

# Disrupting Stereotypes: A Usability Report on Inclusive Design for Invisible Disabilities, including ADHD and Anxiety

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# Table of Contents

<b>Table of Contents</b>	<b>2</b>
<b>Thanks and Acknowledgements</b>	<b>4</b>
<b>Executive Summary</b>	<b>5</b>
Affirmative Findings	5
Quick wins	5
Findings and Recommendations	6
<b>Background</b>	<b>7</b>
Reasons for Selecting Financial Aid Pages	7
<b>Methods</b>	<b>9</b>
Usability Test Design	9
Participants	9
Test Design and Materials	10
<b>Discussion of Test Findings</b>	<b>11</b>
Recommendation One: Provide Definitions for Acronyms	11
Background	11
Insights	11
Recommendations	11
Rationale	12
Recommendation Two: Improve Navigation to Scholarships Page	12
Background	12
Insights	13
Recommendations	13
Rationale	13
Recommendation Three: Consolidate Cost Information to Fewer Pages	14
Background	14
Insights	14
Recommendations	15
Rationale	15
Recommendation Four: Revise Net Price Calculator	15
Background	15
Insights	15
Recommendations	16
Rationale	16
Recommendation Five: Use Tables to Display Cost Information	17
Background	17
Insights	17
Recommendations	17
Rationale	17
<b>Insights and Implications</b>	<b>20</b>

How Participants Find Cost Information	20
Insights	20
Implications	20
Devices Used by Participants	21
Insights	21
Implications	21
Assistive Technology Use	22
Insights	22
Implications	22
<b>Conclusion</b>	<b>23</b>
<b>Appendix</b>	<b>25</b>
User Personas	25
<b>Testing Tasks and Rationale</b>	<b>29</b>
Task 1: Calculating the Total Cost of Attendance	29
Task 2: Calculating Cost of Attendance Minus Grants	29
Task 3: Evaluating Housing Options	29
Task 4: Evaluating Dining Options	29
Task 5: Finding Scholarships	30
Wrapping Up	30
Usability Testing Script	31
Recruitment Poster	32

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## Executive Summary

In the Spring 2023 semester, I recruited students and faculty members with disabilities to test the usability of UMass Amherst financial aid web pages. The purpose of my testing was to learn more about the accessibility needs of people with disabilities. I conducted six remote usability tests with participants using Zoom. Each participant completed five tasks and shared their responses to a series of open-ended questions at the end of each test. These tasks involved finding information related to the cost of attending UMass Amherst for prospective students (i.e., total cost of attendance, net cost of attendance, housing costs, dining costs, and scholarships). Afterward, I generated inclusive personas that reflected the diverse characteristics of the participants. These personas, which are further discussed in the conclusion, offer insights into the accessibility needs of students with disabilities.

What I found: while participants are able to complete all tasks, they wished that information was more consolidated for greater navigability. Most of the time participants spent completing tasks involved trying to locate the appropriate pages to complete the tasks. Participants also wished that there was a stronger information hierarchy on cost pages for improved readability.

## Affirmative Findings

- **Participants were able to find total cost of attendance information with relative ease in the first task.** Of the five tasks, participants spent the least amount of time finding the total cost of attendance.
- **Participants found the net price calculator easy to use.** After participants located the net price calculator, they did not find it difficult to use.

## Quick wins

- **Spell out and/or define acronyms.** For the housing task, three participants did not know what the acronym CHCRC meant. Similarly, for the dining task, no participant knew what the acronym YCMP meant.
- **Move the Net Price Calculator to the top of the Undergraduate Financial Aid website.** All participants experienced difficulty finding the Net Price Calculator. Several participants suggested that the calculator be moved to the top of the Undergraduate Financial Aid website for greater findability.
- **Provide a link to the scholarships page from Undergraduate Financial Aid and Financial Aid Services pages.** Several participants had trouble finding scholarship information.

## Findings and Recommendations

- **Consolidate information into fewer pages.** Five participants stated that they prefer it when cost information is consolidated on one page rather than multiple.
- **Provide a financial aid tab on the UMass Amherst home page with links to all cost information.** Three participants wished that there was a tab or page with all relevant cost information for prospective students.
- **Expand the Net Price Calculator's definition of independent student.** One participant stated that the Net Price Calculator's assessment of independent students as being 24 years old, married, and/or has legal dependents other than a spouse (e.g., children) is limiting, as they did not fit that criteria but were considered independent according to [FAFSA's criteria](#).
- **Participants used personal computers to access cost information, rather than mobile devices.** All student participants stated that they used their personal computers to find cost information as prospective students, as this allowed them to more easily compare cost information by having multiple tabs open. This finding suggests the importance of making cost information accessible for students using personal computers.
- **Put cost information before visuals.** Pages such as the [Residential Meal Plans](#) page begin with a banner image before presenting information on cost. Two participants stated that they preferred that cost information be placed before visuals to reduce scrolling.

## Background

UMass Amherst has made a significant commitment to web accessibility by including an [Accessibility Resources](#) page with a definition of accessibility, web development and content resources, and accessible course materials resources as well as an [Accessibility](#) page which provides a definition of accessibility and links to resources for students, faculty, staff, and visitors. The university also hosts an annual Digital Equity and Inclusion week to promote a more digitally inclusive campus. However, to continue improving accessibility at the university, it's important to understand the usability needs of students with disabilities.

