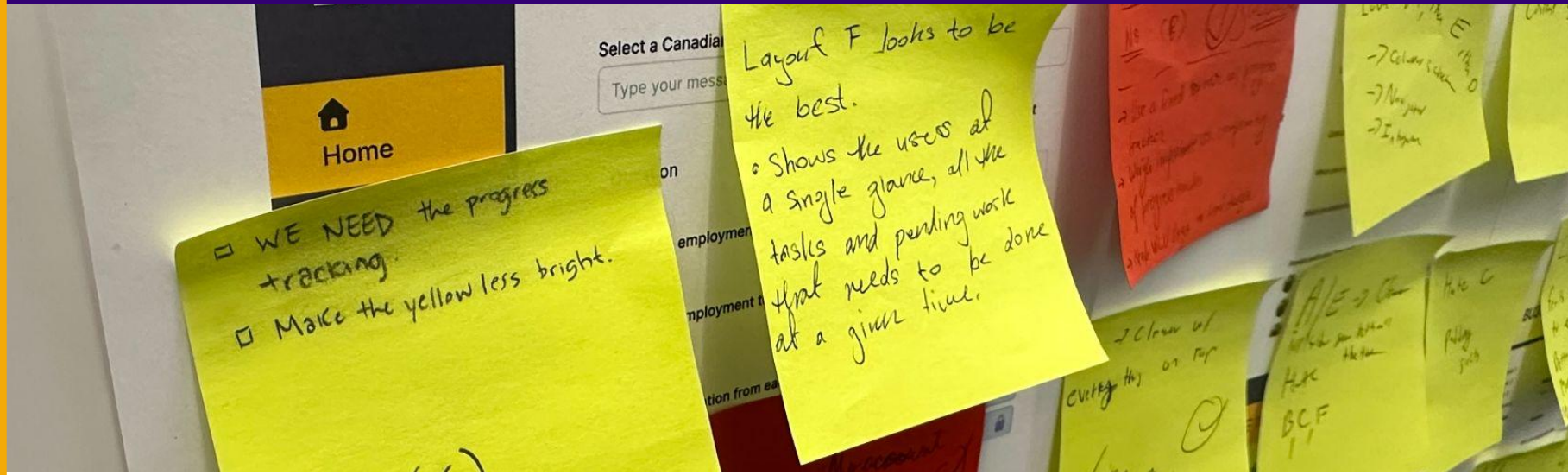
BU354 Dashboard

Comparative Usability Report



November 4 2025

LAZARIDIS
School of Business & Economics
WILFRID LAURIER UNIVERSITY

Executive summary

The Lazaridis School of Business & Economics at Wilfrid Laurier University's Start-Up Lab was contracted by the professors of BU354, Human Resources Management, **to build a dashboard for their weekly assignments**. This document summarizes the design decisions made for this project.

The design process was led by **Derek Song**, a co-op student working under under the Laurier Start-Up Lab. After getting the opinions of more than **59 students,** the resulting platform features a collapsible sidebar aligned with Laurier's visual identity and an interface inspired by MyLearningSpace, Google Docs, and Laurier Navigator. The home dashboard prioritizes upcoming deadlines, and Dashboard A (tested against 7 other medium-fidelity prototypes) will be further refined based on strong student preference.

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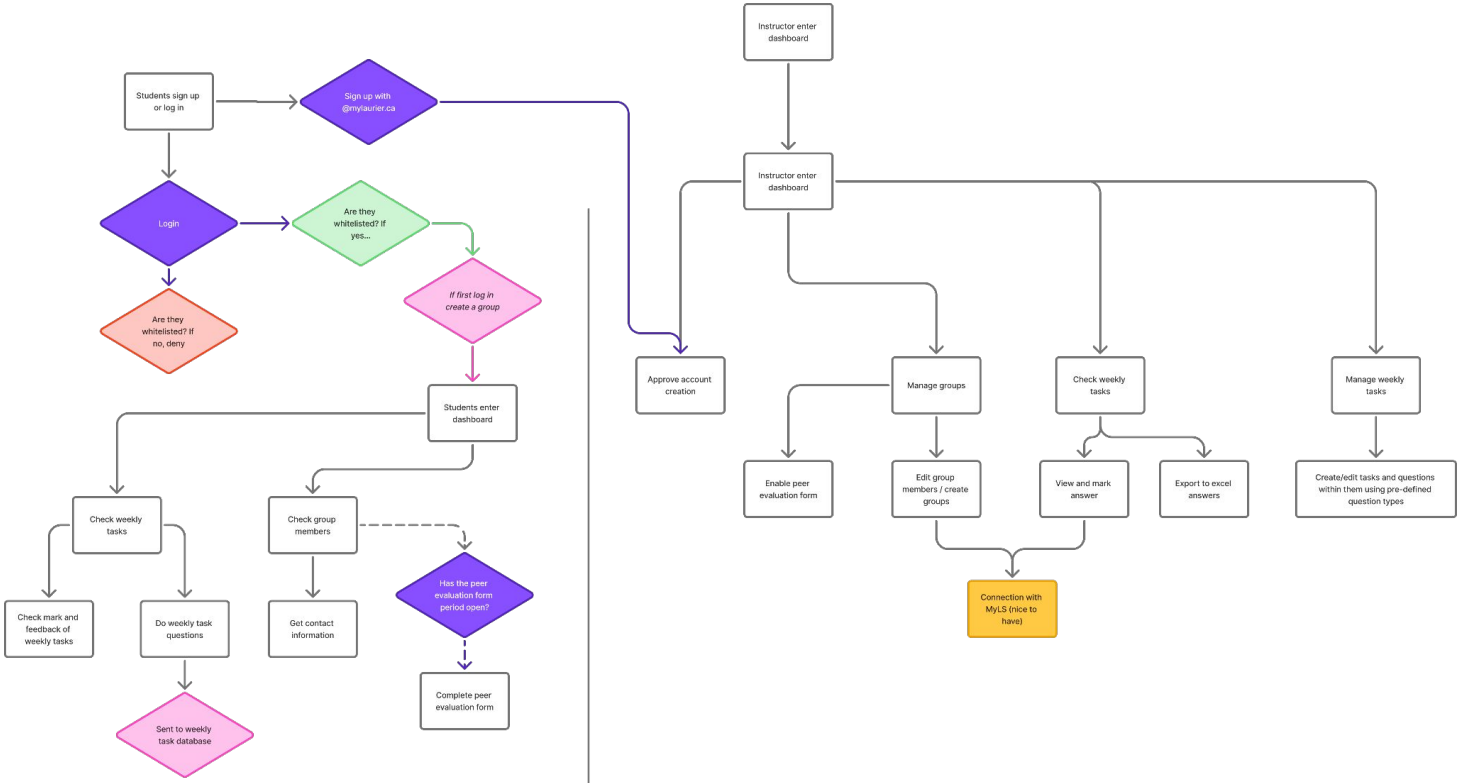
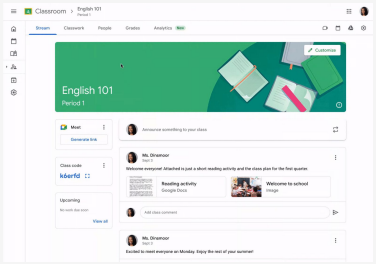
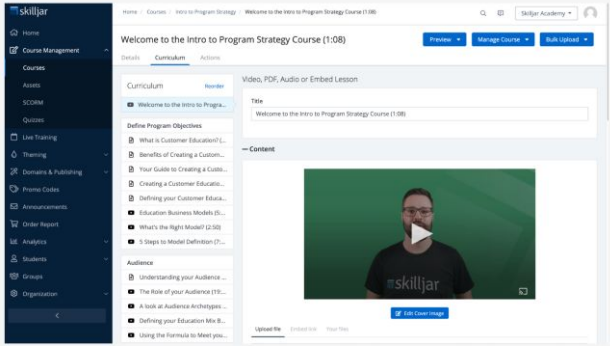
PDFs of all graphs can also be found at: https://github.com/twotoque/BU354-UXdata/tree/main/pdfs

