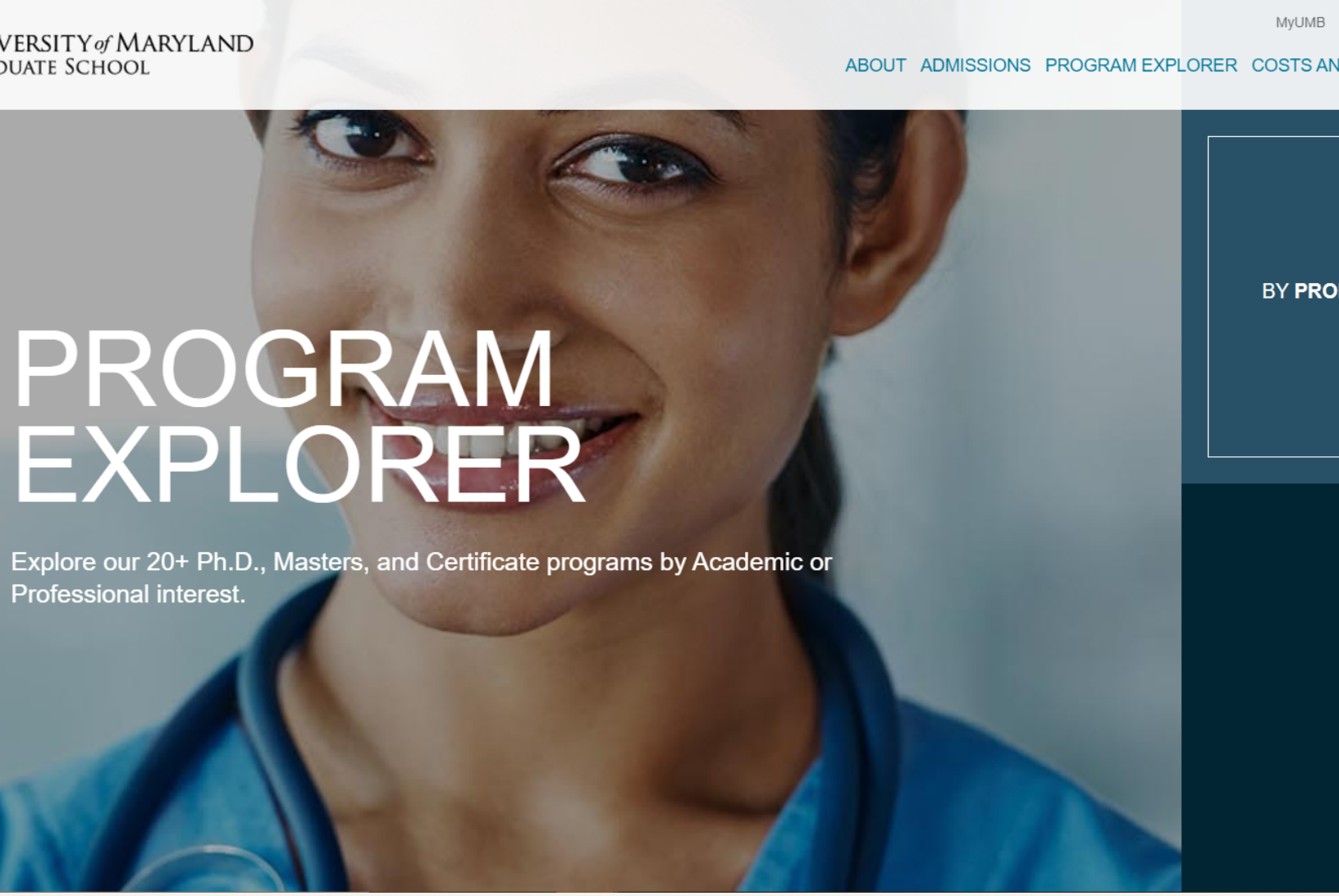

UMB Program Explorer

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Prepared for:
The University of Maryland, Baltimore
Graduate School, Physician Assistant Program

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Introduction

The current Physician Assistant (PA) program list on The University of Maryland Baltimore (UMB) Graduate School website presents a wide variety of information. The UMB Physician Assistant program list website also has some usability issues, which present challenges for prospective students and minor issues for returning students when viewed through the lens of the "10 Usability Heuristics for User Interface Design" (Nielsen, 2020). One issue with the current UMB website is the lack of wayfinding, which does not allow users to quickly see their educational pathways and possible career outcomes. UMB's current ranking in *U. S. News and World Report* (2019) is 144. Including a wayfinding tool for user exploration of programs may help improve visibility of the UMB programs and could move the ranking higher in *U. S. News and World Report*.

This report presents recommendations and findings related to the UMB Physician Assistant program list website, including industry best practices and recognized design guidelines. Research on potential users, user analysis, and industry web design principles are included throughout this report and may be found in our reference list. Using this research, iterative design, and several rounds of user testing, we built a program explorer tool to help users navigate the wealth of information on the UMB Physician Assistant program list website . We hope our client enjoys reviewing our goals, prototypes, lessons learned, and recommendations.



Study Summary

The University of Maryland, Baltimore website was introduced by our client in February. We discussed their needs and made observations of our own. The current website manages a lot of graduate program information with a program explorer tool. Our clients asked for a more interactive, tailored experience for their prospective students, faculty recruits, and for assessment officials. We chose to focus on potential students during this redesign, because Universal Design for Learning suggests that improvements for one group support better interaction for all users (Meyer, Rose, & Gordon, 2014).

Potential students for the Physician Assistant track and for other graduate programs must have completed a Bachelor's degree, so our personas ranged from 28 to 42 years old. We used these personas to build a paper prototype, as reference points during user testing, and as reflection points as we made the final changes to our wayfinding tool. Our wayfinding tool is based on research from a wide spectrum of disciplines, including game design, librarianship, and medical technology.

As the study concluded, we realized that further development and customization was needed for successful implementation of this wayfinding tool. Our clients can further develop our application by focusing user attention, utilizing progressive disclosure, and allowing flexible interaction with their information. We look forward to seeing our suggestions interpreted and implemented by our client.

Project Background and Goals

Background

The University of Maryland Baltimore (UMB) Graduate School Physician Assistant program list website presents program information in a way that limits quick findability. Although all of the programs are listed and there is a tool designed to filter the programs, the diversity and strength of UMB's programs is hidden from potential students, new faculty, and academic officials. UMB offers a wide array of Certificate, Master's, and PhD programs that offer new students and existing Physician Assistants exciting ways to grow their careers. Showcasing these programs with a program explorer tool can benefit UMB's overall brand impression and potentially improve faculty recruitment, student applications, and school rankings (Kim & Yu, 2016).

