ACCESS ed
P R O J E C T

ClickerAUDIT Manual

(Accessibility and Universal Design Information Tool)

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Introduction

Clickers are frequently used in post-secondary classrooms to quickly record and display information related to answers to a questions posted by the professor during lecture. Clickers allow for immediate feedback both to the students and the professor. They also provide a convenient way for professors to track attendance and monitor the comprehension of material. The ClickerAUDIT evaluates the accessibility and usability aspects of clickers. It also compares the quality of clickers.

ClickerAUDIT Instructions

This audit requires the investigation of multiple features of clickers, including the programming, clicker device, buttons and the answering of the questions using the clicker. Print copies should be available so that the AUDIT can be used in various locations. Data from the printed copy are then entered into the Microsoft Excel™ worksheet to obtain a summary of the results. If desired, the auditor can alternatively carry a laptop computer and enter scores and data directly into the spreadsheet. Total scores can be reviewed at the end of both the usability and accessibility sections allowing the user to identify where improvements can be made. The ClickerAUDIT also contains a summary, displaying comparative graphs that reflect overall accessibility.

The clickers can be graded in two ways. First, the company can self-assess the clicker they have created after completion. Second, the end user can evaluate a clicker that is already used in a classroom to provide feedback to the company. The ClickerAUDIT will help companies improve their clickers by identifying problems and assessing outcomes.

1. Print a copy of the Microsoft Excel worksheet: ClickerAUDIT, which contains ClickerAUDIT part 1 and part 2.

2. Clearly write the label of the clicker (along with your name and date) at the top of the worksheet.

3. Thoroughly assess the clicker.

4. Score the ClickerAUDIT items using the trichotomous scale.

5. Write comments about the clicker, or specific issues identified by the ClickerAUDIT, in the comments section.

6. Enter responses into the Microsoft Excel Worksheet. Excel will automatically create the graphs.

7. Examine and consider the implications of the graphs as they present the scores.

Background

At the University of Wisconsin—Milwaukee (UWM) clickers have been used throughout various classes to enhance the interactive nature of the course. Clickers are personal response systems that use infrared or radio frequency to transmit student responses to questions posed by the instructor. The responses are sent to a receiver and displayed on the screen for the entire class to see. Each clicker has the capability to be registered to each student, which allows each student to have their own unique signal and allows the instructor to track each student's response individually.

Clickers are newer technologies that are becoming more prevalent within the university system; however, there is a concern around their accessibility and usability. Recently clicker technology was introduced to the faculty and staff at UWM and since then the Rehabilitation Research Design and Disability Center at UWM introduced them to a group of university Deans at a conference in Chicago, IL. In each instance slight problems were encountered with the technology concerning answering questions, pressing the buttons, or registering each clicker. The purpose of this AUDIT is to assess the accessibility and usability of the clicker technology in order to increase its use as an interactive response agent across courses and universities.

All ACCESS-ed AUDITs include consideration and review of 13 impairment types. These include: 1) Hard of hearing, 2) Deaf, 3) Low vision, 4) Blind, 5) Expressive Communication, 6) Comprehension Disorders, 7) Other Cognitive Disorders, 8) Sensitivity Impairments, 9) Mental and Behavioral Impairment, 10) Lower Body Impairment, 11) Upper Body Impairment, and 12) Head, Neck, and Trunk Impairment, and 13) Overall Body Impairment.

This audit is part of a series of audits that have been developed through the ACCESS-ed Project (Accessible Campus Climate Environment Support System for Education), a national Demonstration Project to Ensure Students with Disabilities Receive a Quality Higher Education Program, funded in part by the U.S. Department of Education's Office of Post-secondary Education. The project is designed to develop and test a process that delivers infrastructure to campuses nationwide, through which campus wide universal design instructional environment is sustainable. One of the major activities of the project is dissemination of methods and strategies to promote universal design in higher education.

ClickerAUDIT Manual

Purpose

This manual is designed to make the Accessible and Universal Design Information Tool (AUDIT) as simple and straight forward to use as possible. Step by step instructions, including examples will be given to help the user better understand the purpose and the use of the AUDIT.

