Deliverable B

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GNG 2101

Presented to:
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By:
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Introduction

In this document, we outline all necessary information for the design of a product intended to teach students the basics of soldering. The goal of this deliverable is to identify and organize all of the relevant project information to better understand our client needs and begin conceptualization. Our final goal is to properly design a tool in order to accurately simulate a soldering workshop (in order to teach new users the basic concepts, safe use of tools, etc) all while respecting the needs of our client, and within monetary and time constraints.

Client Statements

- The client is looking for a solution to easily explain what soldering is used for at the beginning of the workshop
- Provide an online workshop as if the user was there in real life
- User experience cost less or equal to 20$
- Available to most students
- Answers to common questions students may have during the workshop
- Follows the in-person workshop's content
- The workshop should be interactive
- The length of the workshop should be around the same as the actual one to not discourage users

Design Criteria

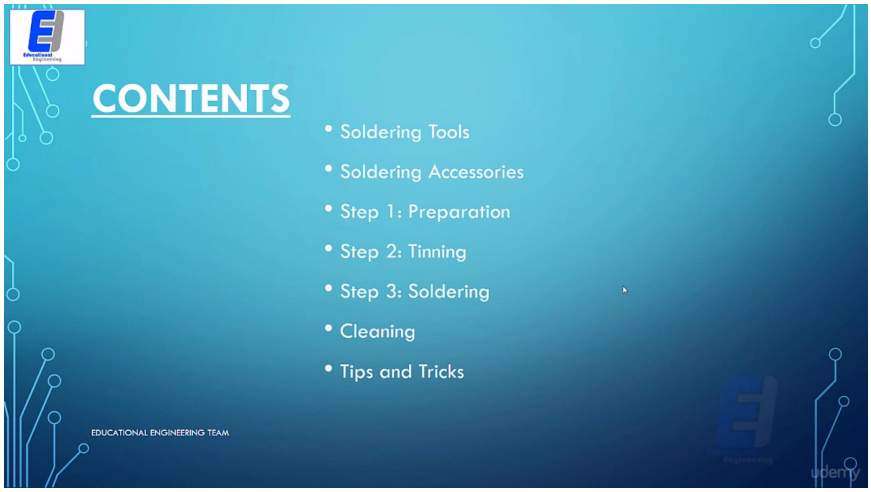
#	Client Statement	Interpreted Needs	Importance
1	The client is looking for a solution to easily explain what soldering is used for at the beginning of the workshop	Provide an introduction to soldering tools and steps	0.2
2	Provide an online workshop as if the user was there in real life	Online solution simulates accurate real world soldering	0.125
3	User experience cost less or equal to 20$	Students attending the workshop will spend a maximum of $20 on the tutorial	0.05
4	Available to most students	Open source tutorial	0.15
5	Answers to common questions students may have during the workshop	The tutorial answers common questions	0.175
6	Follows the in-person workshop's content	The tutorial contains steps of the real workshop	0.1
7	The workshop should be interactive	The tutorial include a hands-on section	0.15
8	The length of the workshop should be around the same as the actual one to not discourage users	The online workshop will be around 90 minutes	0.05

Problem Statement

The MakerLab requires an online interactive soldering tutorial that is easily accessible to students and contains the content of the in-person tutorial at a max price of 20$ (requires minimal equipment and no previous experiences).

Benchmarking

Udemy: How to Solder Electronic Components Like A Professional
Link: https://www.udemy.com/course/how-to-solder-electronic-components-like-a-professional/



This is an online course that teaches the basics of soldering. This course is a combination of slideshows with voice-overs along with videos containing real-life examples of soldering. This course goes over choosing the right tools and materials as well as maintaining them. The course also teaches soldering in a step by step manner while also showing what good and bad soldering looks like.

CIE Bookstore: Soldering Course with SMT Lab
Link: https://www.ciebookstore.com/soldering-course-with-smt-lab

This course teaches the basics of soldering along using lessons, labs and exams along with instructor support if you have questions. This course goes through getting started with soldering and reliable techniques for doing so. The course also teaches you how to work with printed circuit boards and techniques specific to doing so.Lastly it has a final project of creating a siren with flashing lights.

Decision Matrix

Interpreted Needs	Weightings		Does it satisfy the need?	
	Course 1: Udemy	Course 2: CIE Bookstore	Course 1: Udemy	Course 2: CIE Bookstore
Provide an introduction to soldering	0.2	0.2	Yes, but requires some experience in basic electronics	Yes
Online solution simulates them soldering	0	0	No	No, but it gives you the tools to solder in real life
Students attending the workshop will spend a maximum of $20 on the tutorial	0.05	0	Yes (Currently On Sale for $16.99)	No
Open source tutorial	0.15	0.15	Yes	Yes
The tutorial answers common questions	0	0.175	No	Yes
The tutorial contains steps of the real workshop	0.1	0	Yes, Similar to what the client described	No
The tutorial includes a hands-on section	0	0.15	No	Yes
The online workshop will be around 90 minutes	0.05	0.05	Yes	Yes, (Estimated)
Total	0.55	**0.725**		

Target Specifications

#	Metric	Unit	Needs addressed
1	Time	Minutes	The workshop should be no more than 90 minutes.
2	Effectiveness	%	The mode of the grades of the students after taking the tutorial
3	Rating	5 point scale	The enjoyment of the online workshop based on a 5 point scale.
4	Accuracy	5 point scale	The accuracy of the tutorial when compared to real soldering.

#	Target Specification	Marginally acceptable value	Ideal value
1	Length of workshop in term of time.	40 < minutes < 80	60 minutes
2	Effectiveness	70%~90%	100%
3	Rating	~3.5/5	5/5
4	Accuracy	~3.5/5	5/5

Client Meeting

Misconceptions

- We were under the impression that the tutorial itself would be conducted in VR/AR. As new information has shown, it can be any form as long as it follows the guidelines.
- We thought that the online tutorial would be an independent application that would not require any human communication to run (i.e. answering questions, directing students...)

Our process

Our process will not be based around VR/AR, as we originally planned, because of the material limitations (being that the only easily accessible VR material is google cardboard, which limits the interaction we can be incorporated), and will more likely be a more standard simulation (using programs like Unity) in order to increase the accessibility, interaction and ease of use.

Conclusion

The goal of the deliverable is to identify all the client's needs and interpret them into measurable statements. The needs identified were prioritized based on client statements and user statements (The Z11 Team). Some of the client's needs are more crucial than others because if these design needs are not met, then the product will fail its task. Based on the first meeting with the client, there are still some variables that need further clarification, such as what form the tutorial will take. The team will get further information on the tutorial from future client meetings.