User Analysis

The University of Maryland Baltimore (UMB) Physician Assistant program statistics for the classes of 2021 through 2023 show a diverse set of students in terms of age, education level, clinical experience, and Bachelor's degree area of study (University of Maryland, Baltimore, 2022).

Table 1

University of Maryland Baltimore Physician Assistant Program, Physician Assistant Class Profiles

CATEGORY	Class of 2021	Class of 2022	Class of 2023
Age Range	22-49	21-41	22-46
Average Age	28	26	26
Gender	22% Male 78% Female	26% Male 74% Female	35% Male 65% Female

Residency	In-State: 77% Out-of-State: 23%	In-State: 72% Out-of-State: 28%	In-State: 55% Out-of-State: 45%
Education	All have bachelor's Master's degrees: 4 FMG's: 2	All have bachelor's Master's degrees: 5 Doctorate: 1	All have bachelor's Master's degrees: 2 FMG's: 1
Major Fields of Undergraduate Study	Biology: 12 Exercise Science: 4 Genetics: 2 Psychology: 3	Biochemistry: 2 Biology: 14 Exercise Science: 5 Public Health: 4	Biology: 6 Health Science: 3 Psychology: 4 Public Health: 6
Average Cumulative GPA	3.55	3.56	3.53
Average Science GPA	3.50 (83 credits)	3.52 (83 credits)	3.52 (83 credits)
Common Patent Care Experience	Medical Assistant, Paramedic/ EMT, Medical Technician, RAD Tech, PT Tech	CNA, Medical Assistant, Medical Scribe, Paramedic/ EMT, Phlebotomist, PT Tech, Respiratory Therapist	CNA, Medical Assistant, Medical Scribe, Paramedic/ EMT, Occupational Therapist, PT Tech, RAD Tech
Average Patient Contact Hours	4,256	3,532	4,898

Nationally, as well, there is a diverse set of professional backgrounds in the Physician Assistant field. In 2019, for example, 63.3% of all current Physician Assistants had a Bachelor's degree in something other than health or biological sciences (DataUSA, n.d.). UMB's description of their main audience as potential or existing Physician Assistants (with an average GPA of between 3.56 and 3.50) leads us to believe that the main audience for the website will be highly educated. Some of the secondary audiences mentioned include other highly-educated users, such as potential UMB faculty or officials from other academic institutions looking to rank UMB's programs. Accessibility and situational needs for these users may be as diverse as their educational and employment backgrounds. Therefore, our design and testing focused on well-established heuristics for design such as Jakob Nielsen's (2020) "10 Usability Heuristics for User Interface Design "

and other insights directly from our research on users in UMB's target audience. The personas listed below represent three primary student users searching for programs at University of Maryland, Baltimore.

Table 2

Personas Developed by Jess Crawford, Joshua Jones, and Sarah Gilchrist

	Isebel 	**James** 	**Aliyah** 
Nickname	The Student	The Mid-Career PA	The Leader
Age	22	42	34
Pronouns	She/Her/Hers	He/They/Them	She/Her/Hers
Employment	None currently	U.S. Army PA	PA at Hopkins
Education	BS in Biology	Master's Degree	Master's Degree
Lives	In MD with her mom	At Ft. Meade, MD	In Baltimore City
Long-Term Goals	Personal Fulfillment, Career Growth, Flexibility	Less Stress, Leadership Development, Youth Mentorship	Develop Women Leaders
Information-Seeking Goals:	Discover Best Fit Based on Skills and Experience	Identify GI Benefits, Program Length, and Education Credentials	Discover Leadership Programs
Ability	Suffers from chronic migraines and often browses with her screen on low brightness	PTSD affects concentration, Tinnitus interrupts ability to hear	Highly motivated, despite chronic pain from fibromyalgia
Aptitude	Very experienced with technology and university websites	Very experienced with technology	Strategic thinker, Quickly learns new technology
Attitude	Positive, Resilient	Impatient, Easily Discouraged	Impassioned, Optimistic, Sincere

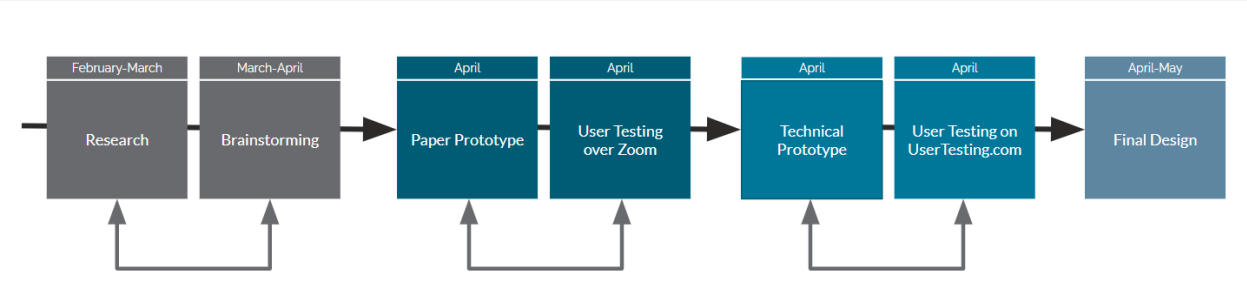
Background	Isebel discovered that she didn't like research while she was a Biology student at Towson. After volunteering at a community center and talking to a family friend, she realized that her people skills and science degree fit better with the PA track.	Active Duty officer, Mos 65D. Battalion (BN)/ Squadron (SQN) physician assistant. Looking to add a certificate to change fields. Burned out on being a PA in the military; getting closer to retirement and end of contract.	Existing PA looking for ways to specialize. As an AAPA (American Academy of Physician Assistants) African Heritage Caucus-LGBT PA Fellowship mentor, Aliyah helps build connections between the communities she serves and PA students. She works with the Family Planning Program at Johns Hopkins Hospital.
Quote	"I want to find a program that I can grow in. I didn't end up liking my original degree path in undergrad, so I am looking for flexibility in an advanced degree."	"The military has supported me, but I'm ready to move on in my career."	"I agree with Audre Lorde that 'In our work and in our living, we must recognize that difference is a reason for celebration and growth, rather than a reason for destruction.'"

Design Evolution

After extensive research and brainstorming, our team worked together to develop a paper prototype and then a technical prototype for user testing. Although the process moved forward in a linear fashion, iterative design practices influenced our planning, research, and implementation for this design project. Working through four distinct phases with several subphases, we were able to produce a final design to present to UMB. Each phase built on prior research, new input, user comments, and observations to determine areas of improvement for our prototype. The final technical prototype is available for examination using this link: https://adobe.ly/3LjRvui.

