User Experience Report:

Heuristic Evaluation

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MichiganX: UX503x Principles of Designing for Humans

Executive Summary

This document identifies several usability issues in the edX discussion board and offers recommendations on possible solutions. Created by Nielsen (1994), heuristic evaluations offer an alternative to formal usability testing and are “cheap, fast, and easy to use” (p. 24). Heuristic evaluations are a discount method for highlighting usability issues in a user interface so they can be dealt with as part of the iterative design process (Nielsen, 1994). While Nielsen recommends “three to five evaluators” to uncover the majority of usability problems (p. 26) one evaluator can uncover around 35% of the possible issues (Figure 2.2, p 33). Because of the constrained nature of the edX course and assignment, this report details the findings of a single evaluator.

Findings and Recommendations in Brief

The major usability problems uncovered in this heuristic evaluations focus on attempting to edit a post. As one of the core elements of using the discussion board, these issues should be resolved before any less important issues. The minor usability problems were also uncovered while attempting to edit a post. The majority of these issues related to the graphics used in the edit a post interface.

Finding 1: The functionality of editing a post is hidden from the user.
Recommendation: This problem could be easily solved by adding a Edit and Delete button to the main screen.

Finding 2: When editing a line of text the list button did not react as expected.
Recommendation: Change the programming for the list button to be able to create multiple lines with numbered list items.

Finding 3: The user interface for the header and horizontal rule are confusing.
Recommendation: A drop down menu similar to the one used by Google for formatting would be a clearer way show this task.

Finding 4: The redo button takes the user to the forum main page. **Recommendation:** Rather than moving the user away from the editing screen, continued clicking on the button should result in no action. The evaluator believes this outcome will be less disorienting to users.

Finding 5: Code formatting does not behave as expected. All line breaks are removed.
Recommendation: For the code formatting button it would be helpful to have an HTML

option on the page to have more control over what is being shown in a post. At the very least this formatting option should not remove line breaks.

Finding 6: Search results for the term “discussion board” return limited results. **Recommendation:** Expand the available search terms the search engine can return. Or update how pages on the site are tagged so they can be included in a search. Users expect to be able to find results with the words in the titles, with the words on the page, etc. Through site navigation the evaluator found several pages on the Help site that describe how the discussion board work. These pages should be returned in the search results.

Finding 7: The icon used to insert a link into a post is unclear. **Recommendation:** Revise the image to use a more familiar metaphor. Some possible solutions could be a chain link and the word link.

Finding 8: The icon used to insert code into a post is unclear. **Recommendation:** Revise the image to use a more familiar metaphor. Some possible solutions could be the carrots used in HTML with a backslash </> for Code or the word HTML. Another possible solution could be the word Code for any kind of code to display in the text.

Finding 9: The icon used to insert a graphic into a post is unclear. **Recommendation:** Since the metaphor is unclear the evaluator suggests revising the image to be like one used in other products. For example Google uses a stylized mountain. Microsoft Word uses a similarly stylized mountain with the word picture below the graphic. Screenshot 11 shows these two buttons for inserting a graphic.

Finding 10: The first line of the text appears under the title of the post which could be confusing to the user. **Recommendation:** Rather than showing part of the post the evaluator recommends just providing a link to the header/title of the post. This would clear up the issues to text being cut off.

Introduction

EdX is an online provider of massively open online courses (MOOCs). “Founded by Harvard and MIT in 2012, [it] offer[s] high-quality courses from the world’s best universities and institutions to learners everywhere” (edX, 2012). The University of Michigan has partnered with edX to offer a “Micro-Masters Program” in User Experience Research and Design. One of the courses in this program, *Principles of Designing for Humans*, allows participants the opportunity to conduct a heuristic evaluation of the edX discussion board.

In evaluating the edX discussion this evaluator will address the following questions:

- Does the interface and or specific interactions of the edX discussion board comply with Nielsen’s heuristics?
- How is the heuristic violated?
- What is the severity of the violation?
- How could this usability issue be potentially solved?

