Using Behavior Analytic Instructional Methods and Organizational Behavior Management to Train Behavior Analysts

Jose Martinez-Diaz, PhD, BCBA-D
Florida Institute of Technology & ABA Technologies, Inc.

Outline

A. Introduction
B. Entertainment or Education? It Takes a Team
C. Instructional Design: Curriculum Development
D. The Technology of Teaching: Instructional Delivery
E. Evaluating & Improving Curriculum and Instruction

The Shame of American Education

“It has long been said that college teaching is the only profession for which there is no professional training. Would-be doctors go to medical schools, would-be lawyers go to law schools, would-be engineers go to institutes of technology, and would be college teachers just start teaching.”
(American Psychologist, 39)

Many College Professors Suffer from:

- Curriculum Development Disorder (CDD)
- Dysteachia
Outline

A. Introduction
B. Entertainment or Education? It Takes a Team
C. Instructional Design: Curriculum Development
D. The Technology of Teaching: Instructional Delivery
E. Evaluating & Improving Curriculum and Instruction

It is Predicted That...

“By 2015, 25 million post-secondary students in the United States will be taking classes online. And as that happens, the number of students who take classes exclusively on physical campuses will plummet from 14.4 million in 2010 to just 4.1 million five years later...”

Ambient Insight Research, January, 2011

“The meta-analysis found that, on average, students in online learning conditions performed better than those receiving face to face instruction.”

• Attributed to additional learning time and instructional elements
• Literature Research 1996 – 2009
• Contrasted online to face to face condition
• Measured student learning outcomes
• Provided adequate information to calculate an effect size.

What is More Important?

Entertainment OR Education
Entertainment?

For a 2-Hour Movie

Or Education?

Professor Dr. Bond

Teaching Assistant
Jim Kirk

Education

Copyright by Jose Martinez Diaz and ABA Technologies
So...

How do we DESIGN, DELIVER, and TEACH online courses without compromising educational outcomes?

Solutions

• Team approach with full support of administration
• Behavior analytic approach for instructional design and instruction
• Highly interactive high-tech methods to deliver instruction
• OBM methods to achieve best performance from all!

Ernest A. Vargas: Triad Model

Integration of:

– Science (of Behavior)
– Technology (Engineering)
  • Instructional Design
  • Instructional Delivery
– Organization (Management; Teams)
You Need a Team...

- Academic Head + Program Director + Administrator
- Curriculum Team
- Instructional Team
- Evaluation & Improvement Team
- Computer Instructional Technology Team
- Support staff
- Administrative support!

Organizational Structure

- Head, School of Behavior Analysis (Jose)
- Program Director (Jose)
  - Lead Instructor
  - Curriculum Teams
  - Instructional Teams
- Administrator (C. Schmitt, MA, MS)
  - E-Technology & Tech Support Teams
  - Registration Team

Outline

A. Introduction
B. Entertainment or Education? It Takes a Team
C. Instructional Design: Curriculum Development
D. The Technology of Teaching: Instructional Delivery
E. Evaluating & Improving Curriculum and Instruction
**Instructional Design**

- Principles of Behavior Analysis
  - Direct Instruction
  - Programmed Instruction
  - PSI
  - Precision Teaching

**Curriculum Team**

1. Content Expert(s)
2. Instructional Design Expert(s)
3. Evaluation and Improvement Expert(s)
4. Support Staff

---

**Instructional Design & Curriculum**

- What to teach
- In what sequence
- Learning objectives
- Critical attributes
- Variable attributes
- Examples (that tie to critical attributes)
- Non-examples (that tie to critical attributes)
- Instructional materials

---

**Instructional Design & Curriculum (Continued)**

- Design ASRs for frequent practice
  - Acquisition ASR Type 1: Example or Not?
  - Acquisition ASR Type 2: Discriminate...
  - Fluency ASRs
- Evaluate Mastery of Objective(s)
  - Unit Tests (Multiple Versions)
  - Assignments
  - Final Exam (Multiple Versions)
Instructional Design & Curriculum

• What to teach
• In what sequence
• Learning objectives
• Critical attributes
• Variable attributes
• Examples (that tie to critical attributes)
• Non-examples (that tie to critical attributes)
• Instructional materials

Example of What to Teach & In What Sequence

• What:
  – BACB Fourth Edition Task List (General)
  – For each task... What to actually teach
• Sequence (BACB calls it a course sequence)
  – What tasks go into what courses
  – In what order do you teach the courses
  – Within each course, order of covering tasks

Learning Objectives

• Provide a specific and clear criterion for measuring student achievement
  – Criteria for evaluating the quality of an objective
  – Good: Define...; give example...; discriminate between examples of...
  – Bad: Understand..., grasp the importance of...
• Test items and assignments should be based on objectives
• Bloom's Taxonomy
Example of Taking a General Task and Writing Objectives for It

**Examples of Objectives**

1. State at least three different definitions of the term “behavior”.
2. List and explain the critical attributes of the term “behavior”.
3. List and explain the variable attributes of the term “behavior”.
4. Correctly discriminate between examples and non-examples of behavior.