Table 3

Timeline for iterative research, testing, and design



In addition to brand standards from UMB, we consulted peer institution websites to glean information about layout, content, and format. We also used Nielsen's Heuristics (see Appendix for additional details) to inform our design and redesign and consulted

WebAIM.org to determine optimal contrast levels for grays, colors, and text. Industry standards and current practice support our use of these standards.

The Paper Prototype

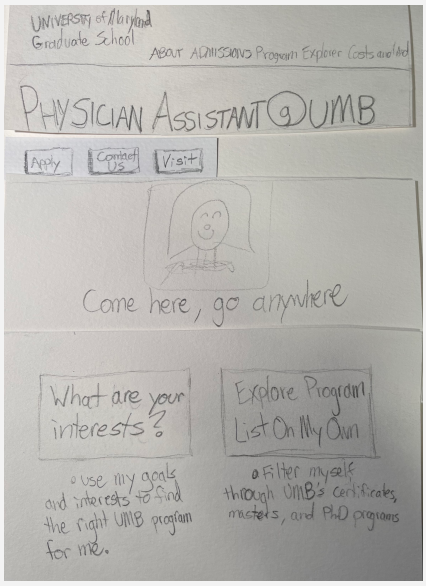
Our paper prototype was developed with input from all team members based on our observations of other program explorers, including the Johns Hopkins Carey Business School (2022) site, the Army Journey Exploration Tool (2020), and the U.S. Department of Education College Scorecard (2022). Peer institution sites were also consulted, including Anne Arundel Community College (2017), Baylor College of Medicine (2021), and Community College of Baltimore County (2022). We agreed that industry standards suggested using images and quotes from people related to the program, providing information in discrete chunks to facilitate understanding, and offering options for navigation that allow users to correct mistakes or start over.

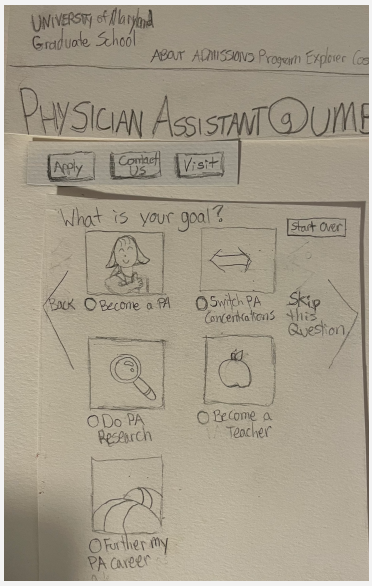
As they moved through the paper prototype, users were asked to imagine that they were a current Physician Assistant with an interest in research. We recruited six users for paper prototype testing using a convenience sampling method. These users aligned with different aspects that we discovered while researching Physician Assistants and with characteristics of our personas: James, Aliyah, and Isebel. Summary details for our users are also included in the Appendix for this report. Because people at any stage in their Physician Assistant careers and people from many different backgrounds might be looking at the UMB site, we focused on users that were at least 21 with some college education.

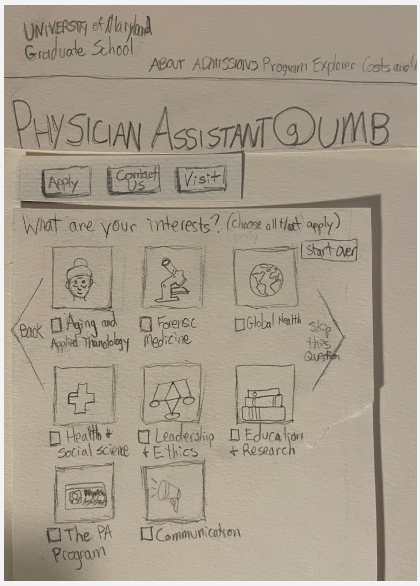
Images of the final stage of our paper prototype are displayed here for reference. We gathered information about placement, verbiage, and usability after each user test.

Figures 1, 2, and 3

Paper Prototype images for the Homepage, Wayfinding Page 1, and Wayfinding Page 2