## Reasons for Selecting Financial Aid Pages

At UMass Amherst, financial aid web pages are frequently used by students to estimate the cost of attendance. Ensuring the accessibility of these pages is vital as it enables students with disabilities to access the necessary information to make informed decisions about their education. Inaccessible web pages may prevent students with disabilities from accessing important financial information and resources, which can create barriers to their education and hinder their ability to succeed academically.

To ensure inclusivity and accommodate the needs of all students, it is crucial to adopt a user-focused design approach. User-focused design gives users a voice in the design process through methods such as usability testing. By incorporating this feedback, designers can create more accessible and user-friendly products that benefit all users. An accessible design not only benefits people with disabilities but also enhances the overall user experience by making it easier and faster to find information.

It's worth noting that universal design originated as a concept aimed at creating environments and products that are accessible to everyone, with a specific focus on addressing the needs of people with disabilities. However, over time, the term "universal design" has been diluted and used as a marketing buzzword without necessarily upholding its original intentions. By prioritizing user-focused design, designers can strive to reclaim the true essence of universal design and ensure that their designs are inclusive and considerate of diverse needs.

To this end, I conducted qualitative usability tests of UMass Amherst financial aid websites. The goal of these tests was twofold: to identify the accessibility needs of students with disabilities when interacting with UMass Amherst websites and to inform revisions that will enhance the accessibility of current and future web pages.

My usability testing tasks aimed to answer the following questions:

- Can participants quickly and easily find the information they need on the website?

- How do participants perceive the website's design and layout, and how does it affect their user experience?
- How do participants' disabilities influence their interaction with the web?



## Methods

To gain insights into the accessibility needs of students with disabilities, I conducted qualitative usability testing on financial aid web pages at UMass Amherst. I followed best practices for qualitative usability testing, such as encouraging a think-aloud protocol and having participants complete tasks that simulate real-world scenarios. I focused on financial aid web pages for the following reasons:

- **Ensuring Equal Access:** It is important that all students, regardless of ability, have the same access to financial aid information
- **Role of Cost in Decision-Making:** Cost is a significant factor in the decision-making process of choosing a college or university
- **Navigation Challenges:** Financial aid websites are often confusing and filled with technical jargon, making them challenging to navigate

## Usability Test Design

To provide a detailed analysis of the financial aid web pages' usability at UMass Amherst and identify any accessibility barriers for students with disabilities, participants completed cost-related tasks that were grouped into five categories: total cost, net cost cost after aid, housing, dining, and scholarships.

By categorizing the tasks in this way, the study aimed to offer a comprehensive assessment of the financial aid web pages' effectiveness and usability, as well as to identify any potential issues that could hinder students with disabilities from accessing the cost-related information they need on the university's website.

## Participants

Prior to conducting usability testing, I received a determination from the Human Research Protection Office (HRPO) that my project did not meet the definition of human subject research under federal regulations. I then recruited six participants for qualitative usability testing through various methods, such as hanging up posters around the campus, contacting Disability Services, and discussing the testing in various English classes. The participant pool consisted of:

- Five participants who self-identified as having a disability that impacts their web usage
- Three participants who identified as female, two as nonbinary, and one as male
- Two faculty members, two undergraduate freshmen, and two undergraduate seniors

Name <sup>1</sup>	Pronouns	Role on Campus	Disability	Assistive Technology
Olivia	She/her	Faculty	Low vision, ADHD	Screen magnifier
Charlotte	She/her	Faculty	PTSD, dyslexia, ADHD	27" iMac screen
Riley	They/them	Undergraduate freshman	ADHD	N/A
Parker	They/them	Undergraduate freshman	ADHD, hypermobile joints	N/A
Kyle	He/him	Undergraduate senior	N/A	N/A
Emma	She/her	Undergraduate senior	Anxiety	N/A

## Test Design and Materials

The usability testing sessions were conducted remotely via Zoom, and their duration ranged from 45 to 75 minutes. A more detailed description of tasks can be found in the Testing Tasks and Rationale section of the Appendix.

- **Participants completed five cost-oriented tasks.** Participants were asked to think out loud by verbalizing their reactions (confusion, decisions, etc.) as they navigated the web pages to find information about the costs associated with attending UMass Amherst. After completing all tasks, participants were asked to complete a qualitative interview to assess their experiences and reactions to the tasks.
- **Participants completed tasks using their personal computers.** For each test, both audio and screen recordings were captured using Zoom. Prior to the test, all participants signed a consent form agreeing to the use of their audio and screen recordings.

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<sup>1</sup> All names were changed to protect the identity and confidentiality of study participants.

## Discussion of Test Findings

The following section outlines my recommendations based on insights from the usability tests I conducted, as well as my rationale for these recommendations, inspired by accessibility best practices. The second part of this section reflects implications of insights revealed through the testing.

### Recommendation One: Provide Definitions for Acronyms

*“CHCRC...Is there anything up here that tells me what that means? You know, I just wished they spelled that out.”*

- Charlotte, faculty

#### Background

Participants were asked to find the cost of a first-year dorm with two people in the Honors College as well as the least expensive on-campus meal plan available for first-year students.