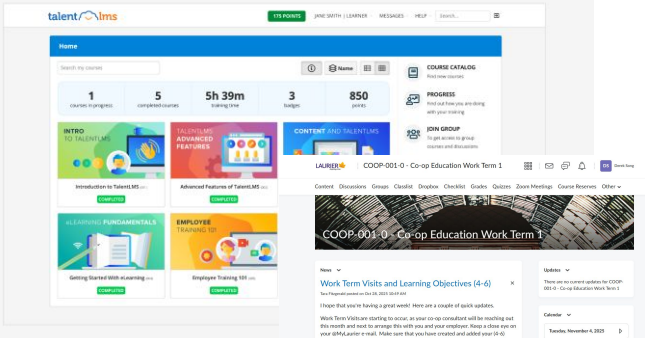
User flow

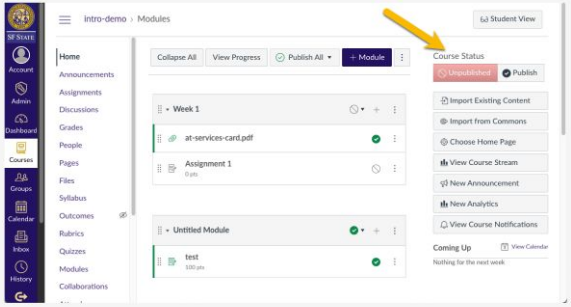

Students sign up or log in
Sign up with @mylaurier.ca
Login
Are they whitelisted? If yes...
Are they whitelisted? If no, deny
If first log in create a group
Students enter dashboard
Check weekly tasks
Check group members
Check mark and feedback of weekly tasks
Do weekly task questions
Get contact information
Has the peer evaluation form period open?
Sent to weekly task database
Complete peer evaluation form
Instructor enter dashboard
Instructor enter dashboard
Approve account creation
Manage groups
Check weekly tasks
Manage weekly tasks
Enable peer evaluation form
Edit group members / create groups
View and mark answer
Export to excel answers
Create/edit tasks and questions within them using pre-defined question types
Connection with MyLS (nice to have)

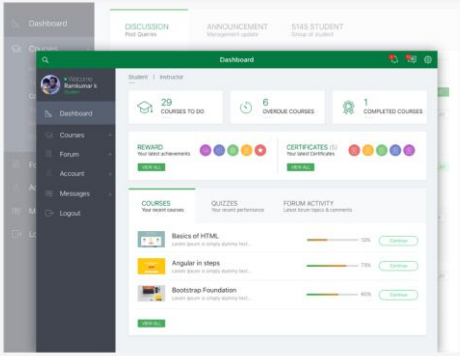
Examples of similar learning websites

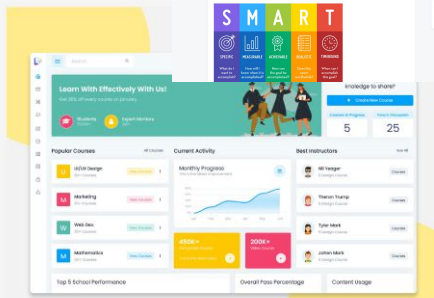








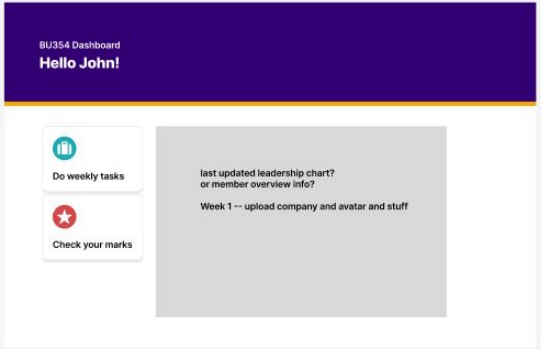




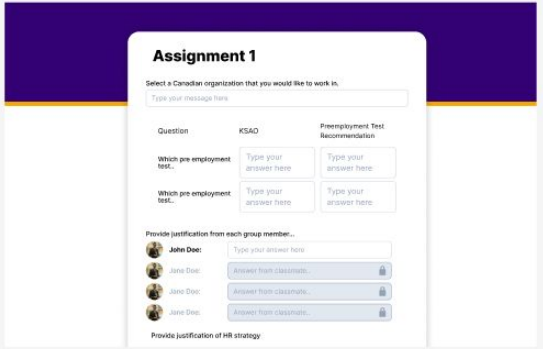
Low-fidelity prototypes

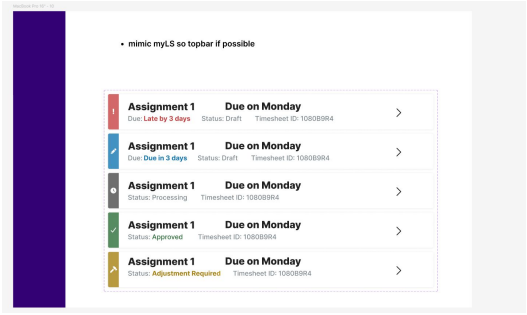
MacBook Pro 16" - 4

MacBook Pro 16" - 6



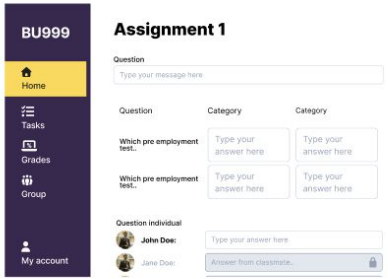
MacBook Pro 16" - 3



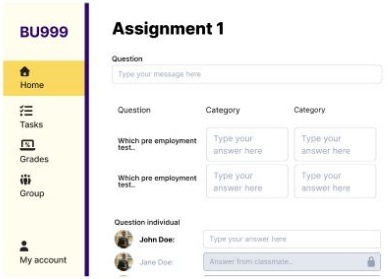


Mid-fidelity prototypes

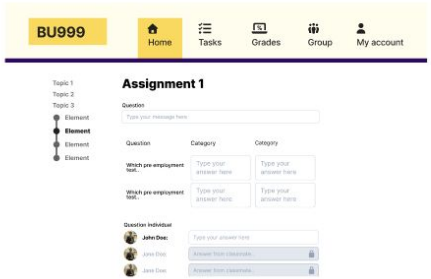
A



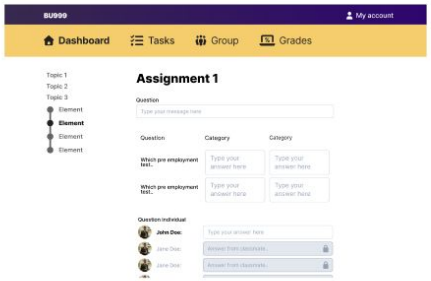
B



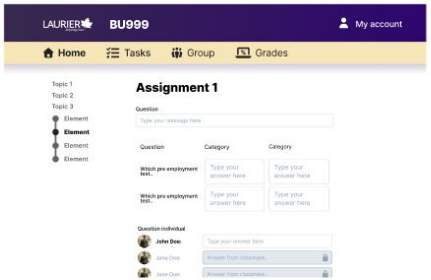
C



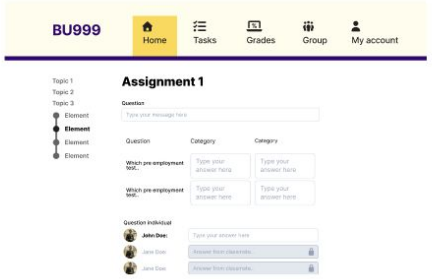
D



E



F



Viewable at:
https://www.figma.com/proto/iyxzz8QmrJeckuwIlBQChe/BU354-Dashboard-Public-Figma?node-id=1-3383&p=f&t=e2igoweknUdeY7lf-1&scaling=min-zoom&content-scaling=fixed&page-id=1%3A3109&starting-point-node-id=1%3A3383&show-proto-sidebar=1

