Using Learning Centers in Inclusion: A Usability Study on a Teacher Resource Website

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Hello!

Tiana Guerrero

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- BA in Elementary Education
- Teacher at a Public Elementary School on Maui
Introduction

Purpose, Research Questions, Literature Reviews
Problem

● Why create “Learning Centers for K-5 Inclusion Teaching & Learning”?

○ Educators need support in finding resources that will assist them in effectively creating an inclusive environment in which all students can achieve.

○ Educators implementing inclusion often face barriers regarding planning time, resources, and training.” (Andreason, 2014)
Problem

● What is “inclusion”?
  ○ “A democratic philosophy whereby all students are valued and educators normalize differences through differentiated instruction.” (Baglieri & Knopf, 2004)

● What is “differentiated instruction”?
  ○ “Providing student’s multiple approaches so that each student can learn effectively and ultimately provides students with equitable access to high-quality education.” (Tomlinson, 2017)
Learning Centers encourage differentiation in process and products as well as allows multiple means of receiving and demonstrating knowledge.”

Voltz, Sims, & Nelson, 2010
Problem

Why is inclusion learning important?

- Hawaii Department of Education Inclusion Initiative
  - Inclusion Rate - 51%
  - 80% or more of the school day

- 1st year in Public Elementary Schools
  - Teachers need SUPPORT
Problem

- “Learning Centers for K-5 Inclusion Teaching & Learning” will provide:
  - Information about inclusion teaching & learning
  - Learning Center Resources for grades K-5
    - Literacy Centers
    - Mathematics Centers
Target Audience

- Current K-5 educators at a public elementary school on Maui that work closely with students in various roles and environments
  - inclusion classrooms, growth block groups, small group sessions, and learning center environments
Purpose

The purpose of the usability study was to assess the **ease-of-use** and **navigation** of the website containing information and resources to support inclusive teaching and learning for K-5 teachers at a public elementary school on Maui.
Research Questions

01. Are learners able to efficiently and easily navigate between pages utilizing the toolbar?
   - **Task 1** - Locate information about inclusion learning
   - **Task 2** - Locate information about Literacy Centers
   - **Task 3** - Click on “Literacy Centers”

02. How easy or difficult is it to find various learning centers on the teacher resource website?
   - **Task 4** - Locate a literacy center
   - **Task 5** - Locate a mathematics center
   - **Task 6** - Download a learning center
Design Approach
Design Considerations & Strategies
Design Considerations

- Concise and straightforward content
- Simple navigation
- Colors that expressed particular emotional responses (blue, green, orange)
- Consistent and linear layout
Design Strategy - ARCS Model

- **Attention** - variability (range of media)
- **Relevance** - familiarity (present content in a way that is relatable); relate to work situations
- **Confidence** - self-growth (utilize resources in their own classrooms)
- **Satisfaction** - immediate application (apply knowledge in real-world situations)
Technology

Tools Used for Development & Implementation
Wireframe

Google Drawings
Prototype

Learning Centers for K-5
Inclusion Teaching and Learning

Welcome!
Are you looking for ways to differentiate your instruction to meet the needs of all your students, but don't know how to make it fun? This website, Learning Centers for Inclusion is designed for K-5 teachers in need of strategies and resources to assist them in facilitating centers in their inclusion classroom. Learning centers are areas/activities designed to teach, reinforce, or extend a particular skill or concept. This website can specifically provide teachers with various tools and activities to support their instruction, during learning centers.

What is Inclusion?
Inclusive teaching and learning practices are instrumental in
Prototype (cont.)

- **Pictures & Media**
  - Youtube
  - Free Open Source

- **Content**
  - Online Articles
  - Teacher Pay Teachers
  - Teacher blogs
Usability Sessions

- **Screen Capture**
  - Navigability
  - Functionality
  - Time on tasks

- **Voice Recording**
  - Verbal responses
  - Insight into user experiences
Visual Design

Key Design Elements Utilized in Website Development
Web Design

Gestalt Principles of Universal Design

- Similarity
- Continuity
- Closure
- Proximity
- Common Fate
Continuity

Letter Centers

Alphabet Cards
Alphabet cards can be used in a variety of ways to refine your students’ letter-sound recognition. In a small group, the teacher can flash them and ask for the letter name or sound. Another option could be to partner students up and have them “quiz” each other on the letter name or sound.

Letter Formation Cards
Letter formation cards are useful when students are beginning to write their letters. They allow your students to learn how to properly form letters. You can have them build the letters using playdough, have them draw the letters in sand, or have them trace the letters using a tracing book.

Find the Letter
For extra help in recognizing letters, both uppercase and lowercase, use activity worksheets such as these to find the letter among other letters. Students can complete a worksheet or two in a small group.
Poetry Centers

Poetry Task Cards
Poetry reading center in the classroom exposes students to a variety of poems. For this center, place a couple of poetry collection books or printed poems that your students will enjoy and poetry response task cards. During the center, the students read a poem and respond to the poem using the task cards.