#### Insights

- Three participants did not know what the acronym CHRC meant
- All participants did not know what the acronym YCMP meant
- Two participants were confused by the DC acronym

#### Recommendations

- Define acronyms (CHCRC, YCMP, DC) the first time that they appear on a page
- Use a clear and concise definition, avoiding technical jargon or complex language
- Provide a glossary or acronym list to help users easily find and understand the meaning of each acronym

RESIDENTIAL OR COMMUTER PLAN

YCMP Gold

\$1,669.50 / Semester

- Open to Juniors and Seniors Only (57+ completed Credits)
- Includes 100 DC/Retail Meals (\$12.00/meal)
- Dining Dollars not included

YCMP Platinum

\$3,066.00 / Semester

- Open to Juniors and Seniors Only (57+ completed Credits)
- Includes 200 DC/Retail Meals (\$12.00/meal)
- Dining Dollars not included

\* A dollar-for-dollar exchange program that can be used in retail dining locations, food trucks, late night, University Club & Restaurant, UPub, Concessions and Dining Commons. Dining Dollars carry forward during the academic year (Fall to Spring). Additionally, Dining Dollars can be added to the Unlimited 500, Unlimited 250, and YCMP Off-Campus 155/65 and the YCMP On the Go meal plan at any time.

\*\* Meal Exchanges can be used at any official UMass Dining retail operation with a value of \$12.00 per meal.

Fig 1. The [Residential Meal Plans](#) page displays information about meal plan costs, including YCMP meal plans. However, the figure does not provide a definition or explanation of what YCMP refers to.

## Rationale

Defining acronyms is crucial for creating an inclusive and accessible web experience for all users. Acronyms can be confusing and difficult to understand, especially for individuals with cognitive or learning disabilities. Defining acronyms helps ensure that everyone can understand the content on a website, regardless of their abilities. This is particularly important for websites that provide critical information, such as those related to cost.

Furthermore, defining acronyms can also help with search engine optimization (SEO) and improve the visibility of the website. Search engines prioritize websites with well-defined content, and defining acronyms helps search engines understand the website's content better.

## Recommendation Two: Improve Navigation to Scholarships Page

*"The [scholarships] task was difficult because there was no clear way to find it."*

- Emma, undergraduate senior

## Background

Participants were asked to find one scholarship available to accepted first-year students at UMass Amherst.

## Insights

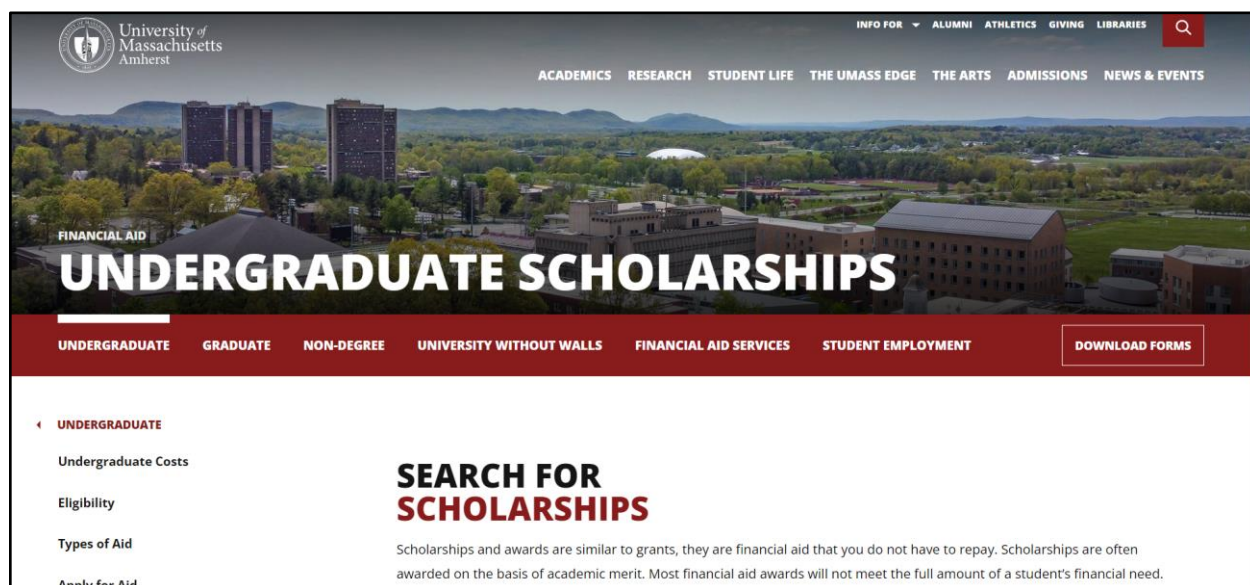
- On average, it took participants 3 minutes 15 seconds to find the Scholarships page
- Two participants stated that they found the vast amount of scholarship options overwhelming

