gantt chart when looking at the projected time it would take versus how long it did take. Agile worked well in other parts of the project such as meeting with the client. In the agile methodology, the client has much more involvement with the direction of the project as shown in the meeting records section of Appendix C. The meeting records worked well in relation to the Gantt chart by providing quality feedback on the product each iteration of the cycle and allowing for more beneficial development of the product.

Meeting with the client was an important part of the progression of the product and there were only five meetings recorded as shown in the section C of the Appendix. To improve the quality of the project in the future more meetings should be had more often to maintain a high level of productivity and to keep on top of workloads. When meetings were had with the client, they held very little value to the progression of the product so to improve the development process the project manager should discuss more in depth with the client. It was recommended to change the Gantt chart to MS project in one of the meetings to better present a more professional approach to project management. It was a struggle to do this due to not having access to the software at home so it was decided that the Gantt chart would stay in excel. To benefit project management an acceptance criterion should have been made and reviewed with the client. This could have detailed necessary features about the product in more detail. Another issue of a feature that was suggested

at a meeting and could not be implemented was the introduction of an oracle apex database. However, in a later meeting it was explained that it was difficult to get something like this to work with Laravel so it was agreed that PhpMyAdmin could be used to store the database information instead. The tool Laragon was used for development so this was not too difficult to do as it is a supported database within the application.

The aims and objectives for the project have been addressed by drawing on the above information to carry out a professional approach to project management. By doing this a structured approach could be taken to fulfil each requirement mentioned in the product proposal and within meetings with the client. It became much easier to keep track of the product's development by operating in this manner as a result. Evaluation of the product using students which were also the audience for the product gave an insight into the overall success of the project. Whereas, technically the aims and objectives were completed fully to the specification there are ways in which it could have been improved. Better time management towards the importance of tasks could have led to a better-quality product which could have potentially changed students minds about using the website.

There were a few issues encountered throughout the project that ultimately effected the quality of the product. As mentioned above a huge problem was time allocation and keeping track of this. Due to the size of the project it was a lot to undertake for one individual and so time was favoured to the more interesting parts of the project. This left some tasks such as the events planner becoming a lower priority when it should have in fact been equal to both the forums and chat system. Neglection of HTML and CSS during production was also a big issue as this was very important to dictate the look and overall feel of the project. And during the product evaluation this was a major issue that continually popped up during in interviews.

The use of an online repository acts as a way in which to back up code on the internet. This is an important part of project management because it protects the product from being lost through either hardware malfunctions or just general breaking of code. Sometimes it is easier to just roll the code back to a working state than trying to find the source of the problem. For this project, github was used to back up the code as shown in section D of the Appendix. Github was used because it is one of the most reliable online code repositories and is used by many developers in the industry. An alternative to using Github would be to use bitbucket.

The project was a success as a proof of concept however there is still a lot of improvements that could be made for future iterations. The research proved very supportive of the purpose of this product to exist and the project management methodology was relevant to the choice. However, there was little engagement with the target audience until the end of the product's development because of ethical risk factor assigned to this project. This meant that evaluation of the product could not use students to assess its effectiveness until the final product was produced. As a result, the product produced only partially met the needs of students with some rejecting the choice to use the website in the future. If an approach revolving around students was taken in the future, then a higher quality product could be produced by focussing on the needs outlined.

Evaluating everything that has happened throughout the course of the production project the project was hindered by poor project management. Perhaps to make the workload easier within the future the project specification for the aims and objectives for the product should be simplified. Balancing the production of the product, writing the report on top of all the other necessary parts of the report was difficult to say the least. A project such as this may be something that would work better developing it with in a group as it would be very easy to split up parts of the website to other developers because the project was so big.

Overall, the project proved the point that a social media website focused around educational purposes needs to exist. It is still recommended that an agile approach is taken to keep the end user involved within the development cycle. However, instead of the use of a Gantt chart it would be better to use a task board and burndown charts to show the progress of the project. A task board is much easier to see what needs to be done and a burndown chart is much better at highlighting the progress in specific stages of development. This gives a better view of analytics by showing where things fell short and where they went well.

9. Summary and Conclusions

This section of the report will draw on the research gathered earlier in the project development life cycle to provide recommendations and conclusions for the project work as a whole. Further work that can be done in the sector will also be pointed out to perhaps improve the quality of the product if the project was undertaken again.

In summary of the findings from the research portion of the project. Literature clearly showed the need for the existence of a product to address the issue of educational social media. The only real negatives of social media on students was mainstream websites such as Facebook and Twitter. The research showed that students who used these sites often became addicted and suffered an academic disadvantage as a result of this. However, it was also found that sites such as these did show prospects of educational purposes in the ways of informal and collaborative learning. Distractions on these social media platforms are what lead to the most of the student's not using the platform for educational purposes despite the majority having access to mobile devices. Some benefits were found in the use of VLE systems as used by the open university but still interface was lack lustier for the purpose of engaging with students. Thus, the project served a purpose in combining social media environment interfaces with an educational purpose to create the product.

From the research uncovered into the issue of mainstream social media's effects on social media, there are some recommendations to be made for the future projects. Firstly, focusing more on a responsive mobile application than a website that can do both would be more appropriate for the project. Many students have access to mobile devices whereas some may not be fortunate to have access to laptops and computers as home. Considering the technological gap here and even technical skills it would be far more user friendly to focus more on the mobile appearance of the product. Also, maybe focusing the project more around student's as the main client would have provided more clear results on what their requirements of such a product would be. So, it is recommended to involve student's more in the process to ensure rich requirements for the project specification. The use of sprint task boards and burndown charts would have also listed what needs to be done from the project aims and objectives clearly so these should be used in place of the Gantt chart. The time constraint of Gantt charts felt too close together, so it was hard to be productive focusing on the next task that needs to be done rather than the current one.

Further work to be carried out in the area could include statistical analysis in the way of surveys on a variety of student age groups to gauge which audience the product would benefit the most. Using these findings, the development of the project could be refined to specifically suit the user's needs. This would also allow the user to raise things that they would be interested seeing in the product therefore improving the usability for the new audience. Very little research has been done into the true benefits of social media in the field of educational and how significant its benefits can be on

performance. Therefore, for essential further work and progression intense statistical analysis of data should be taken before moving forward with another iteration of the product.

Overall, in conclusion the purpose of the project is evident based on the research, but a more user centred approach would improve the overall quality of the project. In the case of this project, time was not allocated appropriately for how long it took to complete tasks so more time should be spent than expected on development. It is felt that the aims and objectives of the project were of use but poor time management lead to a worse product and bad project management.

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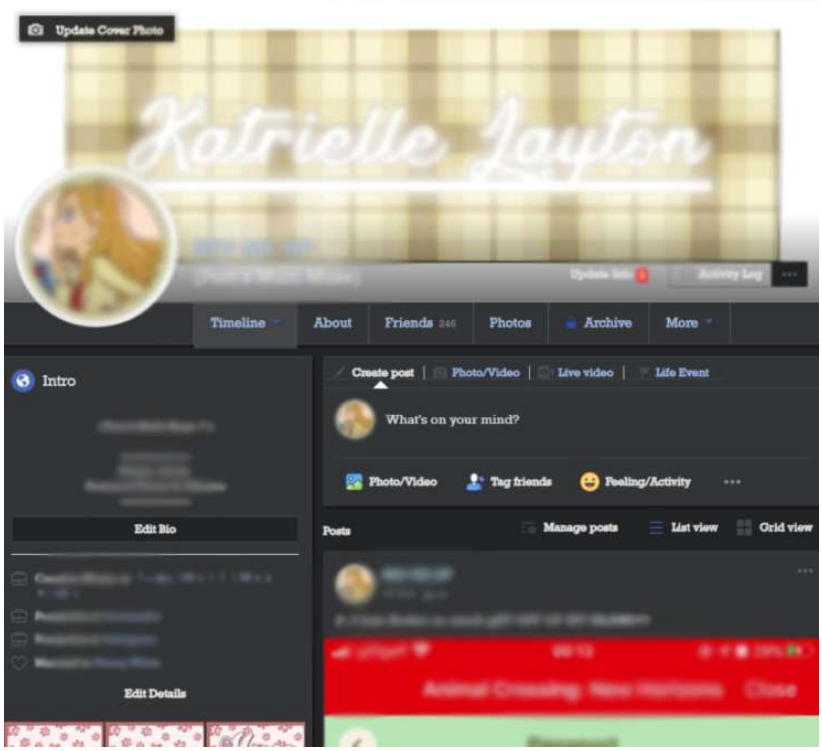
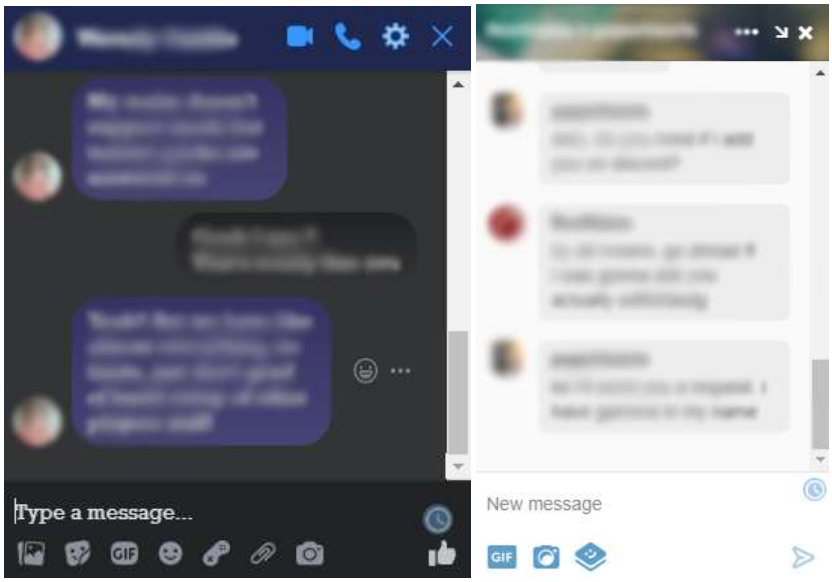
11. Appendices

