Integrating Assessment of SEL Into an Early Childhood Science Learning Context

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Overview

• DARPA sponsored project
• Purpose
• Theoretical Framework
• Results
• Importance
• Next Steps
Purpose

1. Develop and validate social and emotional learning (SEL) assessments for young children learning from Physics and SEL video games

2. Assess students’ emotion knowledge, perspective-taking, & resilience on a large-scale basis
Theoretical Framework

- Perspective-taking (Selman, 1980)
- Ability to view a situation from several viewpoints including one’s own (Ormrod)
- Central to emotional intelligence (Denham, Zinsser, & Bailey, 2011)
Theoretical Framework

Bandura’s (1968) Social Cognitive Theory:

- Through social interactions individuals learn directly and vicariously, and
- learn by observing effective models (i.e., similar, credible, competent)
Methodology: Assessment Development

- CRESST validated requirements-based approach
- Ontologies, learning objectives design templates, task specifications, and pilot tests
Methodology: Assessment Development

- Scenario-based assessments using problem and asset sets
- Response modes that can be used by non-readers
- Scenarios and icons refined through play testing
Methodology: Assessment Development
Methodology: *Data Collection*

Sample: 117 Kindergarten through 5th Grade Students

![Age Pie Chart]

- 9 years: 18%
- 10 years: 13%
- 11 years: 6%
- 12 years: 15%
- 13 years: 23%

![Grade Pie Chart]

- Kindergarten (K): 13%
- First Grade (1): 23%
- Second Grade (2): 24%
- Third Grade (3): 13%
- Fourth Grade (4): 13%
- Fifth Grade (5): 10%
Methodology: Data Collection

✔ Research design: Randomly assigned to four alternate forms
✔ Assessment Design: Balanced missing block design
✔ 8 Scenarios and 31 items tested

<table>
<thead>
<tr>
<th>Block</th>
<th>Form 1</th>
<th>Form 2</th>
<th>Form 3</th>
<th>Form 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sad A (3items)</td>
<td>v</td>
<td></td>
<td></td>
<td>v</td>
</tr>
<tr>
<td>Sad B (3items)</td>
<td>v</td>
<td>v</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Happy A (3items)</td>
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<td>v</td>
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<td>v</td>
</tr>
<tr>
<td>Happy B (2items)</td>
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<td>v</td>
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<tr>
<td>Angry A (3items)</td>
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<td>Angry B (3items)</td>
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<td>v</td>
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<tr>
<td>Fear A (3items)</td>
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<tr>
<td>Fear B (3items)</td>
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<tr>
<td>Number of students</td>
<td>30</td>
<td>27</td>
<td>30</td>
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</tbody>
</table>
Results

✓ Towards Assessment Validation

✓ Based on item response frequency and distribution the pre-test data revealed that the “identify emotion of target character” and “identify self-emotion” could be both exact (preferred) and partially (secondary option) scored.

✓ Consistent with conceptual understanding of emotion knowledge and previous literature on perspective-taking.

✓ Both scoring models kept for further analysis at post-test stage.
Results

Effectiveness analysis: Did the treatment work?

- Treatment consisted of 30 minute video game on physics and SEL
- Although alternative IRT models were explored, the best fit for effectiveness analysis was exact scoring:
  - Post-test group mean increased by 0.3 standard deviation
  - Mean difference between pre and post (t= 2.67, p< .05)
  - Variance decreased by 80%
Results

Group comparative findings:

- Differences across age groups (i.e., K-2 and 3-5) with respect to identifying and responding to more complex emotions (i.e., sadness and anger) found at pre-test, but not at post-test.

- Consistent with decrease in variance at post-test

- Exploratory because of small sample size
Importance

✓ Assessments focus on commonly-experienced social interactions for young children

✓ Major foci are diverse student populations, differing in culture, ethnicity, or age

✓ To date there are few SEL measures targeting the current age-group that can be implemented on a large-scale basis either on-line or on paper.
Next Steps

✔ Further predictive/concurrent validity research needed utilizing external measures (e.g., empathy, emotional intelligence)

✔ Utilizing measures in different modes (e.g., computer-based, face to face administration) with same sample population and same mode with different target populations