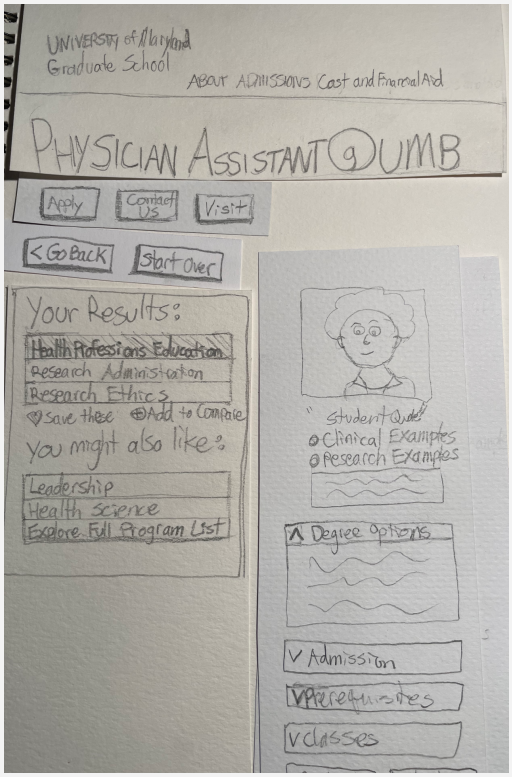


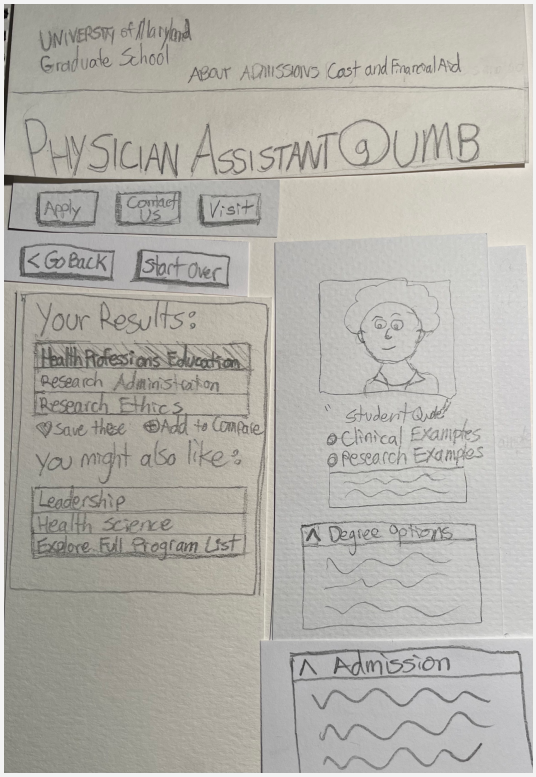




Figures 4 and 5

Paper Prototype images for the Results Pages with expanded Admission Submenu





During the user testing process, we noticed that users preferred the verbiage “What are your interests?” instead of “Help Me Explore” on the homepage. We offered only two options on the homepage: one designed to take users to the full list of programs and one designed to take users through the wayfinding exploration tool. In addition to this simple design, we welcomed users with a photo and an inviting phrase, “Come here, go anywhere.” As users navigated through the wayfinding tool, we made fewer adjustments to these two pages, but made note of some confusion related to finding research-related programs. The results pages went through the most changes, including grouping the results closer together to create the perception of a menu, adding buttons to save results and to compare results to each other, and including dynamic carets to indicate expandable content.

Our paper prototype was based on a desktop layout, so we used a two-column format to display information on the results pages. Having so much information on the page caused some users to spend more time looking for relevant details after being given the prompt. We applied the following Nielsen’s Heuristics (2020) to this part of the design: application of consistent standards (four), assuring a match between the system and the real world (two), giving users control and freedom (three), providing visible options to stimulate recognition over recall (six), and allowing flexibility and efficiency of use (seven). User errors and feedback about what users liked, wished were different, and disliked, allowed us to create a final paper prototype that led to a robust technical prototype for our first peer-review session.

The Technical Prototype

As we approached the technical prototype phase of this design process, we were given access to UserTesting.com, a worldwide user testing platform. We selected users over the age of 21 with at least a Bachelor's degree or higher that spoke English. Each member of our team received three user test trials, so we ended up with nine users from the United States, Canada, France, Italy, and Mexico. Users engaged with our technical prototype by following prompts before attempting to navigate through the tool. Several users ignored the prompts and became confused about what they were supposed to do until they revisited the prompts and completed their tasks. We used the same task suggestions and asked for the same feedback from these users (both in the Appendix) as we did from the users in the paper prototype testing scenario.

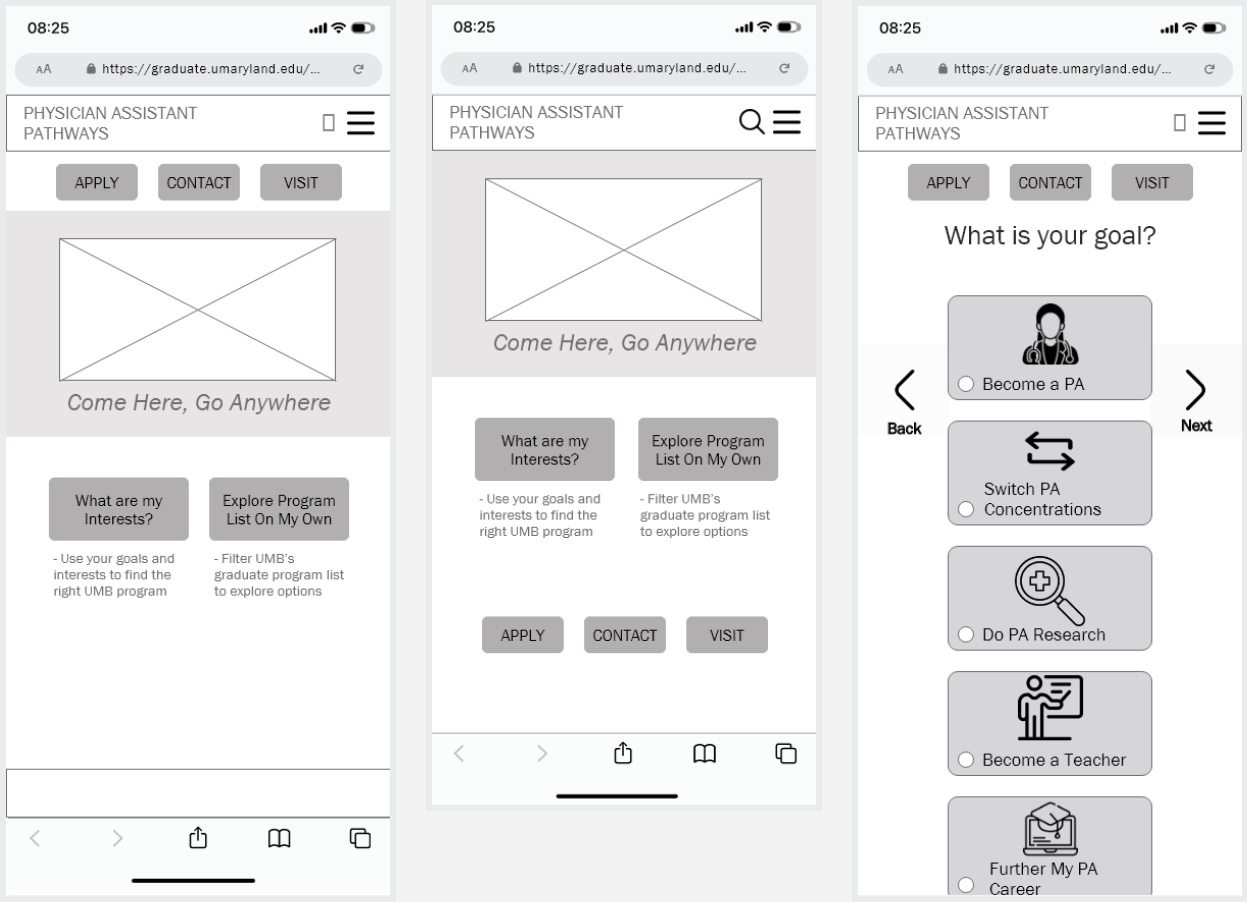
Before we could begin designing our technical prototype, we first considered adjustments needed to convert our laptop format to a mobile-friendly format. Moving content from two columns to one column allowed us to prioritize information using chunking and progressive disclosure. We brought this initial prototype to our fellow designers for feedback before presenting the technical prototype to users at UserTesting.com.

During our peer-review, we were asked to move our "Apply," "Contact," and "Visit" buttons from the top of the page to a space below the individual images on the results pages by three users. By the end of our user testing for this phase, these buttons were moved to the bottom of each page in order to reduce clutter (Nielsen's Heuristic eight), provide order (Nielsen's two), and provide flexibility and efficiency (Nielsen's seven). Our

homepage remained similar to our original design, except for the movement of these buttons.