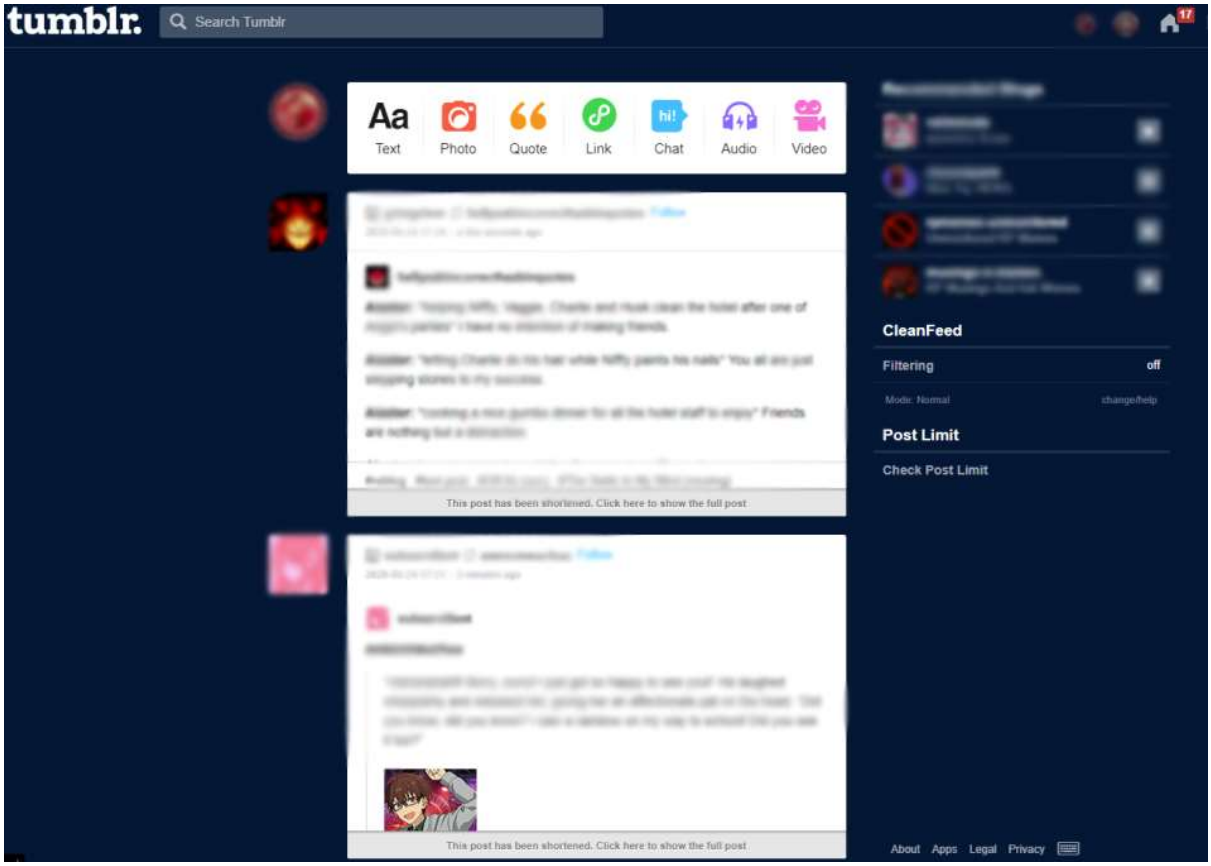
The Appendices contains all the artefacts referenced within the report that are too large to be put in text. Please refer to here whenever mentioned to in text for clarity.