Sample size

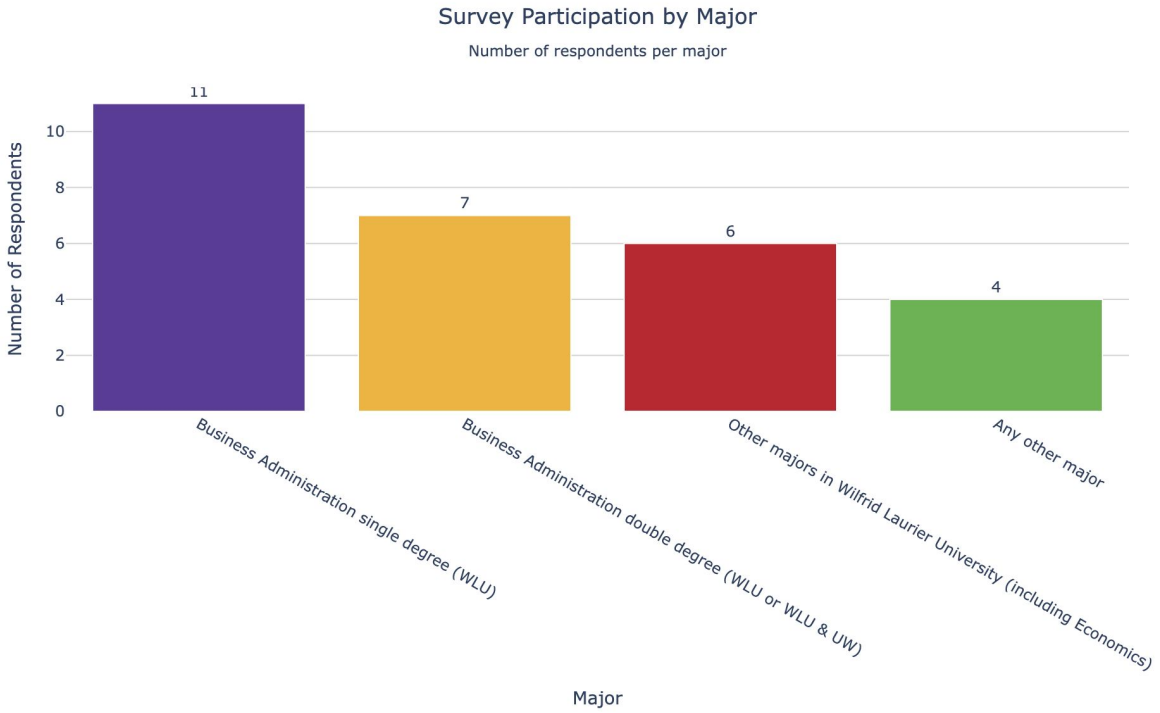
~59 Students

28 survey respondents

31 sticky notes

Students may fill out multiple sticky notes, but most only did 1.

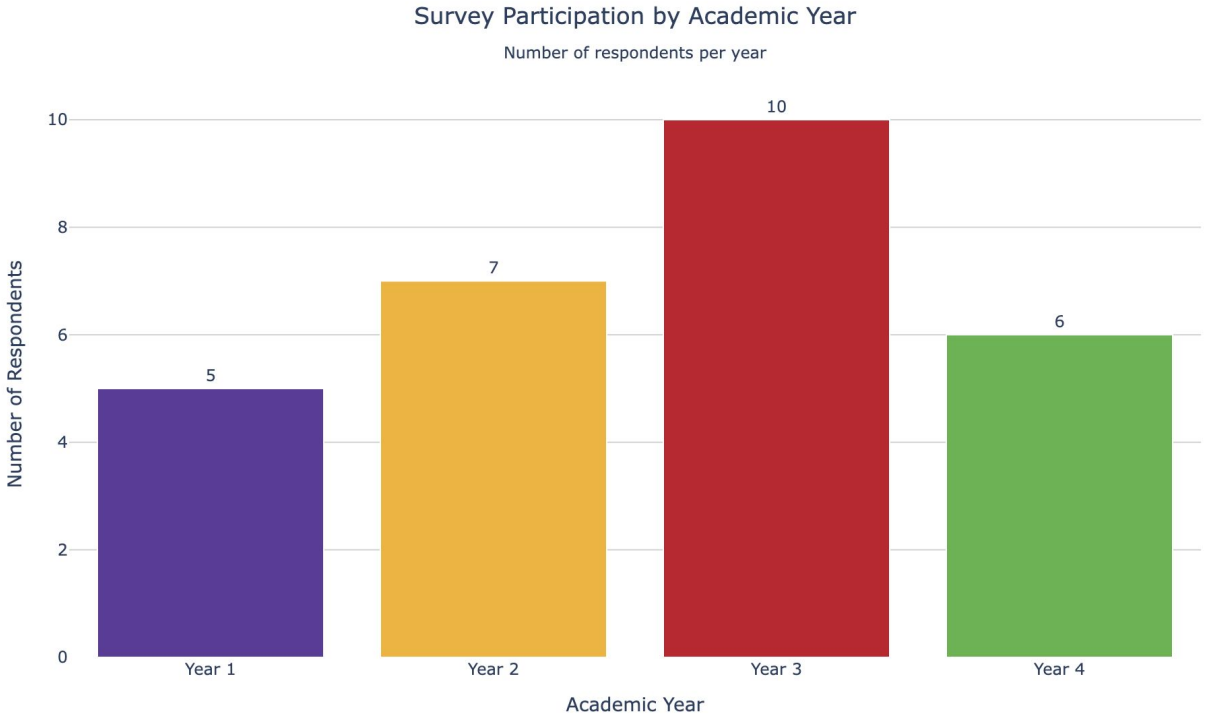
Sample size



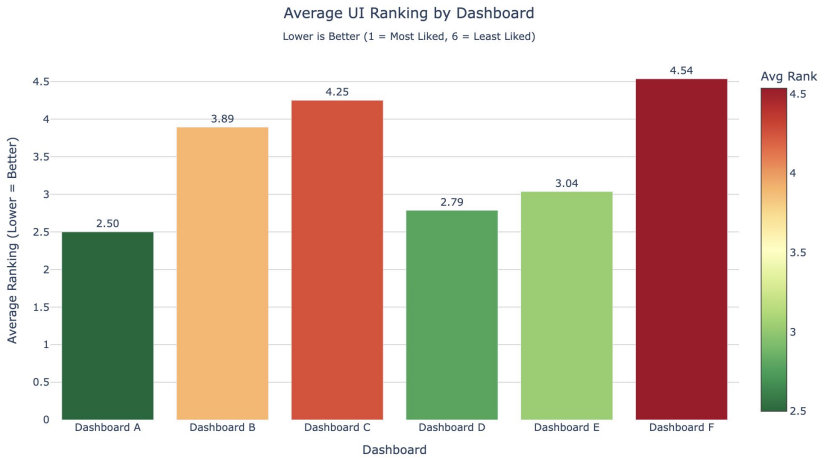
18 (64%) survey respondents will need / had to take BU354

Sticky note participants were not asked about major

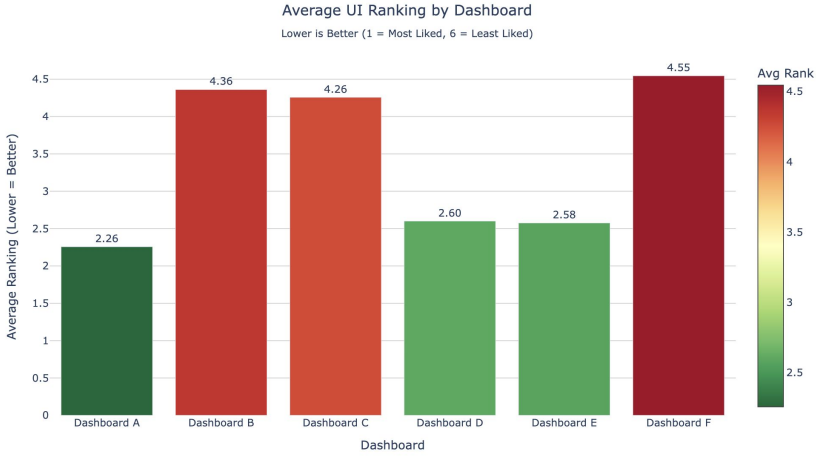
Sample size


Survey Participation by Academic Year
Number of respondents per year
Number of Respondents
0
2
4
6
8
10
5
7
10
6
Year 1
Year 2
Year 3
Year 4
Academic Year

