Comparing the Highlight Feature on E-Readers: Kindle vs. Nook

M. Phan & J. Teves

Summary. The rising demand of owning a light-weight, portable device that can hold an entire library's worth of books has created a growing market of electronic reading devices. This article summarizes the major findings of the design issues encountered when using two particular e-Readers: the Kindle 2 and the Nook 1st Edition. Specifically, the Technique for Human Error Assessment (THEA) was employed to assess three highlight-related tasks on both e-Readers. Results obtained from the THEA technique reveal that both devices rely heavily on user interaction with a key function area (i.e., the "select wheel" on the Kindle 2 and the D-pad on the Nook 1st Edition) to perform tasks such as highlighting a phrase. However, these areas lack intuitiveness and are not easy to use due to their small size. Additionally, other design issues (e.g., confusing labeling, unclear mode, and the lack of separation of different functions) were identified. A recommendation was provided to address each of the design issues mentioned in this article.

INTRODUCTION

Barnes & Noble and Amazon reported increased sales in 2010, which is said to be partly due to the consumer demand for their e-Readers' products and accessories (Barnes & Noble Reports Fiscal 2011 Third Quarter Financial Results, 2011; Glover, 2011). On the other hand, 2011 has greeted the public with the news that Borders Books is having financial difficulties and is set to close stores nationwide (Bosman & De la Merced, 2011). Presently, only a small percentage of readers use electronic reading devices (Familiarity with e-Reader Devices, 2010), chances are that number will increase in the coming years especially with the resurgence of tablet devices. It makes sense for companies, such as Barnes & Noble, to invest in electronic devices that would usher the public into the new era of reading experience.

In short, the arrival of various e-Readers in the market has given book enthusiasts an enriched reading experience. Not only are they able to carry thousands of books where ever they go, some of these devices also allow users to browse the web, play games, and listen to their favorite music. To lead this particular niche, companies should be constantly evaluating the design of their products to make sure that it continues to cater to the needs of the consumers. What are the common tasks that users perform? Are the users able to successfully perform the tasks that they intend to do? What issues do they encounter?

Purpose

The main objective of this analysis was to uncover the various issues with the Kindle 2 and the Nook 1st Edition while performing three highlight-related tasks. Human error identification was performed using the Technique for Human Error Assessment (THEA) to analyze the causes of errors, consequences, and design issues relevant to errors encountered using these devices.

METHOD

Materials

One Kindle 2 and one Nook 1st Edition were evaluated. Figure 1 shows the physical appearance of the two devices while Table 1 shows the features and specifications of each device.
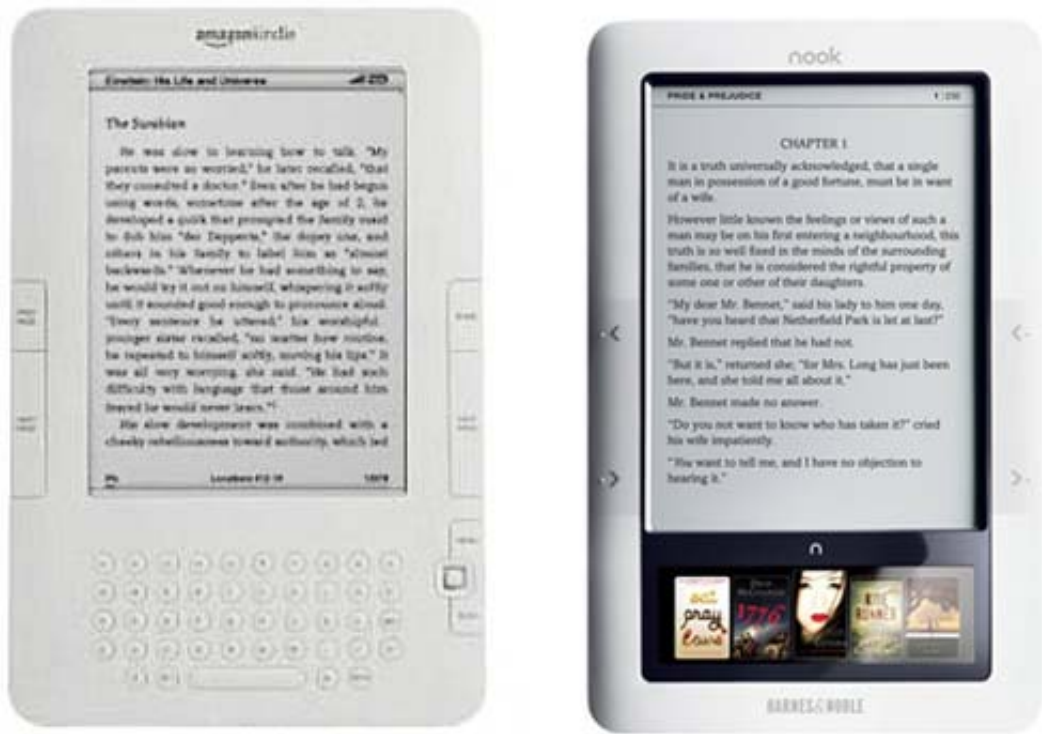

