University of Ottawa

Faculty of Engineering

GNG2101 - Introduction to Product Development and Management for Engineers and Computer Scientists

Project Deliverable G: Prototype 2

Submitted By: Team Z1

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Introduction:

This deliverable will demonstrate our second prototype as well as show its main design details, test the product's critical functionality compared to target specifications. The prototype will also be used to demonstrate the webpage layout as well as its main features. It will also be used to demonstrate what a normal interaction between a user and the website would look like while demonstrating how the webpage is aesthetically pleasing and easy to use. Furthermore, after our third client meeting our team obtained a lot of valuable feedback from our client's both being positive and negative. Our team will outline these comments in this deliverable and will try to use them as a base for our second prototype; to enhance the user interaction and overall informative aspect of our website. This document will be concluded by doing prototype testing and performance analysis in comparison to the target specifications set out in deliverable B, and finally, our team will outline what we wish to show to demonstrate on the final design day to check if our "Solution Works efficiently".

Client Feedback:

Positive:

The positive feedback is as follows:

- Our clients liked the extra documentations included in the homepage which gives users a bit of a background on basic 3D printing and its different applications.
- Our clients liked the main menu section with the different images which lead to different subsections. They thought this would be easier for newer users to interact with and follow along.

Negative:

The negative feedback is as follows:

- A pre-lab section shouldn't exist as people outside the GNG2101 domain will be using the website.
- Adding links instead of uploading the actual videos into the website can be a bit confusing for users and may look unprofessional.
- The titles allocated to the subsections in the homepage are not self-explanatory.

Change:

The changes recommended by our client were as follows:

- To switch the pre-lab section into something different to suit the needs of all users and not just GNG2101 students only.
- To add CEED information instead of GNG2101 TA information for the help center section.
- The title allocated to the subsections in the homepage would be changed into something more self-explanatory and easy to understand.

Improve:

- Before beginning the workshop, a survey will pop up asking the users different questions; e.g if they have ever used a 3D printer, their purpose of participating in the workshop… etc. This will be our replacement to the pre-lab.
- Videos will be uploaded into the website replacing the links that already existed.`
- To make the website easy to roam around without being forced into sections. While also having hints for users that want the web page to guide them to what they have to do.

Second product prototype:

Description:

The goal of our second product prototype which is a physical (i.e. tangible) prototype, will be to complete and develop our website homepage and lab sections. This will allow us to not only evaluate where we are at in our overall workload in regards to the completion of the website but will also allow for web page testing in regards to user experience and roamability of the different lab sections. The completion of the lab sections will also give us direct feedback on the content of these sections. This will allow us to know if each user is getting all the information necessary to complete the CEED beginner 3D printing labs and will tell us if the website is interactif enough for each user's liking. This feedback will determine what changes need to be made to our lab section and therefore is crucial for the completion of our final product.

Purpose:

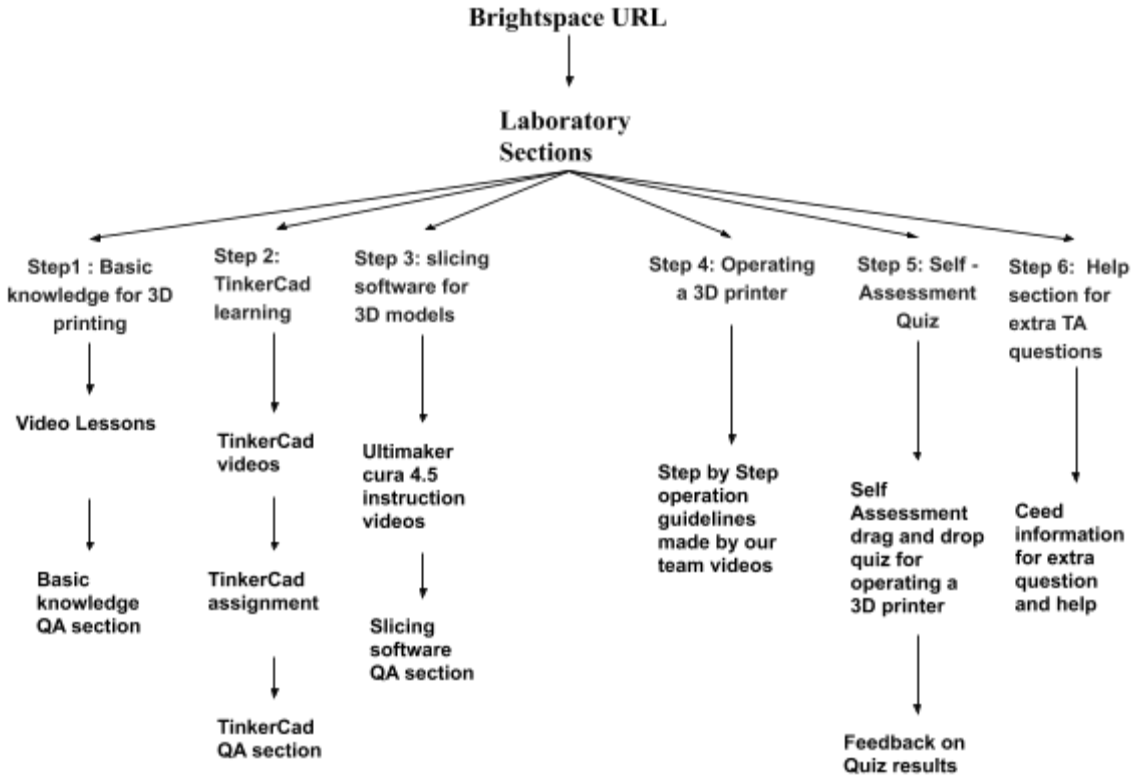
- To determine if the content of each lab section is informative and interactive
- To see if the website is easily accessible and easy to work with
- To evaluate the aesthetics of the website and see if the lab sections are easy to navigate and complete in chronological order