Findings

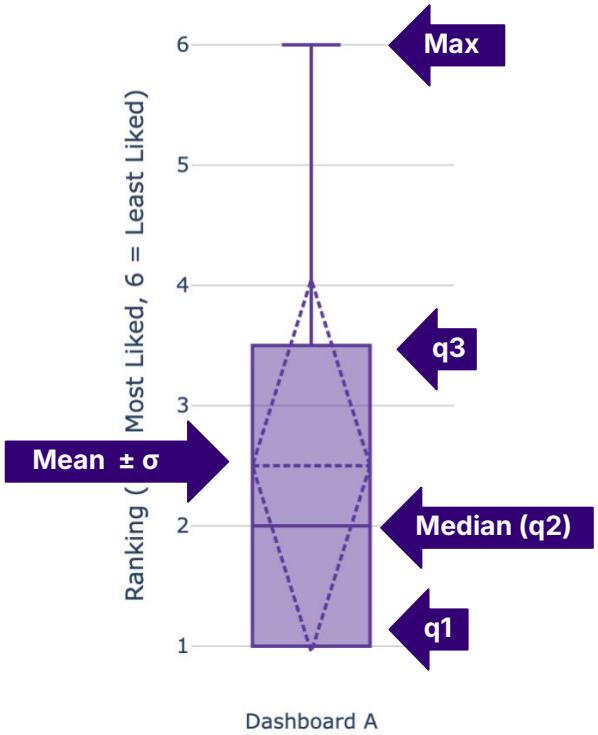


Bar graph with only survey respondents



Bar graph with both survey respondents and sticky note data

Sample distribution



- **If median is lower than mean:** most respondents found it **positive** since ratings cluster at lower end *(right skewed)*

- **If median is higher than mean:** most respondents found it **negative** since ratings cluster at higher end *(left skewed)*

Sample distribution

Specific formulas are also explained in the appendix, located on the end of this document. While most of it is automated by Python libraries, the document outlines how each value is attained.

This document is also viewable here: https://github.com/twotoque/BU354-UXdata/blob/main/formuale.pdf

BU354 Dashboard: Comparative Usability Report - Formulas

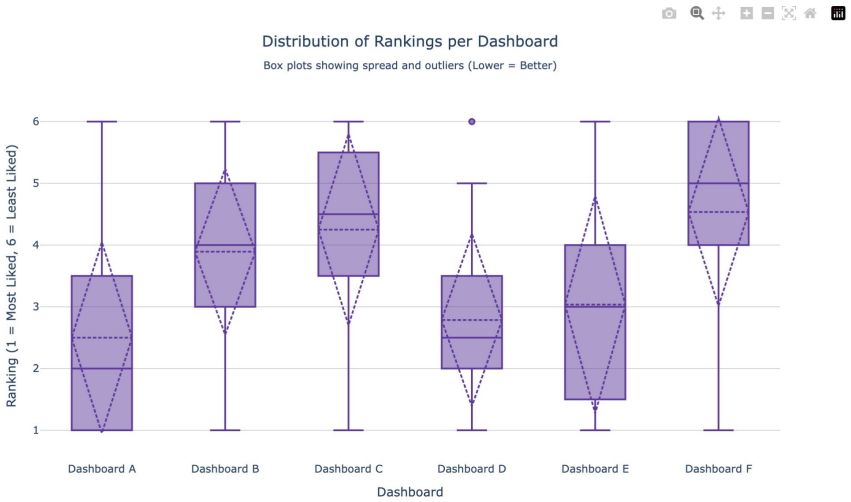
Derek Song

Note. For clarity and readability, the formulas in this document avoid using the general notation n (total responses) and k (number of categories). Instead, each formula is written directly in terms of the specific variables used in the BU354 UX analysis (e.g., observed counts for dashboard A vs dashboard E).

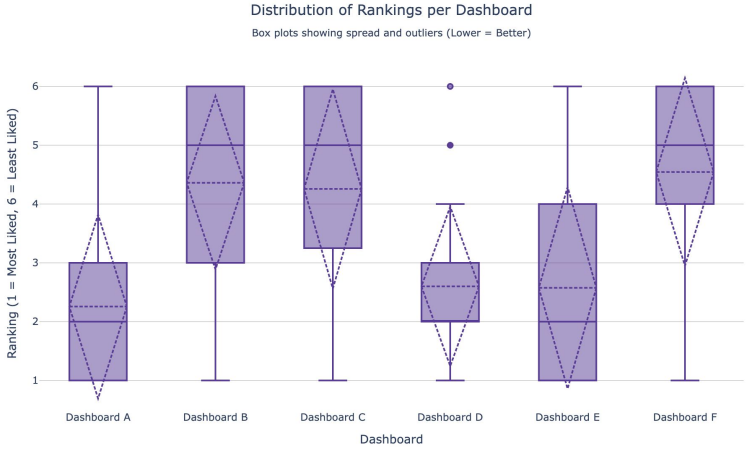
$$s_d = \sqrt{\frac{\sum_{i=1}^{\text{number of respondents}} (d_i - \bar{d})^2}{\text{number of respondents} - 1}}$$

$$\chi^2 = \frac{(O_{\text{category 1}} - E_{\text{category 1}})^2}{E_{\text{category 1}}} + \frac{(O_{\text{category 2}} - E_{\text{category 2}})^2}{E_{\text{category 2}}}.$$

Sample distribution



Distribution with only survey respondents



Distribution with both survey respondents and sticky note data

Sample distribution

Two frontrunners, though dashboard A is slightly preferred

Only Survey

Dashboard A:
- Median: 2
- Mean: 2.5
- Standard Deviation: 1.546

Dashboard E:
- Median: 3
- Mean: 3.035
- Standard Deviation: 1.762

All Data

Dashboard A:
- Median: 2
- Mean: 2.25
- Standard Deviation: 1.564

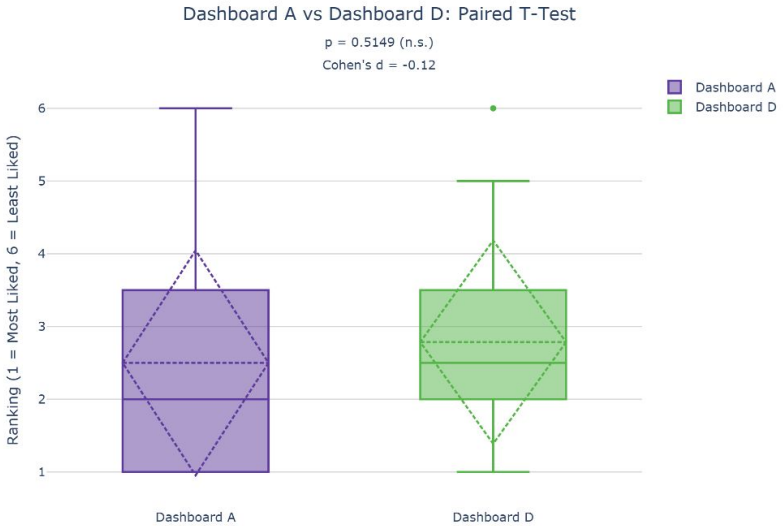
Dashboard E:
- Median: 2
- Mean: 2.575
- Standard Deviation: 1.715

T-test: A vs E dashboards

Slight trend toward liking dashboard A more, but effect size is small (Cohen's d= -0.21), and students did not reliably prefer dashboard A compared to D (p=0.2671)

T-test: A vs D dashboards

Slight trend toward liking dashboard A more, with the effect size being negligible (Cohen's d= -0.12), and again students did not reliably prefer dashboard A compared to D (p=0.5149)