Task & Objectives (continued)

22. Given a definition for “behavior” in a collective term.
23. Given that behavior is a collective term, use the term, behavior, correctly.
24. Define the term property.
25. List the fundamental properties of behavior.
26. Define each of the fundamental properties of behavior.
27. State the associated dimensional quantity.
28. Define the dimensional quantity.
29. Define the term property.
30. Define each of the dimensional quantities of behavior.
31. Give examples of each of the dimensional quantities of behavior.
32. Discriminate between fundamental properties and dimensional quantities of behavior.
33. Define topography.
34. Give examples of topography.
35. Given that magnitude and intensity are topographical properties of a response and not quantities.
36. Define function.
37. Give examples of function.
38. Give non-examples of function.
39. Discriminate between topography and function.
40. Define response class.
41. Define topographical response class.
42. Give examples of topographical response classes.
43. Define functional response class.
44. Give examples of functional response classes.
45. Discriminate between topographical and functional response classes.

Copyright by Jose Martinez-Diaz and ABA Technologies
Example of Definition

“Behavior is that portion of an organism’s interaction with its environment that involves movement of some part of the organism.”

(Johnston & Pennypacker, 2009)

Example of Critical Attributes of Behavior
1. Behavior is a biological phenomenon.
2. Involves movement (actions)
3. Can only be done by a living organism
4. Observable
5. Measurable
6. Involves interaction with the environment

Instructional Design & Curriculum
• What to teach
• In what sequence
• Learning objectives
• Critical attributes
• Variable attributes
• Examples (that tie to critical attributes)
• Non-examples (that tie to critical attributes)
• Instructional materials

Critical & Variable Attributes
• Critical attributes: Things that must be present for an instance to be an example of a concept
  – E.g., for X to be an example of behavior it must involve interaction with the environment
• Variable attributes: May vary...
  – E.g., behavior may be unlearned or learned
Critical Attribute of Behavior #1: Behavior is a Biological Phenomenon

- Only biological organisms engage in behavior
- Behavior has a biological basis
- Behavior has an evolutionary basis
- Interacting with the environment always involves biological processes.
  - Mediated by the nervous system
  - Involves receptors, effectors, etc.

Ex: Variable Attributes (of Bx)

- The organism behaving
- Topography
- Learned vs. unlearned
- Respondent vs. operant vs. schedule induced
- Private vs. public
- Social vs. automatic - & - Verbal vs. non-verbal
- Discrete response vs. Not - & - Single R vs. chain
- Requires manipulandum (or not)
- Socially appropriate or not
- Effect on the environment

Instructional Design & Curriculum

- What to teach
- In what sequence
- Learning objectives
- Critical attributes
- Variable attributes
- Examples (that tie to critical attributes)
- Non-examples (that tie to critical attributes)
- Instructional materials

Examples & Non-examples

- Select examples to represent a broad range that varies along non-critical dimensions and variable attributes
- Tie to critical attributes
- Continuum of examples versus non-examples
  - Minimally to maximally similar
Example of Examples (of Bx)

• Doing sit-ups
• Doing one’s laundry
• Practicing playing guitar
• Completing one’s homework
• Asking someone out to dinner
• Refusing dessert when offered
• Covertly multiplying 12 X 15

Example of Non-Examples (of Bx)

• Failing to comply
• Not nagging
• Having a positive attitude
• Having poor impulse control
• Being stubborn
• Expecting to get a reward
• Processing an instruction
• Knowing your multiplication tables

Instructional Design & Curriculum

• What to teach
• In what sequence
• Learning objectives
• Critical attributes
• Variable attributes
• Examples (that tie to critical attributes)
• Non-examples (that tie to critical attributes)
• Instructional materials

Curriculum Documents

• Each course has an Instructional Handbook consisting of:
  ✓ Unit Guided Notes & Study Guides
  ✓ Unit Power Point Handouts
  ✓ Active Student Responding Exercises
  ✓ Assignments

• Each co-instructor has additional materials available to all students
Sample Instructional Handbook

Instructional Design & Curriculum (Continued)

• Design ASRs for frequent practice
  – Acquisition ASR Type 1: Example or Not?
  – Acquisition ASR Type 2: Discriminate...
  – Fluency ASRs
  Provide immediate feedback
    Why correct is correct; why incorrect is not...