The ClickerAUDIT contains two parts: a) Accessibility and b) Usability. Accessibility is based on official norms and standards (e.g. specific guidelines set up federally like the ADA ABA or Section 508 guidelines). Usability contains more of a user perspective in addition to the official norms and standards.

Questions are scored on a trichotomous scale: "Yes" (the item under review is present and effective), "Somewhat" (the item under review exists to some extent, but is lacking a certain feature) and "No" (The item under review does not meet the criteria specified or item is not present). Total scores can be reviewed at the end of both the usability and accessibility sections allowing the user to identify where improvements can be made. The ClickerAUDIT also contains a summary, displaying comparative graphs that reflect overall accessibility.

ClickerAUDIT

The ClickerAUDIT contains two parts: a) Accessibility and b) usability. Accessibility is based on official norms and standards (e.g. specific guidelines set up federally like the ADA ABA guidelines). Usability contains more of a user perspective in addition to the official norms and standards.

The trichotomous scoring scale (e.g. Yes, Somewhat, No) attempts to provide a score to each item present in the AUDIT. A "Yes" score indicates the item is present. This should not be selected if there is any doubt if the item is present. A "Somewhat' score indicates that the item is present to some extent. If you are unsure, if the item is present or not, or if the item is only partially present, you would mark "Somewhat". A "No" score indicates that the specified item is not present.

ClickerAUDIT Components

Parts

Part I. Accessibility

Accessibility reviews essential features of clickers. Without accessibility features some end users may not be able to access clickers provided by professors in their classes.

Part II. Usability

Usability reviews the features related to easily understood and effective clickers for all end users. Without usability features, some individuals may not be able to easily manipulate or benefit from clickers.

Sections

Section 1 – Programming

Section 2 – Clicker Device

Section 3 – Buttons

Section 4 – Answering

Scoring

Place an "X" in the appropriate column for each question. The trichotomous scoring scale (e.g. Yes, Somewhat, No) attempts to provide a score to each item present in the AUDIT. A "Yes" score indicates the item is present. This should not be selected if there is any doubt if the item is present. A "Somewhat' score indicates that the item is present to some extent. If you are unsure, if the item is present or not, or if the item is only partially present, you would mark "Somewhat". A "No" score indicates that the specified item is not present.

Interpreting Graphs

The AUDIT summary graphs display the accessibility and usability scores for both parts of the AUDIT. The graphs help determine the perceived levels of accessibility and usability for the clicker under review.

Part I: Accessibility

1) "Yes" Scores

Accessibility
Part 1 Scores
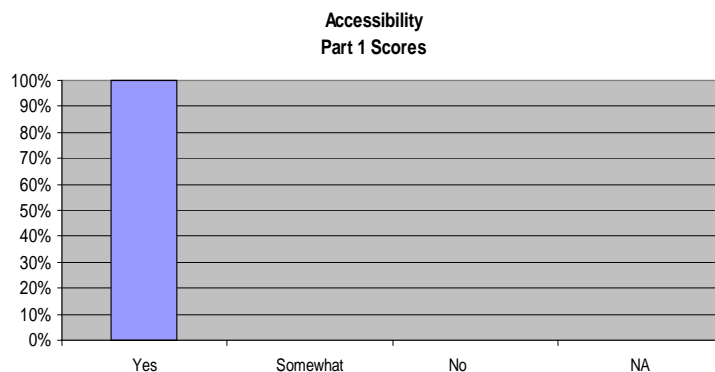
Accessible to all: A 100% "Yes" score indicates full, basic access to people with disabilities. Any score less than 100% means someone would not be able to access the clicker.
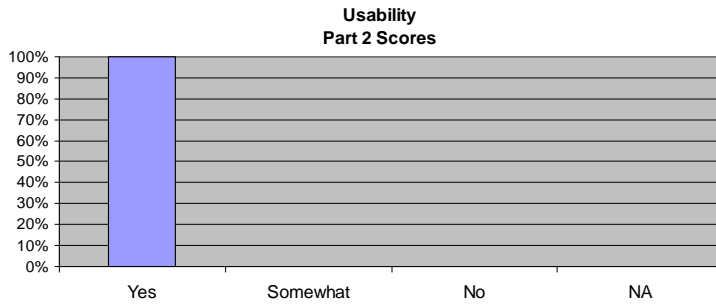
2) "No" or "Somewhat" Scores