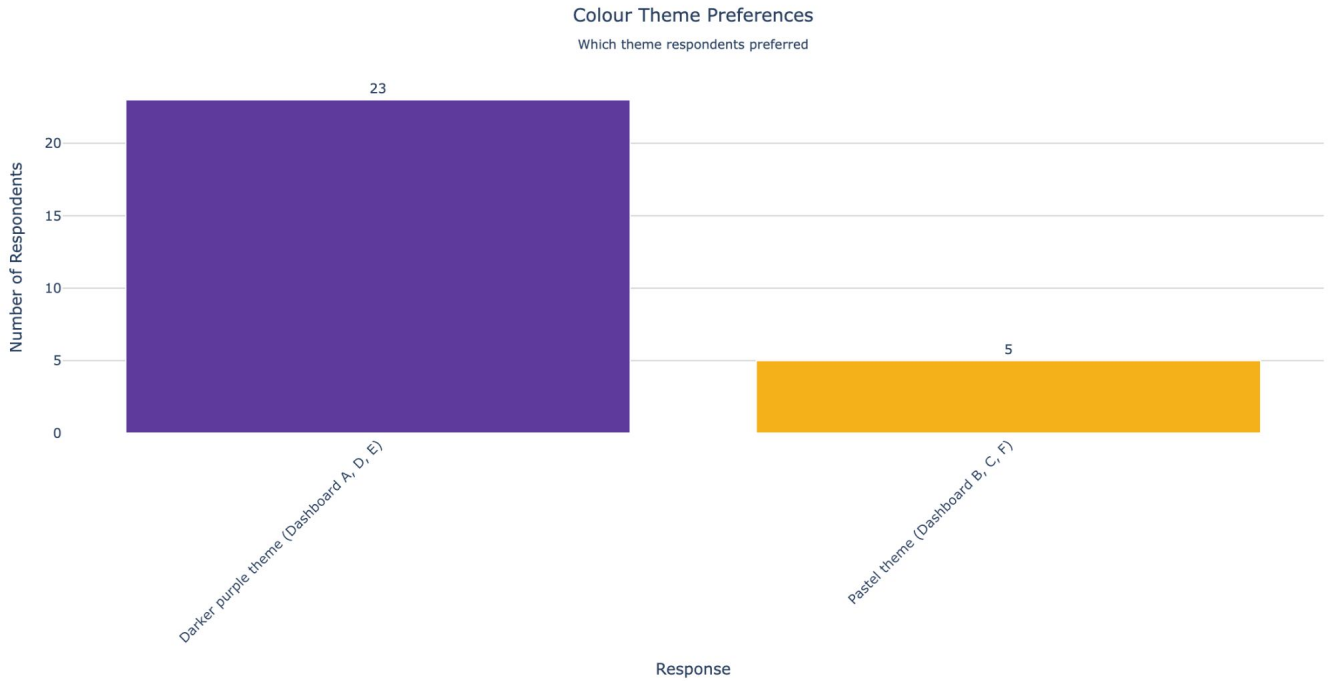
Findings

Bar graph with only survey respondents by major
Dashboard A wins by students who have to take BU354
(red, yellow)

Findings

Bar graph with only survey respondents by major

Colour scheme and features



Colour scheme purple wins

Colour scheme and features

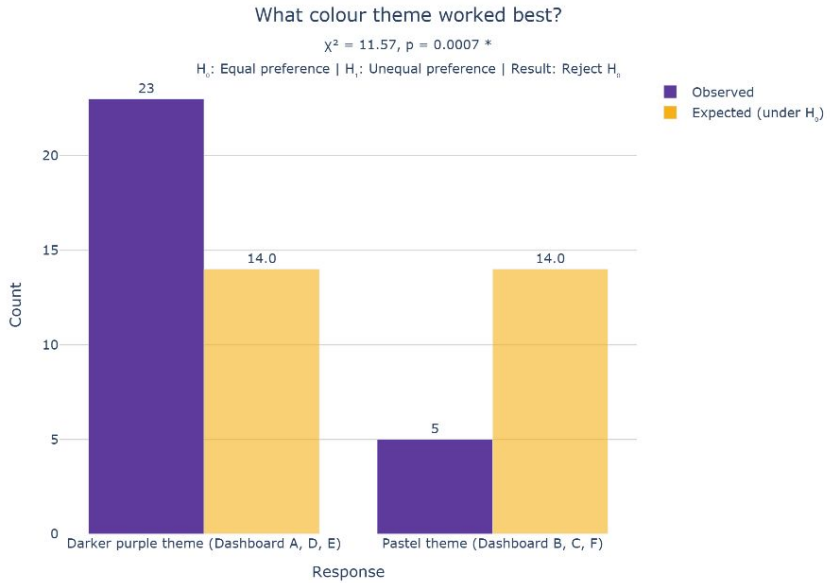
Sticky note respondents preferred purple colour scheme

- *“Darker shades (purple) consistent with Laurier brand”*
- *“Lemon (brighter) yellow colour scheme is bad, feels like Windows XP colours”*
- *“Hate B, contrast sucks”*
- *“Keep primary: Purple, secondary: Yellow”*
- *“Make the [highlighted] yellow less bright”*
- *“E is okay due to the (tinted) yellow”*

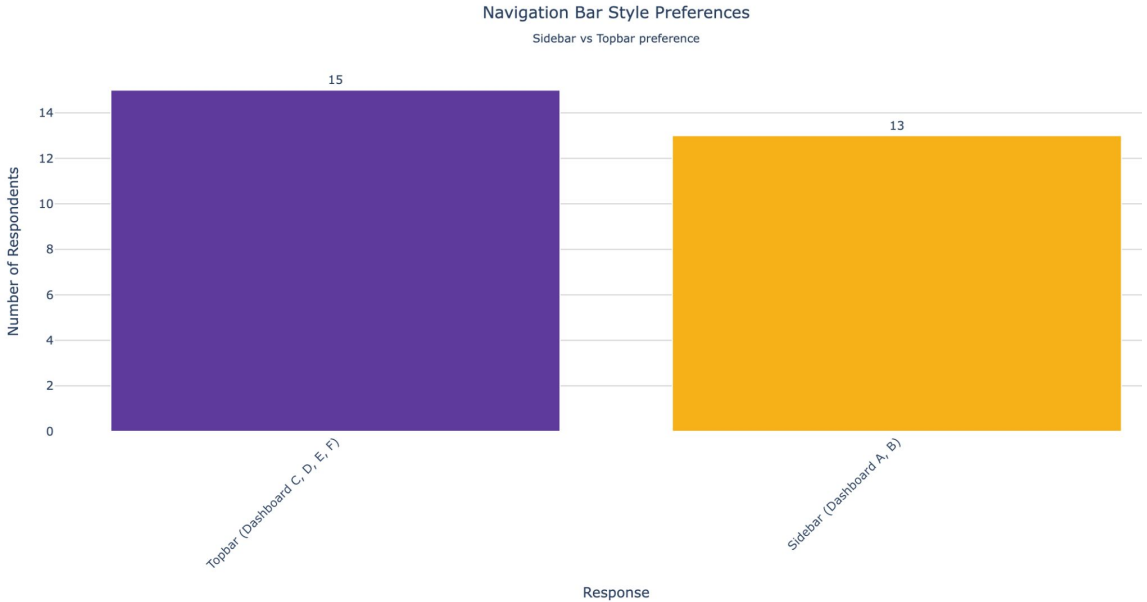
Colour scheme and features

Doing a chi-squared test, students did **significantly prefer** the darker purple theme over the patel theme.

Given null hypothesis (h0) assuming students like them equally, alternate hypothesis (h1) assuming students like one over another, with p<0.007 then we reject the null hypothesis.



Colour scheme and features



While a “topbar” slightly wins in the survey, most sticky note respondents did prefer a sidebar

Colour scheme and features

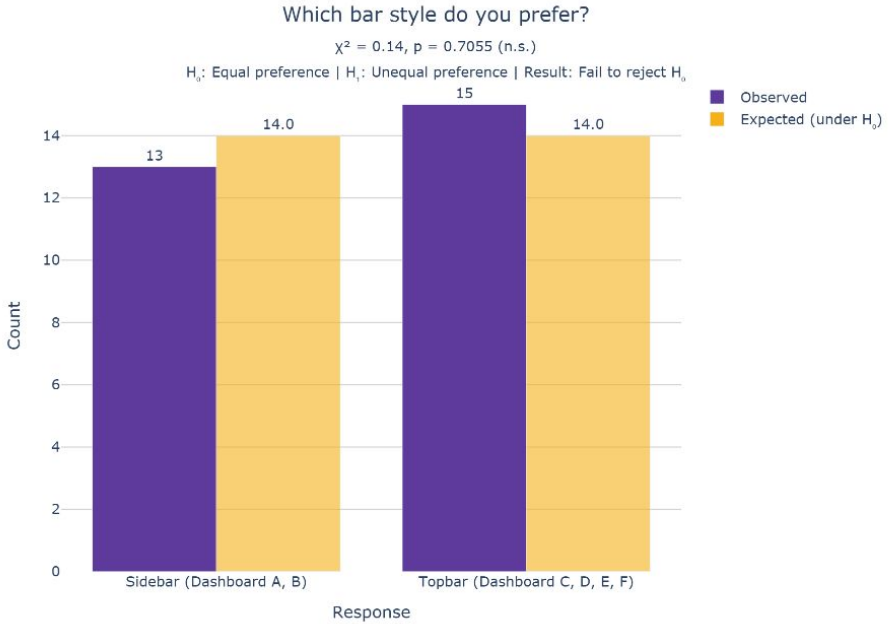
Sticky note respondents divided on top or side bar, but somewhat preferred top bar. Comparisons with **Navigator (sidebar)** and **MyLearningSpace/Google Docs (topbar)**