• Evaluate Mastery of Objective(s)
  – Unit Tests (Multiple Versions)
  – Assignments
  – Final Exam (Multiple Versions)

---

Example of Type 1 Acquisition ASR

- Is telling someone what you ate for breakfast an example of behavior?
  1. Yes
  2. No

Example of Type 1 Acquisition ASR

- Is failing to respond to the teacher’s request to get up from the floor an example of behavior?
  1. Yes
  2. No
Example of Type 2 Acquisition ASR

Failing to respond to the teacher’s request...

1. Which critical attribute does it fail to meet?
2. A function has not been determined.
3. “Behavior” is a collective term, and should not be used in plural form.
4. The topography is not described.
5. Does not pass the Dead Person’s Test.

Example of Fluency ASR

- Set timer for 1-minute
- Ask students to write down as many examples of behavior as they can when told to start.
- Start timer and say “Start!”
- Timer rings; Ss put down pens
- Grade: Count # correct
- May also count # incorrect
- Graph data (2 lines if correct & incorrect)

Instructional Design & Curriculum (Continued)

- Design ASRs for frequent practice
  - Acquisition ASR Type 1: Example or Not?
  - Acquisition ASR Type 2: Discriminate...
  - Fluency ASRs
- Evaluate Mastery of Objective(s)
  - Unit Tests (Multiple Versions)
  - Assignments
  - Final Exam (Multiple Versions)

Tests for Mastery

- Several test items are written for each objective
- At least two versions of each unit test
- Cumulative final exam based on course objectives
- At least two versions of final exam
Outline

A. Introduction
B. Entertainment or Education? It Takes a Team
C. Instructional Design: Curriculum Development
D. The Technology of Teaching: Instructional Delivery
E. Evaluating & Improving Curriculum and Instruction

Instructional Team

• Lead Professor
• Lead Co-instructors
• Co-instructors
• Co-Instructor Manager and Assistants

Instructional Delivery

Principles of Behavior Analysis

- Present / Demonstrate (Short)
- Active Student Responding
- Data ➔ Modify Instruction

Delivery Methods

- Video (Short lecture/ASRs) + Interaction with Materials (Instructional Handbook) - 35/45 hours
  — Jose and Guest Instructors
- Live (10 hours/45)
  — Mostly online through video conferencing in a virtual classroom, but also in brick-&-mortar classrooms
  — Co-instructors (Leads, Assistant Leads, & PT co-instructors)
- Discussion Board, Email & Phone Calls
- Interaction with Online Materials
Demonstration of Video Delivery +

① View a Sample of the Guided Notes
② Go to Video
③ Watch and participate...

Example of Video

ASR #38

- Is this a codic?
- Saying “cookie” as a result of seeing the word “cookie”.
- 1=yes
- 2=no

Live Online Delivery

• Review of Key and Difficult Points
• ASRs (Polls)
• Q&A time
  – Short sample of session from recording
  – Title:  BEHP5000 Co-Instructor Session – Katie Nicholson_44
  – Uploaded on: 09/18/2011 9:23 PM

Other Online Material

Go to Angel
Outline

A. Introduction
B. Entertainment or Education? It Takes a Team
C. Instructional Design: Curriculum Development
D. The Technology of Teaching: Instructional Delivery
E. Evaluating & Improving Curriculum and Instruction

Evaluation & Improvement

• Curriculum Evaluation & Improvement
• Instructor Evaluation & Improvement
• Program Enrollment
• Student Evaluation & Outcomes

Evaluation & Improvement

• Curriculum Evaluation & Improvement
• Instructor Evaluation & Improvement
• Program Enrollment
• Student Evaluation & Outcomes

Ongoing Curriculum Improvement

• Revision of materials and ASRs
• Replacement of segments in Unit Videos
• Sometimes an entire Unit Video is redone by instructor or even replaced by another instructor
• Item analysis and other procedures to evaluate and improve tests
Long-term Curriculum Improvement

- Data used for major curriculum revisions
- Example: Many lessons learned!
  - 1 Unit per week instead of 7 units in 9 weeks
  - 5 minute video segments instead of 20 minutes
  - And many more...