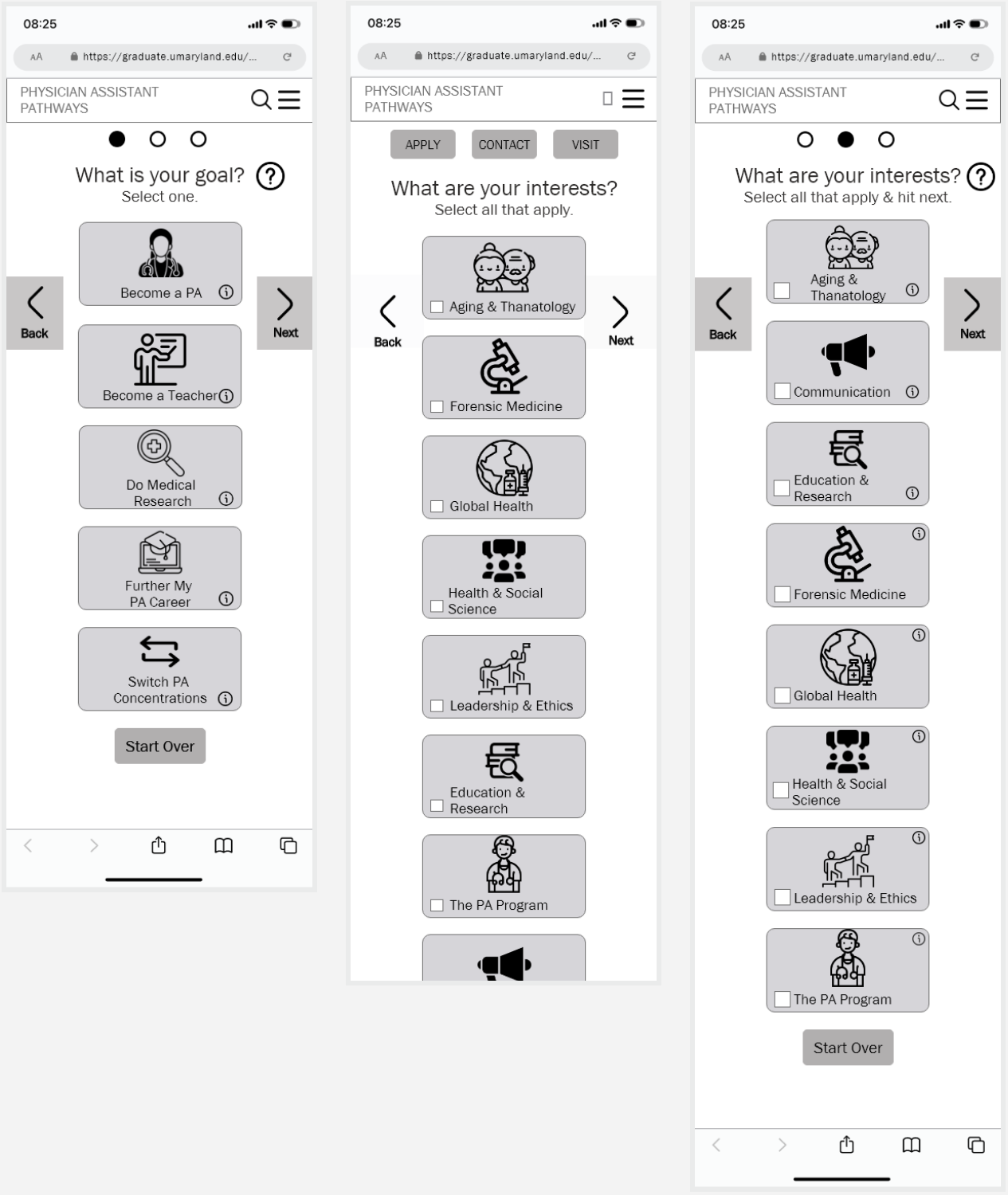
Figures 6, 7, and 8

Technical Prototype images for the Homepage, revised Homepage, and Wayfinding pg. 1