Accessibility
Part 1 Scores
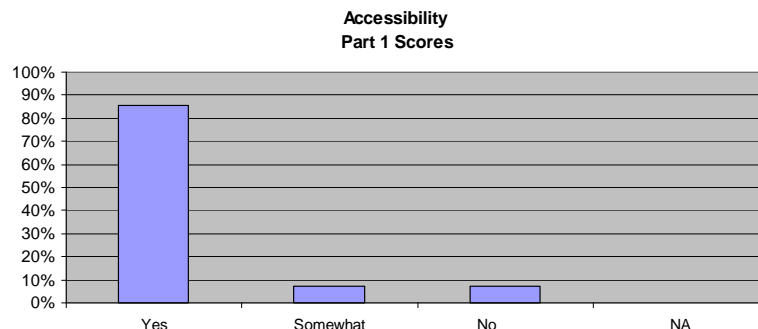
Somewhat Accessible: Any "no" or "somewhat" scores indicate that some people with disabilities will not be able to access to the clicker.

Part II: Usability

1) 100% "Yes"

Usability
Part 2 Scores

[Bar chart showing Usability Part 2 Scores with Y-axis from 0% to 100% in 10% increments. Categories: Yes, Somewhat, No, NA. Yes bar is at 100%.]

Usable: A 100% "Yes" score indicates that accessing the clicker was presented in a highly usable fashion for all individuals.

2) Any "No" or "Somewhat"

Usability
Part 2 Scores

[Bar chart showing Usability Part 2 Scores with Y-axis from 0% to 100% in 10% increments. Categories: Yes, Somewhat, No, NA. Yes bar is at about 45%, Somewhat at about 22%, No at about 30%.]
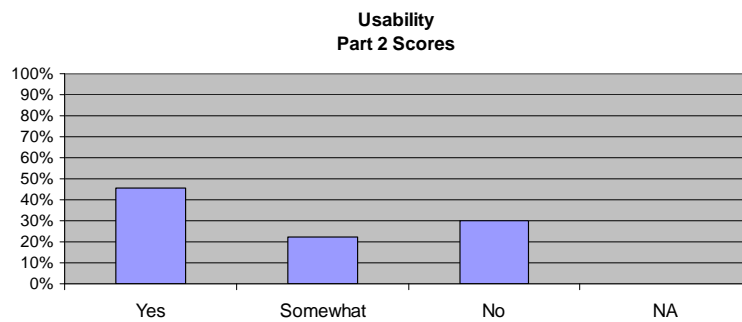
Somewhat Accessible: The higher the "Somewhat" or "No" scores, indicate a less usable clicker.

Part 1: Accessibility

Section 1 - Programming

1. Instructions for programming are provided to the user.

Instructions are included with the each clicker so everyone has access to the instructions.

2. Instructions are clear and comprehensible for all individuals.

Instructions should be simple, step-by step so users can easily follow all steps. The instructions should be written at a level that is understandable by most people. (e.g. avoiding jargon or technical terms people who did not design the clickers may not understand).

3. Programming can be completed within 5 minutes.

Programming should be simple and quickly completed. Therefore, instruction steps need to be straight forward.

Section 2 - Clicker Device

1. The clicker can be operated with either the left or right hand.

The clicker device should be designed to allow users who are right or left handed to use the clicker. Some devices are specific to right handed use (e.g. most scissors) and this makes using the device more difficult for left handed users.

2. The clicker can be operated by devices other than the hand (e.g. head or mouthstick).

The clicker and it's buttons should be activated by another part of the body or device besides the fingers or hand. (e.g. if someone is using a mouth stick or head wand, they should be able to push and activate the buttons without difficulty).

Section 3 - Buttons

1. Buttons discriminate from each other (each button is raised and material is separate from the actual clicker).

Each button should be raised and far enough apart that a user can identify where button is versus the next button. The button areas should not overlap because this may cause confusion.