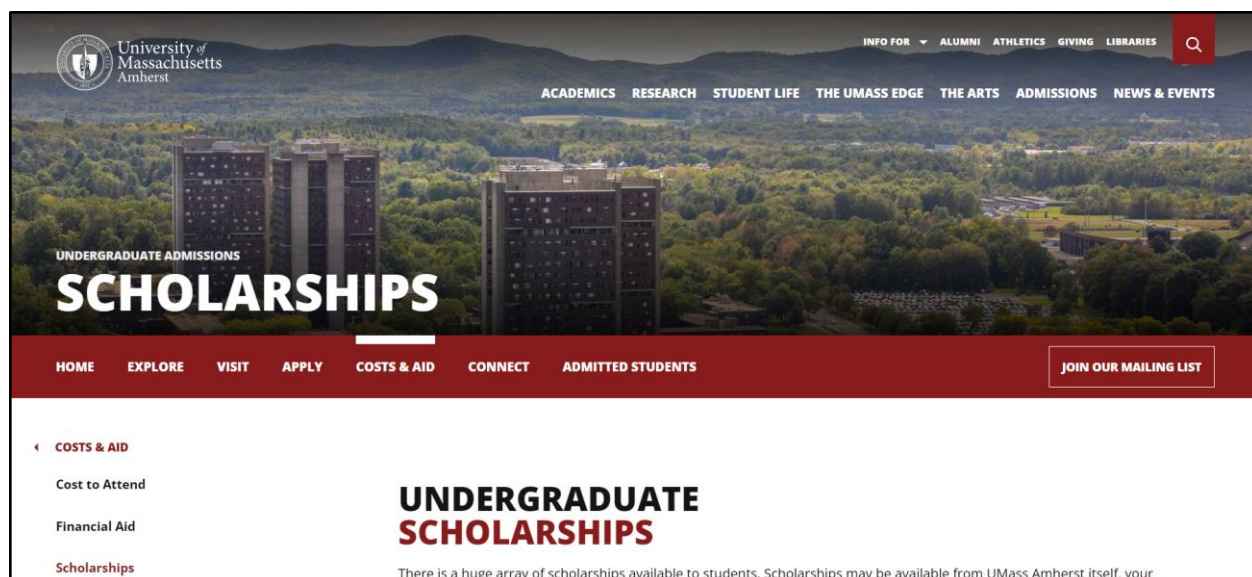
## Recommendations

- Provide a more visible link to the scholarships page from Undergraduate Financial Aid and Financial Aid Services pages
- Consolidate Scholarship information to one page instead of two (Undergraduate Scholarships and Scholarships)

## Rationale

Making scholarship information easily findable on the UMass Amherst website is essential for ensuring that students and their families are better able to identify funding opportunities that may be available to them. Additionally, making scholarship information easily accessible can promote equity by reducing barriers to higher education and ensuring that those who need financial support are able to access it. Prominently displaying scholarship information on the UMass Amherst website can help attract potential students who are looking for institutions that prioritize student support and success.





Figs 2 & 3. The screenshots display the [Undergraduate Scholarships](#) page as well as the [Undergraduate Admissions Scholarships](#) page. These two pages could be merged into a single resource that provides comprehensive information about scholarships available for both incoming first-year students and current UMass Amherst students. The consolidated page would also clearly differentiate the resources available for each group.

## Recommendation Three: Consolidate Cost Information to Fewer Pages

*“It would be nice to have at least sort of a directory where you could find links to these specific pages or information that doesn’t change a lot.”*

- Parker, undergraduate freshman

*“I think consolidating the information into fewer links and pages might be helpful.”*

- Kyle, undergraduate senior

## Background

Participants were asked to provide their feedback on how to improve financial aid web pages at UMass Amherst.

## Insights

- Regarding the question of how participants would improve financial aid web pages, five participants expressed a preference for consolidating cost information into a single page.

## Recommendations

- Identify the most critical cost information and consolidate it into one, easily findable web page
- Create a drop-down on the UMass Amherst home page of pertinent cost information (e.g., tuition and fees, dining, housing, scholarships, financial aid)
- Use tables and charts to display cost information visually, making it easier for users to compare costs

## Rationale

Consolidating university cost information to fewer web pages can provide a more accessible and user-friendly web experience for students and their families. Reducing the number of web pages where cost information is available can make it easier for students to find what they need quickly. Having multiple web pages can make it more challenging for students to navigate the website and find the information they need, which can be frustrating and time-consuming. In addition, having fewer web pages with cost information can make it easier for UMass Amherst to maintain and update the content. It can be challenging to keep track of multiple web pages with the same information, and consolidating this information can simplify the process and reduce the likelihood of errors.

## Recommendation Four: Revise Net Price Calculator

*“I am an independent student, so I wasn’t able to get exactly the right information here. I remember using this calculator, actually, and I was really frustrated.”*

- Riley, undergraduate freshman

*“If you hadn’t redirected me to it, I wouldn’t have known it existed.”*

- Olivia, faculty

## Background

Participants were asked to find the cost of attending UMass Amherst for the 2023-2024 school year minus grants.

## Insights

- On average, it took participants 3 minutes 55 seconds to find the Net Price Calculator
- Two participants needed to be redirected to find the Net Price Calculator
- All participants found the Net Price Calculator intuitive and easy to use
- One participant stated that the Net Price Calculator’s definition of an independent student is limiting to independent students who do not meet the criteria

## Recommendations

- Move the Net Price Calculator to the top of the Financial Aid web page or use a calculator icon for greater visibility
- Expand the Net Price Calculator's definition of an independent student to better match [FAFSA's criteria](#)

## Rationale

The Net Price Calculator is a critical tool for prospective students and their families to estimate the true cost of attending UMass Amherst. By ensuring that the Net Price Calculator is easily findable on the university website, UMass Amherst can provide greater transparency in its pricing and financial aid policies, helping to build trust with prospective students and their families. This commitment to transparency demonstrates that UMass Amherst is dedicated to helping students make informed decisions about their education. Furthermore, by prominently displaying the Net Price Calculator, UMass Amherst can showcase its commitment to affordability and accessibility as a public university, which is critical for attracting prospective students who are looking for institutions that prioritize transparency and affordability.