Evaluation & Improvement

- Curriculum Evaluation & Improvement
- Instructor Evaluation & Improvement
- Program Enrollment
- Student Evaluation & Outcomes

Performance Matrix: Bonus Pay Example

Co-Instructor Z contributed to the discussion board on average 3 times a week, hosted all of his Online Meetings, and subbed for his fellow co-Instructors twice. Completed all of his checklists and submitted all but of them two on-time, earned 50 points on the Online Meeting scorecard and was rated 19/20 by his students.

<table>
<thead>
<tr>
<th>Item</th>
<th>20</th>
<th>40</th>
<th>60</th>
<th>80</th>
<th>100</th>
<th>120</th>
<th>Weighting</th>
<th>Weighted Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion Board Horizoned</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
<td>20%</td>
<td>0.6</td>
</tr>
<tr>
<td>Incentives</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
<td>20%</td>
<td>0.6</td>
</tr>
<tr>
<td>Online Meetings Works Performed</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
<td>20%</td>
<td>0.6</td>
</tr>
<tr>
<td>Checks Completed</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
<td>20%</td>
<td>0.6</td>
</tr>
<tr>
<td>Checks Submitted Traditional</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
<td>20%</td>
<td>0.6</td>
</tr>
<tr>
<td>Attendance</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
<td>20%</td>
<td>0.6</td>
</tr>
<tr>
<td>Submissions</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
<td>20%</td>
<td>0.6</td>
</tr>
<tr>
<td>Base</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
<td>20%</td>
<td>0.6</td>
</tr>
<tr>
<td>Goal</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
<td>20%</td>
<td>0.6</td>
</tr>
<tr>
<td>Total Bonus</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
<td>20%</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Co-Instructor Z's weighted scores are calculated by multiplying the Conversion Score (from the conversion scale) X by the Weighting Score. This gives Co-instructor Z weighted scores of respectively 15, 24, 10, 15, 20 and 24 for a total of 94.5. Therefore, he earns 94.5% of his total possible earning him bonus pay of $94.50.
**Performance Matrix Average**

BEHP 5003: History of Performance Matrix Average Scores from July 08 - October 10

**One-on-One Training**

Increase in Co-instructor Performance Matrix Scores after One-on-One Training & Technical Support

**Co-Instructor Retention**

Co-Instructor Retention Between Terms

**Evaluation & Improvement**

- Curriculum Evaluation & Improvement
- Instructor Evaluation & Improvement
- Program Enrollment
- Student Evaluation & Outcomes
2014-2015 Projected Enrollment

- Student seats in first ½ of 2014-2015:
  - April 2014 Term: 2402
  - July 2014 Term: 2685
  TOTAL: 5087
- Projected: 10,174

Evaluation & Improvement

- Curriculum Evaluation & Improvement
- Instructor Evaluation & Improvement
- Program Enrollment
- **Student Evaluation & Outcomes**

Data Used for Student Evaluation

- Acquisition ASRs
- Fluency ASRs
- Unit Practice Tests
- Unit Tests (2 per unit)
  - Scores & Item Analyses
- Comprehensive Final Examinations
- Pass Rate for Courses
- **Mock Behavior Analysis Exams**
Other Data Used for Program Evaluation

- Feedback by Co-Instructors based on interaction with students in live sessions, discussion board, etc.
- Feedback by Students
- Pass Rate for Certification Exams

2013 BCaBA Exam Pass Rate

- 67% of first-time candidates passed exam
- Only one university did better (72%)
  - It is a small degree program (10 candidates)
- Range: 35% to 72%
- Our # of candidates: 304
- That is 304/699 = 44% of all candidates
- Overall pass rate for all candidates: 57%
- Overall pass rate for other programs: 47%

2013 BCBA Exam Pass Rate

- FIT’s ABA Online Pass Rate: 66%
- Average Pass Rate: 58%
- Range: 0% to 100%
- # of FIT Candidates: 566
- That is 566/3006 = 19% of all candidates
- All programs with higher pass rates were very small degree programs
- Second largest certificate program: 56% (172)

The Bottom Line: Student Outcomes

- Caution: To train behavior analysts it is necessary, but not sufficient to provide excellent academic instruction
- We also need excellent supervised work experience
  — Some stories
THANK YOU!

• Contact info:
• jose@abatechnologies.com