Poets of Poetry
Have your students show their understanding of poetry elements, such as similes, metaphors, alliteration, etc. With this fun and easy center. Students read poetry cards with an example of a poetry element and slip the card into the correct poetry element "pocket."
Subtraction Centers

Word Problems & Addition/Subtraction Centers
This is a group of 4 math centers. The 1st center is to match a given word problem with the correct number sentence, picture, and strategy used (addition or subtraction). The 2nd center is to solve and sort math problems based on if it is true or false. The 3rd center is a subtraction center using any available object as counting pieces. There is also a game center that can be used to review addition or subtraction based on what your students need.

Spring Subtraction Center (2 digit)
Here is a great center to help students practice their double digit subtraction skills! Students can do this independently or with a partner! In this activity students will match subtraction number sentences (flowers) to the answers (flower pots). Also included is a record sheet where students can record the number sentences next to the answers.
Methodology

Evaluation Instruments, Data Collection, & Implementation
Implementation

Location: Classroom @ Public Elementary School on Maui

Iteration 1
Iteration 2
Iteration 3
Data Collection

**Before Study**
- Completion of Pre and Demographic Data
- Pre-Survey - Google Forms

**During Study**
- Verbal Feedback (think-alouds, interview)
- Usability Protocol Script & Interview

**After Study**
- Completion of Post Survey
- Severity of Problem Rating (Molich, Jeffries, & Dumas)
- Average Task Completion Time (Sauro)
- Post-Survey - Google Forms
- Severity of Problem Rating Chart (Molich, Jeffries, & Dumas) & Task Completion Time (Sauro)
Evaluation Instruments: Pre-Survey

- **Demographic Data**
  - Gender
  - Age
  - Role/Position @ School
  - Number of Years @ School
  - Computer Abilities/Confidence
  - Internet Usage
Evaluation Instruments: Post-Survey

- **User Experience**
  - Design Layout
  - Navigation
  - Ease-of-Use
  - Effectiveness
  - Participation
Evaluation Instruments: Task Completion & Severity Rating

- **Usability Sessions & Tasks**
  - Rated by **Severity of Problem** (Molich, Jeffries, & Dumas)
  - Average **Task Completion Time** (Sauro) in seconds
    - **No Issue** (0-10 sec)
    - **Minor** (11-21 sec): Delayed user briefly.
    - **Serious** (21-160 sec): Delayed user significantly but eventually allowed user to complete task.
    - **Catastrophic** (160+ sec): Prevented user from completing task.
Evaluation Instruments: Verbal Feedback

- **Interview Questions**
  - Gauged participant feedback on the Homepage and initial reaction to:
    - Navigation Options
    - Available Content
    - Design & Layout
    - Target Audience
Evaluation Instruments: Verbal Feedback

● Usability Sessions & Tasks
  ○ Verbal Feedback via “think-alouds”
  ○ Comments and responses following each task

  - Were the literacy centers organized in a way that was easily accessible? Why or why not?
  - While completing this task, were there any buttons, centers, or aspects that were confusing? How?

Thank you! Do you have any other comments for this task in particular?
Results & Discussion

Task Completion Times & User Feedback
# Demographic Data

Table 1.

*Participant Gender, Age, and Number of Years Associated with School*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Female</td>
<td>9</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-29</td>
<td>1</td>
<td>11.1%</td>
</tr>
<tr>
<td>30-39</td>
<td>1</td>
<td>11.1%</td>
</tr>
<tr>
<td>40-49</td>
<td>3</td>
<td>33.3%</td>
</tr>
<tr>
<td>50+</td>
<td>4</td>
<td>44.4%</td>
</tr>
<tr>
<td><strong>Number of Years</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-12 mo.</td>
<td>1</td>
<td>11.1%</td>
</tr>
<tr>
<td>2-5 yrs.</td>
<td>3</td>
<td>33.3%</td>
</tr>
<tr>
<td>6-10 yrs.</td>
<td>2</td>
<td>22.2%</td>
</tr>
<tr>
<td>10+ yrs.</td>
<td>3</td>
<td>33.3%</td>
</tr>
</tbody>
</table>
Demographic Data (cont.)

Computer Proficiency

- Novice: 11%
- Advance Beginner: 22%
- Competent: 56%
- Proficient: 11%

Internet Confidence

- Novice: 11%
- Advance Beginner: 22%
- Competent: 45%
- Proficient: 22%
Demographic Data (cont.)

