EYE DROPPER ASSISTANT, BME 402

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Note: Team member Tommy is currently participating in a Co-Op and is devoting time to that position. Tommy will work on what he can this semester for the project but due to this conflicting commitment, his contributions *may* be limited.

Problem Statement

Administration of eye drops is difficult for patients, especially older adults and those with limiting diseases like arthritis. This results in eye drop waste and tip contamination. The team will design a device to assist patients in squeezing the eye drop bottle while releasing a consistent amount of solution per drop. This device will improve the administration of eye drops for the patient while minimizing eye drop waste.

Brief Status Update:

The team is traveling to the Oakwood retirement community to complete preference testing. The results from the study will help determine whether or not the device is successful in creating a mechanical advantage for users, as well as determine which version of the device users will prefer. The team also hopes to gain feedback regarding any changes that should be made to the device.

Difficulties & Advice Requests:

Team members are learning more about how to approach the business side of engineering. The current difficulty the team is having is creating presentations that are approached as a business pitch rather than an academic study.

Current Design:



Design Changes:

- Nose piece removed and platform implemented for user to rest on eyebrow bone.
- Altered the squeezing mechanism to be more uniform for injection molding.
- Separated components to allow for less complex injection molding procedures.

Materials and Expenses:

lt aus	Description	Manufacture	Part	Data	OTV	Cost	Tetal	1 to b			
Item	Description	r	Number	Date	QIY	Each	lotal	LINK			
Existing Devices											
Droppy Eye											
Drop	Competing	Droppy,									
Dispenser	Design	Amazon	DR001	9/25	1	9.99	9.99	<u>Link</u>			
GentleDrop			ASIN:								
Eye Drop	Competing	GentleDrop,	BOBQB								
Guide	Design	Amazon	HRKV1	9/25	1	17.99	17.99	<u>Link</u>			
			Proto	typing							
	Prototype										
Silicone	Materials	PETUNIA	ASIN:								
Eyelash	(Handle	SKINCARE,	B00UVL								
Curler	Grips)	Amazon	NDVQ	10/25	1	7.49	7.49	<u>Link</u>			
		UW									
		Makerspace									
MakerSpace		Ultimaker 3D									
Print	Prototype v1	Print	N/A	10/31	1	4.96	4.96	N/A			
		UW									
		Makerspace									
MakerSpace		Ultimaker 3D									
Print	Prototype v2	Print	N/A	11/10	1	5.07	5.07	N/A			
		UW									
		Makerspace									
MakerSpace		Bambu Labs									
Print	Prototype v3	3D Print	N/A	11/13	1	4.5	4.5	N/A			
		UW									
		Makerspace									
IVIakerSpace	Drototurosu2	Bambu Labs	NI / A	11/11	1	4.00	4.00	NI / A			
Print	Prototype V3	30 Print	IN/A	11/14	1	4.96	4.96	N/A			
		UW									
Na-las Cara		Makerspace									
IVIakerSpace	Drototurosu2	Ultimaker 3D	NI / A	11/15	1	0.10	0.10	NI / A			
Print	Prototype v3	Print	N/A	11/15		8.16	8.16	N/A			

		Manufacture	Part			Cost		
Item	Description	r	Number	Date	QTY	Each	Total	Link
		UW						
		Makerspace						
MakerSpace		Ultimaker 3D						
Print	Prototype v4	Print	N/A	11/17	1	10.08	10.08	N/A
		UW						
		Makerspace						
MakerSpace		Ultimaker 3D						
Print	Test Fixture	Print	N/A	11/29	1	13.78	13.76	N/A
		UW						
		Makerspace						
MakerSpace	Final	Ultimaker 3D						
Print	Prototype	Print	N/A	12/1	1	7.36	7.36	N/A
		UW						
	Multiple	Makerspace						
MakerSpace	Final	Ultimaker 3D						
Print	Prototypes	Print	N/A	12/8	1	11.6	11.6	N/A
		UW						
	Multiple	Makerspace						
MakerSpace	Final	Ultimaker 3D						
Print	Prototypes	Print	N/A	2/6	1	7.84	7.84	N/A
		UW						
	Prototype	Makerspace						
MakerSpace	Adjusted For	Ultimaker 3D						
Print	IM	Print	N/A	2/23	1	2.15	2.15	N/A
		UW						
	Parts for	Makerspace						
MakerSpace	Connection	Ultimaker 3D						
Print	Mechanism	Print	N/A	2/26	1	2.8	2.8	N/A
		UW						
		Makerspace						
MakerSpace	Prototypes	Ultimaker 3D						
Print	for Testing	Print	N/A	3/4	1	8.2	8.2	N/A
		UW						
		Makerspace						
MakerSpace	Prototypes	Ultimaker 3D						
Print	for Testing	Print	N/A	3/4	1	8.75	8.75	N/A