12. Appendices A

13. User interface research



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Legal
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Customize your view
Sometimes you need to freshen things up a bit, like swapping colors, super-sizing your text, or revisiting your dark mode selection, all of which you can do in your settings.
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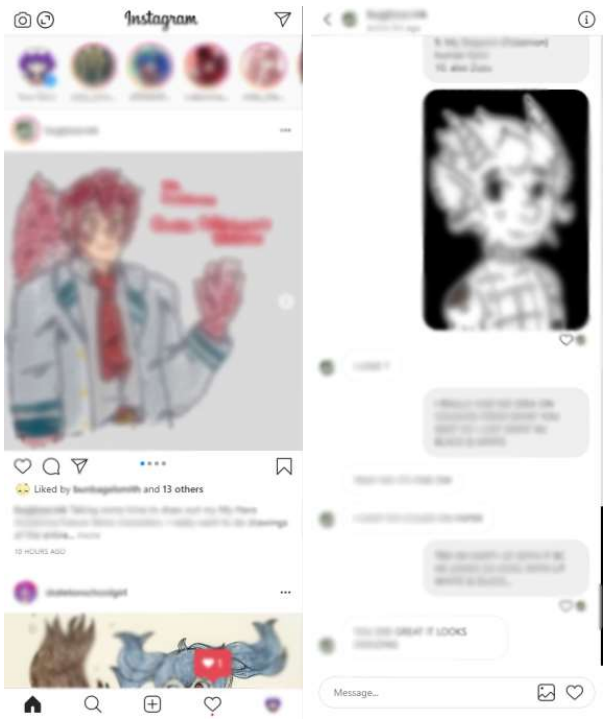
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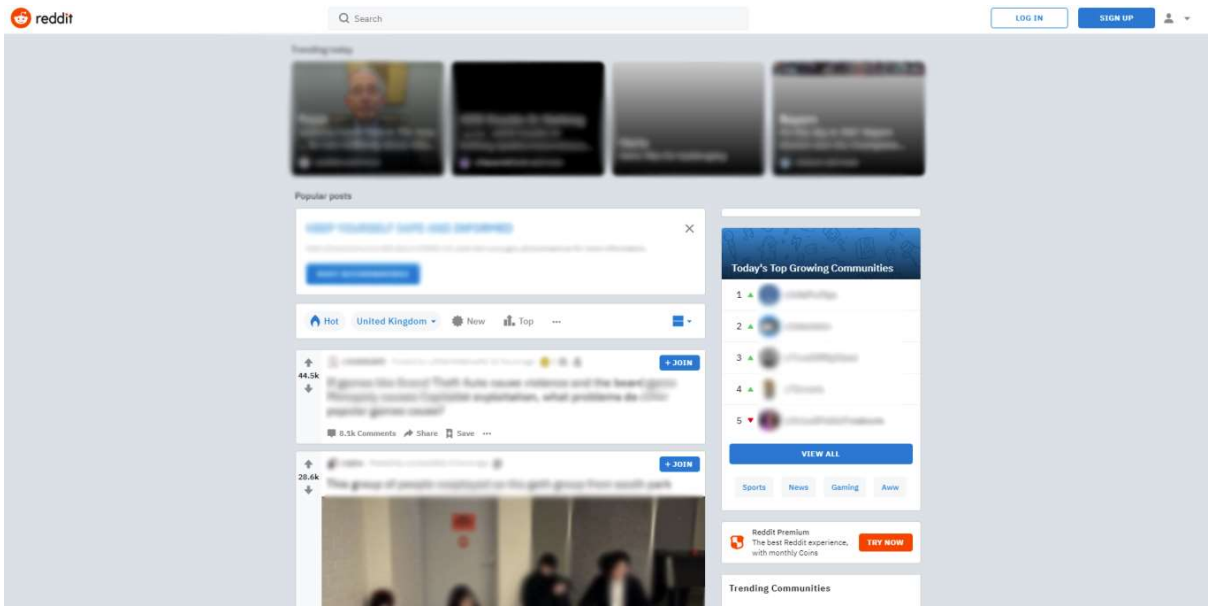
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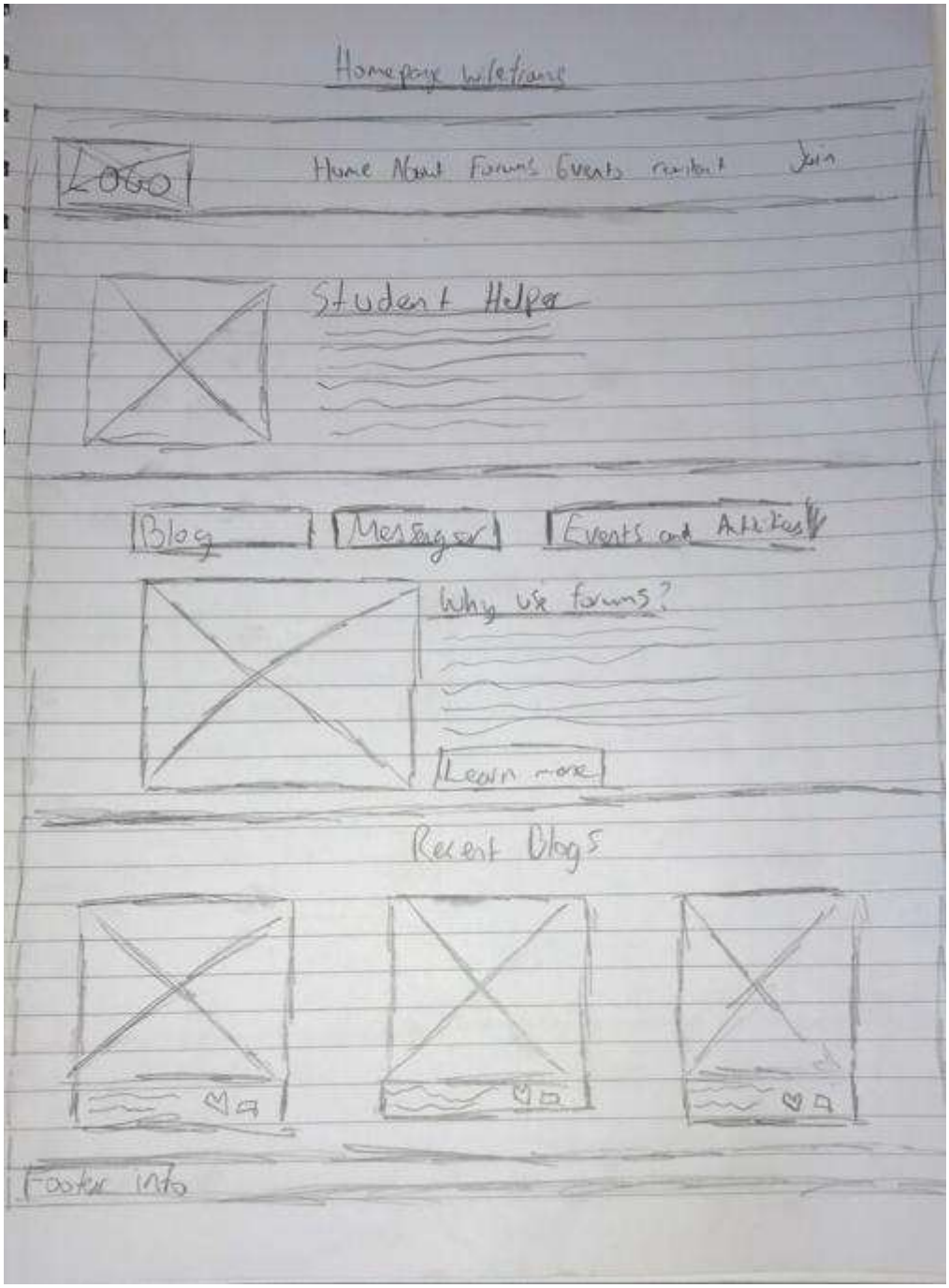
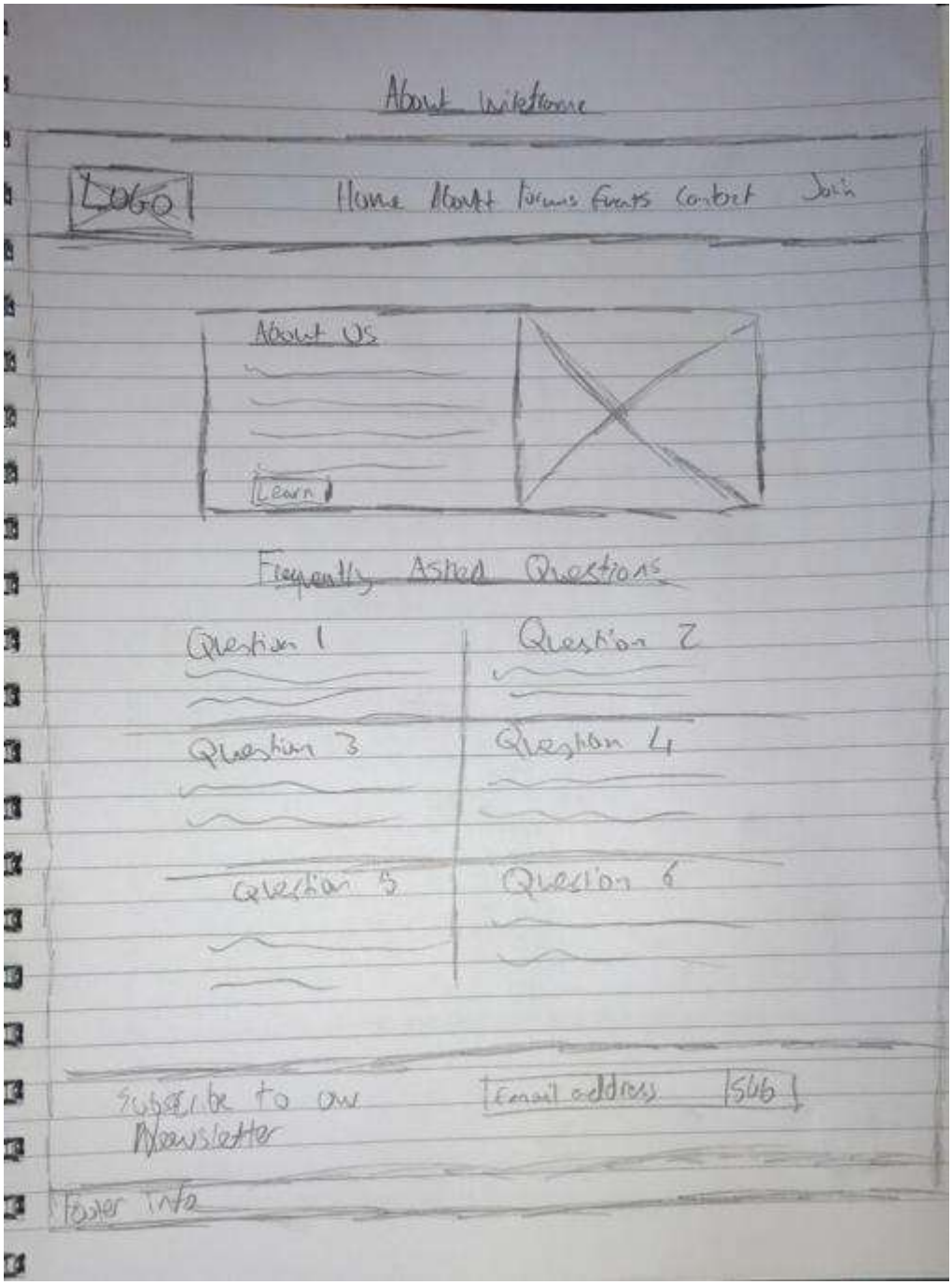
14. Wireframes