- *"Side bar (A) is easiest to see all of the content"*
- *"A looks like Navigator"*
- *"Used a fixed top bar w/ progress tracker"*
- *"A would be nice if the **sidebar was collapsible**"*
- *"Favorite is A, then D. since easier to scroll side bar"*
- *"Sidebar takes too much space"*
- *"Never a fan of side bar, more intuitive if on top, so used to using top bar (MyLS, Docs)"*

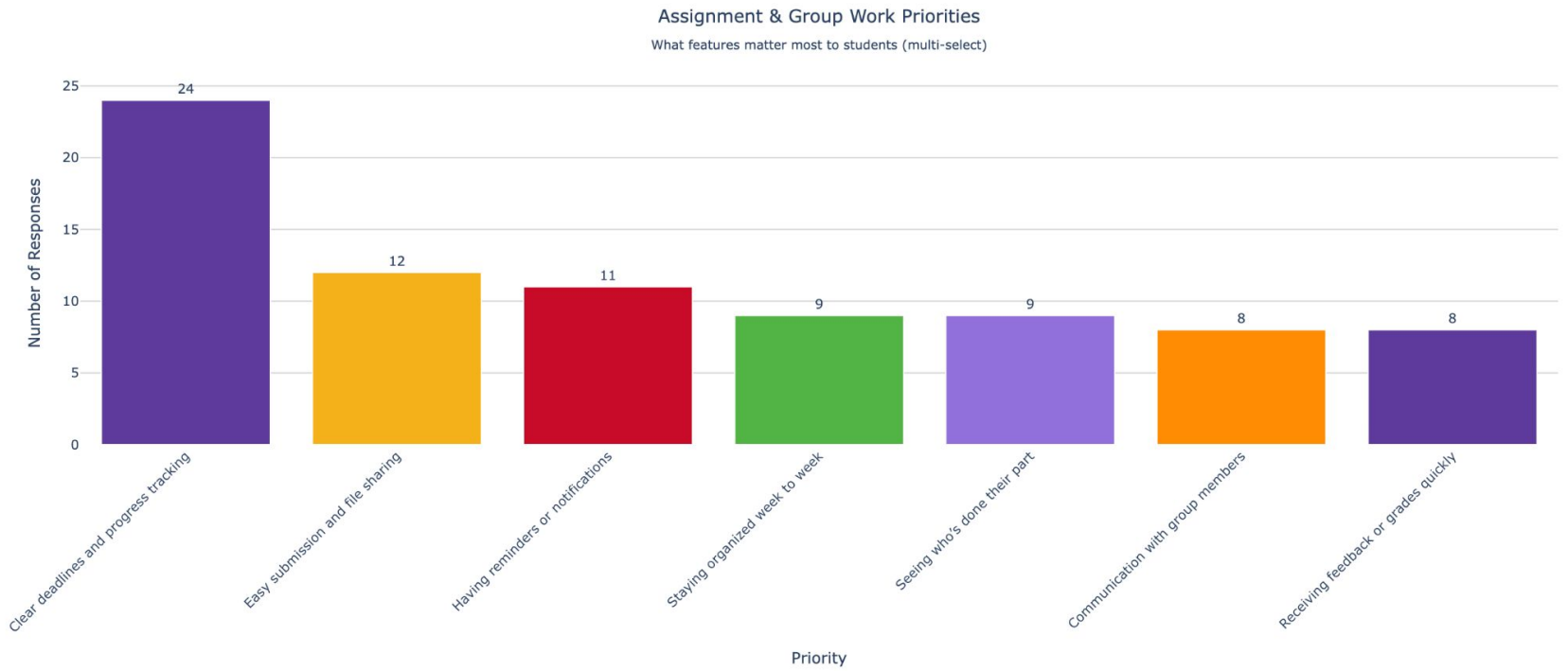
Colour scheme and features

Doing a chi-squared test, students did **not significantly prefer** sidebar navigation or topbar navigation.

Given null hypothesis (h0) assuming students like them equally, alternate hypothesis (h1) assuming students like one over another, with p=0.78 then we fail to reject the null hypothesis.



Colour scheme and features



Colour scheme and features

Most users wanted a progress bar tracker

- *“Used a fixed top bar w/ progress tracker”*
- *“Weigh importance vs complexity of progress tracker”*
- *“Progress Bar is confusing”*
- *“Progress bar, would rather see it on top”*
- *“Progress bar → Easy to navigate”*
- *“We need the progress tracking”*

Colour scheme and features

Users liked the inclusion of the Wilfrid Laurier University logo

- *“Keep WLU logo in final design”*
- *“D + E: use WLU logo”*
- *“Top bar is better, Laurier logo is [good], top font is good”*
- *“WLU logo is trivial to the school”*
- *“Doesn’t like E but likes the Laurier Logo”*

Colour scheme and features

My Account should be separated from content hierarchy

- *“E: my account separate”*
- *“Likes how my account is separate”*

Dashboard can be adapted for other courses (like bohr.wlu.ca)

- *“Confused on why we are building this platform solely for one course”*

Final recommendations

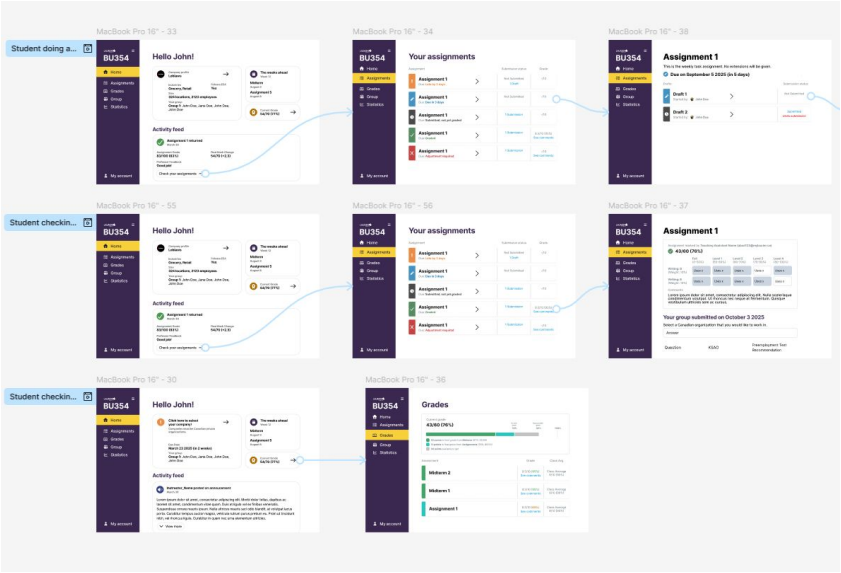
1. A collapsible sidebar with the Wilfrid Laurier University logo, with user interface elements similar to MyLearningSpace, Google Docs, & Laurier Navigator

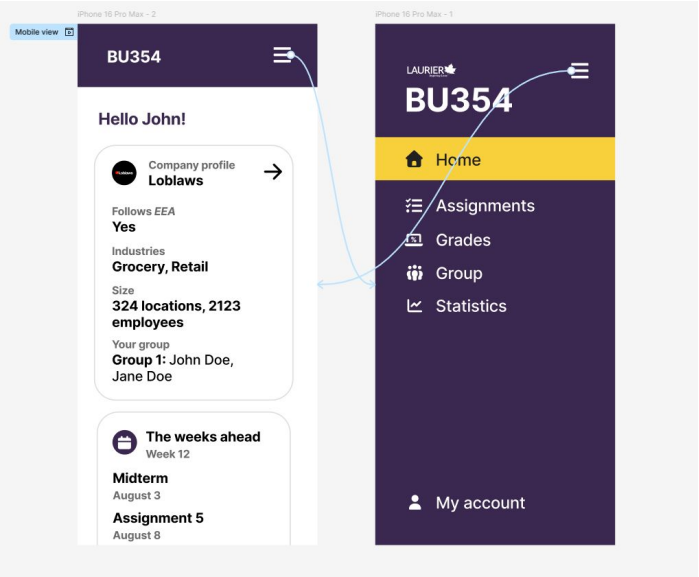
2. Usage of the purple primary colour scheme

