Using a systematic conceptual model for a process evaluation of a middle school obesity risk-reduction nutrition curriculum intervention: *Choice, Control & Change*

Heewon Lee, Isobel R. Contento, & Pamela Koch
Learning Objectives

• Gain an overall understanding of process evaluation in school-based nutrition intervention studies.

• Recognize advantages of using a systematic conceptual model for process evaluation.

• Identify components and measures of process evaluation used in the Choice, Control & Change curriculum intervention.

• Understand the findings of process evaluation in the Choice, Control & Change curriculum intervention.
Types of evaluation in intervention research

Depending on stage of the research

• Pilot studies
• Formative evaluation
• Summative evaluation
Types of evaluation in intervention research

Depending on what you are measuring

- Outcome evaluation
- Process evaluation
Outcome evaluation

- Physiological outcomes (i.e. Height and weight)
- Behavioral outcomes (i.e. fast food intake)
- Theory based psychosocial variables (i.e. self-efficacy)
Process evaluation

- Quality control and monitoring
- Evaluating how an intervention is actually implemented
- The purpose is to ↓ type III error and explain program effects
- To improve intervention content
Components of Process evaluation

Behavioral intervention research projects varied in their conceptualization of the components of process evaluation, based on:

- Study setting – hospital, community, worksite, or school
- Intervention type – clinical, individual counseling, curriculum, or environmental change intervention
## Components

- Dose - dose delivered & dose received
- Fidelity – quality and integrity of the intervention
- Recruitment and maintenance of participants
- Context
- Resources
- Reach (i.e. attendance)
- Barriers to implementing the program
- Initial use of program activities
- Continued use of program-specified activities
- Contamination (i.e. competing programs)
- Exposure (i.e. preferred activity)


Process evaluation in school-based nutrition education interventions

Common process evaluation components

- Attendance rates / feedback on teacher training sessions
- Dose / completion of the lessons and activities
- Fidelity
- Parent take-home newsletters returning card / parent attendance rates on events
- Satisfaction / preferred activities (from teachers and/or students)
- Teacher characteristics
<table>
<thead>
<tr>
<th>Reference/Target audience</th>
<th>Process evaluation components</th>
<th>Process evaluation results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gimme 5</strong></td>
<td>• Teacher training attendance</td>
<td>• 95% attended the trainings</td>
</tr>
<tr>
<td>Multi-component randomized nutrition program: 4&lt;sup&gt;th&lt;/sup&gt; – 5&lt;sup&gt;th&lt;/sup&gt; graders</td>
<td>• Dose / completion</td>
<td>• 47% activity implementation (extent)</td>
</tr>
<tr>
<td>To eat five servings of fruit, 100% juice, and vegetables (FJV) every day.</td>
<td></td>
<td>• Lowest proportions (22%): behavior change activities: goal setting, social rewards, problem solving, and asking skills.</td>
</tr>
<tr>
<td><strong>High 5</strong></td>
<td>• Dose / completion</td>
<td>• Delivering program by trained staff maximizes the intervention implementation (&gt;90%)</td>
</tr>
<tr>
<td>Multi-component randomized nutrition program: 4&lt;sup&gt;th&lt;/sup&gt; graders and their families</td>
<td>• Family attendance</td>
<td>• Family participation in evening program (24%)</td>
</tr>
<tr>
<td>To increase fruit and vegetable consumption.</td>
<td>• Parent feedback</td>
<td>• Home activities (85%)</td>
</tr>
<tr>
<td><strong>5-a-Day Power Plus</strong> in St. Paul, Minnesota</td>
<td>• Dose / completion</td>
<td>• 95.5% completion in 4&lt;sup&gt;th&lt;/sup&gt; grade, 84.4% in 5&lt;sup&gt;th&lt;/sup&gt; grade</td>
</tr>
<tr>
<td>A randomized school-based trial: 4&lt;sup&gt;th&lt;/sup&gt; – 5&lt;sup&gt;th&lt;/sup&gt; graders</td>
<td>• Fidelity</td>
<td>• 91.8% fidelity by teachers’ self-reports in 4&lt;sup&gt;th&lt;/sup&gt; grade, 82.6% in 5&lt;sup&gt;th&lt;/sup&gt; grade</td>
</tr>
<tr>
<td>To increase fruit and vegetable consumption</td>
<td>• Parent returning cards</td>
<td>• 91% taste testings fidelity by direct observation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 59% home activities implementation by returning curriculum cards</td>
</tr>
</tbody>
</table>
### Pathways