The screenshot displays the UMass Amherst Financial Aid page. At the top, there are three accolades: "Top 100 'Best College Values' in public colleges" from Kiplinger's Personal Finance, "Most bang for the tuition buck" from Money Magazine, and "# 26 Top public colleges and universities" from U.S. News & World Report. Below these, the main heading is "WHAT DOES UMASS EDUCATION COST?". To the right of this heading is a list of links: "UNDERGRADUATE COSTS", "GRADUATE COSTS", "UNIVERSITY WITHOUT WALLS COSTS", and "NET PRICE CALCULATOR". The "NET PRICE CALCULATOR" link is circled in red. At the bottom right, there is a red button that says "QUESTIONS? ASK SAM".

Fig 4. The Net Price Calculator is currently positioned in the middle of the [Financial Aid](#) page, requiring visitors to scroll past promotional information before accessing the calculator. Positioning the calculator higher up on the page would enhance its visibility.



## Recommendation Five: Use Tables to Display Cost Information

### Background

Participants were asked to find the cost of a first-year dorm with two people in the Honors College.

### Insights

- All participants found the layout of the Housing Costs page to be confusing
- The housing cost information is not presented in a proper list format (see Figure 8), which can create difficulties for users of screen readers to access the information

### Recommendations

- Formatting housing costs in a table can help students and their families to compare different housing options

### Rationale

Using tables to display cost information is a good practice because it increases accessibility for students and their families. Tables provide a clear and organized visual representation of complex cost data, making it easier to quickly compare different costs and make informed decisions. By presenting cost information in a clear and organized manner, UMass Amherst can demonstrate its commitment to providing accurate and comprehensive information about the cost of attending their institution, which is particularly crucial for families who are making important financial decisions about their child's education. This approach promotes transparency and accessibility, ensuring that all visitors to the website can find and understand the information they need.

In-State	
Tuition/Fees:	\$17,364
Housing:	\$8,612
Food:	\$7,144
Total:	\$33,120

Fig 5. The previous version of the Undergraduate Costs page depicted cost information in a table format, however, it omitted additional details, including expenses for books, travel, and other miscellaneous costs. Moreover, alternative housing and food expenses were not accounted for.

In-State	
Tuition/Fees:	\$17,357
Housing -- Average yearly cost:	\$8,686
<a href="#">Options are available</a>	
Food -- Average yearly cost:	\$7,282
<a href="#">Options are available</a>	
<b>Direct Cost Total:</b>	<b>\$33,325</b>
Books:	\$1,000
Travel:	\$400
Miscellaneous Expenses:	\$1,000

Figs 6. The current [Undergraduate Costs](#) page features a well-organized table format, presenting a succinct summary of tuition and fees, housing expenses, food costs, and other additional fees, with the total direct cost highlighted in bold. The page also offers links to external resources.

```

<table style="width: 727.6px;"><tbody><tr><td style="width: 496px;">Tuition/Fees:</td>
  <td style="text-align: center; width: 229px;">$17,357</td>
</tr><tr><td style="width: 496px;">Housing -- Average yearly cost:<br /><a href="https://www.um
  <td style="text-align: center; width: 229px;">$8,686</td>
</tr><tr><td style="width: 496px;">Food -- Average yearly cost:<br /><a href="https://umassdini
  <td style="text-align: center; width: 229px;">$7,282</td>
</tr><tr><td style="width: 496px;"><strong>Direct Cost Total:</strong></td>
  <td style="text-align: center; width: 229px;"><strong>$33,325</strong></td>
</tr><tr><td style="width: 496px;">Books:</td>
  <td style="text-align: center; width: 229px;">$1,000</td>
</tr><tr><td style="width: 496px;">Travel:</td>
  <td style="text-align: center; width: 229px;">$400</td>
</tr><tr><td style="width: 496px;">Miscellaneous Expenses:</td>
  <td style="text-align: center; width: 229px;">$1,000</td>
</tr><tr><td style="width: 496px;">Average Federal Loan Fees:</td>
  <td style="text-align: center; width: 229px;">$40</td>
</tr><tr><td style="width: 496px;"><strong>Total including Indirect Costs:</strong></td>
  <td style="text-align: center; width: 229px;"><strong>$35,765</strong></td>
</tr></tbody></table><h4> </h4>

```

Fig. 7. The screenshot reflects the HTML used to format one of the tables on the current [Undergraduate Costs](#) web page. In order to enhance the existing table's accessibility for users who are visually impaired, it is crucial to include a caption and summary that can be used by non-sighted resources. Adhering to [W3C's standards](#), tables should be structured using HTML to ensure improved accessibility for users employing assistive technologies, such as screen readers.

