Monitoring Instructional Programs
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Vermont State I-Team

"You must do the thing you think you cannot do.”
Eleanor Roosevelt

Why Collect Data?

Allows for precise and accurate evaluations of instructional strategies and interventions
Allows for decision making and adjustments over the course of the intervention
Accountability

Data Collection: A Process

Select the behavior
Define the target behavior(s)
Choose a data collection system
Determine when to collect data
Implement the data collection system
Summarize and graph data
Utilize data to make decisions about program effectiveness

So what are the data collection options and how do I decide which one to use?

Types of Data Collection Procedures/Systems

Anecdotal Reports
Permanent Product Recording
Event Recording
Interval Recording
Time Sampling
Duration Recording
Latency Recording

Anecdotal Recording

• Write down the setting as you initially see it, describe the individuals and their relationship, identify the occurring activity
• Record everything the targeted student says and does and to whom or to what
• Describe everything said and done to the student and by whom
• Clearly differentiate between fact and your interpretation of what is being observed
• Useful for initial data collection to get the big picture
Permanent Product Recording

Tangible items that result from behavior
Do not need to directly observe student, review the concrete results of behavior
- Quizzes, tests, fluency measures, school discipline records, writing samples, homework, audio recordings, video recordings

Event Recording

The number of times a behavior occurs
Most directly and accurately reflects the number of times a behavior occurs
Useful when attempting to increase or decrease a specific behavior
Needs to be a discrete behavior (obvious or agreed upon beginning and end)
Used when instructing from a task analysis

Duration Recording

Temporal rather than numerical dimension
Easily identifiable beginning and end (operational definition)
Average duration & Total duration

Latency Recording

How long a student takes to begin performing a behavior

Interval Recording

Approximation of actual behavior
% of intervals in which behavior occurs
Appropriate for high frequency and continuous behaviors
Less accurate than event recording, more accurate than time sampling

Interval Recording (cont.)

I.d. specific observ. time period (10 – 60 min.)
Observation period divided into equal time intervals (10 – 30 sec.)
Behavior noted if it occurs at any time during the interval

Beware high frequency and extended time behaviors
**Time Sampling**

- I.d. specific observ. time period (10–60min.)
- Observation period divided into equal time intervals (e.g., 30 sec./1 min./3min./5min.)
- Allows observing over longer periods of time
- Behavior noted if it occurs at the end of the interval
- Best for frequent or long duration behaviors

**Choosing a System**

- Is the target behavior numerical or temporal?
  - If numerical:
    - Continuous?
    - Frequency?
  - If temporal:
    - Time to initiate?
    - Elapsed time?
    - Third party?

**Data Decision Making Flow Chart**

**Reliability**

A second observer simultaneously and independently records the same data; calculate inter-observer reliability

- **Frequency:**
  - Smaller #
  - Larger #
  - \( \frac{19}{20} = .95 \approx 95\% \)

- **Duration & Latency:**
  - \( \frac{7}{9} \times 100 = 78\% \)
  - \( \frac{\text{Shorter # of min.}}{\text{Longer # of min}} \times 100 = \% \text{ agreement} \)

**Reliability**

A second observer simultaneously and independently records the same data; calculate inter-observer reliability

- **Interval Recording:**
  - Agreements
  - Agreements + Disagreements
  - \( \frac{7}{7+3} \times 100 = 70\% \)
  - \( \frac{\text{Agreements}}{\text{Agreements} + \text{Disagreements}} \times 100 = \% \text{ agreement} \)
Factors That Influence Inter-observer Agreement

- Reactivity
- Observer Drift
- Complexity
- Expectancy

Components of Data Collection Systems

<table>
<thead>
<tr>
<th>Student’s name</th>
<th>Date, Time, Location</th>
<th>Length of observation</th>
<th>Behavior observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of behavior</td>
<td>Space for recording data</td>
<td>Scoring code</td>
<td>Data summary</td>
</tr>
<tr>
<td>Comments?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Why graph data?

