

Title: Reusable 3D pelvic floor teaching model for layered construction activities (Super-Models) 200/300

Date: 10/3/2026 - 10/9/2026

Client: Kelsey Henriquez

Advisor: Prof. David Dean

Team:

Katherine Ahlquist (kahlquist@wisc.edu) - Co-Team Leader

Sara Mlodik (mlodik@wisc.edu) - Co-Team Leader

Mina Hawkins (mjhawkins@wisc.edu) - Communicator

Abigayle Chapman (akchapman2@wisc.edu) - BWIG

Hiba Shah (hashah2@wisc.edu) - BPAG

Karen Pisano (kpisano@wisc.edu) - BSAC

Problem statement

The Physician Assistant anatomy curriculum currently has a pelvic floor anatomy workshop that uses a 2-dimensional paper template of the bony pelvis, on which PA students build pelvic floor musculature and tissues using colored Play-Doh. While the activity promotes hands-on learning, the 2D model does not adequately allow students to develop the three-dimensional spatial relationships required for future clinical practice. The client needs a classroom set of pelvic outlet models that accurately represent the normal adult pelvic anatomy, including anatomical landmarks for muscle and ligament attachment, that can serve as a stable scaffold for students to build pelvic floor musculature. It should be durable enough for repeated classroom use, easy to assemble and store, and allow Play-Doh or another inexpensive modeling material to be adhered and removed without causing residue or degradation.

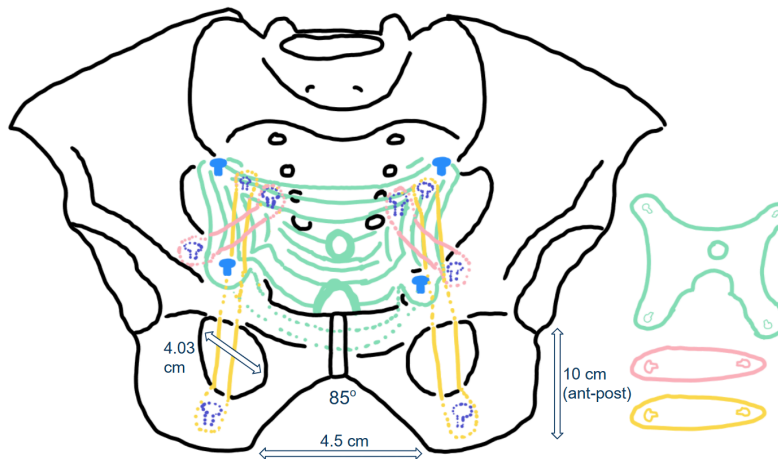
Brief status update

We delivered an oral presentation to fellow BME students and advisors explaining the problem statement and sharing our progress including the preliminary design. We have updated our website photo of the group. This week the preliminary report is due so the team began and submitted a report that now included a fabrication method, for the preliminary design. Part of the team met up at the UW Maker space for a preliminary consultation of 3D printing resources. More consultations with Jesse will be scheduled to coordinate logistics for bulk printing.

Difficulties / advice requests

N/A

Current Design



In the Pegs with Attachments design, there are 6 pieces total: a 3D printed pelvis, a flexible pelvic diaphragm, 2 flexible sacrospinous ligaments, and 2 sacrotuberous ligaments. The outer surface of the model will be coated with matte Mod Podge spray, allowing for better Play Doh adhesion onto the 3D printed surface. The pelvis is a simplified model, with the iliac crest sections superior to the proximal end of the sacrum removed. To allow the attachment of the diaphragm and ligaments, there are pegs on the pelvis surface. **To address the lower longevity score, the attachment pegs will be metal semi-tubular rivets reinforced with adhesive to withstand repeated use without snapping under grip forces up to 624 N. Each rivet features an exposed neck for removable attachments and a stem deeply embedded into a matching socket and secured with cyanoacrylate adhesive to distribute lateral loads and prevent failure.** Each of the flexible ligaments and diaphragm will have attachment holes at the ends with a wide and a narrow section to allow application and removal of the structures from the pegs. The diaphragm will be shaped like an 'X', having 4 attachment sites on each corner, as well as an inlet and a hole to allow students to scaffold the male or female anatomy. Finally, all structures will adhere to an average of male and female anatomical dimensions, creating a gender-neutral multi-piece pelvis model.

*Changes to design indicated in bold

Materials and expenses

Prospective Materials and Expenses

Item	Description	Manufac-turer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
3D-Printed Scaffold										
Main body of pelvic model	3D printed using PLA from the UW Madison Makerspace	UW Madison Maker space	N/A	N/A	N/A	10/06.2026	30	5	150	N/A
Rivets	360 rivets needed for 30 models' ligament attachment sites. 8 50 pks needed.	Uxcell	N/A	Amazon	N/A	10/06.2026	8	5.36	42.88	Link
Modpodge	The entire outer surface requires coating.	Modpodge		Plaid	SKU 1469	10/06.2026	3	7.79	23.37	Link
Gorilla Glue	Used to secure 360 rivets into place	Gorrilla	N/A	Amazon	N/A	10/06.2026	2	8.98	17.96	Link
Pelvic accessories: Ligaments & Diaphragm										
TPU	3D printed using from the UW Madison Makerspace	UW Madison Maker space	N/A	N/A	N/A	10/06.2026	120	Awaiting Cost Estimate		N/A
							TOTAL		\$234.21	

Major team goals for the next week

- Begin fabrication and narrow in on rivet, CAD, and material design details
- Have at least 3 functioning prototypes to show client
- Calculate the specific costs of the required materials.

