A Self-efficacy Approach to Assess the Effectiveness of Web Localisation and Accessibility Training

RODRIGUEZ VAZQUEZ, Silvia, O'BRIEN, Sharon

Abstract

In order to ensure that multilingual web content is accessible to everyone, including those with functional diversity, we need to encourage an 'accessibility thinking' among future localisation professionals. However, to the best of our knowledge, most training institutions do not teach yet the needed technical competence on the matter. Dublin City University in Ireland and the University of Geneva in Switzerland were two of the few exceptions in the last two years, as they offered a Master's course on localisation which included the acquisition of basic accessibility knowledge and know-how as one of the main learning outcomes. With a view to assessing the effectiveness of such an accessibility-enhanced learning programme, we conducted an exploratory study with the postgraduate students enrolled in the module, at both universities. By adopting an action research strategy, we administered a scientifically validated questionnaire built around the concept of self-efficacy at the beginning of the web localisation module (week 6 of the course) and at the end (week 9). As described in prior work (Doherty and Kenny, 2014), the [...]
A Self-efficacy Approach to Assess the Effectiveness of Web Localisation and Accessibility Training

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AGENDA

Research Context
- How we understand web localisation
- Web accessibility (WA) and prior work on multilingual WA

Research Motivation

Methodological Framework

Main Findings

Research Indicators & Future Research Avenues
“The aim of localisation should be that **people from a specified locale** can use the product **without any difficulty** in their own language”  

Sandrini (2008)
“All users (especially those with disabilities) can perceive, understand, navigate, interact with and contribute to the web”
WCAG 2.1 Principles and guidelines

**Perceivable**

1.1 Text Alternatives:
Provide text alternatives for any non-text content (changeable to large print, braille, speech, symbols or simpler language...)

1.2 Time-based Media:
Provide alternatives for time-based media.

1.3 Adaptable:
Create content that can be presented in different/simpler ways without losing information or structure.

1.4 Distinguishable:
Make it easier for users to see and hear content including separating foreground from background.

**Operable**

2.1 Keyboard Accessible:
Make all functionality available from a keyboard.

2.2 Enough Time:
Provide users enough time to read and use content.

2.3 Seizures:
Do not design content in a way that is known to cause seizures.

2.4 Navigable:
Provide ways to help users navigate, find content, and determine where they are.

2.5 Input Modalities:
Make it easier for users to operate functionality through various inputs beyond keyboard.

**Understandable**

3.1 Readable:
Make text content readable and understandable.

3.2 Predictable:
Make Web pages appear and operate in predictable ways.

3.3 Input Assistance:
Help users avoid and correct mistakes.

**Robust**

4.1 Compatible:
Maximize compatibility with current and future user agents, including assistive technologies.

Research Context
Multilingual Web Accessibility

Challenge 1. Transferability
**Research Context**

**Prior Work**

- **Lack of awareness / low level of awareness**
- **Insufficient knowledge**
- **Uncertainty regarding accountability for MWA**
- **Lack of support in translation technology**

**2012-2018**

**Role of web localisation professionals in the achievement of an accessible multilingual web**

- **Questionnaires**
- **Analysis of web documents**
- **Interviews**
- **Tool review & creation**
- **Controlled Experiments**

**145 subjects**

(web accessibility experts, academics, localisation professionals and other localisation industry representatives, screen reader users)

**15,000 web pages**
1) Favourable localisation landscape

- Ever-evolving industry
  - Technological progress
  - Increasing language coverage
  - New client demands
  - Strengthened service portfolio

- LSPs now see themselves as “Solutions companies”, “one stop shops”
2) Lack of WA training in Translation curriculum

- **Most training institutions do not teach** yet the needed theoretical and technical competence on the matter
  - University of Salamanca, 2013 - Present
  - Dublin City University, Ireland (2016-2017)

- **Accessibility is not yet fully integrated in localisation courses**
  - Studied as a separated module within the course
  - Effectiveness not measured yet quantitatively
3) Development of a theoretical framework (work in progress)