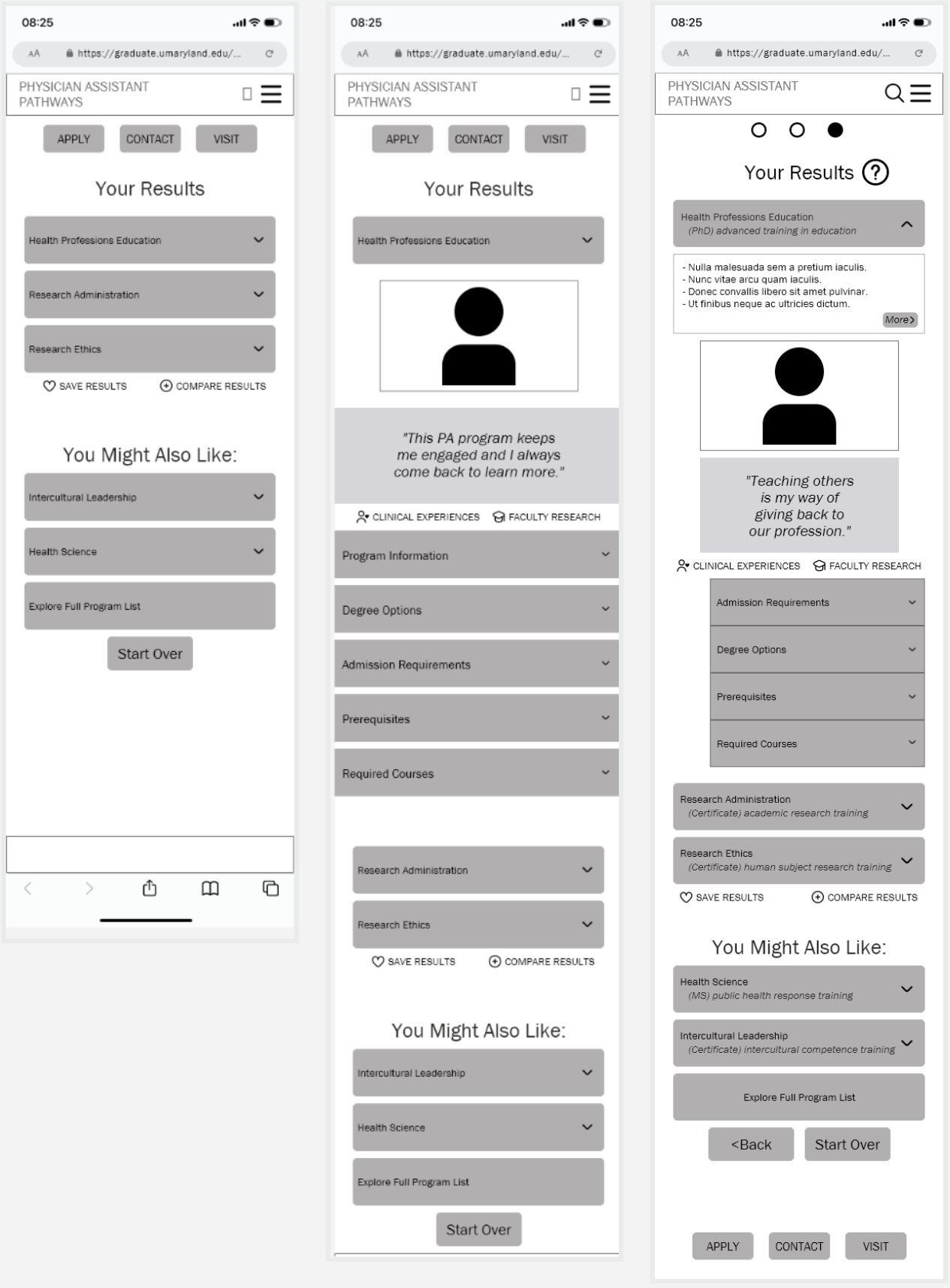
Figures 9, 10, and 11

Technical Prototype images revised Wayfinding pg. 1, pg. 2, and revised pg. 2



Figures 12, 13, and 14

Technical Prototype images from original and revised Results pages



On the wayfinding pages, we removed radio buttons from the first page in order to prevent errors (Nielsen's Heuristic five). Guidance text, information buttons, and a FAQ menu were also added to the wayfinding pages to allow users to recognize errors (Nielsen's nine) and retain control (Nielsen's three). Providing multiple means of recovery from errors (Nielsen's nine) was also supported by the inclusion of back and next buttons from the paper prototype, moving the "start over" button to the bottom of each page, and including sequential dots at the top of the page to allow users to start over or move forward at their own pace. Another user-requested change was related to organization of options on the wayfinding pages and on the results pages. We alphabetized the options on each wayfinding page and alphabetized the results within the primary menu and the secondary menu on the results pages (Nielsen's two) in order to ease findability for these users.

More than one user requested information about the delivered results on the condensed results page, so we included short descriptions of each program under the program name on the results pages. Maintaining this formatting throughout the results pages allows users to recognize options quickly and easily (Nielsen's six). We also made changes to the movement on this page so that users expanding submenus would remain focused on submenu content instead of being moved to the top of the page. Overall, the final design is easier to navigate and provides content when users need the information.

Lessons Learned

- **Users Valued:**
  - **Ease of comparison**
  - **Consistency & simplicity**
  - **Progressive disclosure**
  - **Alternate options**

Throughout our design process, we found that users valued being able to quickly understand a program and quickly compare potential programs to one another. They appreciated consistency in terms of button placement and availability, and simplicity in our labeling and in the design of our pages. Limiting text and providing opportunities for progressive disclosure were also themes that emerged. The breakdown of these themes by user in both the paper and technical prototypes is listed below in table format.

Table 4

Paper Prototype User Results

	User P1	User P2	User P3	User P4	User P5	User P6
Age	31	26	26	42	36	35
Comparison		Enjoyed being able to compare options quickly with the results	Liked the ease of comparison of programs that had overlapping interests.			
Consistency & Simplicity	Asked for clarity in the wording of several sections. Liked the clean layout.		Liked keeping the buttons in one place	He liked that the home page is simple and clear. Requested more clear language for the interests.	She likes that they meaning of each item and icons are really straightforwa rd	Wanted results pages to be less busy
Progressive Disclosure		Liked the "birds eye view" of each listing before expanding the drop down				Liked the expandable options and wanted more
Alternate Options	Thought anyone who knew what they were looking for would click the other explorer option of "Explore program options on my own"	"There was also the You might also like...I like the workflow that has a lot of ways to easily jump to another page."	"Always being able to go back and add stuff is important"	Selected a "You might also like" option as their next step	Liked the alternate option of exploring the program list on their own and also the start over button	Utilized the "You might also like" section of alternate results and liked that the user is given alternate ways to handle program research

Table 5

Technical Prototype User Results, Part 1 (Users 1-5)

	User 1	User 2	User 3	User 4	User 5
Age	22	48	27	27	34
Comparison		Would like the result titles to be scroll- sticky when they are expanded so that they are easier to compare		Requested a better way to compare info	
Consistency & Simplicity		Requested that back/start over buttons were omnipresent for consistency, requested there be clarity in next steps provided	Thought it was simple and easy to find information	Requested more consistent elements and logical category sorting	Appreciated "clean UI"
Progressive Disclosure	Wanted increased progressive disclosure by giving a better idea of what to expect from each menu		Liked how it narrowed someone down into a path slowly		“I love this page with the expanded drop down information”
Alternate Options			Would have utilized alternate "Explore program list on my own" option		Would have utilized alternate "Explore program list on my own" option

Table 6

Technical Prototype User Results, Part 2 (Users 6-9)

	User 6	User 7	User 8	User 9
Age	42	34	49	24
Comparison		Wanted to compare results "faster" and suggested having more information side by side		
Consistency & Simplicity	Wanted to alphabetize interest and goal options for clarity and consistency in apply, contact, visit, buttons	Wanted to see simplified pages	Appreciated findability and simplicity, and wanted apply, contact, visit at the bottom of all pages to increase that	Wanted the home page to be cleaner by placing the contact, visit, apply buttons at the bottom of the page
Progressive Disclosure	Requested more progressive disclosure with more information showing as a hovering pop up		Liked the results page drop down system and felt it was very organized	Requested a help button to give more information
Alternate Options		“I love that it also suggests something else [referring to suggestions for additional programs]."		Liked that there were two entry options

Recommendations

- Focus User Attention
- Utilize Progressive Disclosure
- Allow Flexible Interaction

After our testing with the paper prototype and the technical prototype, we found that our users valued three main principles in our app: our design guiding their attention, progressive disclosure to display information, and flexibility in their browsing experience. We recommend building the public-facing program explorer with these three main areas, Neilsen's Heuristics, and WebAIM's accessibility standards in mind.