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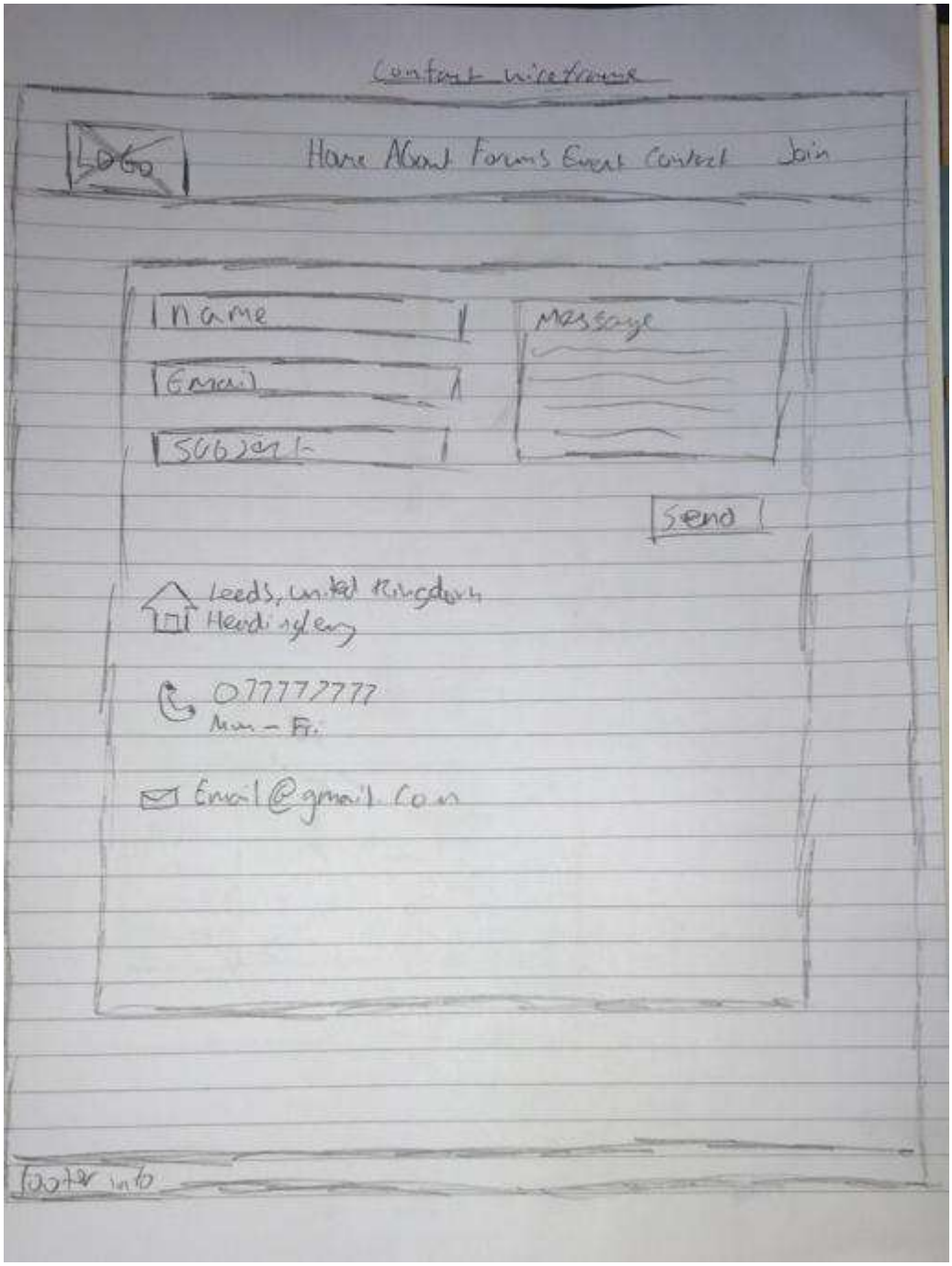
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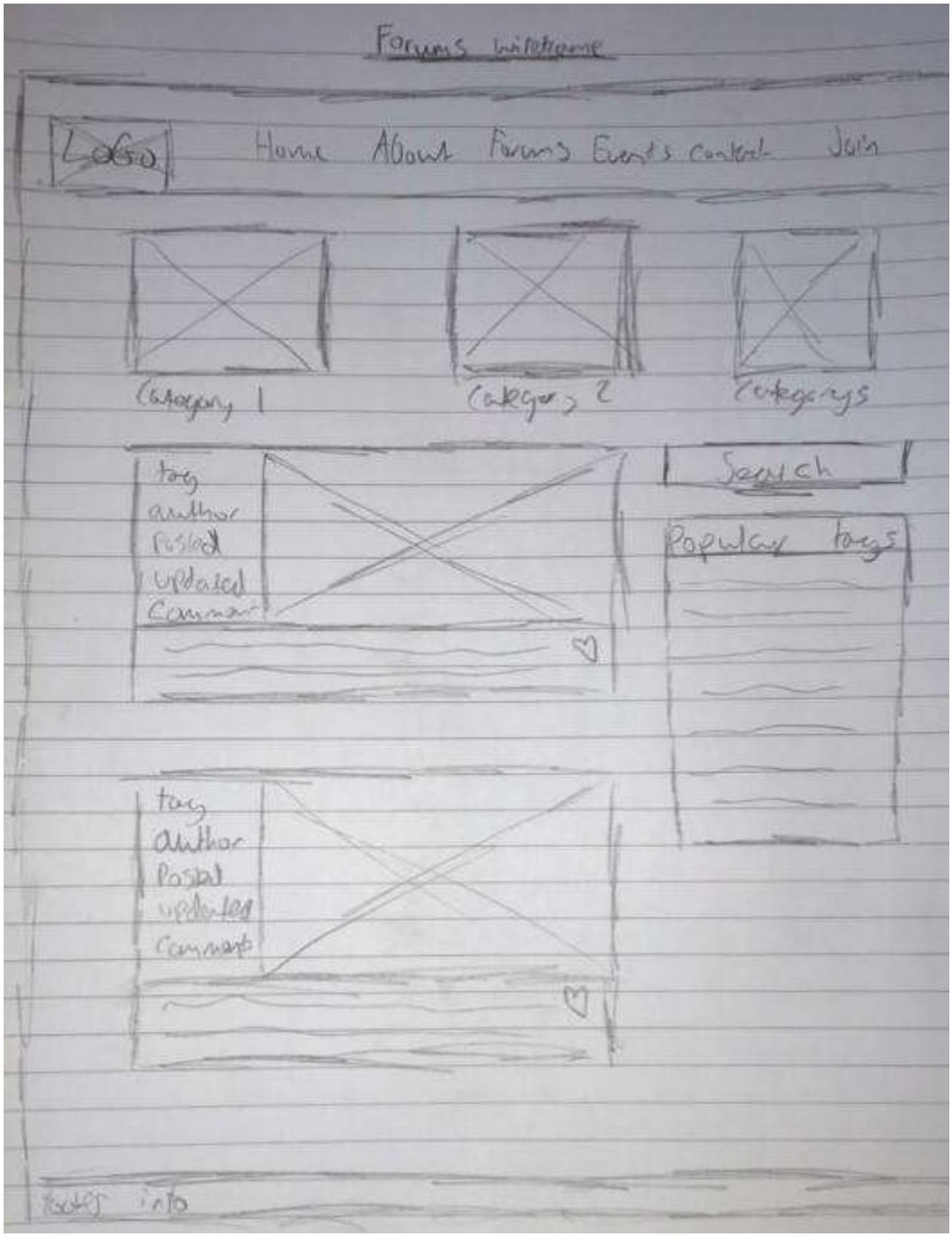
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