Assessing Learner Characteristics and Technology Capabilities: Survey Development & Validation

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Instrument Genesis

Development of an Online Bilingual Special Education Certification Extension Program prompted the initial development

Key pieces of literature:


van Dijk, Jan (2002). A framework for digital divide research. *Communication Institute for Online Scholarship, Inc.*. 12,
Intersection

**Communication**
Technology Capabilities

- Mental Access
  - Attitude
  - Perception
- Materials Access
  - Ownership
  - Membership
- Usage Access
  - Need
  - Opportunity
- Skills Access
  - Education
  - Convenience

**Education**
Learner Characteristics

- Psychological
  - Motivation
  - Attitude
  - Confidence
- Learning Style
  - Group Work
  - Independence
  - Communication
- Situational Factors
  - Commuting Issues
  - Schedule Conflicts
  - Access

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van Dijk, 2002

Bernard, et al., 2004
McVay, 2001
Mattice, et al., 1999
Methods

- Theory vs. Reality (need)
- Identify and Compare
- Create Instrument and refine Item Pool
- Test Item Pool
  - Construct validity (face validity)
  - Content validity (cognitive item analysis)
  - Criterion related validity (external validity)

Construct Validity
Phase 1

• Face validity
  Discussions among developer
  – What is the need?
  – What do we want to ask?
  – How do we ask it?
Content Validity
Phase 2

- Cognitive Item Analysis
  - What did the whole question mean to you?
  - Would you re-word the question? How?
  - When you created your response, what was it that you had in mind?

**Example Question 1**

<table>
<thead>
<tr>
<th>Original Question</th>
<th>Feedback</th>
<th>Revised Question</th>
</tr>
</thead>
</table>
| I do not give up easily, even when confronted with obstacles. | • I pursue challenges  
• This asks me if I can be defeated or scared off easily. I definitely do not. | I do not give up easily when confronted with technology related obstacles (e.g., Internet connection issues, difficulty with downloads, difficulty locating information, unable to contact instructor immediately, etc.). |
### Example Question 2

<table>
<thead>
<tr>
<th>Original Question</th>
<th>Feedback</th>
<th>Revised Question</th>
</tr>
</thead>
</table>
| I believe I am responsible for my own education; what I learn is ultimately my responsibility. | • Do I take pride in my education  
• That me, and me alone, is responsible for how I perform in class.  
• Do not rely on anything or anyone but yourself. This is the only way you will learn and accomplish things effectively | I believe I am responsible for my own education; what I learn is ultimately my responsibility. For example, I am responsible for communicating with my professor when I have difficulty understanding, obtaining answers to questions I might have about assignments, material, and content, etc. |
<table>
<thead>
<tr>
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<th>Feedback</th>
<th>Revised Question</th>
</tr>
</thead>
</table>
| I am comfortable working in alternative learning environments.                  | • This asked me if I was comfortable working outside the regular education sector and servicing students who are special education or who simply have different emotional/physical needs.  
  • Am I flexible?  
  • Working with variety, can I do it?  
  • Do I adapt well to change.                                                                                                                  | I am comfortable working in alternative learning environments. Alternative learning can be defined as spaces outside of the traditional classroom such as library, online, home, etc. |

Alternative learning can be defined as spaces outside of the traditional classroom such as library, online, home, etc.
Criterion Related Validity
Phase 3

- Compares to other measures/scales
  - van Dijk
- Larger sample
- Broader sample (online, web enhanced)
Phase 3: Large-scale validation

- N = 500, Mid-sized urban teacher college in the North East
- Undergraduate/Graduate students accessing technology-mediated learning
  - Web-enhanced, Podcasts, Entirely online courses
- Mostly in the age bracket - Under 21 & 21-25
- Race/Ethnicity – 74% White, 13% African American, 7% Hispanic, 5% Asian Pacific Islander, >1% American Indian, 2% Mixed Race, >1% Other
- Mostly English Dominant – with 8 different language groups represented.
### Phase 3: Preliminary Findings

<table>
<thead>
<tr>
<th>Question</th>
<th>Implications</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 32</td>
<td><strong>Classroom</strong> – Most students know how to do this, therefore able to provide</td>
<td><strong>Link to a tutorial, not needed to go over in class.</strong></td>
</tr>
<tr>
<td>Ability to download</td>
<td><strong>Institution</strong> – Some are not able to do this, provide tutorial</td>
<td><strong>Spend minimal time creating help document – text version versus video or webinar.</strong></td>
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<tr>
<td>488/501 - .doc</td>
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<td></td>
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<tr>
<td>437/501 - .jpeg</td>
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<td></td>
</tr>
</tbody>
</table>
Phase 3: Preliminary Findings

- Subscale 1: Learner Characteristics (14 items)
  - SD were all above .5 with a range of .537 to .759
  - Cronbach’s Alpha of .845
  - Alpha would not be increased if you removed any single item

- Subscale 2: Technology Capabilities (24 items)
  - Findings forthcoming

- Comparison with other scales/measures
  - Findings forthcoming
Implications and Discussion

- What have we learned about survey creation and our own ability to communicate?
- What are the implications for future research
  - Technology needs for teachers/training
  - Access to education based on delivery systems
  - Students who “use” and students who do not
  - Trends
  - Readiness for online learning
  - Variances between student & faculty across the digital divide
  - Variances between faculty only, students only, districts, etc.