Next week's individual goals

- Katherine
 - Meet with Jesse on Wednesday to talk about the 3D printing of pelvis.
 - Begin the CAD work for the 3D printing
 - Begin design ideas for a stand that will propping up the pelvis so it will support students building.
- Sara
 - After attending the design consultation on Wednesday, being the next steps in editing the CAD model by adding holes, removing the iliac crests, and changing filament infill near attachment points

- Decide the specific dimensions of the pelvis and ligaments and assist in creating the CAD model of the ligaments and diaphragm
- Mina
 - Become more involved in the fabrication plan after attending client meeting, team meeting, and advisor meeting.
 - Schedule session for required BME training.
 - Attend the design consultation on Wednesday to understand the fabrication of our models better.
- Abigail
 - Attend the design consultation on Wednesday, glean more information regarding the feasibility of our fabrication plan and adjust as needed
 - Begin development of CAD model and determine what is necessary for holes
 - Consider development of a block for model to rest on during classroom activities (for appropriate angle)
 - Assist with finalizations of pelvic dimensions
 - Research cleaning methods for our chosen materials
- Hiba
 - Look into if there are any materials that need to be ordered
 - Work on building prototype
- Karen
 - Attend the design consultation on Wednesday to learn more about CAD model development
 - Help decide specific dimensions for each component of the model

Timeline

Task	Sept			Oct					Nov				Dec	
	11	18	25	2	9	16	23	30	6	13	20	27	4	13
Project R&D														
Empathize	x	x	x	x										
Background...	x	x	x	x										
Prototyping					x									
Testings														
Deliverables														
Progress Reports	x	x	x	x	x									
PDS		x	x	x	x									
Design Matrix			x											
Prelim Presentation				x										
Prelim Deliverables					x									
Show and Tell														
Final Poster														
Final Deliverables														
Meetings														
Client	x				x									
Advisor	x	x	x	x	x									
Website														
Update	x	x	x	x	x									

Filled boxes = projected timeline
 X = task was worked on or completed

Previous week's goals and accomplishments

- Create a fabrication plan to be used for the 3D printing, ligament attachments, and diaphragm attachments
- Complete the preliminary report

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Katherine	10/4/2026	Created and updated this weeks progress report	0.5	9.25	19.5 hr
	10/4/2026	Read through PDS comments and updated my section	0.5		
	10/6/2026	Wrote the discussion and conclusion of the preliminary design.	1.5		
	10/6/2026	Drafted the prospective materials and expenses table	0.5		
	10/6/2026	Read through the current state of the preliminary report, leaving comments and suggestions, updating resources and checking for cohesiveness.	1		
	10/5	Design Lab meeting/brainstorm	1.5		
	10/7/2026	Wrote the competing design section of the preliminary report	.75		
	10/7	Read through the entire preliminary report and provide feedback. Later assisted in final touches and tying up loose ends with unanswered comments.	2.5		
	10/7	Feedback Fruits	.5		

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Sara	10/4	Team meeting regarding fabrication planning	.45	8.2	19.7 hr
	10/5	Team meeting regarding new peg	1		

		attachment sites and short consultation with the design lab			
	10/5	Researched types of Rivets and the type to use for our models	0.25		
	10/6	Completed the fabrication section of the preliminary report: continued researching material properties and designing fabrication methods	2.5		
	10/6	Completed the fabrication protocols steps for the appendix of the preliminary report	1.5		
	10/6	Updated PDS version 1 into version 2, aligning new design specifications with the preliminary report	0.5		
	10/6	Read through the preliminary report and made comments for improvements	1		
	10/7	Revising, editing, addressing comments, and finalizing the preliminary report	1.5		
	10/7	Gave peer evaluations	0.5		

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Abigayle	10/4	Team meeting regarding fabrication planning	.45	8.45	24.95 hr
	10/4	Peg design idea and research regarding peg reinforcement, drawing of new design	1.5		
	10/4	Modifications and re-working of design following discussion with the team	1		
	10/4	Writing Preliminary report	2		
	10/5	Design Lab meeting/brainstorm	1.5		
	10/6	Reading through and modifying preliminary report	0.5		
	10/7	Revising, editing, and submission of preliminary report	1		
	10/7	Feedback fruits	.5		

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
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Mina	10/06	Worked on Preliminary Report - Background and Client Information	3	6	19.5 hr
	10/06	Conducted additional research on anatomical landmarks to incorporate into the background section of Preliminary Report	.5		
	10/07	Worked on Preliminary Report - Design Specifications and edited and reviewed my sections.	2		
	10/07	Completed Feedback Fruits	.5		

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Hiba	10/06	Writing Preliminary report	2	2.45	13.20
	10/04	Team meeting regarding fabrication planning	.45		

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Karen	10/4	Team meeting covering fabrication and Preliminary Report responsibilities	.5	4.5	18.5
	10/5	Preliminary Report - Testing	2		
	10/6	Completing Feedback Fruits	.75		
	10/7	Editing Preliminary Report	1		
	10/8	Updating Progress Report	.25		