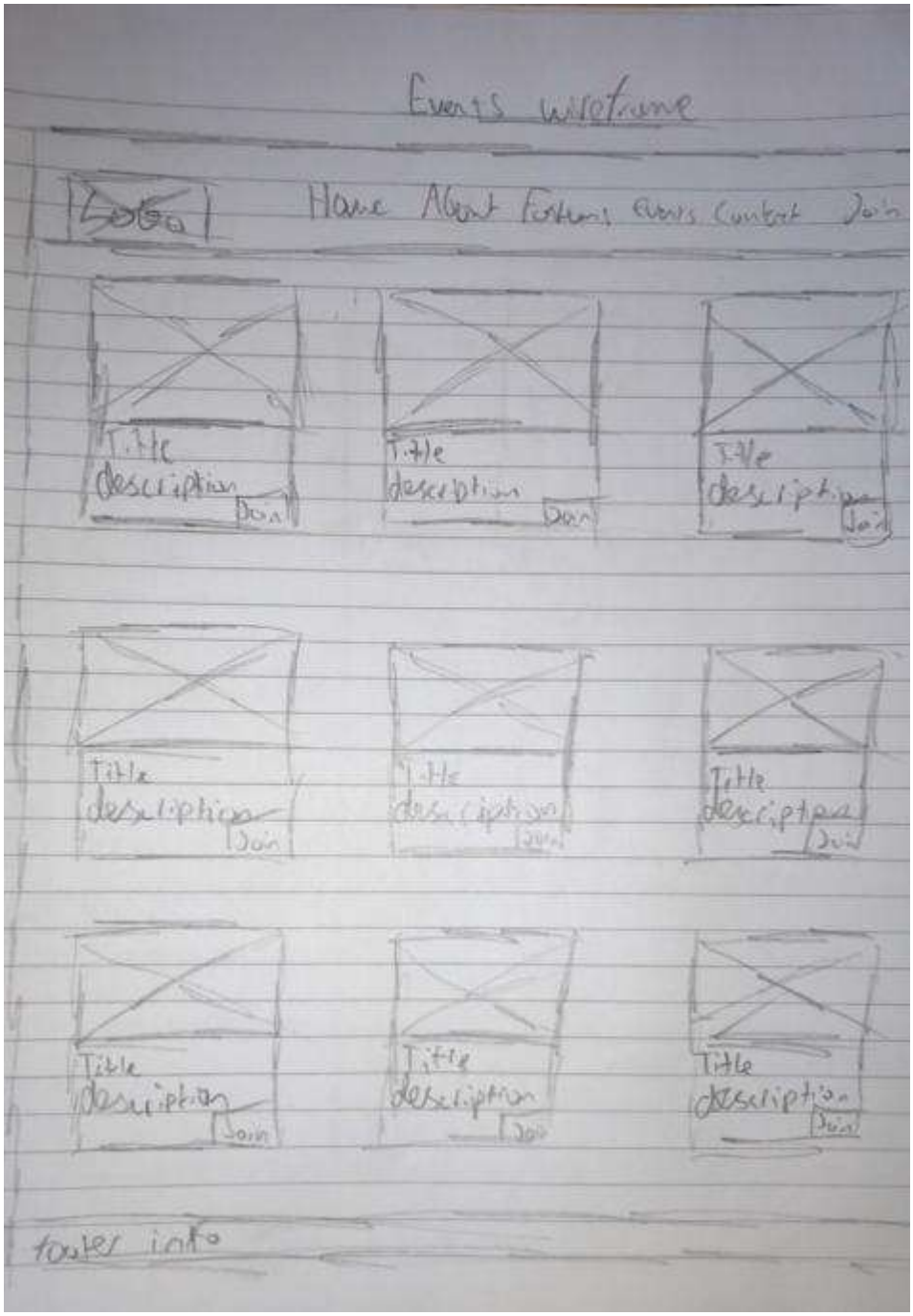
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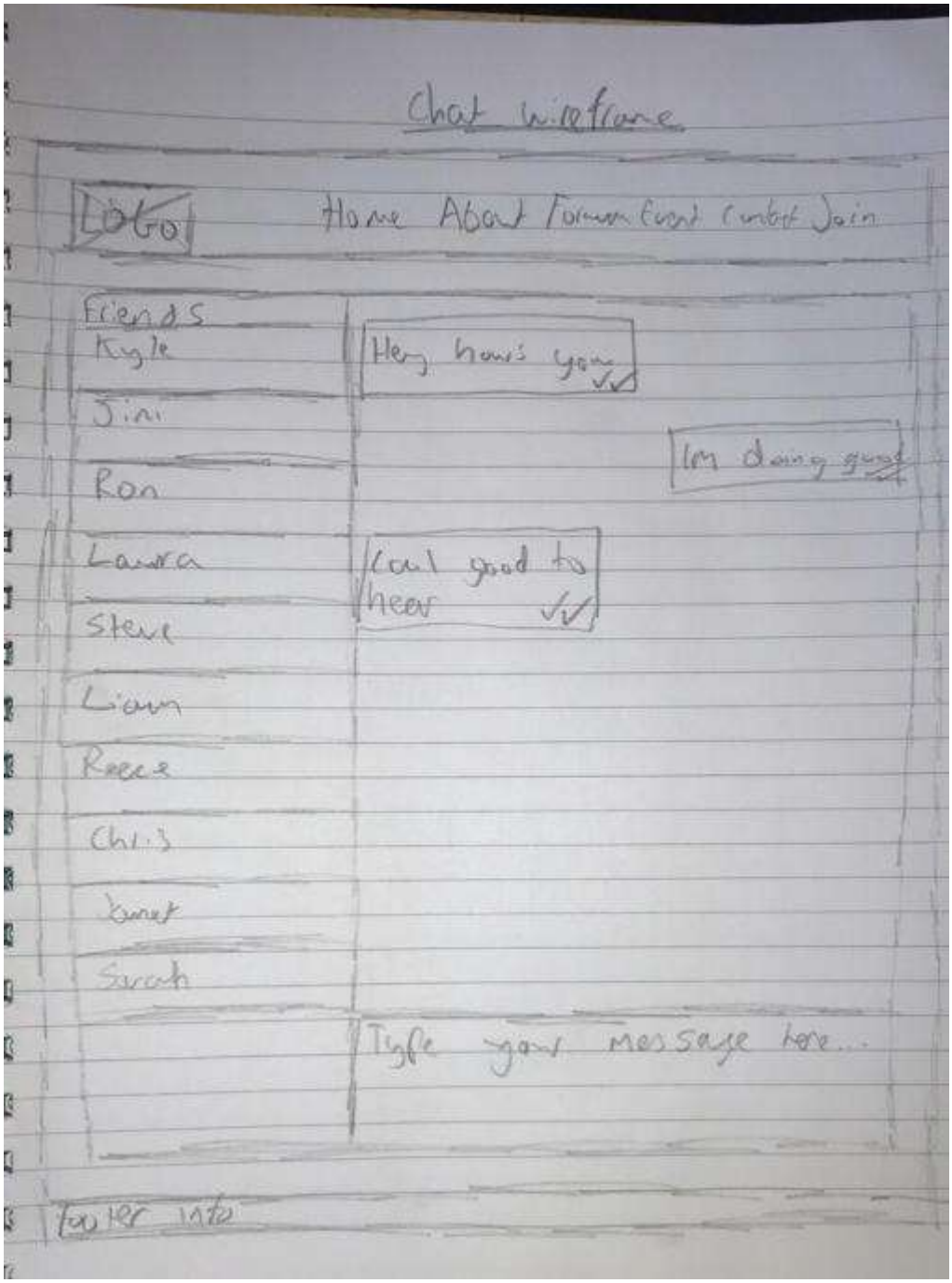
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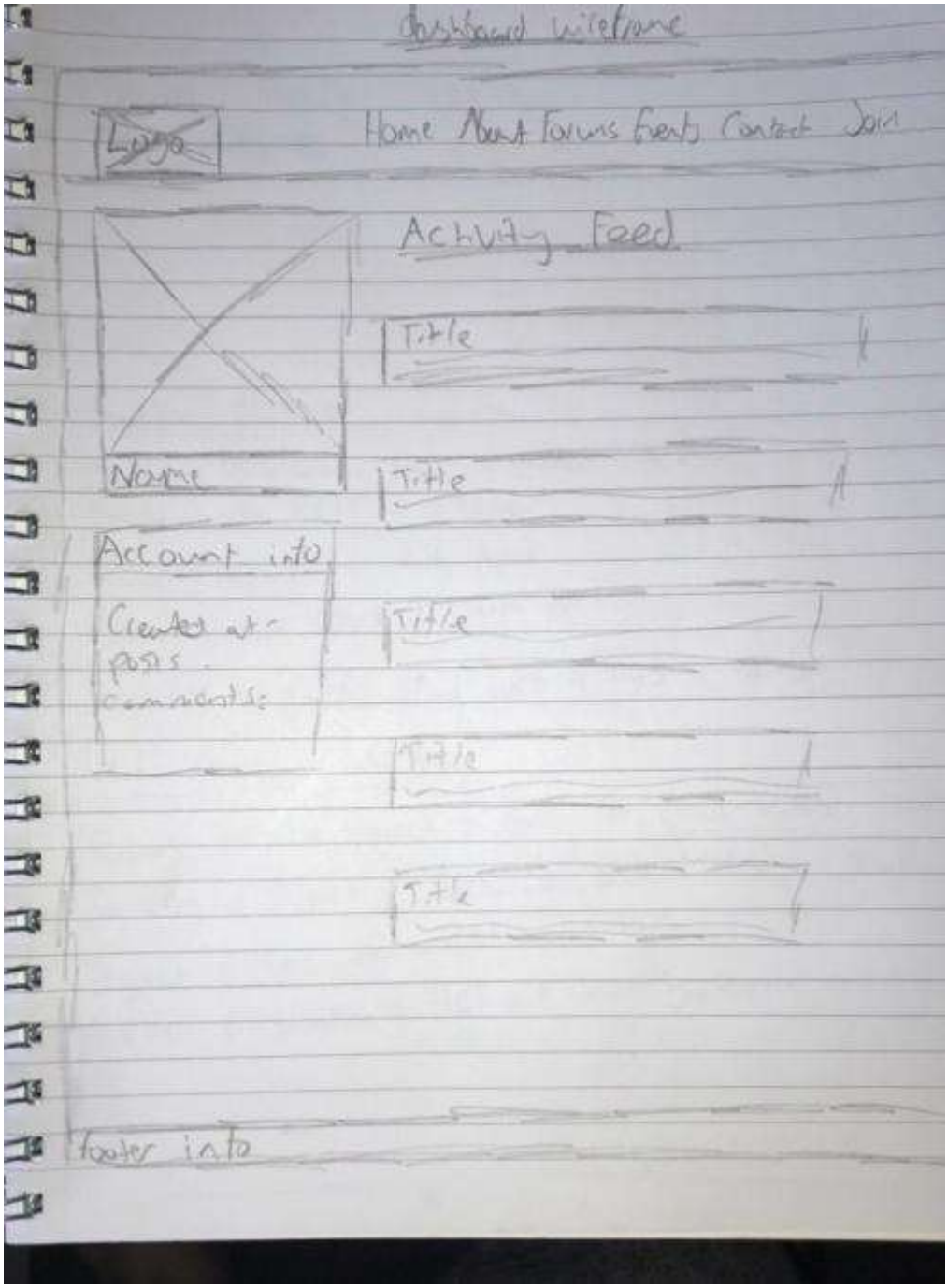