While Nielsen recommends “three to five evaluators” to uncover the majority of usability problems (p. 26) one evaluator can uncover around 35% of the possible issues (Figure 2.2, p. 33). Because of the constrained nature of the edX course and the assignment, this report details the findings of a single evaluator.

Methods

Most heuristic evaluations include several segments. The initial segment involves training evaluators to understand Nielsen’s heuristics. The evaluators then conduct their analysis during the second segment. The analysis is then followed by a debrief where the evaluators discuss their findings with each other. The fourth and final part includes evaluators assigning severity ratings to the usability problems (Nielsen, 1994, p. 38).

Scope of the Evaluation

The *Designing for Humans* course included most but not all of these segments. The author was trained on Nielsen’s heuristics, conducted an analysis of the discussion board, and individually assigned severity ratings to the issues. A debriefing on the issues occured asynchronously in the form of peer reviews of usability problems with other evaluators. The only one of Nielsen’s segments not included in this evaluation is a

collaboration among a team of evaluators to agree on the issues together and then assign a severity score.

Heuristics Used

According to Newman (2017), a heuristic is “a rule of thumb more general than a guideline.” These generalizable principles can then be used any time during the iterative design process to assess usability problems. Since the criteria for the discussion board evaluation is focused on Nielsen’s heuristics, a brief description, quoted from Nielsen (1994), is provided below. These heuristics are “derived from a factor analysis of 249 usability problems” (Table 2.2, p. 30):

1) Visibility of system status: The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.
2) Match between system and the real world: The system should speak the user’s language, with words, phrases, and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.
3) User control and freedom: Users often choose system functions by mistake and will need a clearly marked “emergency exit” to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.
4) Consistency and standards: Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.
5) Error prevention: Even better than good error messages is a careful design which prevents a problem from occurring in the first place.
6) Recognition rather than recall: Make objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.
7) Flexibility and efficiency of use: Accelerators-unseen by the novice user-may often speed up the interaction for the expert user to such an extent that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.
8) Aesthetic and minimalist design: Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.

9) Help users recognize, diagnose, and recover from errors: Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.
10) Help and documentation: Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not too large.

Developing a List of Usability Problems and Assessing Severity

The evaluator spent three to four hours using the interface attempting to complete a series of tasks. While completing these tasks the evaluator referred to Nielsen's heuristics to determine if there were any problems. The main tasks included 1) creating a new post, 2) creating several new posts, and 3) using the Help features. Each of these tasks had several sub-tasks. These included 1) replying to a question, 2) editing a new post, 3) formatting an existing post, 4) undoing and redoing an action in a post, 5) anonymously posting with code, 6) editing code in post replies, 7) exploring error conditions and responses, 8) using the search box on the Help website.

After creating a list of usability problems the evaluator moved the list from a Google document with text and screenshots to a Google spreadsheet. Moving from a document to a spreadsheet allowed for greater ease in sorting and categorizing the issues. Once the list was in a spreadsheet the author categorized the problems using a four point scale based on Nielsen (1994) and Newman (2017). Table 1 shows the scale used for this heuristic evaluation. The scale increased in severity with one having a minimal impact and four being imperative to fix. There were no issues that scored a four in this evaluation.

Table 1

Scale Used for Assessing Severity of Usability Problems

1 = Cosmetic problem; no real usability impact
2 = minor usability problem; fix if there is time
3 = major usability problem; important to fix
4 = usability catastrophe; imperative to fix

Findings and Recommendations

This findings and recommendations section outlines each of the major findings with a screenshot from the interface, a severity score, a description of the heuristic violated and a recommendation to fix the problem. Major problems are discussed first followed by minor problems.

Major Usability Problems

The evaluator encountered most of the major usability problems while attempting to edit a post. As one of the core elements of using the discussion board, these issues should be resolved before any less important issues. The final major usability problem comes from the help search of the edX website.

Finding 1: The functionality of editing a post is hidden from the user.
Severity Score: major usability problem; important to fix
Heuristic Violated: Recognition rather than recall.

The discussion board interface did not have a clear button to click to edit the post. The evaluator needed to click the menu button and then locate the Edit option from a drop down menu in order to edit a post. Screenshot 1 shows the hidden Edit button.