Internet Access Type

- Desktop/Laptop Computer: 33%
- Mobile: Tablet, iPad, Smartphone: 67%

Internet Activity

- Email: 100%
- Entertainment: 44.4%
- News: 44.4%
- Research: 66.7%
- Shopping: 77.8%
- Social Media: 44.4%
- Work: 44.4%
Results

Average Task Completion Time: Rounds 1, 2, & 3
Results

Participant Severity Rating

<table>
<thead>
<tr>
<th># of Participants</th>
<th>Pre-Task</th>
<th>Task 1</th>
<th>Task 2</th>
<th>Task 3</th>
<th>Task 4</th>
<th>Task 5</th>
<th>Task 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- No Issues
- Minor
- Serious
- Catastrophic
Revisions

1st Iteration

2nd Iteration

Learning Centers for K-5 Inclusion Teaching and Learning

Learning Centers for K-5 Inclusion Teaching and Learning
Revisions

Learning Centers for Inclusion Teaching and Learning

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2nd Iteration

Learning Centers for K-5 Inclusion Teaching and Learning

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3rd Iteration
# User Experience: Design Layout

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Section Average Round 1</th>
<th>Section Average Round 2</th>
<th>Section Average Round 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Website is visually appealing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Text is clearly written</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Media is interesting and related to the topic</td>
<td></td>
<td></td>
<td>4.59 (↓)</td>
</tr>
<tr>
<td>Organization of information is clear</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1= Strongly Disagree; 2= Somewhat Disagree, 3= Somewhat Agree; 4= Agree, 5= Strongly Agree
## User Experience: Navigation

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Section Average Round 1</th>
<th>Section Average Round 2</th>
<th>Section Average Round 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main navigation is easily identifiable</td>
<td>5</td>
<td>5</td>
<td>4.75 (↓)</td>
</tr>
<tr>
<td>Toolbar labels are clear and concise</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of buttons/links are reasonable</td>
<td>5</td>
<td>5</td>
<td>4.75 (↓)</td>
</tr>
<tr>
<td>Links are consistent and easily identifiable</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1= Strongly Disagree; 2= Somewhat Disagree, 3= Somewhat Agree; 4= Agree, 5= Strongly Agree
### User Experience: Ease-of-Use

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Section Average Round 1</th>
<th>Section Average Round 2</th>
<th>Section Average Round 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main navigation is easily identifiable</td>
<td>5</td>
<td>5</td>
<td>5 (=)</td>
</tr>
<tr>
<td>Toolbar labels are clear and concise</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1= Strongly Disagree; 2= Somewhat Disagree, 3= Somewhat Agree; 4= Agree, 5= Strongly Agree
## User Experience: Effectiveness

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Section Average Round 1</th>
<th>Section Average Round 2</th>
<th>Section Average Round 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information on the website is useful</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information was easy to find on the website</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I felt comfortable navigating the website</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would use the learning centers on the website with my students</td>
<td>5</td>
<td>5</td>
<td>4.87 (↓)</td>
</tr>
<tr>
<td>Website is effective in providing information about inclusion learning</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1= Strongly Disagree; 2= Somewhat Disagree, 3= Somewhat Agree; 4= Agree, 5= Strongly Agree
## User Experience: Participation

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Section Average Round 1</th>
<th>Section Average Round 2</th>
<th>Section Average Round 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructions &amp; guidelines for participation in the usability testing were clear</td>
<td>5</td>
<td>5</td>
<td>5 (≡)</td>
</tr>
</tbody>
</table>

*1= Strongly Disagree; 2= Somewhat Disagree, 3= Somewhat Agree; 4= Agree, 5= Strongly Agree*
Overall User Experience Results

Average User Experience: Rounds 1, 2, & 3

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Participation</td>
<td>5</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>4.96</td>
</tr>
<tr>
<td>Ease of Use</td>
<td>5</td>
</tr>
<tr>
<td>Navigation</td>
<td>4.92</td>
</tr>
<tr>
<td>Design Layout</td>
<td>4.86</td>
</tr>
</tbody>
</table>

1 = Strongly Disagree; 2 = Somewhat Disagree, 3 = Somewhat Agree; 4 = Agree, 5 = Strongly Agree
Qualitative Results:
What did you like best about the website?
Qualitative Results:
What was your overall impression about navigating the website?
Qualitative Results:

What was your overall impression about the learning centers on the website?
Discussion

Lessons Learned
- Website Platform (strengths & weaknesses)
- Toolbar is essential to navigability
- Allow more time between iterations for revisions

Improvements
- Include additional questions about experience with learning centers
- Usability Protocol Script
  - questions & verbiage

Future Developments
- Mobile friendly
- Additional teaching resources, content areas, & learning centers
Conclusion

● Useful resources for their teaching as a means to differentiate instruction
● Easy to use and navigate
● Look forward to the utilizing the centers
● Overall, satisfied with their participation in the usability study
Thanks!

Any questions?

You can contact me at tianague@hawaii.edu.