3. Upcoming deadlines must be present in the home dashboard

4. Dashboard A will be adapted due to the preference by students who will need to take BU354

High-fidelity prototype

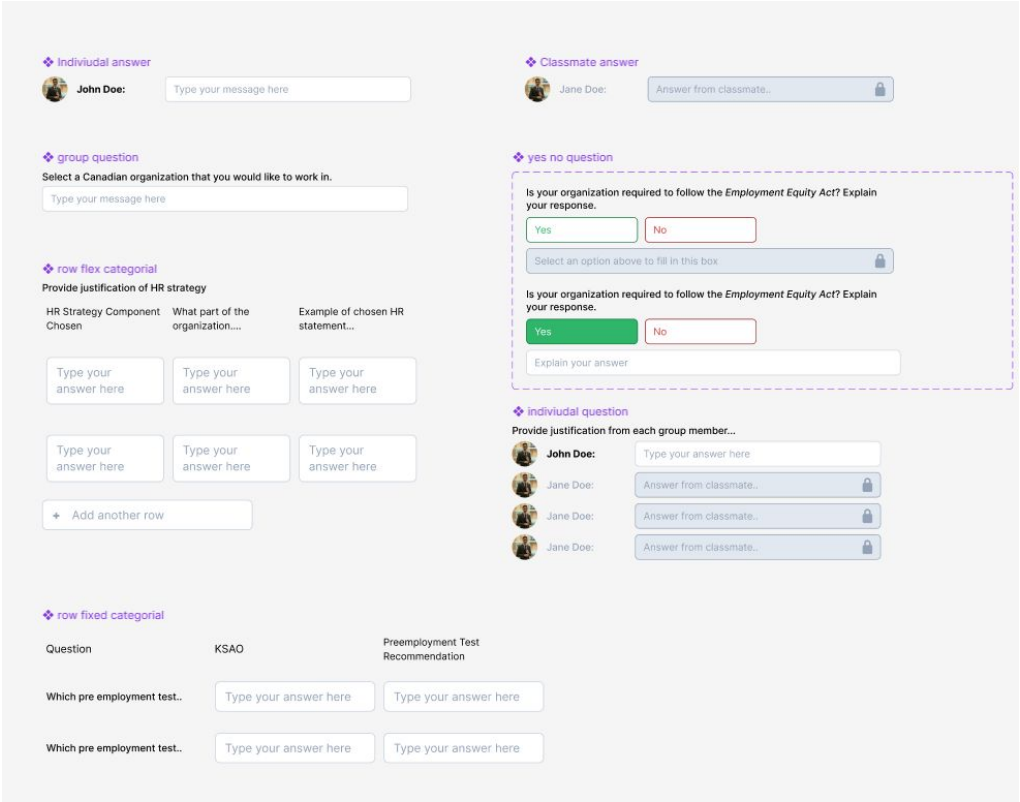




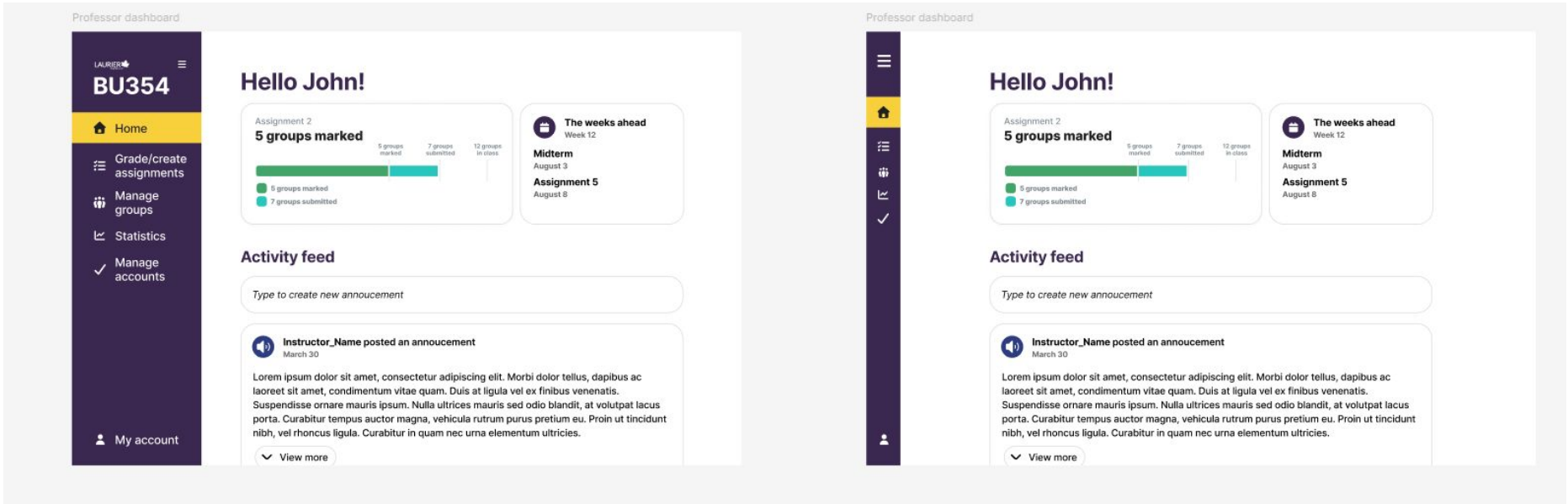
With 10+ user flows for both student and professors. Viewable at:
https://www.figma.com/proto/iyxzz8QmrJeckuwIlBQChe/BU354-Dashboard-Public-Figma?node-id=1-6026&p=f&t=nD5LAKoPBDNLzIlr-1&scaling=min-zoom&content-scaling=fixed&page-id=0%3A1&starting-point-node-id=1%3A6026&show-proto-sidebar=1

High-fidelity: Question system

Based on ShadCN components to speed up development.