Housing Accommodations	Undergraduate Room Rates for Fall 2022-Spring 2023
	Standard Shared Room - \$3,920.00
	Standard Single Room - \$5,163.50
	Break Housing Shared Room - \$4,220.00
	Break Housing Single Room - \$5,463.50
	Sylvan Shared - \$3,577.50
	Sylvan Single - \$4,707.50
	Cashin Shared - \$3,877.50
	Cashin Single - \$5,007.50
	Single Room in North Apartments - \$7,060.50
	CHCRC First-Year Shared - \$4,262.50
	CHCRC First-Year Single - \$5,619.50
	CHCRC Suite Shared - \$4,674.00
	CHCRC Suite Single - \$6,167.00
	CHCRC Apartment Shared - \$5,346.00
	CHCRC Apartment Single - \$7,060.50
	Expanded Housing - \$3,353.00
	Economy Triple, Standard - \$2,882.00
	Economy Triple, CHCRC - \$3,225.00
	Mount Ida Shared Room - \$3,920.00
	Mount Ida Single Room - \$5,163.50

Fig 8. The [Housing Costs](#) page contains valuable information on the various housing options available to undergraduate students. However, the information is presented in an unstructured manner, without a clear hierarchy or organization. Reformatting this information into a table, possibly categorized by residential community, would significantly enhance its readability and accessibility for sighted users. Proper HTML is essential for ensuring that tables are properly formatted for screen reader users.

# Insights and Implications

*“I tend to look under the menus and try and go there rather than search for things, because I don’t always know how to word things quite right to be able to find things that I’m looking for.”*

- Parker, undergraduate freshman

## How Participants Find Cost Information

It is essential to understand how students access financial aid information for several reasons. By understanding how students access financial aid information, UMass Amherst can make necessary changes to ensure that the information is accessible to all students, regardless of their backgrounds or circumstances. Furthermore, usability of a website depends on how easily users can navigate through it to find the information they need. Therefore, understanding how students access financial aid information can help UMass Amherst to identify any challenges or difficulties students may face while navigating their website.

### Insights

- One participant used the search bar on the UMass Amherst home page to find cost information
- Five participants got to cost information by clicking on tabs starting from the home page
- One participant stated that they prefer using Google search to find cost information
- Three participants mentioned that they like to have multiple tabs open at the same time to better compare information

### Implications

- Including a prominent search bar on the website can be a valuable tool for students to quickly locate the cost information they require, as demonstrated by one participant's use of the search bar
- UMass Amherst should ensure that the tabs are intuitive and labeled appropriately to prevent confusion for students who prefer to have multiple tabs open at once
- UMass Amherst should consider search engine optimization to ensure that their cost information is easily discoverable and accessible through external search engines, such as Google

## Devices Used by Participants

*“On the mobile website [home page], first of all, it’s not a video. Second of all, it does show the search bar... It’s more prominent... I find the mobile website easier.”*

- Riley, undergraduate freshman

*“I think comparing schools is easier on desktop because I could have multiple windows open side by side.”*

- Riley, undergraduate freshman

Understanding the devices students use to access cost information is crucial to ensure that the UMass Amherst website is optimized for various devices. By understanding which devices students are using, UMass Amherst can make the necessary changes to optimize their website for different devices, improving the user experience and engagement.

## Insights

- All participants used their personal computers or laptops to complete testing tasks
- All student participants stated that they used their personal computers or laptops to find cost information as prospective students
- One participant stated that the layout of the UMass Amherst home page is more user-friendly on mobile

## Implications

- UMass Amherst should ensure that its website is optimized for use on personal computers or laptops, including responsive design to adapt to different screen sizes
- Students who find the mobile layout more user-friendly may prefer to access cost information through their mobile devices, so UMass Amherst should ensure that the mobile layout provides easy access to cost information.

## Assistive Technology Use

*“It is exhausting for my eyes to visually scan that much space in order to find information. And they’re all with a white background, so they’re pretty bright on your eye and there’s no real option to change that.”*

- Olivia, faculty

*“Some of the moving screens were distracting.”*

- Charlotte, faculty

Assistive technologies enable individuals with disabilities to access and use digital content. It is important to understand what assistive technologies students use to access university cost information to make sure that the UMass Amherst website is designed to be compatible with these technologies. Additionally, knowing what assistive technologies students use can help UMass Amherst to identify potential accessibility barriers on their website. For example, if a significant number of students are using screen readers to access cost information, the website must be designed to provide accurate and descriptive alternative text for images and other visual content. Although none of the users in the study used screen readers, a preliminary examination of the tested pages in this study revealed that alternative text was used inconsistently to describe visual content. By identifying such accessibility barriers, UMass Amherst can make the necessary changes to ensure that all students can access cost information easily.

## Insights

- One participant reported using a screen magnifier to access web information
- One participant reported using a 27” iMac to better see information on the screen

## Implications

- Incorporate features such as adjustable font sizes, color contrast options, and responsive layouts that adapt to different screen sizes for low vision and blind users
- Provide alternative text for images to ensure that they are accessible to users who use screen readers.
- Regularly test the website with various assistive technologies to ensure that it is accessible and user-friendly for all users

## Conclusion

Reflecting on my thesis process, there are a couple of aspects that I would have approached differently. While I initially planned for the recruitment period to span two weeks, it quickly became apparent that this timeframe was unrealistic, especially without a monetary incentive. To enhance my recruitment efforts, I employed several strategies, such as hanging up posters around campus, placing a poster in the Assistive Technology Center, reaching out to Disability Services, creating a post on LinkedIn, and discussing my testing in multiple classes. In hindsight, I acknowledge that starting the recruitment process earlier and providing a monetary incentive may have resulted in a higher number of responses and a more diverse participant pool. Despite the challenge, I successfully recruited six participants with diverse abilities and backgrounds for testing, which granted me valuable insights into the usability of UMass Amherst financial aid web pages.