**Multi-center randomized controlled trial: 3<sup>rd</sup> – 5<sup>th</sup> graders**

41 schools in 7 American Indian communities, 1704 students

To reduce % body fat, dietary fat and increase fruit and vegetables and physical activity

<table>
<thead>
<tr>
<th>Reference/Target audience</th>
<th>Process evaluation components</th>
<th>Process evaluation results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Teacher training attendance</td>
<td>Training attendance: 95.6, 98, and 92%, in 3&lt;sup&gt;rd&lt;/sup&gt;, 4&lt;sup&gt;th&lt;/sup&gt;, and 5&lt;sup&gt;th&lt;/sup&gt; grade, respectively</td>
</tr>
<tr>
<td></td>
<td>Dose / completion</td>
<td>Curriculum: &gt;90% taught in the 3&lt;sup&gt;rd&lt;/sup&gt; to 5&lt;sup&gt;th&lt;/sup&gt; grades</td>
</tr>
<tr>
<td></td>
<td>Family returning cards</td>
<td>Family: return card rate from 63.2% in 3&lt;sup&gt;rd&lt;/sup&gt; grade to 39.8% in 4&lt;sup&gt;th&lt;/sup&gt; grade</td>
</tr>
<tr>
<td></td>
<td>Preferred activities</td>
<td>Snack preparation and taste testing was favorite activities of students</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active games were popular among students and teachers</td>
</tr>
</tbody>
</table>

### The Child and Adolescent Trial for Cardiovascular Health (CATCH)

**3<sup>rd</sup> – 5<sup>th</sup> graders**

Multi-component randomized nutrition program

To reduce risk for cardiovascular disease

<table>
<thead>
<tr>
<th>Reference/Target audience</th>
<th>Process evaluation components</th>
<th>Process evaluation results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dose / completion</td>
<td>80% completion in 4&lt;sup&gt;th&lt;/sup&gt; grade, 84% completion in 5&lt;sup&gt;th&lt;/sup&gt; grade.</td>
</tr>
<tr>
<td></td>
<td>Fidelity</td>
<td>25% of modification in 4&lt;sup&gt;th&lt;/sup&gt; grade in California (the highest)</td>
</tr>
<tr>
<td></td>
<td>Teacher characteristics</td>
<td>14.6 competing events in Louisiana over 3 years, 20 in Texas</td>
</tr>
<tr>
<td></td>
<td>Other mediating factors</td>
<td>More than half the teachers had &gt;10 years of teaching experience</td>
</tr>
<tr>
<td>Reference/Target audience</td>
<td>Process evaluation components</td>
<td>Process evaluation results</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td><strong>Planet Health</strong></td>
<td>• Training attendance</td>
<td>• 87% (n=86) of the classroom teachers and 100% of the PE teachers (n=9) completed first-year training.</td>
</tr>
<tr>
<td></td>
<td>• Dose / completion</td>
<td>• 3.5 lessons for the year, on average</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• PE teachers completed 8.2 micro-units during the year, on average</td>
</tr>
<tr>
<td>Randomized, controlled field trial with 5 intervention and 5 control schools (public schools in 4 Massachusetts communities): 1295 ethnically diverse grade 6 and 7 students</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Training attendance</td>
<td>• &lt; 33% of the lessons in 7th grade</td>
</tr>
<tr>
<td></td>
<td>• Dose / completion</td>
<td>• &lt; 50% of the lessons in 8th grade</td>
</tr>
<tr>
<td></td>
<td>• Fidelity</td>
<td>• Fidelity: 80% of activities per lesson, when lessons were observed</td>
</tr>
<tr>
<td></td>
<td>• Family feedback</td>
<td>• 33% family behavioral coupons, and 50% of homework cards returned in 7th grade</td>
</tr>
<tr>
<td><strong>TEENS</strong></td>
<td>• Dose / completion</td>
<td></td>
</tr>
<tr>
<td>A 2-year group-randomized trial in 16 middle schools in Minnesota: 7th and 8th grades</td>
<td>• Fidelity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Family feedback</td>
<td>• Fidelity: 80% of activities per lesson, when lessons were observed</td>
</tr>
<tr>
<td>To increase fruit and vegetables and lower fat foods</td>
<td>• Fidelity</td>
<td>• 33% family behavioral coupons, and 50% of homework cards returned in 7th grade</td>
</tr>
<tr>
<td><strong>DOiT</strong></td>
<td>• Dose / completion</td>
<td>• 50% implementation by teachers self-reports</td>
</tr>
<tr>
<td>A cluster randomized controlled trial with 10 intervention and 9 control secondary school in Amsterdam.</td>
<td>• Fidelity</td>
<td>• Barrier: time</td>
</tr>
<tr>
<td>To prevent overweight and obesity</td>
<td>• Barrier</td>
<td>• Student participation = 66% (6.6/10 points).</td>
</tr>
<tr>
<td><strong>Pro Children</strong></td>
<td>• Dose / completion</td>
<td>• Implementation: 2-16 lessons</td>
</tr>
<tr>
<td>A group-randomized trial: 5th and 6th grades</td>
<td>• Appreciation of the project (satisfaction)</td>
<td>• Appreciation of the project: 2.3/3points</td>
</tr>
<tr>
<td>Norway, Spain, and Netherlands</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Measures of process evaluation