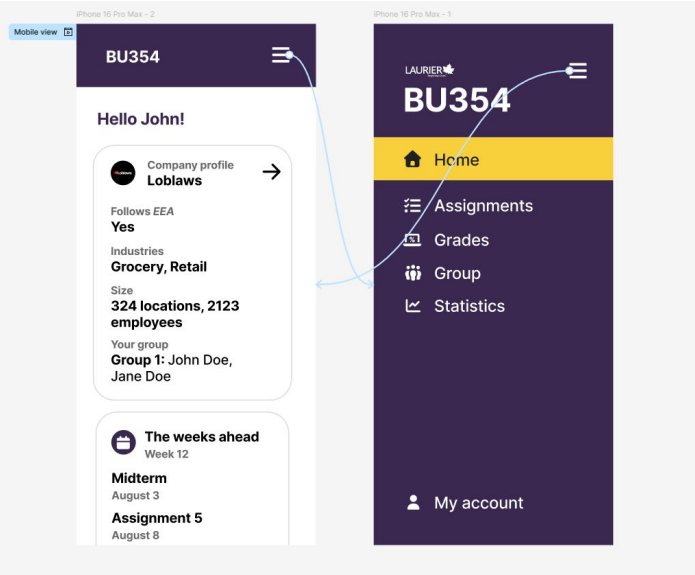


High-fidelity: Sidebar



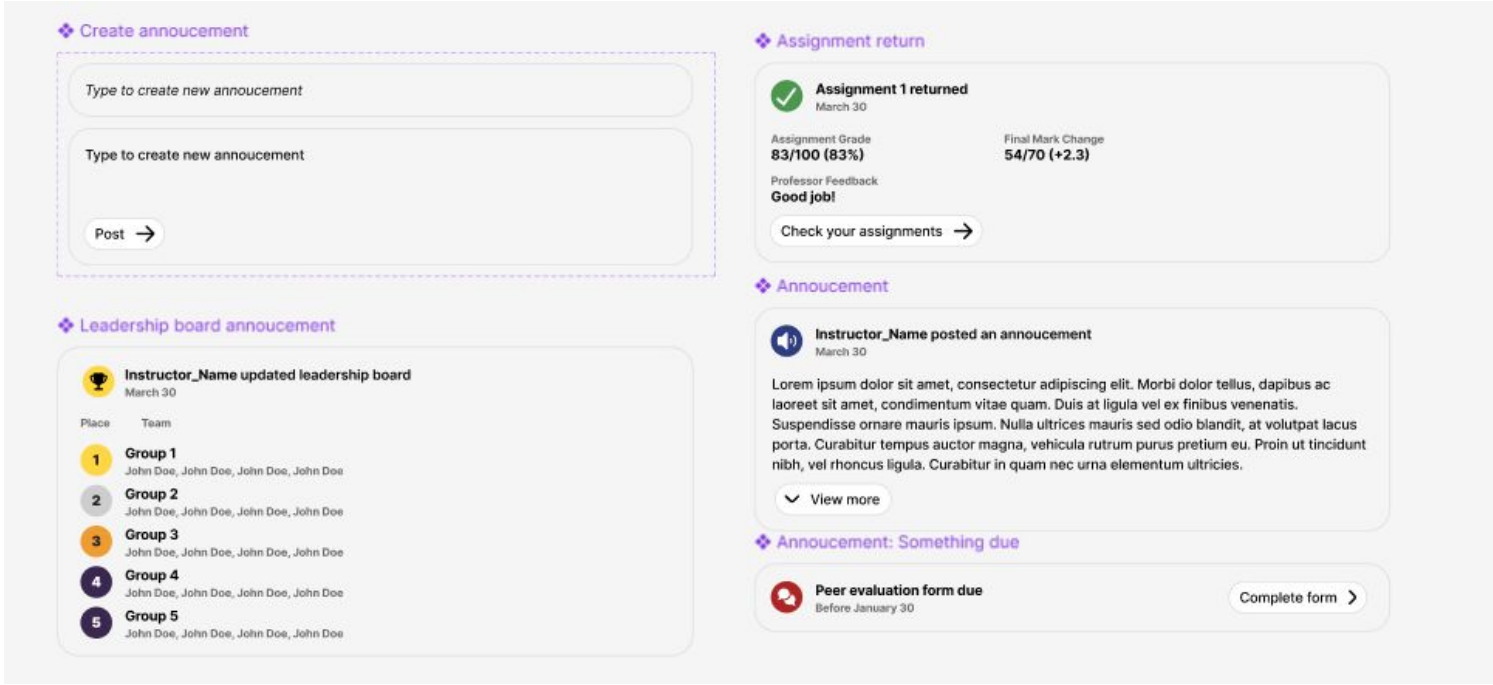
Sidebar can be collapsible.

High-fidelity: Sidebar



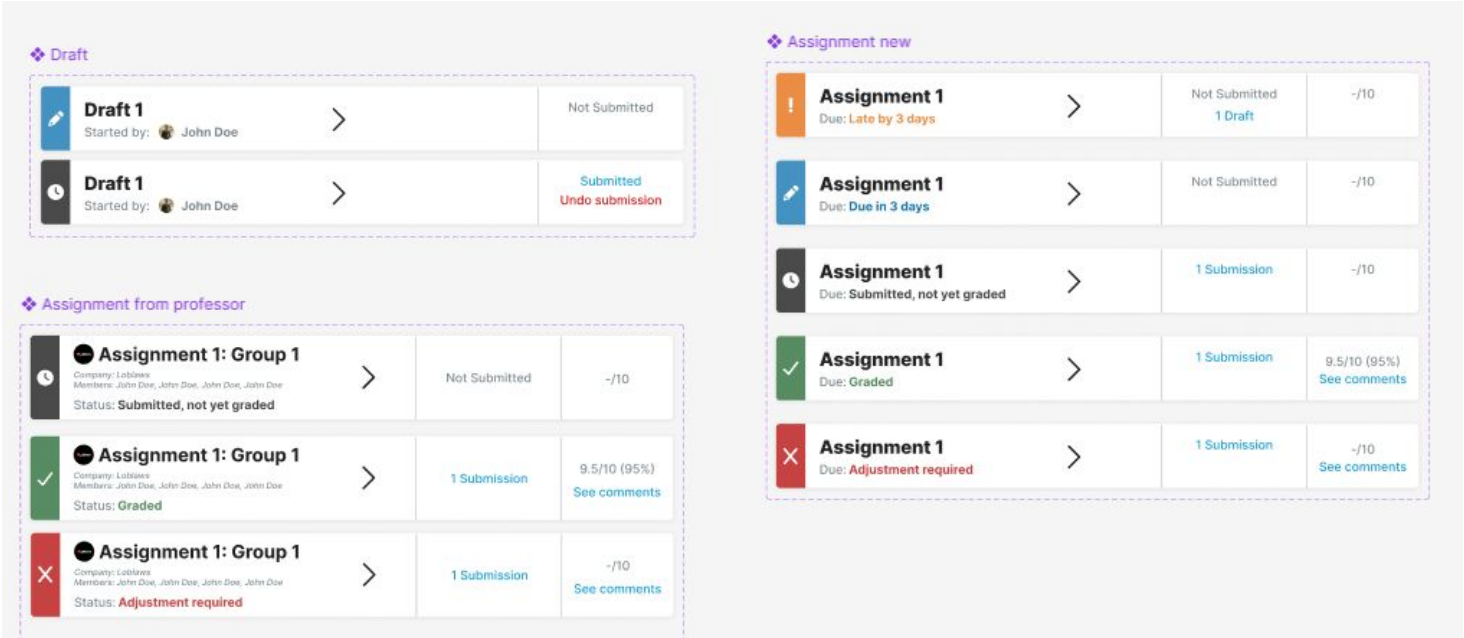
A similar system is used for mobile.
This time, only a fixed top bar is there to mimic MyLearningSpace's flow.

High-fidelity: Announcement system



Similar to Google Classroom.

High-fidelity: List of assignments system



Similar wording to MyLearningSpace, using colours and symbols to make statuses stand out better.

Appendix

Formula sheet

BU354 Dashboard: Comparative Usability Report - Formulas

Derek Song

Note. For clarity and readability, the formulas in this document avoid using the general notation n (total responses) and k (number of categories). Instead, each formula is written directly in terms of the specific variables used in the BU354 UX analysis (e.g., observed counts for dashboard A vs dashboard E).

Paired sample t-tests

In the BU354 Comparative Usability Test, a paired samples t-test is performed to compare the rankings of two dashboards. The Python code the uses `scipy.stats.ttest_rel` package. Internally it computes the difference of the observed difference between the scores of the two dashboards.

$$d_i = \text{dashboard A}_i - \text{dashboard E}_i$$

The mean of these paired differences is then calculated as:

$$\bar{d} = \frac{1}{n} \sum_{i=1}^{n} d_i$$

Since the data represent a sample of some students as opposed to the population of students, the sample standard deviation of the differences is used:

$$s_d = \sqrt{\frac{\sum_{i=1}^{\text{number of respondents}} (d_i - \bar{d})^2}{\text{number of respondents} - 1}}$$

The paired t-statistic computed by `ttest_rel` is equal to:

$$t = \frac{\bar{d}}{s_d / \sqrt{\text{number of respondents}}}, \qquad df = \text{number of respondents} - 1$$

This difference compares the observed mean difference to the standard error of the mean difference (we check the standard error here to find out how "messy" our data is.). If we have a small standard error (usually from larger sample sizes or low variability) we get a bigger t-value.

In addition to statistical significance, we also find out the effect size using Cohen's d for paired samples, which uses the standard deviation of the difference scores:

$$d_{\text{Cohen}} = \frac{\bar{d}}{s_d}$$

The effect size indicates how meaningful the difference is. For example, an effect size of $d = 0.21$ is considered small, suggesting that students did not show a strong preference between Dashboard A and Dashboard D. The Python code mirrors this formula directly by dividing the mean difference by the standard deviation of the paired differences.

Chi-square tests

The chi-square goodness of fit test is used to determine whether the observed distribution of responses differs from an expected distribution. Here we always assume

H_0 : All response categories are equally preferred. (e.g. students do not prefer X over Y)

and the alternative hypothesis is:

H_1 : At least one category is preferred more or less than expected

Under the equal-preference assumption, the expected count for each category is n/k. As we will always do a dual comparsion in this report, this simplifies to

$$E = \frac{\text{number of respondents}}{2}.$$

for each category. To find out the chi-square statistic, we compute: (with O being observed, and E being expected)

$$\chi^2 = \frac{(O_{\text{category 1}} - E_{\text{category 1}})^2}{E_{\text{category 1}}} + \frac{(O_{\text{category 2}} - E_{\text{category 2}})^2}{E_{\text{category 2}}}.$$

with degrees of freedom:

$$df = \text{number of categories} - 1.$$

To quantify the magnitude of the deviation from equal preference, we compute Cramér's V:

$$V = \sqrt{\frac{\chi^2}{\text{number of respondents}(\text{number of categories} - 1)}}.$$