When I initially embarked on the recruitment process, my objective was to include a blind user and a user with mobility issues to investigate the interaction between screen readers and web pages, as well as the usability of keyboard-controlled assistive technologies. Although I did not succeed in recruiting participants from these specific categories, I encountered an unexpected opportunity by recruiting a participant with PTSD. This participant opened my eyes to the fact that I had not previously acknowledged PTSD as a disability relevant to website accessibility. This realization underscores the importance of expanding our understanding of disabilities and recognizing how they can impact user interactions.

Given that my participant pool did not encompass users with all types of disabilities, it is crucial to underscore the significance of adhering to general accessibility guidelines. For example, despite not having a screen reader user among my participants, it is essential to conduct website testing with a screen reader to gain a better understanding of how blind individuals access information. Tools like the [WebAim contrast checker](#) and the [WAVE accessibility checker](#) can provide a preliminary overview of accessibility issues. Nonetheless, these tools do not offer a comprehensive evaluation of all accessibility concerns. To gain a more comprehensive understanding of a website's accessibility, it is important to combine these tools with usability testing and adherence to accessibility guidelines.

Moreover, I created personas based on the characteristics and needs of my participants. The intention behind these personas was to shift the focus beyond just adhering to accessibility guidelines and delve into the more human side of accessibility. Personas serve as a valuable resource in fostering empathy and inclusivity throughout the design process, reminding designers to consider the diverse needs and experiences of individuals with disabilities. By incorporating personas, designers can create more accessible and user-centered web experiences.

Overall, I aspire for this report to contribute to an expanded definition of accessibility. While accessibility is often viewed in terms of regulations and guidelines, it is important to recognize that, ultimately, accessibility is vital for fostering equitable and inclusive experiences for all students. By enhancing the accessibility of a website, all users can enjoy a more positive and inclusive experience.



# Appendix

## User Personas

To gain insight into the accessibility requirements for students with disabilities, I used the results from the usability tests to create personas for prospective students. The purpose of these personas is to provide a contextual understanding of the diverse experiences of students with disabilities.

To ensure inclusivity, I developed personas for:

- A transfer student with ADHD and dyslexia who identifies as male
- A prospective student with low vision who identifies as nonbinary
- A prospective student with ADHD who identifies as female

The transfer student with ADHD and dyslexia who identifies as male represents the experience of students with multiple disabilities, as many individuals with disabilities have more than one condition. Additionally, one usability testing participant reported having both ADHD and dyslexia, making this persona relevant to my findings.

The persona of the prospective student with low vision who identifies as nonbinary highlights the unique challenges experienced by students with visual impairments, as low vision can manifest differently for each individual. I developed this persona in response to one of the usability testing participants who reported having low vision, as well as to two additional usability testing participants who identified as non-binary.

Lastly, I included the prospective student with ADHD who identifies as female to highlight how ADHD can manifest differently in women, as well as to reflect the experiences of the four usability testing participants who reported having ADHD.

I included a range of personas to showcase students' diverse accessibility needs. However, it is also important to recognize that the experience of one person with a disability does not represent the experiences of all individuals with that disability. Disabilities such as visual impairments can present on a spectrum, ranging from mild to severe. To ensure inclusivity and accessibility, it is crucial to recognize and understand the unique challenges and needs of each individual and to create websites that are inclusive and cater to their specific needs.

## Michael

- **Age:** 24
- **Work:** Community college student
- **Neurodiversity:** ADHD, dyslexia

### Goals and Motivations

- Transfer to a four-year university for biology
- Learn about financial aid options as a first-generation, low-income student

### Bio

Michael is a hard-working student who struggles with staying on task. He prefers websites with a minimalistic layout.

### Challenges

- Difficulty reading long blocks of text
- Struggles with visual clutter and busy website layouts
- Trouble with maintaining focus while using the web

### Assistive Technologies

- Text prediction software
- Text to speech software

### Technology Use

- Uses personal laptop

### In-Context

- Dyslexia affects 15% of the U.S. population (Bureau of Internet Accessibility)
- It is important to provide readable and understandable content for web users with dyslexia

## Jordan

- **Age:** 19
- **Work:** High school senior
- **Disability:** Low vision

### Goals and Motivations

- Get accepted into a college program for linguistics
- Learn about affordable housing accommodations for students with low-vision

### Bio

Jordan experiences reading difficulties resulting from a soccer injury. They prefer websites with large text and sufficient color contrast.