2. The buttons are clearly labeled as to which button corresponds to which answer.

Buttons should be clearly marked in order to help users discriminate between buttons. Labels should be placed near the button, so not to confuse users who may be unsure as to which button the label belongs to. (e.g. if a label is located centrally between two buttons the user might have difficulty identifying which button the label corresponds to).

3. Great force is not required in order to press each button on the clicker (ADA states no more than 5 pounds of force).

Only moderate touch is needed to activate the buttons on the clicker. However, if accidentally bumping the clicker, the buttons are not activated.

4. The clicker can be pointed in other directions other than just at the receiver in order for the answer to register with the receiver.

In case the clicker is not directly aligned with the receiver, the answer will still register when the corresponding button is pushed.

5. Enough pressure is required so in the case that the individual bumps the clicker it does not register an answer.

Slight touch to activate the clicker buttons could be caused from accidentally bumping the clicker.

6. An individual can press the buttons with any finger and by using various combinations of fingers to push the buttons.

The clicker is not designed to be pushed only by the thumb; any finger should be able to activate the button.

7. Accidentally pressing the "GO" or "?" button on the clicker leaves the student's response(s) unaffected.

Pressing the "GO" or "?" button does not affect the student's responses that they have already entered. It does not make them start over. They are able to continue using the clicker to answer questions.

Section 4 - Answering

1. There is a clear visual indication on the clicker such as a light when you have answered a question on the screen.

The clicker lights up when each answer registers. The light is large and bright enough for the user to see.

2. There is a clear auditory indication on the clicker such as a beep when you have answered a question on the screen.

The clicker beeps when each answer registers. The user can hear the beep and know the answer has registered.

3. There is a clear tactile indication from the clicker such as a vibration when you have answered a question.

The clicker vibrates when each answer registers with the receiver. This let's the user know they have selected an answer to the current question.

4. It is clear from looking at the screen and at the clicker which buttons need to be pressed in order to answer each question.

The corresponding answers available to the questions (e.g. A, B, C, D) match with the buttons on the Clicker in order to answer the question.

5. Individuals are able to change their answer by pressing a different number or letter up until the polling session is closed.

If the student decides to change his or her answer, they can select another answer by the end of the session for that question and it will replace their answer. This can also be accomplished by selecting a button that will "clear" the old answer and allow the user to enter the new answer.

Part 2: Usability

Section 1 - Programming

1. There are three or more practice sessions completed following programming in which scores are not counted.

More practice sessions will ensure clicker users really understand and feel comfortable using the clicker. Three sessions should give adequate time for users adjust to using the clicker.

Section 2 - Clicker Device

1. Larger versions of the clicker device are available, as needed.

The clicker is available for users who may have difficulty seeing the buttons and labels or have difficulty pushing the small clicker buttons.

2. There is a place for headphones to be plugged into the clicker in order for the user to hear auditory feedback from the clicker.

A port is available to attach headphones for auditory feedback. This allows the user to hear the feedback without distracting the other audience members or confusing users has to which clicker made the noise.

3. The clicker requires only one registration per user for all uses.

The clicker does not have to be registered upon each use. Only one initial registration should be required; the clicker should store the information for that particular user.

Section 3 - Buttons

1. The middle button has a small raised bump on it to allow for tactile location of the center of the clicker.

The middle, center button has a small button so the user can tactilely identify the center of the clicker. Similar to a keyboard keypad, the number five is the center number and

has a raised portion. The user can then identify where the other numbers are based on this tactile marking.

2. Buttons are raised off of the clicker device (about 1/4 inch) and are a different material than the clicker to allow for discrimination between buttons.

The buttons are raised enough so the user can tactilely identify one button from another. Although they will still be labeled, this helps differentiate between the buttons.

Section 4 - Answering

1. Individuals are able to view on the presentation screen whether or not their answer has registered with the receiver.

The receiver displays a visual message on the presentation screen that shows if the each clicker response was registered with the receiver.

2. There is speech output to let the user know what question he or she is on, what answer he/she selected, and when an answer was selected.

Speech or voice output let's the user know which question he or she is currently answering and when he or she has selected and entered an answer to that corresponding question.