1. Use Minimalist Design Strategies to Focus User Attention

We recommend using minimalist design strategies to focus user attention on programs and program details. We were able to reduce a large number of program offerings into a more condensed list using the navigation tool we designed. Users liked having their personalized results listed in alphabetical order, with additional information available when they wanted the information. Several users also wanted to explore the full list on their own, which suggests that minimalist design could be applied to the full program list, too.

2. Make Additional Information Visible, Without Being Overwhelming

Users exploring our site commented that they would like to know more about options before clicking on them. This resulted in the addition of "info buttons" and "help buttons" on our site that allow the user to preview content before clicking on the item. We were also asked to provide short descriptions for each program under the program name

on the results page. This allows the users to make a more informed decision, to quickly scan the list for comprehension, and to determine whether they wish to retake the quiz or look at the full program list.

3. Allow User Freedom and Flexibility

People naturally wish to use the most efficient way to seek information and each person has their own conception of what is the most efficient way. By providing a quiz tool with navigation and "start over" buttons, we allow users to see how their interests might align with programs. When presenting the full list of programs, the client may wish to provide users with a short description of the program and an "info button" that explains more about that program. Including an option to expand the full list to show all details at once might also support flexible and efficient interaction with the information.

What would our users think?

To further illustrate how our recommendations might be implemented, let's revisit our research-backed personas and see what they would think as they try to achieve their goals using the final design of our app.

James
The Mid-Career PA

Isebel
The Student

Aliyah
The Leader

Isebel, as a current undergraduate student, really wants to be guided through this next stage in her scholarship. She is new to this career path and is not sure what options are possible, so the exploration tool is a great asset to her. Isebel would appreciate how our page shows all of the results in one place. That way Isebel can easily explore her results or choose to move back and discover additional options on the site.

"I'm new to this and not sure what options are possible. I like that it shows my results all in one place so I can explore easily or backtrack."

"I'm not sure where I want to go next as a Physician Assistant, so I like being able to select multiple interests and goals."

James is really hoping to explore new career paths in the PA field. Having the option to select more than one of his interests in the wayfinding tool might help him uncover more information about the direction that he wants to take. Having some structure helps James navigate the selection process for this next step in his career, because his military background provided a lot of structure. He also appreciates being able to get more information on each of the listed interests by clicking the information icon.

"Discovering more about program requirements, details, and specifics will help me find a way to pursue my goals."

Aliyah is already practicing medicine and wants to build her leadership skills and deepen her understanding of diversity in medicine. Having options that clearly show her which programs align with those goals will allow her to determine which track she wishes to pursue first. Comparing details on the results pages allows her to see a lot of information at once without overwhelming her. Initially, she was concerned she was in the wrong place, but the FAQ button helped her understand what her next steps should be.

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Appendix

Nielsen's Heuristics

1. **Visibility of System Status** - keep users informed
2. **Match Between System & Real World** - reduce jargon, use natural logic and order
3. **User Control and Freedom** - include undo buttons and to back out of mistakes
4. **Consistency and Standards** - follow platform and industry standards
5. **Error Prevention** - confirm choices; eliminate error conditions
6. **Recognition Rather Than Recall** - make options visible
7. **Flexibility and Efficiency of Use** - users tailor experience to level of knowledge
8. **Aesthetic and Minimalist Design** - eliminate irrelevant information and distraction
9. **Help Users Recognize, Diagnose, and Recover from Errors** -

   use plain language and suggest solutions
10. **Help and Documentation** - provide help when needed; list concrete steps

Test Design - Task Prompts

1. If you weren't sure which programs you were interested in, how would you look at your options?
2. If you were a PA practicing family medicine and were looking to get into the research field, which option would you select ?
3. While still approaching this as a PA practicing family medicine looking to get into the research field, which options would you select on this page?
4. Show us how you would view a different option for your results.
5. How would you view the admission requirements for this option?

Test Design - User Evaluation Questions

Follow up Questions About User Experience:

1. What did you like the most about this site?
2. What do you wish were different about this site?
3. What ideas do you wonder about that were not included in this site?
4. Overall, what areas would you most like to see changed?

User Demographics - Paper Prototype

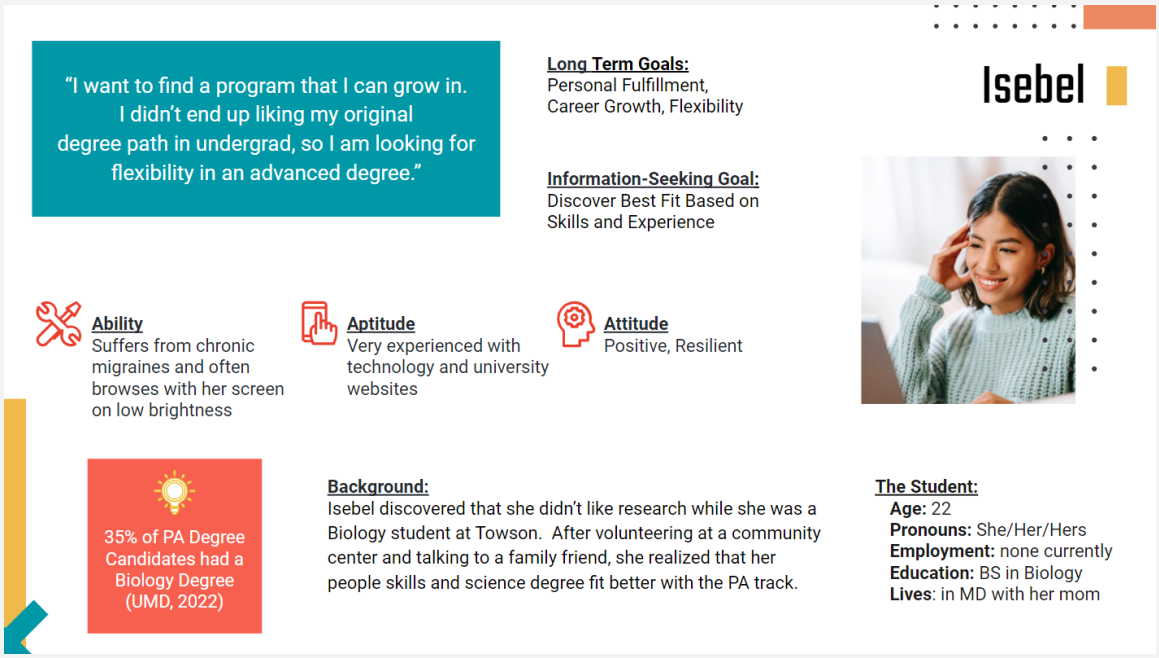
- 6 Users from Convenience Sample
- Ages ranged from 26-42
- Jobs included:
    - Full-Time Student
    - Social Worker
    - Active Military
    - Military Contractor
    - Medical Resident
    - Tech Startup
- Levels of Education:
    - 1 Medical Degree
    - 1 Master's Degree
    - 3 Bachelor's Degree
    - 1 Associate's Degree
- Gender identity included 2 women and 4 men
- Technology Usage included
    - Social Media (5 Users)
    - Games (4 Users)
    - Devices (6 Users)