Function:

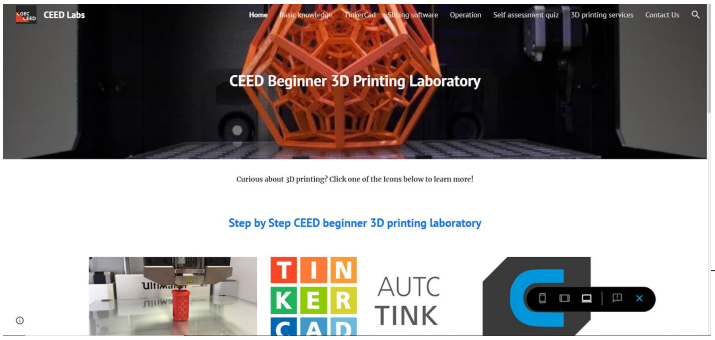
The function of our team's second prototype will be to have the overall lab broken down into sub sections. This will allow students to easily complete the lab in chronological order or allow users to roam as they please. The purpose of this second prototype is to fill each lab section with informative videos, interactive QA sections, fun assignment and extra information regarding 3D printings applications and services. This second prototype will also allow us to test the functionality of our website and conduct surveys with other students to see if they like the way the website is formated and if they themselves had attended the lab would come out fully prepared to 3D print in the real world.

Updated Flow Diagram:

To better improve and understand user interaction throughout our web interface, we devised an updated model that would demonstrate how users could (and ideally would) navigate throughout the domain. This flowchart would be effective in delivering the most efficient user experience. Similar to our initial web flow design, we think that simplicity would be key in depicting all the operations of a 3D printer and portraying it to users in the most superficial way. One would start by entering the domain url and end with all the knowledgeable requirements to begin 3D printing. For further help and understanding, we adapted a “contact us” subpage where users would be able to contact professionals such as our TA’s for better comprehension. The flow diagram is presented as a function subheading that follows.

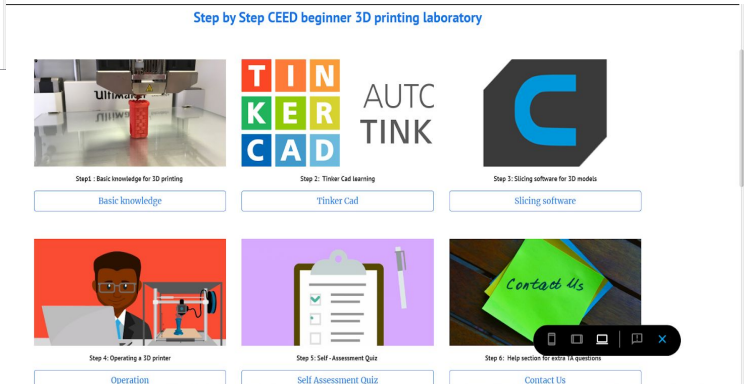


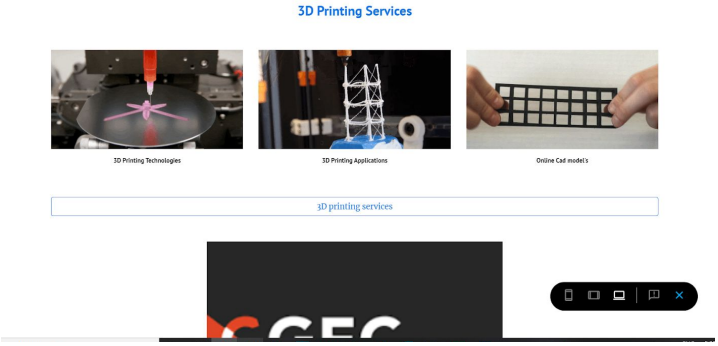
Website:



← Home page

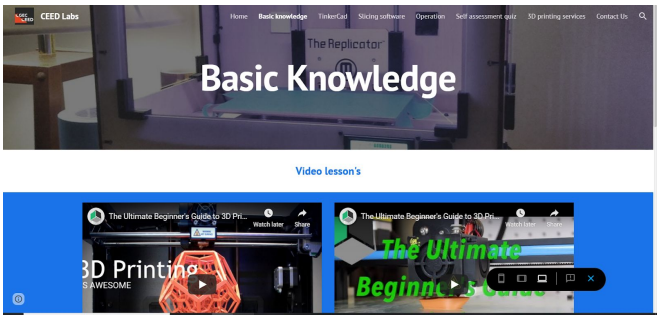
Step by step Laboratory sections →

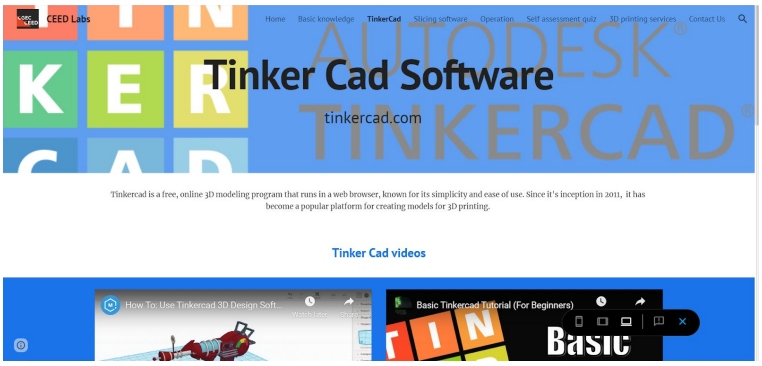




← Extra information section

Basic knowledge section of lab→





← TinkerCad section of lab

Prototype Testing:

Goal:

The overall goal of the testing conducted on our 2nd prototype will be to ask 5 people around each of our own teammates' houses which have experience in regards to surfing on the web and taking online classes and asking them a series of questions in regards to the performance of our second prototype after trying it out. Each person will be asked questions which are directly related to our set out target specifications and metrics. These target specs will then be compared to our recorded results and presented in tabular format.

Prototype 2 Testing:

Criteria #	Criteria	Units	Target	Person #1	Person #2	Person #3	Person #4	Person #5
1	Cost of prototype	Can $	< 30$	0	0	0	0	0
2	Time necessary to complete lab section	Minutes	< 90	55	64	60	50	70
3	Interactive	1-5 points	3	4	3	2	4	3
4	Cost for student	Can $	< 30$	0	0	0	0	0
5	Informative	1-5 points	3	3	5	5	4	5
6	Aesthetically pleasing	1-5 points	4	2	4	5	5	3
7	Easy to use	1-5 points	4	4	4	2	5	3

Point system:

1-Failed to meet requirements **3-Okay** **5-Meets requirement**

2-Marginal **4-Acceptable**

Results in regards to testing:

After conducting a study with each of our group members' families who had online learning experience we finally got to a final conclusion on our second prototype. Our prototype had a lot of very good aspects which worked perfectly for what we had intended for our website but did still have some defaults. These pros and cons were derived from the prototype testing table which included results conducted after 5 different people used our website.

Pros:

- Easy to navigate
- Easy to use
- Very informative
- Organized

Cons:

- Needs to be more interactive
- Needs a bigger QA section for each lab section
- Shorter informative videos
- Website needs to be fine tuned to be very aesthetically pleasing

Design Day Presentation and Solution Verification:

On Design Day, we will present a general overview of our project plan and our progression over the duration of this course. We will concisely explain how we went about creating our final product, starting with our first prototype and ending with our final prototype. Our explanation will touch on topics such as our project's

- Problem statement
- Client/user needs
- Design criteria
- Target specifications
- Product prototyping
- Testing
- Video overview of our website
- Instructions for completing the CEED 3D printing laboratory

Conclusion:

Upon completion of our third client meeting and receiving constructive feedback, we came up with the second prototype for our website. The final product is coming together and is starting to look like an authentic online interactive learning platform. The product has drastically improved from the first prototype. All subsections have been added into the website with some additional documentations. We intend to meet with our clients one more time, to receive final feedback and construct the third and final prototype for our product. Following this, we would be able to finally publish our product and make it available for the public and affirm the means through which payment processing would occur and consumer interactiveness would be achieved. Our product is not solely made for CEED users but they will surely have the advantage over those using it from different engines. The end goal of our product is to be interactive and should have a friendly environment for users of all age demographics to come and learn about 3D printing on a school run online platform, and our second prototype proves that this goal is highly achievable.