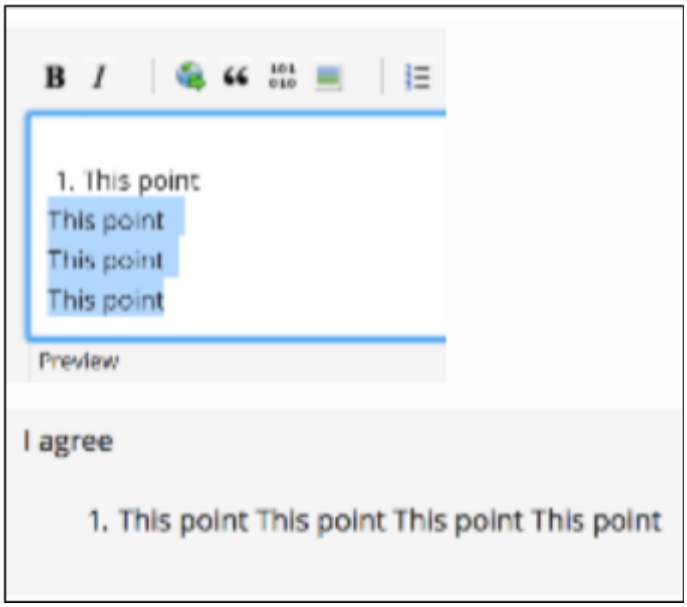
Screenshot 1

Recommendation: This problem could be easily solved by adding a Edit and Delete button to the main screen. Specifically moving the words Edit and Delete from being on a submenu to the main screen.

Finding 2: When editing a line of text the list button did not react as expected.
Severity Score: major usability problem; important to fix.
Heuristic Violated: Consistency and standards.

When selecting multiple lines of text the evaluator expected the list to be created with multiple numbered items. Instead the tool created a single numbered line. Screenshot 2 shows the editing screen as well as the output text.

Screenshot 2



Recommendation: Change the programming for the list button to be able to create multiple lines with numbered list items.

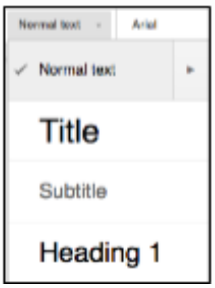
Finding 3: The user interface for the header and horizontal rule are confusing.
Severity Score: major usability problem; important to fix.
Heuristic Violated: Consistency and standards.

The graphical buttons for the header and horizontal rule formatting are unclear. The images used seem similar to other buttons for alignment and spacing. Screenshot 3 shows the images from the interface.

Screenshot 3

Recommendation: A drop down menu similar to the one used by Google for formatting would be a clearer way show this task. Screenshot 4 shows an example from the Google Docs interface.

Screenshot 4



Finding 4: The redo button takes the user to the forum main page.
Severity Score: major usability problem; important to fix.
Heuristic Violated: Visibility of system status.

Clicking the redo button multiple times in the edit window takes the user to the main forum page. This action was disorienting for the evaluator who expected to roll back changes several times rather than being taken to another screen of the discussion board. Screenshot 5 shows the redo button in the editing window interface.

Screenshot 5

Recommendation: Rather than moving the user away from the editing screen, continued clicking on the button should result in no action. The evaluator believes this outcome will be less disorienting to users.

Finding 5: Code formatting does not behave as expected. All line breaks are removed.
Severity Score: major usability problem; important to fix.
Heuristic Violated: User control and freedom.

When the evaluator attempted to insert computer code (SQL and HTML) into a discussion post all of the line breaks were removed from the code. The evaluator assumed that with a code button he could insert code as needed and that the code

button would help to maintain the original formatting including multiple line breaks. Line breaks improve the readability of the code. If the discussion is used in a programming/coding class the forum needs to behave differently. Screenshot 6 shows the output code after adding it into a post.

Screenshot 6

Recommendation: For the code formatting button it would be helpful to have an HTML option on the page to have more control over what is being shown in a post. At the very least this formatting option should not remove line breaks.