User Demographics - Technical Prototype

- 9 Users from Convenience Sample
- Ages ranged from 22-49
- Jobs included:
    - Full-time Student
    - Restaurant Owner
    - Hospitality Worker
    - Healthcare Engineer
    - Government Accountant
    - Human Resources
    - Educator
    - Performing Artist
    - Software Marketer
- Levels of Education:
    - 2 Master's Degrees
    - 6 Bachelor's Degrees
    - 1 Associate's Degree
- Gender identity included 4 women and 5 men
- Technology Usage included
    - Social Media (9 Users)
    - Games (7 Users)
    - Devices (9 Users)

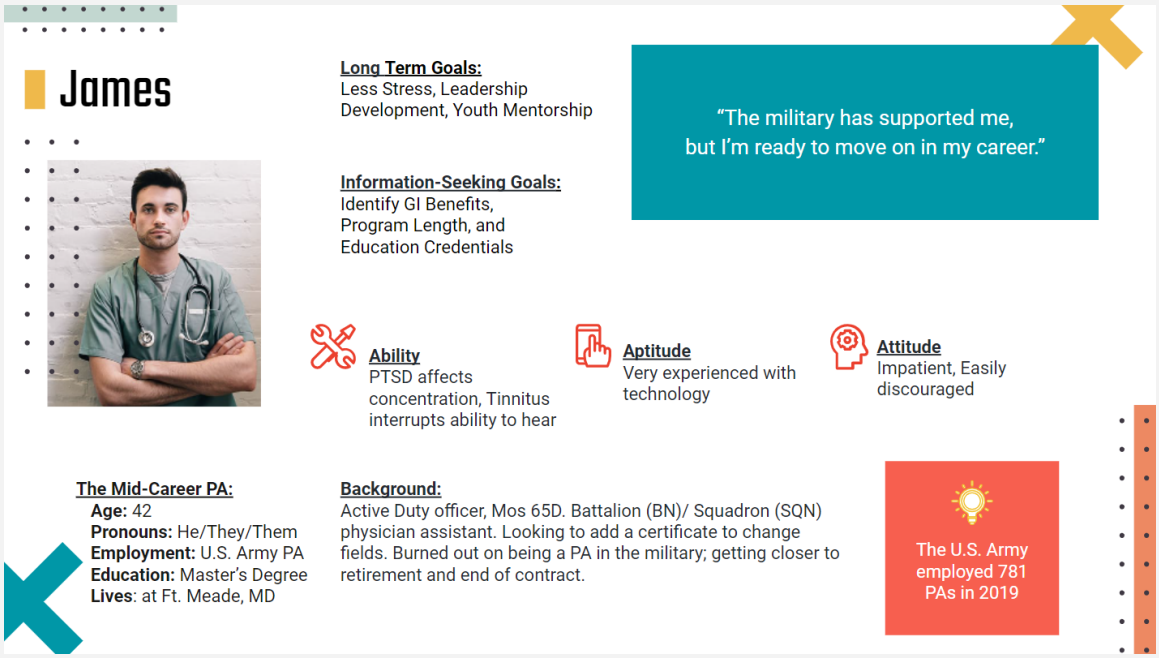
Persona Summary: Isebel

Isebel helped us gain perspective on what an undergraduate would think of the site.



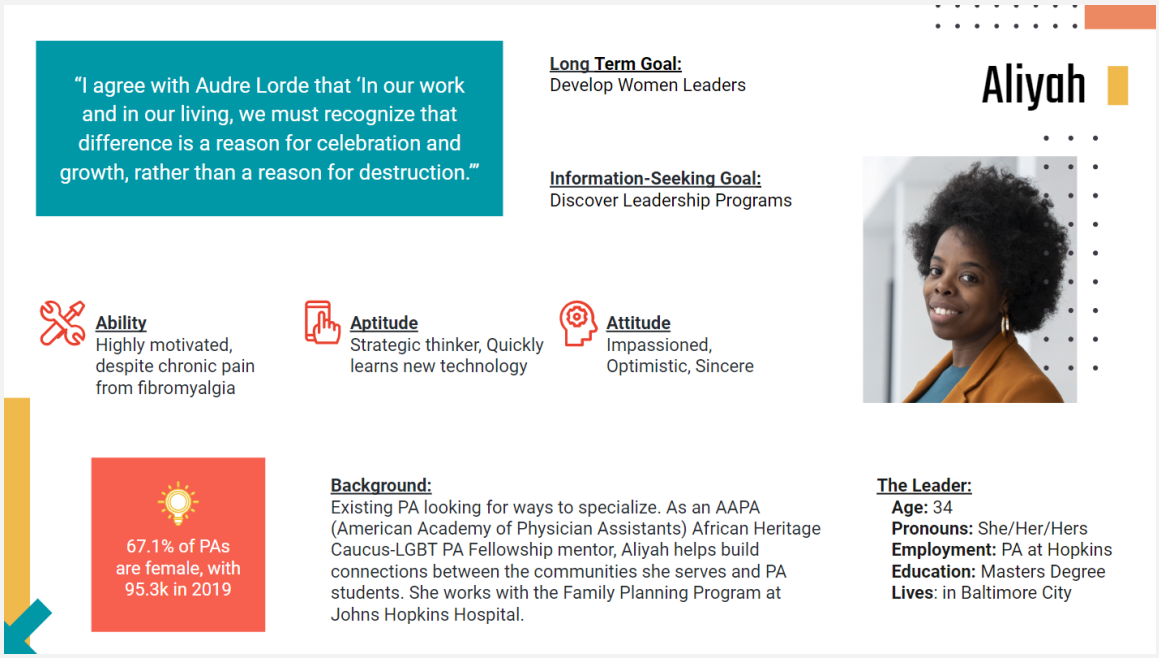
Persona Summary: James

James allowed us to focus on how a mid-career military PA might interact with the site.



Persona Summary: Aliyah

Aliyah reminded us to think about PAs looking for leadership skill development.



Persona Summary: Mahnoor

Mahnoor allowed us to consider other candidates as they used the site.