### Challenges

- Difficulty reading small font sizes and low-contrast text
- Experiences eye fatigue from prolonged screen time
- Struggles to find specific information on a page

### Assistive Technologies

- Screen magnifier
- Large monitor

### Technology Use

- Uses family desktop computer

### In-Context

- There are 246 million people around the world with low-vision (W3C)
- Due to the diversity of visual impairments, low-vision users must be able to adjust user interfaces to meet their needs

## Lily

- **Age:** 18
- **Work:** High school senior
- **Neurodiversity:** ADHD

### Goals and Motivations

- Get accepted into a college program for electrical engineering
- Apply for merit scholarships as a student with a 4.6 weighted GPA

### Bio

Lily is a highly motivated student who sometimes struggles with attention. She prefers websites without a lot of motion.

### Challenges

- Difficulty staying focused
- Struggles with information retention when reading online
- Trouble managing multiple tasks at the same time

### Assistive Technologies

- Google Chrome animation blocker

### Technology Use

- Uses school computers

### In-Context

- Boys (13%) are more likely to be diagnosed than girls (6%) (CDC)
- Using a clean, predictable web layout helps to minimize distractions for web users with ADHD (Bureau of Internet Accessibility)

## Testing Tasks and Rationale

### Task 1: Calculating the Total Cost of Attendance

- **Scenario:** You are an in-state undergraduate student looking to calculate the total cost of attending UMass Amherst.
- **Task:** Using the UMass Amherst website, find an estimate of the total in-state undergraduate costs for 2023-2024.
- **Rationale:** This task assesses whether participants are able to find information on the total cost of attending UMass Amherst by navigating to the [Undergraduate Costs](#) website.

### Task 2: Calculating Cost of Attendance Minus Grants

- **Scenario:** You are a prospective first-year student planning on receiving financial aid. You want to find information about the cost of attending UMass Amherst, minus grants.
  - You are:
    - 18 years old
    - Plan to live in a dorm
    - Live in Montana
    - Unmarried and childless
    - Are an only child living with one parent
    - Have an annual income of \$15,000
- **Task:** Find the cost of attending UMass Amherst for the 2023-2024 school year minus grants.
- **Rationale:** This task evaluates participants' ability to locate the Net Price Calculator on the [Financial Aid](#) website and assesses the accessibility of the calculator.

### Task 3: Evaluating Housing Options

- **Scenario:** You are an accepted first-year student evaluating housing options for the 2023-2024 school year.
- **Task:** Identify the cost of a first-year dorm with two people in the Honors College.
- **Rationale:** This task evaluates participants' ability to locate the [Housing Costs](#) page on the UMass Amherst website. It also examines whether the CHRC (Commonwealth Honors College Residential Community) acronym is easily understandable.

### Task 4: Evaluating Dining Options

- **Scenario:** You are an on-campus accepted first-year student looking to evaluate on-campus meal plans.
- **Task:** Identify the least expensive on-campus meal plan available for first-year students.

- **Rationale:** This task aims to evaluate participants' ability to find the [Residential Meal Plans](#) section on the UMass Amherst website. It also aims to determine if participants can identify meal plan options that are available to first-year students.

## Task 5: Finding Scholarships

- **Scenario:** You are an accepted first-year student interested in learning about scholarships available to incoming students at UMass Amherst.
- **Task:** Locate one scholarship available to accepted first-year students at UMass Amherst on the UMass Amherst website.
- **Rationale:** This task assesses participants' ability to locate the Scholarships web page on the UMass Amherst website. It also seeks to test participants' ability to find scholarships that are available to incoming first-year students.

## Wrapping Up

- **Questions:**
  - Do you have any questions and/or feedback for me?
  - Does your disability affect how you interact with the web?
  - Which task did you find the easiest to complete? The most difficult?
  - If you could speak directly with the folks who design the UMass Amherst website, is there anything you'd want them to know?
- **Rationale:** The above questions offer participants the chance to provide valuable input and recommendations to website designers, while also elaborating on how their disabilities influence their interaction with the website.

## Usability Testing Script

Hi, \_\_\_\_\_. My name is Abby, and I'm going to be walking you through this session today. Before we begin, I have some information for you, and I'm going to read it to make sure that I cover everything.

You probably already have a good idea of why I asked you here, but let me go over it again briefly. I'm asking people to try using the UMass financial aid web pages to see whether they work as intended. The session should take about an hour.

The first thing I want to make clear right away is that I'm testing the web pages, not you. You can't do anything wrong here.

As you go through the tasks, I'm going to ask you as much as possible to try to think out loud: to say what you're looking at, what you're trying to do, and what you're thinking. This will be a big help to me.

Also, please don't worry that you're going to hurt my feelings. We're doing this to improve the web pages, so I need to hear your honest reactions.

If you have any questions as we go along, just ask them. I may not be able to answer them right away, since I'm interested in how people do when they don't have someone sitting next to them to help. But if you still have any questions when we're done, I'll try to answer them then. And if you need to take a break at any point, just let me know.

I'm going to record what happens on the screen and our conversation. The recording will only be used to help me figure out how to improve the site, and it won't be seen by anyone except for me and my faculty advisor.

Next, I'm going to ask you to sign a consent form (sent to the participant ahead of time) that provides more information about this study so that you can make an informed decision about participation in this research.

Do you have any questions for me?

**ARE YOU  
INTERESTED IN  
IMPROVING  
WEB ACCESSIBILITY  
AT UMASS AMHERST?**



**FIND OUT  
WHAT **YOU** CAN DO**

**For more details,  
contact [awing@umass.edu](mailto:awing@umass.edu)**