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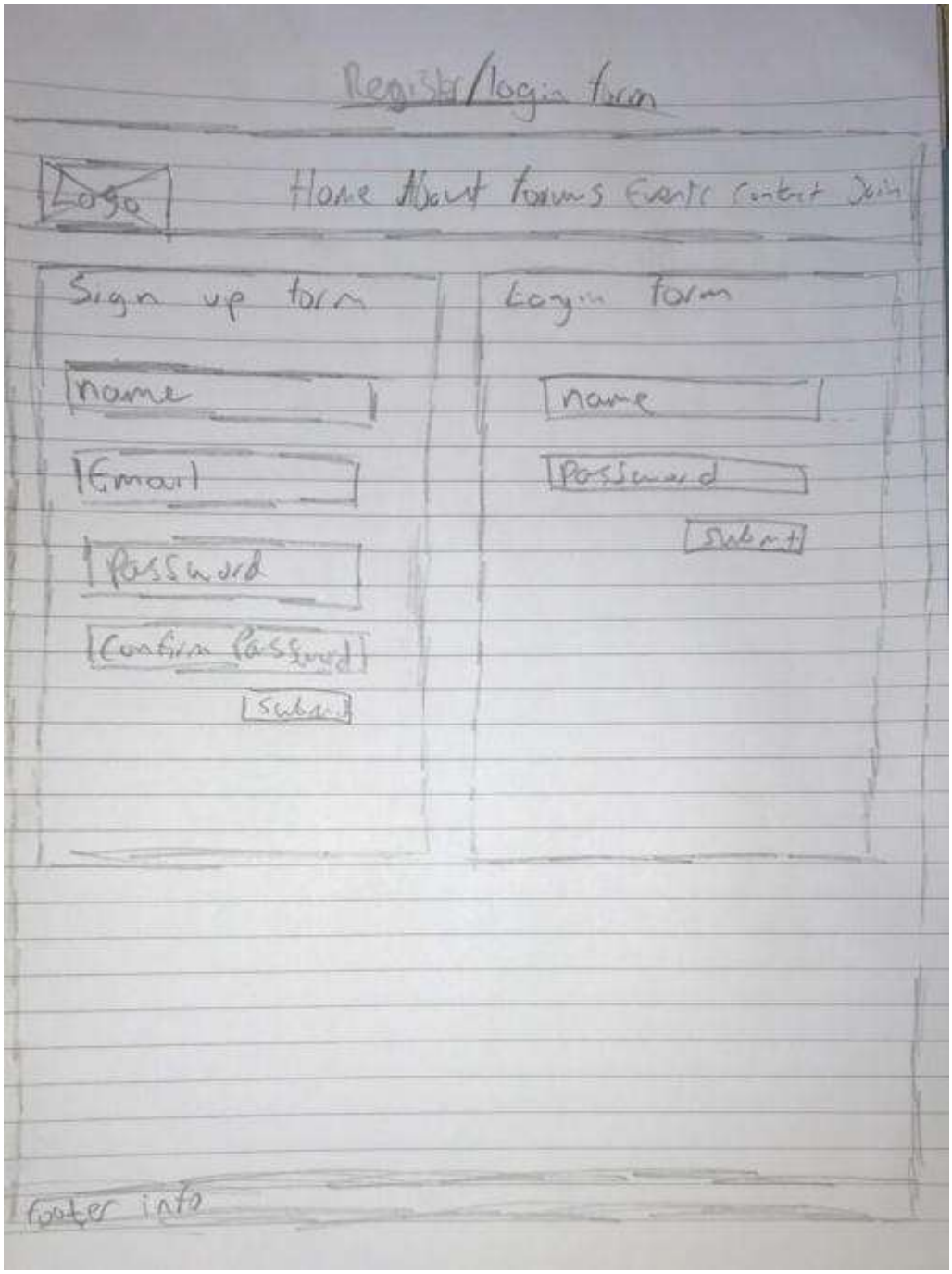
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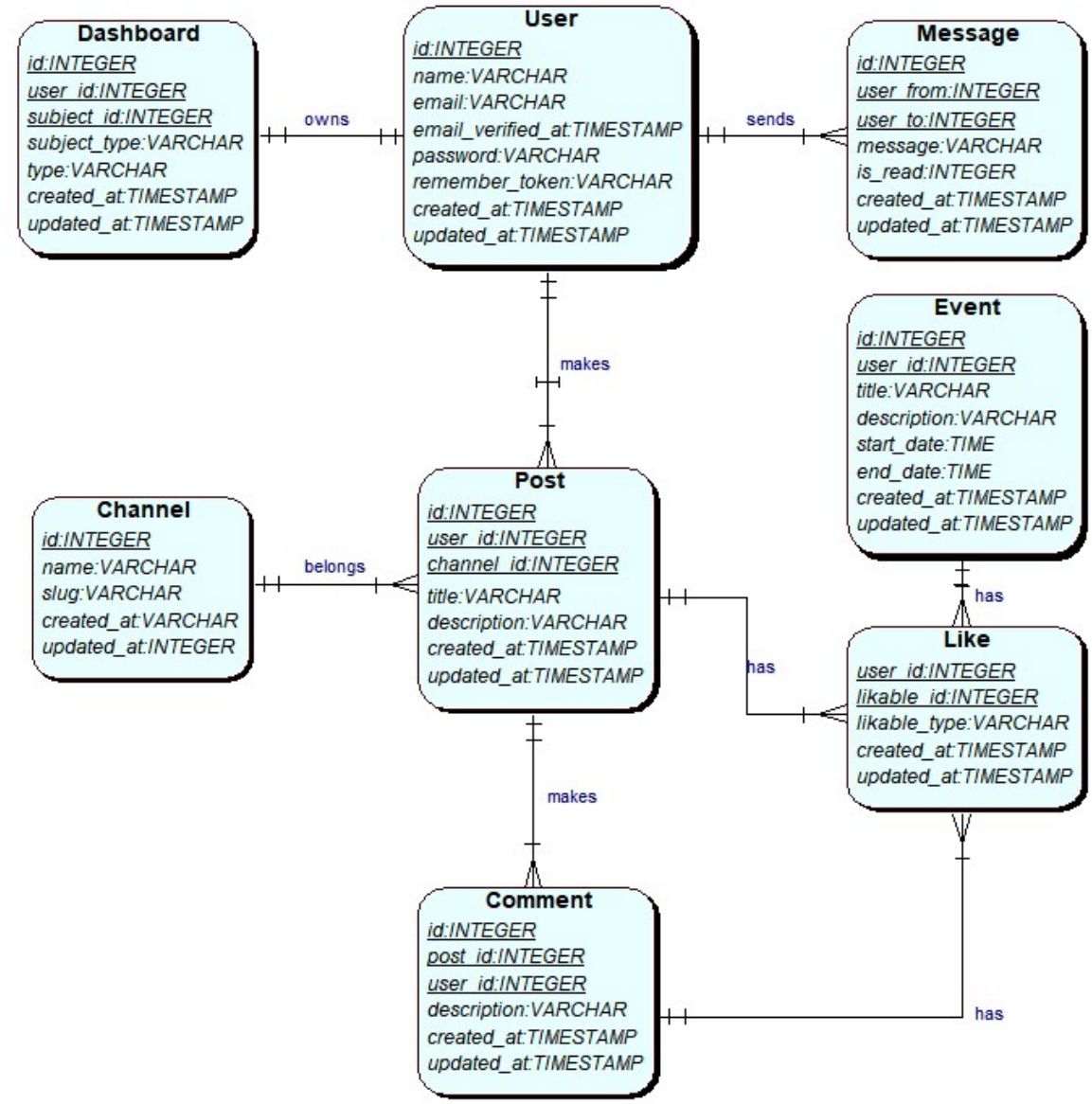
15. Entity Relationship Diagram/ERD