- ALMA project
  - (Análisis y adecuación de los fundamentos e instrumentos de la Localización para la Mejora de la Accesibilidad en contenidos web)

- Localiser competence proposal
  - HCI-related sub-competences
    - Accessibility, usability, UX...
Goal: Measure the **effectiveness** of a learning programme offered to localisation students on the topic of web localisation and accessibility

**The study**

**Overview**

- **MSc/MA Translation Technology**
- **Localisation course**
- **Web localisation module**: 3 weeks (4 lecture hours and 2 lab hours)
  - HTML & CSS
  - Web localisation best practices
  - Web accessibility best practices

**Procedure**

- Presentation of the study
- Consent form

***

1. **Questionnaire 1** (before web l10n module)
2. Web localisation module
3. **Questionnaire 2** (after web l10n module)
Methodology

Measuring effectiveness through self-efficacy

- Questionnaire built around the concept of self-efficacy (Compeau and Higgings, 1995)
  - Individual’s confidence in his ability to control thoughts, feelings and actions to achieve a desired outcome in a given concept.
  - Used in different technological contexts in the past (Joo, Bong and Choi, 2000; Doherty and Kenny, 2014)

- 12 different localisation and accessibility-related tasks (6 HTML, 6 WA)
  - Task for students:
    1. Judge whether the skills they had could help them perform those tasks (Yes/No)
    2. Indicate their degree of confidence in their response (10-point scale), where:
       • 1: Not at all confident
       • 5: Moderately confident, and
       • 10: Totally confident
## Methodology

### The notion of self-efficacy

<table>
<thead>
<tr>
<th>If someone asked me to, ...</th>
<th>Yes/No</th>
<th>1</th>
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<th>5</th>
<th>6</th>
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<th>10</th>
<th>Comments (optional)</th>
</tr>
</thead>
<tbody>
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<td>Yes/No</td>
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</tr>
<tr>
<td>I could solve basic accessibility issues during a web localisation task without any type of assistance</td>
<td>Yes/No</td>
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</tr>
</tbody>
</table>
Methodology

Self-efficacy level variations

For each task, 12 possible variations:

1. No → Yes, confidence
2. No → Yes, = confidence
3. No → Yes, confidence
4. No → No, confidence
5. No → No, = confidence
6. No → No, confidence
7. Yes → No, confidence
8. Yes → No, = confidence
9. Yes → No, confidence
10. Yes → Yes, confidence
11. Yes → Yes, = confidence
12. Yes → Yes, confidence
Methodology
Self-efficacy level variations

For each task, 12 possible variations:

1. No $\rightarrow$ Yes, confidence
2. No $\rightarrow$ Yes, = confidence
3. No $\rightarrow$ Yes, confidence
4. No $\rightarrow$ No, confidence
5. No $\rightarrow$ No, = confidence
6. No $\rightarrow$ No, confidence
7. Yes $\rightarrow$ No, confidence
8. Yes $\rightarrow$ No, = confidence
9. Yes $\rightarrow$ No, confidence
10. Yes $\rightarrow$ Yes, confidence
11. Yes $\rightarrow$ Yes, = confidence
12. Yes $\rightarrow$ Yes, confidence
Participants

8 participants
(age $\bar{x}=25.85$, $sd=1.79$ )

23 participants
(age, $\bar{x}=25.22$, $sd=0.67$)

Use of the Web (h/week)

- UNIGE
- DCU

<table>
<thead>
<tr>
<th>Use of the Web (h/week)</th>
<th>UNIGE</th>
<th>DCU</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONE</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>1 TO 10</td>
<td>9%</td>
<td>0%</td>
</tr>
<tr>
<td>11 TO 19</td>
<td>22%</td>
<td>13%</td>
</tr>
<tr>
<td>20 TO 29</td>
<td>35%</td>
<td>0%</td>
</tr>
<tr>
<td>30+</td>
<td>35%</td>
<td>88%</td>
</tr>
</tbody>
</table>
Main Findings

