Outcomes Associated with the Translation and Implementation of Research-based Intervention for Learners with ASD in Schools

Samuel L. Odom and Ann W. Cox
National Professional Development Center on ASD

A multi-university center to promote use of evidence-based practice for children and adolescents with autism spectrum disorders
Goals of the National Center

• Promote development, learning, and achievement of children with ASD and support families through use of evidence-based practices
• Increase state capacity to implement evidence-based practices
• Increase the number of highly qualified personnel serving children with ASD
What do we do?
Bridge the Gap

Replicable practices in the classroom

Research-based practices
Working in Partnership With States
State Involvement to Date

- Cohort 1: CA, NM, ID
- Cohort 2: MN, WI, MI
- Cohort 3: TX, VA, VT
- Cohort 4: IN, KY, RI

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State Involvement to Date

• Currently there are 4 groups of 3 states.
• These include:
  - Cohort 1: (2008-2010) Indiana, New Mexico, Wisconsin
  - Cohort 2: (2009-2011) Kentucky, Michigan, Minnesota
  - Cohort 3: (2010-2012) California, Texas, Virginia
  - Cohort 4: (2011-2012) Idaho, Rhode Island, Vermont
NPDC 2- Year Cycle

**Year 1 State Capacity Building**
application development, IAPG formed, strategic plan, model sites confirmed, Autism Training Team completes training

**Model Sites**
program quality, use of EBP, parent involvement, collaborative coaching

**Expansion Sites**
program quality, use of EBP, parent involvement, collaborative coaching

**Year 1 and 2**
Model and Expansion Site Development
Use of Evidence-Based Practices

**Year 2 Sustainability**
strategic plan updated; leadership shift; state ownership of process, materials, further expansion, training, and coaching

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Outcomes of NPDC Partnerships

Overall Program Quality

Use of Evidence-Based Practice

Individual Student Progress

- Family satisfaction
- Sustainability
Outcomes

• APERS – program quality measure
  ▪ Fall and Spring

• Use of Evidence-based Practices
  ▪ Fall and Spring

• Goal Attainment Scale – student outcome measure
  ▪ Assesses growth across year

• Family Questionnaire
  ▪ Fall and Spring

• Sustainability – state use of model during and after PDC involvement
All Current NPDC Data

- 58 school programs
  - 12 Preschool
  - 23 Elementary
  - 12 Middle
  - 11 High
- 142 students
  - (55% inclusive/45% self-contained)
- Nine States:
  - Cohort 1: IN, KY, NM,
  - Cohort 2: KY, MI, MN,
  - Cohort 3: TX, VA, CA (first year only)
I. Quality of the Program
Why is a Quality Program Important?

- The quality of programs contributes to student outcomes.
- Quality programs provide the foundation upon which EBP can be successfully implemented.
- Quality indicators of programs can be captured through observation and interview.
- Program quality can be improved through training and technical assistance.
Assessing Program Quality

• Piloting experimental instrument: *Autism Program Environment Rating Scale (APERS)*

• Designed to assess quality indicators of programs for students with ASD

• Versions of the APERS
  - Preschool and Elementary (P/E)
  - Middle and High School (M/H)
**Example: Score of 5**

<table>
<thead>
<tr>
<th>27*</th>
<th>Team members consistently over-prompt students during instruction.</th>
<th>When needed, key team member uses a clear prompting hierarchy during instruction (e.g., less intensive prompts followed by increased support as needed).</th>
<th>When needed, team members use a variety of prompts during instruction to meet individual student needs (e.g., physical, verbal, gestural).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>☐ Team members consistently under-prompt or use no prompts during instruction.</td>
<td>☑ When needed, key team member uses a clear prompting hierarchy during instruction (e.g., less intensive prompts followed by increased support as needed).</td>
<td>☑ When needed, team members use a clear prompting hierarchy during instruction (e.g., less intensive prompts, graduated guidance, simultaneous instruction).</td>
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<tr>
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<td>☐ When team members use prompts only one form is used with students (e.g., physical, verbal, gestural).</td>
<td>☑ When needed, key team member uses a variety of prompts during instruction to meet individual student needs (e.g., physical, verbal, gestural).</td>
<td>☑ When needed, team members use a variety of prompts to meet individual student needs.</td>
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</table>
Assessment Tool for Measuring Quality

- Autism Program Environment Rating Scale
  - Preschool/Elementary (64 item)
  - Middle/High School (66 items)
- Used to assess quality of program environment
  - Observations in classes
  - Interview Teachers, Team Members, Families
- Generate Overall Score
APERS Process

- Record Review
- Observations
- Interviews

Consensus

- Scoring

Self - Assessment

Debrief / Report

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Autism Program Environment Rating Scale

APERS Profile by Domain

- Classroom Environment
- Class Structure/Schedule
- Positive Classroom Climate
- Assessment
- Curriculum and Instruction
- Communication
- Staff/Peer Relationships
- Personal Ind./Competence
- Functional Behavior
- Family Involvement
- Teaming
- Overall Score

Inadequate | Adequate | Exemplary
How Do We Use The APERS?