Upcoming Team and Individual Goals:

Team: The team will submit another IRB application for accuracy testing. The team will also continue improving the shark tank presentation and researching the market for the device. *Individual:*

- Jenna:
 - ➤ Reach out to PI for the injection molding lab in WID
 - ➤ Rework shark tank slides based on feedback from George Zorich
 - > Complete preference testing at the retirement community
- ✤ Eva:
 - Meet with George Zorich from Pharmacy School ShaRx Tank to discuss strategy for meeting with Mark Baum (Harrow Health)
 - Meet with Stephanie for an IRB consult on Monday to discuss the next application
 - Complete preference testing at retirement community with team and begin analyzing survey results
- Tevis:
 - ➤ Finalize a quote for injection molding
 - > Attend the first round of testing at oakwood
 - ➤ Continue gathering info for the shark tank slides
- ✤ Tommy:
 - Measure small bottle sizes
 - Redesign the bottle squeezing mechanism
 - > Print prelimary prototype with new squeezing mechanism
- ✤ Kasia:
 - Meet with IRB people to learn more about what is expected in the application that allows for subjects to dispense eye drops into eye using assistive device
 - ➤ Create IRB application
 - ➤ Continue improving shark tank presentation
- ✤ Anabelle:
 - Meet with IRB to learn about the second IRB application allowing subjects to now administer drops into their eyes using our device
 - > Continue working on the Shark Tank presentation

Timeline:

Task	Jan		F	eb				March	า		April				Мау	
	26	2	9	16	23	1	8	15	22	29	5	12	19	26	3	10
Project R&D																
Research	 Image: A second s	\														

Prototyping	1	1	1	1							
Testing					1	1					
Deliverables											
Progress Reports	1	1	1	1	1	~					
Prelim presentation			1								
Final Poster											
Meetings											
Client		1		1		~					
Advisor	1	1	1	1	1	~					
Website											
Update	~	~	~	~	~	~					

Project Goal	Deadline	Assigned	Progress	Completed
Preference Human Testing	2/29	All	In Progress	
Preliminary Oral Presentation	2/9	All	Completed	Yes
Preliminary Deliverables	2/28	All	Completed	Yes
Show and Tell	3/22	All	Not Started	
Executive Summary	4/19	All	Not Started	
Final Poster Presentation	4/26	All	Not Started	
Final Deliverables	5/1	All	Not Started	

Summary of Weekly Team Member Design Accomplishments

Team: The team prepared for preference testing by creating a script and gathering necessary materials. The team also continued working on simplifying the design of the device while maintaining the overall functionality.

Individual:

- ✤ Jenna:
 - ➤ Looked over feedback notes from Shark Tank meeting
 - > Look into potential packaging quote options
- ✤ Eva:

- Communicated with Laura Conger from IRB regarding our future plans with submitting another application for administering eye drops into eyes
- > Completed the recommended IRB consultation request form
- Met with client to plan for preference testing and create a merged document for screening, script, and survey
- Tevis:
 - > Printed the prototypes for testing
 - > Communicated with paula about WID opportunities
 - > Started researching how to get an accurate quote
- Tommy:
 - > Planned for and attended outreach session
 - ➤ Measured 2 large eye drop bottles
- ✤ Kasia:
 - > Met with Client to create a script for preference testing
 - ➤ Improved Shark Tank presentation
 - ➤ Discussed plan for next IRB application
- ✤ Anabelle:
 - > Met with team to discuss plans for the preference testing
 - ➤ Discussed initial plans for the second IRB application