Self-efficacy (judgement only)

Students' judgement of what they can do has significantly increased ($p < 0.001$)
Main Findings

Self-efficacy
(overall)

Students overall confidence in being able to carry out a given task has significantly increased
(p < 0.001)
Main Findings

Self-efficacy (overall distribution)
Main Findings

Self-efficacy variations (I)

<table>
<thead>
<tr>
<th></th>
<th>HTML</th>
<th>A11Y</th>
<th>ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>%</td>
<td>Total</td>
</tr>
<tr>
<td>Confidence increase</td>
<td>98</td>
<td>39.84</td>
<td>71</td>
</tr>
<tr>
<td>Confidence stagnation</td>
<td>27</td>
<td>10.98</td>
<td>17</td>
</tr>
<tr>
<td>Confidence decrease</td>
<td>25</td>
<td>10.16</td>
<td>8</td>
</tr>
</tbody>
</table>

- Yes-Yes: 66%
- No-Yes: 28%
- No-No: 5%
- Yes-No: 1%
**Main Findings**

**Self-efficacy variations (II)**

<table>
<thead>
<tr>
<th></th>
<th>HTML</th>
<th>A11Y</th>
<th>ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>14</td>
<td>27</td>
<td>41</td>
</tr>
<tr>
<td><strong>Confidence increase</strong></td>
<td>14</td>
<td>27</td>
<td>41</td>
</tr>
<tr>
<td>%</td>
<td>13.59</td>
<td>26.21</td>
<td>14.7</td>
</tr>
<tr>
<td><strong>Confidence stagnation</strong></td>
<td>4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>%</td>
<td>3.88</td>
<td>3.88</td>
<td>4.67</td>
</tr>
<tr>
<td><strong>Confidence decrease</strong></td>
<td>16</td>
<td>38</td>
<td>54</td>
</tr>
<tr>
<td>%</td>
<td>15.53</td>
<td>36.89</td>
<td>30.91</td>
</tr>
</tbody>
</table>

The pie chart shows the distribution of self-efficacy variations with 66% Yes-Yes, 28% No-Yes, 5% No-No, and 1% Yes-No.
Research Indicators

Overall...
- Data shows positive learning outcomes
- Significant increase observed in HTML and WA self-efficacy

BUT:
- We need to adopt a critical angle:
  - Is a positive judgement with a low or moderate confidence level enough?
  - Interpretation of self-efficacy stagnation: Does this mean that we need further training hours? Changes in our training techniques?
    - More in-depth analysis needed

Acceptable level of effectiveness of our training programme on localisation and accessibility
Future Research Avenues

- **Data from the study itself**
  - Explore correlations between self-rated knowledge of HTML/accessibility and self-efficacy levels
  - Explore correlations between self-efficacy levels and final course grades
    - In Doherty and Kenny (2014), none was found
  - Individual consultation with students

- **Integration of accessibility concerns in localisation and translation technology courses**
  - Continue developing theoretical framework
Thank you


Additional slides
<table>
<thead>
<tr>
<th>HTML-related statements</th>
<th>Yes/No</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tr>
<td>I could identify the metadata that need to be localised in a web page</td>
<td>Yes</td>
<td>No</td>
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<td>I could identify the cultural references/data that need to be localised in a web page</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>I could translate a basic HTML document with a CAT tool</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>I could translate a basic HTML document without the need of a CAT tool</td>
<td>Yes</td>
<td>No</td>
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<td>I could make minor modifications to a localised HTML document after translating it with a CAT tool</td>
<td>Yes</td>
<td>No</td>
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<td>I could solve basic accessibility issues during a web localisation task if I was provided with written guidance on how to do it</td>
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**Notes:**
1. An accessibility evaluation tool allows its user to automatically check a web page or site against a set of accessibility guidelines, flagging accessibility barriers and sometimes suggesting solutions on how to solve them.