- Complete APERS at the start of the school year (baseline).

- Use baseline data to improve the quality of programs for learners with ASD through training and coaching.

- Repeat APERS at the end of school year to measure program improvement.
Average APERS Scores

Mean APERS Total Score: Preschool/Elementary Version (n = 34)

Pre Post

Mean APERS Total Score: Middle/High School Version (n = 24)

Pre Post
d = 1.28
d = 1.10
Mean APERS Subdomain Scores: Preschool/Elementary Version
(n = 34)
Mean APERS Subdomain Scores: Middle/High School Version (n = 24)
II. Use of Evidence-based Practices
What are EBP?

Focused interventions that:

• Produce specific behavioral and developmental outcomes for a child
• Have been demonstrated as effective in applied research literature
• Can be successfully implemented in educational settings

(Odom, Colett-Klingenberg, Rogers, & Hatton, 2010)
Process Used to Identify EBP

• Identified outcomes related to the core features of autism
• Reviewed literature related to outcomes and the key words autism, ASD, and autism spectrum, limited by age (birth – 21)
• Identified and grouped teaching interventions that addressed these outcomes/domains
• Determined criteria and whether an evidence base supported the practices
NPDC Criteria

To be considered an evidence-based practice:

• Two randomized or quasi-experimental design studies,
• Five single subject design studies by three different authors, OR
• A combination of evidence such a one group and three single-subject studies
Assessing Use of EBP

- Antecedent-based interventions
- Computer-aided instruction
- Differential reinforcement
- Discrete trial training
- Extinction
- Functional behavior assessment
- Functional communication training
- Naturalistic interventions
- Parent-implemented intervention
- Peer-mediated instruction/intervention
- Picture Exchange Communication System™

- Pivotal response training
- Prompting
- Reinforcement
- Response interruption/redirection
- Self-management
- Social narratives
- Social skills training groups
- Speech generating devices
- Structured work systems
- Task analysis
- Time delay
- Video modeling
- Visual supports
Resources on NPDC’s EBP

• EBP Briefs (http://autismmpdc.fpg.unc.edu)
  ▪ Overview
  ▪ Evidence Base
  ▪ Steps for Implementing
  ▪ Implementation Checklist
  ▪ Sample Data Collection Forms (optional)
Resources on NPDC’s EBP

• Online Modules (Collaboration with OCALI)
  ▪ Posted on AIM Website (www.autisminternetmodules.org)
  ▪ Narrative content with video examples of practices being implemented
  ▪ Includes downloadable EBP brief components
  ▪ Pre/ Post knowledge assessment
  ▪ Case study examples
  ▪ Learning activities, Discussion questions
Implementation Fidelity

• Implementing an intervention in same manner in which it was done in the evidence-based research

• How is this achieved?
  ▪ Use self-learning modules on practices
  ▪ Offer training on the practice, as needed
  ▪ Use implementation checklists for the EBP to capture fidelity of implementation
  ▪ Coach on the practice until fidelity is attained
Coaching

Form of embedded professional development used to:

- Refine existing skills and/or acquire new teaching skills in EBP

Coaching is a vehicle to develop:

- An ongoing, confidential relationship that recognizes individual expertise and professional growth
Coaching

• Supports practitioner’s ability to apply knowledge to skills in the classroom

• Focuses on content that encourages the use of data to inform practice
  (Annenberg Institute for School Reform, 2004)

• Uses adult learning principles and respects the learner’s professionalism and ability to make decisions
Coaching – Promising Practice

Coaching leads to . . .

• Improvement in instructional capacity, increasing teachers’ ability to apply what has been learned to their work with students.

• Improvement in the instructional culture of the school.

(The Annenberg Institute for School Reform, 2004)
Coaching Components

Preobservation Conference
Select coaching target, obs plan, data collection plan

Observation
Collect data for meaningful discussion and planning

Postobservation Conference
Discuss obs, discuss ways to change behavior, plan for ongoing support

Feedback & Support from NPDC

3 Components Of Cyclical Coaching Process
## Sample Implementation Checklist

### Implementation Checklist for Naturalistic Intervention

<table>
<thead>
<tr>
<th>Observation</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<tr>
<td>Date</td>
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<td>Observer’s Initials</td>
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### Step 1. Identifying a Target Act

1. Teachers/practitioners select a specific target act/skill to be the focus of intervention that:
   - focuses on prelinguistic or linguistic communication and/or
   - social skills.