Figure 1. The e-Readers evaluated in this study: the Kindle 2 (left) and the Nook 1st Edition (right).

Table 1. Features and Specifications of Kindle 2 and Nook 1st Edition

Specifications	Kindle 2	Nook 1st Edition
Weight	10.2 ounces	11.6 ounces (Nook Wi-Fi)
Width	5.3 inches	4.9 inches
Depth	0.36 inches	0.5 inches
Display	e-Ink electronic display	e-Ink electronic display
Text-to-Speech	Available	None
Memory	2GB built in memory	2GB built in memory with Micro-SD expansion port of up to 16GB

Book Lending	None	Available
Book Lending	Wireless on with reading: 7 days Wireless off with reading: 13-14 days	Wireless on with reading: 4-5 days Wireless off with reading: 9-10 days
Supported file types	AZW, AA, AAX, MP3, MOBI, PRC, PDF, HTML, DOC, JPEG, GIF, PNG, BMP (through conversion)	EPUB, PDF, PDB, MP3, JPEG, GIF, PNG, BMP

Sources: Information was obtained from Amazon.com and BarnesandNoble.com

THE THEA TECHNIQUE

Technique for Human Error Assessment (THEA) is one of many human error identification (HEI) methods that are used to identify and predict potential errors which may occur during human-machine interaction. Specifically, it is a highly structured approach that incorporates Norman's action model in identifying user interface errors (Pocock, Fields, Harrison, & Wright, 2001). It uses a scenario analysis to consider context and then employs a series of questions in a check-list style approach based upon goals, plans, performing actions, and perception/evaluation/interpretation. This technique was selected to analyze the e-Readers because it is easy to apply, generic to be used in any domain, and it offers a structured approach.

Tasks

The analysis primarily focused on the usage of the highlight feature on these two e-Readers because it is a common feature that users want to use as they read. The three highlight-related tasks that were under evaluation are:

1. Add a highlight to text
2. Delete a highlight
3. View previous highlights

Figure 2a and 2b shows the screenshot of the main function area that the user uses to complete the three highlight tasks on the Kindle 2 and the Nook 1st Edition, respectively. Table 2 shows a comparison of the necessary steps to complete the highlight tasks on each of the two devices.
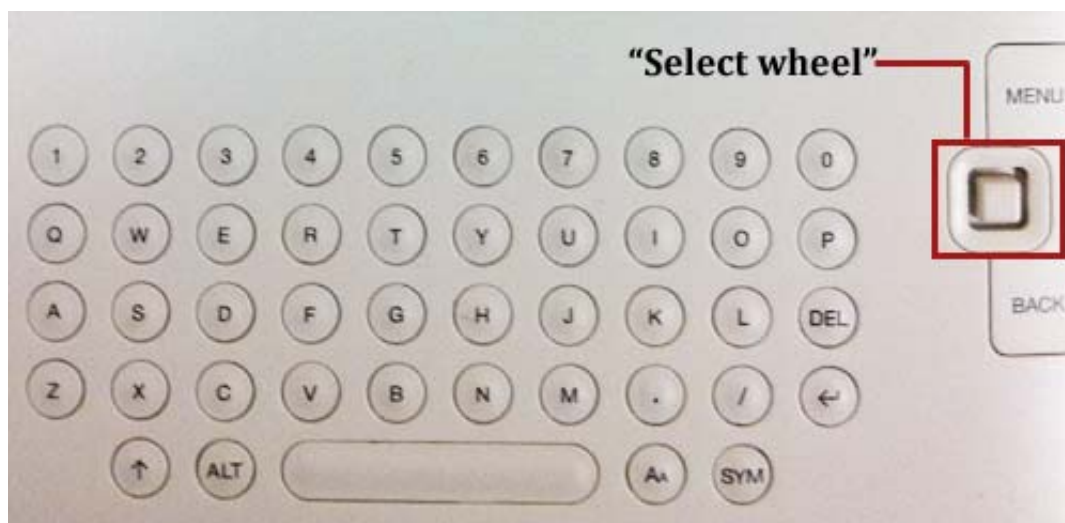

Figure 2a. A close-up of the Kindle 2's function area and "select wheel".

touchscreen D-pad

Figure 2b. A close-up of the Nook 1st Edition's function area and D-pad.

Table 2. Steps to Complete Each of Three Highlight Tasks on the Kindle 2 and the Nook 1st Edition

	Kindle 2	Nook 1st Edition
1. Add a highlight to text	1. Press the "Menu" button 2. Select "Add a Note or Highlight" 3. Move cursor to the appropriate highlight location 4. Click the "select wheel" to 5. Drag cursor over the appropriate words to highlight 6. Once finished, click the "select wheel" again to stop	1. Tap "Highlights and notes" 2. Tap on "Add highlight or note" 3. Use the D-pad to navigate where to start highlight 4. Use D-pad to navigate where to end highlight 5. Tap End selection 6. Tap Submit
2. Delete a highlight	1. Move cursor in between the highlighted words or underline words 2. Press the "DEL" button	1. Tap "Highlights and notes" 2. Tap "View notes on this page" 3. Tap "Delete highlight"
3. View previous highlight	1. Press the "Menu" button 2. Select "View My Notes & Marks"	1. Tap highlights and notes 2. View notes on this page

SUMMARY OF FINDINGS

Below are the summary findings of each device from the THEA table. To view the full THEA table for the Kindle 2 and the Nook 1st Edition, please view **"Appendix A"** and **"Appendix B"**, respectively.

Summary of THEA Findings for the Kindle 2

- **Problem**: The "select wheel" is small and difficult to control as a multi-function button (i.e., for navigational and selection).
- **Recommendation**: Replace the "select wheel" with separate navigational buttons (e.g., "up" button and "down" button) and a separate "select" button.

- **Problem**: The highlight feature is only available for purchased books and not sample books, but it is unclear when the user is viewing a book whether that book has been purchased or not.
- **Recommendation:** Add a header with bolded letters on top of every sample book page which asks the user to buy the book.

- **Problem:** It is not apparent when the user is "in" or "out" of the highlight mode.
- **Recommendation:** Add a noticeable message at the top of the page when the user is in the "highlight" mode and/or increase the visibility of the slanted bar (e.g., make it bolder and blinking), which appears every time the "highlight" mode is activated.

- **Problem:** The "Menu" cannot be accessed when the Kindle 2 goes to "sleep".
- **Recommendation:** Enable the option to press the "Menu" button to get the device out of "sleep" mode.

- **Problem:** It is not apparent which button the user should press to "wake-up" the device.
- **Recommendation:** Make the message on the screensaver that inform the user which button to press to get the device out of the "sleep" mode bigger and bolder.

- **Problem:** There is no "Help" section that provides guidance on basic tasks (e.g., how to delete a highlight).
- **Recommendation:** Add a "Help" option under the "Menu" to assist the user with basic tasks.