Student-helper DB



16. Appendices B

17. Interview questions

Question Number	Question
1	On average how much time do you spend studying per day?
2	What are your impressions of the look and feel of the website?
3	What do you like about the forums page?
4	What don’t you like about the forums page?
5	What do you like about the chat system?
6	What didn't you like about the chat system?
7	What did you like about the events page?
8	What didn't you like about the events page?
9	How do you feel about the product as an educational tool and would you use it?

18. Appendices C

19. Meeting records

School of Computing, Creative Technologies and Engineering

Level 6 Production Project

MEETING RECORD SHEET:	**Meeting N0:1**
Student: Thomas Gale	**Student I.D.:c3523211**
Date of Meeting: 03-10-2019	**Supervisor: MC**

Actions agreed at previous meeting (completed or comment):

1	To develop a project idea – Web/app for Students
2	To have a project title
3	To think of the Aim & Objective and list these down
4	To look into 1st submission and it's requirements and have a plan (gantt chart MS Proj)
5	To carry out some literature review on the topical subject and on how to carry out research
6	

Comments of student (if any):

ABOVE here – student to complete before Meeting with supervisor. BELOW here – complete at the Meeting.

Next meeting (date/time)**:17/10/19**

Agreed Actions to complete before next meeting:

1	To start work on points 1-5 for the next meeting
2	
3	
4	
5	
6	

Comments of supervisor (if any):

School of Computing, Creative Technologies and Engineering

Level 6 Production Project

MEETING RECORD SHEET:	**Meeting N0:2**
Student: Thomas Gale	**Student I.D.: c3523211**
Date of Meeting: 17-10-2019	**Supervisor: MC**

Actions agreed at previous meeting (completed or comment):

1	**To develop a project idea – Web/app for Students**
2	**To have a project title**
3	**To think of the Aim & Objective and list these down**
4	**To look into 1st submission and it's requirements and have a plan (gantt chart MS Proj)**
5	**To carry out some literature review on the topical subject and on how to carry out research**
6	

Comments of student (if any):

The above actions were generally met before the next meeting as I drafted up a project specification which touched on most of the issues above. I further developed my project idea by coming up with an overall topic for the project to help enforce my plans for the product after doing some brief research into my area of interest. However, at our next meeting we discussed that my project title could use a little work as it sounds more suitable to be an objective and my aim could also do with including the type of product I plan to make as well as the issue I am aiming to combat through the project.

***ABOVE here** – student to complete before Meeting with supervisor. **BELOW here** – complete at the Meeting.*

Next meeting (date/time)**:7/11/19**

Agreed Actions to complete before next meeting:

1	Amend project title to better suit the purpose of the project
2	To include the details of the product within the aim of the project
3	Move current title to objectives as it is more appropriate there
4	
5	
6	

Comments of supervisor (if any):

School of Computing, Creative Technologies and Engineering

Level 6 Production Project

MEETING RECORD SHEET:	**Meeting N0:3**
Student: Thomas Gale	**Student I.D.:c3523211**
Date of Meeting: 07-11-2019	**Supervisor: MC**

Actions agreed at previous meeting (completed or comment):

1	To start working on Aim and Objectives.
2	To start work on Website Prototype.
3	To start work on Oracle MYSQL prototype.
4	Focus a methodology for the entire project.
5	
6	

Comments of student (if any):

ABOVE here – student to complete before Meeting with supervisor. BELOW here – complete at the Meeting.

Next meeting (date/time)**: 28-11-2019**

Agreed Actions to complete before next meeting:

1	To start work on points 1-4 for the next meeting
2	
3	
4	
5	
6	

Comments of supervisor (if any): Feedback on 1st Specifications Assignment. 66%. A good attempt made, well done. The aim and objectives sections are completed well and give the reader a good insight into your project. However, the research section could have been enhanced to give detailed areas of research. In project plan I strongly recommend use of MS Project as it is very professional at this level.

School of Computing, Creative Technologies and Engineering

Level 6 Production Project

MEETING RECORD SHEET:	**Meeting N0:4**
Student: Thomas Gale	**Student I.D.:c3523211**
Date of Meeting: 01-04-2020	**Supervisor: MC**

Actions agreed at previous meeting (completed or comment):

1	Add pagination to the forums page
2	Implement a pop out chat window
3	Add a carousel image to some pages
4	
5	
6	

Comments of student (if any): It was mentioned that it was okay to use phpMyAdmin in place of oracle apex for the database. Laravel is already setup to work with phpMyAdmin however more difficult to get it to work with oracle apex in newer versions so it was agreed to stick to phpMyAdmin going forward.

***ABOVE here** – student to complete before Meeting with supervisor. **BELOW here** – complete at the Meeting.*

Next meeting (date/time)**: 18/05/20**

Agreed Actions to complete before next meeting:

1	To start work on points 1-3 for the next meeting
2	
3	
4	
5	
6	

Comments of supervisor (if any):

School of Computing, Creative Technologies and Engineering

Level 6 Production Project

MEETING RECORD SHEET:	**Meeting N0:5**
Student: Thomas Gale	**Student I.D.:c3523211**
Date of Meeting: 18 -04-2020	**Supervisor: MC**

Actions agreed at previous meeting (completed or comment):

1	Tidy up the html css styling of pages
2	Remove remaining whitespace
3	Make sure all code is ready for submission date
4	
5	
6	

Comments of student (if any):

***ABOVE here** – student to complete before Meeting with supervisor. **BELOW here** – complete at the Meeting.*

Next meeting (date/time)**:**

Agreed Actions to complete before next meeting:

1	Finish above points for submission
2	
3	
4	
5	
6	

Comments of supervisor (if any):