2. Teachers/practitioners confirm that the target act is in the learner’s IEP or IFSP.

### Step 2. Collecting Baseline Data

1. Prior to intervention, teachers/practitioners determine the learner’s current use of the target skill.

2. Teachers/practitioners take data on the target skills a minimum of three times in more than one environment.

**Scoring Key:**
- 2 = implemented
- 1 = partially implemented
- 0 = did not implement
- NA = not applicable
Average Percentage of Steps for Implementation Followed with Fidelity for All Cases with 2 or more Data Points

Fidelity 1 (n = 188)  Fidelity 2 (n = 188)  Fidelity 3 (n = 98)  Fidelity 4 (n = 65)  Fidelity 5 (n = 29)  Fidelity 6 (n = 11)  Fidelity 7 (n = 10)  Fidelity 8 (n = 10)
Percentage of Steps for Implementation Followed with Fidelity for all Cases with 2 or More Data Points
Average Percentage of Steps for Implementation Followed with Fidelity for All Cases with 2 or more Data Points
Groups Split into Slow Acquisition (Data Point 4 < 60% Fidelity) and Fast Acquisition (Data Point 4 > 60% Fidelity)

- Slow Acquisition (Datapoint 4 < 60 % Fidelity) with n = 158, 68, 30, 12
- Fast Acquisition (Datapoint 4 > 60 % Fidelity) with n = 158, 35, 17, 11, 10
III. Goal Attainment: Selecting Learner Goals

• Review student’s IEP Goals with teacher/parents

• Identify 3 priority goals for each target student
  ▪ must be area of focus for entire school year
  ▪ must be observable and measurable
  ▪ must be agreed to by family and team

• Make modifications as needed
  ▪ case conference or making an addendum
Examining Learner’s IEP Goals: Goal Attainment Scale (GAS)

• Goal Attainment Scale (GAS) is designed to document progress on IEP goals, objectives, and benchmarks.
• Has a long history in fields of mental health, education, geriatric care
• Provides a summative rating to evaluate outcomes
Assessing Student Progress

• Goal Attainment Scaling: a five point range of performances for students:
  ▪ Much less than expected
  ▪ Somewhat less than expected
  ▪ Expected level of outcome
  ▪ Somewhat more than expected
  ▪ Much more than expected
How Do We Use GAS?

- Select learning objective/benchmark with a defined continuum of outcomes.
- Identify outcomes that reflect the five points on the continuum noted.
- Identify the current level of performance.
- Use the continuum to evaluate growth on a designated schedule (monthly, bimonthly).
- Use GAS to determine final outcome at end of learning period (end of the year).
| **Much less than expected**  
| **(Present Level of Performance)** | When he enters classroom EJ does not greet his peers or professionals |
| **Somewhat less than expected**  
| **(Benchmark)** | When entering the classroom in the morning and with a verbal prompt and picture cue, EJ will greet at least one peer by saying “hi” or waving for 4/5 mornings for a week |
| **Expected level of outcome**  
| **(Annual Goal)** | When entering the classroom in the morning and with a visual prompt, EJ will greet at least one peer by saying “hi” or waving for 4/5 mornings for 2 consecutive weeks. |
| **Somewhat more than expected**  
| **(Exceeds annual goal)** | When entering the classroom in the morning without a prompt, EJ will greet at least one peer by saying “hi” or waving for 4/5 mornings for 2 consecutive weeks. |
| **Much more than expected**  
| **(Far exceeds annual goal)** | When entering school in the morning and without a prompt, EJ will greet at least one peer and one non-classroom professional by saying “hi” or waving for 4/5 mornings for 2 consecutive weeks. |
Frequency of GAS Outcome Ratings (n = 420)
IV. Family Survey

Family Program Questionnaire (n = 99)
### V. Expansion/Sustainability

<table>
<thead>
<tr>
<th>States</th>
<th>NPDC model sites</th>
<th>State only supported expansion sites**</th>
<th>Total sites</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cohort 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN</td>
<td>6</td>
<td>17</td>
<td>23</td>
</tr>
<tr>
<td>NM</td>
<td>6</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>WI</td>
<td>7</td>
<td>Modified model with 10 teams</td>
<td>17</td>
</tr>
<tr>
<td><strong>Cohort 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KY</td>
<td>8</td>
<td>36</td>
<td>44</td>
</tr>
<tr>
<td>MI</td>
<td>6</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>MN</td>
<td>6</td>
<td>Modified model with 10 coach/teacher dyads</td>
<td>16</td>
</tr>
<tr>
<td><strong>Cohort 3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td>6</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>TX</td>
<td>6</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>VA</td>
<td>6</td>
<td>6</td>
<td>12</td>
</tr>
</tbody>
</table>

** In addition to developing new sites, these states report expansion in existing sites to additional students
Questions and Discussion