Finding 6: Search results for the term “discussion board” return limited results.
Severity Score: major usability problem; important to fix.
Heuristic Violated: Consistency and standards

Using the help search with the term discussion board returns only one result with information about the discussion tool in the app. If users are interested in finding answers using these terms they will not be able to find any information relating to the desktop version of the website. Screenshot 7 shows the search results from searching with the terms discussion board.

Screenshot 7

Recommendation: Expand the available search terms the search engine can return. Or update how pages on the site are tagged so they can be included in a search. Users expect to be able to find results with the words in the titles, with the words on the page, etc. Through site navigation the evaluator found several pages on the Help site that

describe how the discussion board work. These pages should be returned in the search results.

Minor Usability Problems

The evaluator encountered most of the minor usability problems also while attempting to edit a post. The majority of these issues related to the graphics used in the edit a post interface. The final minor problem appeared under the title of a new thread in the discussion board. Each issues is listed below.

Finding 7: The icon used to insert a link into a post is unclear.
Severity Score: minor usability problem; fix if there is time
Heuristic Violated: Match between system and the real world

On the edit a post screen there is a button to add a link. However the current image on the button uses an unfamiliar image of the world with an arrow. Screenshot 8 shows this image.

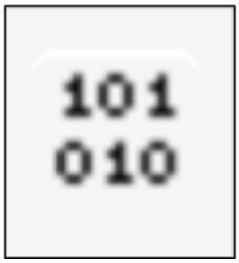
Screenshot 8

Recommendation: Revise the image to use a more familiar metaphor. Some possible solutions could be a chain link and the word link.

Finding 8: The icon used to insert code into a post is unclear.
Severity Score: minor usability problem; fix if there is time
Heuristic Violated: Match between system and the real world

On the edit a post screen there is a button to add code. However the current image on the button uses an unfamiliar image of binary code. Only individuals familiar with binary would know that these numbers mean code. An individual just learning HTML would not understand this metaphor. Screenshot 9 shows this image.

Screenshot 9



Recommendation: Revise the image to use a more familiar metaphor. Some possible solutions could be the carrots used in HTML with a backslash </> for Code or the word HTML. Another possible solution could be the word Code for any kind of code to display in the text.

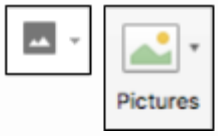
Finding 9: The icon used to insert a graphic into a post is unclear.
Severity Score: minor usability problem; fix if there is time
Heuristic Violated: Match between system and the real world

On the edit a post screen there is a button to add a graphic. However the current image on the button uses an unfamiliar image of colored lines. This image was confusing to the evaluator who thought it could represent selecting a large amount of text. This image is different than many used in other programs. Screenshot 10 shows this image.

Screenshot 10

Recommendation: Since the metaphor is unclear the evaluator suggests revising the image to be like one used in other products. For example Google uses a stylized mountain. Microsoft Word uses a similarly stylized mountain with the word picture below the graphic. Screenshot 11 shows these two buttons for inserting a graphic.

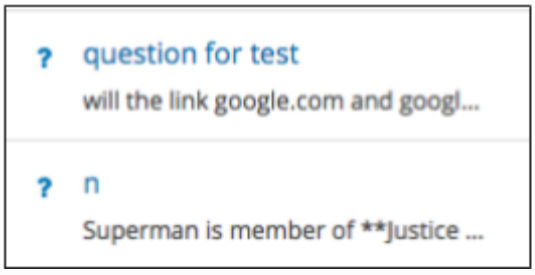
Screenshot 11



Finding 10: The first line of the text appears under the title of the post which could be confusing to the user.
Severity Score: minor usability problem; fix if there is time.
Heuristic Violated: Consistency and standards.

After creating a post, the first line of the text appears under the title. After a certain character length, the post is cut off and the responder would need to click on the post to read the rest of the text. Screenshot 12 shows this issue.

Screenshot 12



Recommendation: Rather than showing part of the post the evaluator recommends just providing a link to the header/title of the post. This would clear up the issues to text being cut off.

References

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