1. Provide a means for organizing data during the data collection process
2. An ongoing picture makes possible formative evaluation, the ongoing analysis of the effectiveness of the intervention
3. Graphs serve as a vehicle for communication among teacher, student, parents, and related service personnel

Graphing Conventions

Values?

2:3 Ratio

Target behavior; number, % rate

Elwood’s Quiet Listening

(Frequency of data collection; date, session)

Permanent Product Data

<table>
<thead>
<tr>
<th>Student: Catherine</th>
<th>Behavior: writing paragraphs of 20 words given title and topic sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td># of words</td>
</tr>
<tr>
<td>3/16</td>
<td>6</td>
</tr>
<tr>
<td>3/18</td>
<td>14</td>
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<td>3/20</td>
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</tr>
<tr>
<td>3/23</td>
<td>10</td>
</tr>
<tr>
<td>3/25</td>
<td>12</td>
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</tbody>
</table>
Permanent Product Graph

Event Recording Data Collection

Event Recording Graph

Duration Data Collection

Duration Graph
Latency Data Collection
Average daily time before beginning work

<table>
<thead>
<tr>
<th></th>
<th>2/6-2/10</th>
<th>2/13-2/17</th>
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</thead>
<tbody>
<tr>
<td>M</td>
<td>6'</td>
<td>4'</td>
</tr>
<tr>
<td>T</td>
<td>8'</td>
<td>5'</td>
</tr>
<tr>
<td>W</td>
<td>3'</td>
<td>3'</td>
</tr>
<tr>
<td>H</td>
<td>4'</td>
<td>6'</td>
</tr>
<tr>
<td>F</td>
<td>4'</td>
<td>3'</td>
</tr>
</tbody>
</table>

Latency Graph
Average daily time before beginning work

Interval Recording Data Collection
Student: Omar
Behavior: out-of-seat
Observation Period: 7 minutes (first 7 minutes of center time)

Interval Recording Graph
Out-of-seat during first 7 minutes of “Centers”

Interval/Time Sampling
Out-of-seat during first 7 minutes of “Centers”
Rate Data Collection

<table>
<thead>
<tr>
<th>Student</th>
<th>Steven</th>
<th>Behavior</th>
<th>Packet assembly</th>
<th>Observation Period</th>
<th>Vocational training at Red Cross</th>
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</thead>
<tbody>
<tr>
<td>Days</td>
<td>No. Completed</td>
<td>Time</td>
<td>Rate per minute</td>
<td></td>
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<tr>
<td>Monday</td>
<td>45</td>
<td>30'</td>
<td>1.5</td>
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<tr>
<td>Tuesday</td>
<td>40</td>
<td>25'</td>
<td>1.6</td>
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<td>Wednesday</td>
<td>45</td>
<td>25'</td>
<td>1.8</td>
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<tr>
<td>Thursday</td>
<td>40</td>
<td>20'</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td>50</td>
<td>25'</td>
<td>2.0</td>
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</tbody>
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Computing Rate

• Divide the number of correct responses by the time taken for responding

\[ \text{Rate} \ (\text{per minute}) = \frac{\text{Number correct}}{\text{Time (in minutes)}} \]

Rate Graph

Daily rate of packet assembly

Data Collection

<table>
<thead>
<tr>
<th>Student</th>
<th>Stacey</th>
<th>Behavior</th>
<th>Reading Fluency</th>
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<tbody>
<tr>
<td>Assessment Period</td>
<td>Language Arts Block - 2nd grade</td>
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<tr>
<td>Weekly Probe</td>
<td>Words Correct/Minute</td>
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<tr>
<td>Week 1</td>
<td>40</td>
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<td>Week 10</td>
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</table>

Graphing Activity

• Take out graph paper
• Design a graph that matches the data on reading fluency
• Be sure to label the graph to include
  – Title
  – Axis
  – Key

Data Collection/Graphing Applied Learning

• Take out goal/objectives you have been working on all along
• Use the decision making flowchart to explore the different data collection options
• Decide which data collection method matches the skill you need to monitor
• Develop/revise a data sheet that enables you to quickly and easily record responses
• Design a graph that provides a way to visually represent the student’s progress on the skill