20. Gantt chart

Social media web app for students

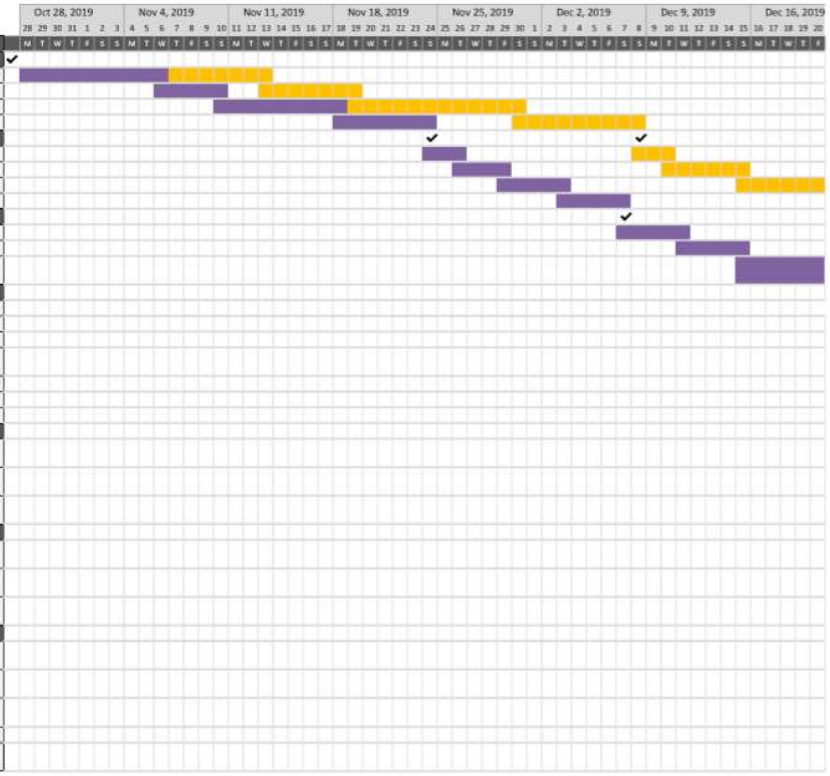
Thomas Gale

Milestone: ✔ Expected Time taken

Start Date: 27/10/2019

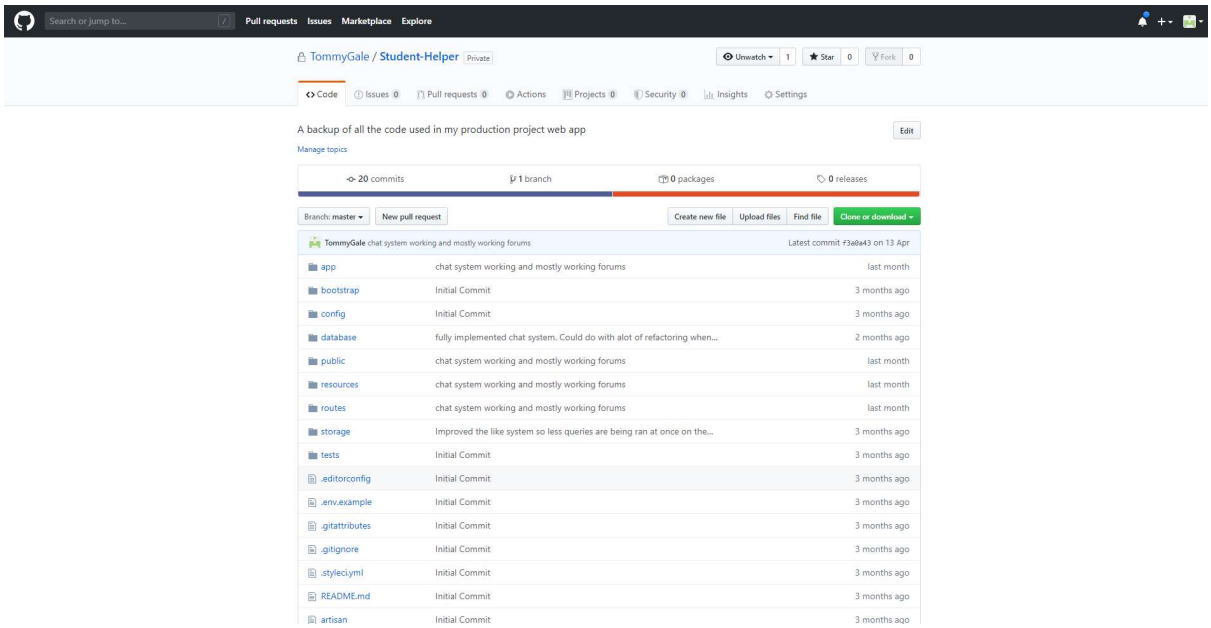
1

TASK	PROGRESS	START	END	DAYS
Research Activity				28
Research around topic area		27/10/2019	06/11/2019	10
Research into similar applications		06/11/2019	10/11/2019	4
Research necessary tools and technologies		10/11/2019	18/11/2019	8
Collect sources and useful information		18/11/2019	24/11/2019	6
Product Development				13
Use research to develop initial design		24/11/2019	26/11/2019	2
Initial ERD for database		26/11/2019	29/11/2019	3
Initial wireframe designs for pages		29/11/2019	03/12/2019	4
Acceptance criteria of features		03/12/2019	07/12/2019	4
Product Design				14
Wireframes for rough idea of all pages		07/12/2019	11/12/2019	4
Developed ERD for structured database		11/12/2019	15/12/2019	4
Acceptance criteria to outline most important features to implement first		15/12/2019	21/12/2019	6
Product Implementation				70
Create core pages of the prototype		21/12/2019	25/12/2019	4
Develop basic database for prototype		25/12/2019	29/12/2019	4
Add needed functionality for prototype		29/12/2019	04/01/2020	6
Expand on prototype with remaining pages,database tables and functionality		04/01/2020	03/02/2020	30
Add accesibility features colours,fonts etc		03/02/2020	07/02/2020	4
Add validation and authentication to pages		07/02/2020	13/02/2020	6
Eliminate any bugs left in the final product		13/02/2020	29/02/2020	16
Product Testing				10
Make sure all routes are setup and lead somewhere		29/02/2020	02/03/2020	2
Check validation and authentication is all working using dummy data		02/03/2020	04/03/2020	2
Eliminate any final bugs that arise during unit testing or within the front end html design		04/03/2020	10/03/2020	6
Product Evaluation				15
Collect feedback from all levels of university students		10/03/2020	14/03/2020	4
Use general feedback to develop a clear conclusion		14/03/2020	18/03/2020	4
Evaluate product overall for the project report		18/03/2020	25/03/2020	7
Writing of Report				29
Include cover letter,table of contents and effective layout for report		25/03/2020	30/03/2020	5
Evaluate research techniques and research gathered		30/03/2020	06/04/2020	7
Evaluate if the product meets the needs of the project		06/04/2020	13/04/2020	7
Discuss and evaluate the project overall		13/04/2020	20/04/2020	7
Include final bibliography refering to all sources referenced throughout the project		20/04/2020	23/04/2020	3



21. Appendices D

22. Github repository



23. Appendices E

24. Project plan/ specification

Project Specification

Section title	Purpose
Project Title	Social media web application to help university students gain an academic advantage.
Project Aim	The aim of the project is to create a web application with a supporting database to encourage university students to socialize around their academic studies. The application will focus around helping students improve their academic performance and confidence within their subjects.
Project objectives	• To investigate the impacts of mainstream social media in correlation to student's academic performance. • To research and compare the academic performance of students that engage with each other and attend most of their timetabled activities versus those who do not. • To research user-friendly interfaces/platforms to help construct a suitable layout for the web application. • To research the relevant tools and technologies needed to create a modern web application and a well-structured database. • To build a web application and database to support the necessary environments needed to create a helpful online social platform for students' academic needs.
Product	The product to be implemented is a social space aimed to help all levels of university students in their academic endeavours. The web application will include a way for students to interact peer to peer, share course experiences and a format for students to plan events to help encourage others to get involved more with the university lifestyle. The product will be developed as a web application using the Laravel framework to meet the expectations of the project. This will also include the use of an SQL database to support the data handling of the website.
Research	Theoretical Research • Social media's effects on academic performance. • Social media websites. • User-interface designs. • Al-Rahmi, W. and Othman, M., 2013. The impact of social media use on academic performance among university students • Evans, C., 2014. Twitter for teaching: Can social media be used to enhance the process of learning? Technical Research • PHP/HTML/CSS using a Laravel framework. • SQL/MySQL database system. • Agile approach versus Waterfall approach. • Secure Encryption of data techniques. • Website accessibility options. • Optimization and Performance.
Evaluation	The product will be evaluated by collecting feedback from end users at the end of the production project to gauge if the product was a success within its intended use. The collected feedback will be used to come to a conclusion and evaluate the aspects of the project that went well and what things could have been improved if the product were to be attempted again. The feedback will be collected in the form of a survey evenly among all levels of university students to ensure the sample size remains fair.