- **Problem**: The option "Add a Note or Highlight" under the "Menu" cannot be accessed once the user starts to move the cursor down a page.
- **Recommendation:** Make the option "Add a Note or Highlight" accessible all of the time.

- **Problem**: It is not apparent how the user might delete a highlight since there is no "Delete" option under the "Menu" function.
- **Recommendation**: Add a "Delete" option under the "Menu".

- **Problem:** It is unclear that the user can view more results by clicking the "Next Page" button when there are more than three results on the "View my Notes & Marks" page.
- **Recommendation:** Add left and right arrows on the "View my Notes & Marks" page along with words to indicate that there are more results if the user clicks the "Next Page" button or that the user can go back to the previously viewed results by clicking the "Prev Page" button.

- **Problem:** It is confusing when previous notes, highlights, and bookmarks are grouped under one heading with no option to separate them.
- **Recommendation:** Add options on the "View my Notes & Marks" page to allow the user the ability to view only previous highlights, notes, or bookmarks.

- **Problem:** It is unclear if clicking on the option "View my Notes & Marks" would allow the user to view previous highlights.
- **Recommendation:** Retitle "View my Notes & Marks" to "View my Notes, Highlights, and Bookmarks".

- **Problem:** The phrase "Showing all Notes & Marks" on top of the "View my Notes & Marks" page is confusing because it misleads the user to think that all results are being displayed on a single page when the results might span over multiple pages.
- **Recommendation:** Change the wording to indicate how many out of the total results is being displayed (e.g. "Showing 3 of 30 results").

- **Problem:** It is unclear if the user should click the "Prev Page" button or the "Back" button to

return to the previous page of the book instead of the previous result page for the "View my Notes & Marks" option.

- **Recommendation:** Add a short reminder at the bottom of the pages to remind the user to press the "Back" button to return to the last viewed page of a book.

- **Problem:** It is unclear the purpose of the "View Popular Highlights" option and why its placement is under the "Menu" along with "View my Notes & Marks" option.
- **Recommendation:** Move the option "View Popular Highlights" to the page where the user can view previous highlights (i.e., under the "View my Notes & Marks" option) and provide a short description of what it is.

Summary of THEA Findings for the Nook 1st Edition

- **Problem:** When the Nook goes to "sleep", the menu containing the tab for "Highlights and Notes" is no longer visible. There is no button that would indicate the presence of such a menu under the touchscreen D-pad.
- **Recommendation:** Add an arrow that would indicate the presence of menus within the D-pad area. When the device goes to sleep, an arrow would inform the user that menu items exist within the touchscreen D-pad.

- **Problem:** It appears that the "Highlights and Notes" feature is absent for materials in some file formats (e.g., PDF).
- **Recommendation:** The option "Highlights and Notes" should remain on the screen and "grayed-out" when that option is not available for that specific file format. This will inform users that such a feature does exist and that it is unavailable for the material that they are reading.

- **Problem:** The tab for "Highlights and Notes" is wide, but very thin and there is always a chance of accidentally hitting other items in the menu.
- **Recommendation:** The size and/or shape of the tab for "Highlights and Notes" should be changed so it would be easier to press when users need to do highlighting tasks.

- **Problem:** After selecting the text and the tapping the "end selection" button on the D-pad, the "Add highlight or note" screen shows up with a text box and a touch keyboard. Although there is an option to skip adding a note, it is an unnecessary step for users who do not intend to add a note.
- **Recommendation:** There should be a tab for "Notes" and a tab for "Highlights". This will eliminate confusion and will allow the user to skip seeing the full touchscreen keyboard that is only needed for making notes.

- **Problem:** If the user is not intending to add a note on the highlight(s) mode, the user could be confused as to what button to press to skip the step. On the touch keyboard that appears on the screen, two possible options are "Cancel" and "Submit". Pressing "Cancel" takes the user back to the screen with the arrow buttons. The correct key to press would be "Submit" since this will save the highlighted text and pressing it would transform the screen back to the "Highlights and Notes" menu.
- **Recommendation:** As previously mentioned, separate tabs for "Notes" and "Highlights" would eliminate this confusion on what button to press to skip the step of adding notes. If "Highlights and Notes" could not be separated then a more intuitive button should be added (i.e., "Skip").

- **Problem:** Once a highlight has been added, the "Highlights and Notes" menu changes and another option appears: "View notes for this page".
- **Recommendation:** The solution to this issue would be to separate highlights and notes. However, if that solution is not viable then the new option should read "View highlights and notes for this page" since it already contains an option pertaining to highlights (i. e., deleting an existing highlight).

- **Problem:** There is no option to edit an existing highlight.
- **Recommendation:** Within the "Highlights" (or "Highlights and Notes") menu, there should be an option to edit existing highlights that would allow users to manipulate existing highlights.

CONCLUSIONS

The two e-Readers, Nook 1st edition and Kindle 2, take advantage of the e-Ink electronic display. Specifications of these two devices showcase products that are lightweight, with long battery life, high-compatibility with different file types, and storage capacity of 2GB (or more, in the case of Nook 1st edition). Although the Nook 1st edition and the Kindle 2 differ in terms of the user interface, with Nook having the touchscreen D-pad and the Kindle having the full physical keyboard, it appears that each device has its own set of issues when it comes to performing tasks such as highlighting texts.

In general, both of the devices have major problems with their multi-purpose navigation. The Nook 1st Edition heavily relies on the user interaction with its D-pad interface to get the user around its menu system, but this small D-pad area can be challenging for users with big fingers and it might not be intuitive enough for users with little experience in using touch interface devices. Similarly, the Kindle 2 placed most of its major functions (e.g., moving the cursor and selecting an option) behind the "select wheel", but this physical button is difficult to use. Controlling this "select wheel" requires great dexterity and precise fine motor movements. If the user is not careful, it is very easy to select the wrong option or activate the wrong command.

Additionally, one major drawback of both the Nook 1st Edition and the Kindle 2 is that they are not full touchscreen devices. The Nook 1st Edition only implements the touchscreen technology on its D-pad area, and the Kindle 2 does not have any touchscreen capability. This poses potential issues for users of full-screen touchscreen device (e.g., touchscreen smartphone users) who are used to interacting with their device using only touch. These users are likely to mistakenly touch an option displaying on the reading screen when they need to press a physical button on the Kindle 2 keyboard or touch only the options that are available inside the D-pad area on the Nook 1st Edition.

It is important to note that the new Kindle (Kindle 3), the soon-to-be released Kindle Tablet, and the Nook Color have addressed some of the issues identified with the highlighting task with new designs. Further error identification analyses should be done to examine the impact of the newer designs on the intuitiveness of this task.

REFERENCES

Barnes & Noble Reports Fiscal 2011 Third Quarter Financial Results (2011). Retrieved March 5, 2011. http://www.barnesandnobleinc.com/press_releases/2011_feb_22_3rd_quarter_financial_results.html

Bosman, J., & De la Merced, M. (2011). Borders Files for Bankruptcy. Retrieved March 5, 2011, from http://dealbook.nytimes.com/2011/02/16/borders-files-for-bankruptcy/.

Familiarity with e-Reader Devices (2010). Retrieved March 5, 2011, from http://floridaresearchgroup.wordpress.com/2010/02/16/demographics-of-kindle-and-other-ereader-users/

Distribution of Ages for Nook Owners (2010). Retrieved March 5, 2011, from http://ireaderreview.com/2010/01/04/kindle-nook-owner-ages-noticeable-differences/

Glover, J. (2011). Rise of the Amazon Kindle as eBooks Outsell Paperbacks in 2010. Retrieved March 5, 2011, from http://www.suite101.com/content/rise-of-the-amazon-kindle-as-ebooks-outsell-paperbacks-in-2010-a339232#ixzz1GR5ywPmz

Pocock, S., Fields, B., Harrison, M., & Wright, P. (2001). THEA – A reference guide. Technical Report,

Pocock, S., Fields, B., Harrison, M., & Wright, P. (2001). THEA - A reference guide. Technical Report, University of York Computer Science, 336.

SUBSCRIBE to *[Usability News](#)*!