- Self-report form
- Observation
- Survey
- Qualitative measures – open-ended questions, interviews…etc.
Using a conceptual model for process evaluation

Mechanisms of behavior change for physical activity programs

Choice, Control & Change
Conceptual model for evaluation

**Process evaluation components**

- **Teacher Professional Development**
  - Workshops
  - On-going teacher support

- **Teacher Implementation**
  - Faithfulness
  - Completion

- **Student Reception**
  - Student engagement
  - Classroom management
  - Student satisfaction

**Outcome evaluation components**

- Mediating variables
- Behavioral outcomes
  - Behaviors: Increasing fruits and vegetables, water, and physical activity, and decreasing sweetened beverages, packaged snacks, and fast food restaurant.
  - Mediating variables
    - Outcome expectations, intention to change, perceived barriers, self-efficacy, and autonomous motivation (competence and autonomy)
    - Knowledge
    - Interests in science
Using a conceptual model for process evaluation

- Helps to determine which components to measure
- Guides for when and how to measure data
- Helps for organization of data
- Clarifies the interactive relationships among process components upon the student outcome measures (i.e. mediating, moderating effects)
- Guides for a comprehensive data analysis plan
- Helps to explain the results in a systematic manner
Choice, Control, & Change
Choice, Control & Change

- A cluster randomized controlled trial during the 2006-2007 school year
- Middle schools in low-income neighborhoods, New York City
- 10 schools were paired, and within pairs, randomly assigned into intervention or control conditions: n=1136
- Curriculum was implemented in science class
Choice, Control & Change

Aims to develop **competence** in navigating today’s complex food system and sedentary environment.

**Behavioral theories**

- Social cognitive theory
- Self-determination theory

**Science education**

- Inquiry-based learning
Choice, Control & Change

**Target behaviors (Energy balance related behaviors)**

- Eat more fruit and vegetables
- Drink more water
- Drink fewer sweetened beverages
- Eat fewer packaged snacks
- Eat less frequently at fast food restaurants
- Walk more
Choice, Control & Change

Theory based psychosocial constructs (potential mediating variables)

- Intention to change
- Outcome expectations
- Perceived barriers
- Self-efficacy
- Personal agency / autonomous motivation
  - competence
  - autonomy
Choice, Control, & Change

How can we use scientific evidence to help us make healthful food and activity choices?

Unit 1: Questioning Our Choices
What influences our food and activity choices?
Lesson 1: Matter of Choice
Lesson 2: What We Like
Lesson 3: Our Food Environment
Lesson 4: Research in the Community

Unit 2: Bodies in Motion
How can we make sure that we get the right amount of energy to help our bodies do what we want them to?
Lesson 5: Making the Case
Lesson 6: Inside Calvin
Lesson 7: Burning Up
Lesson 8: Balancing Act
Lesson 9: My Body

Unit 3: Moving Toward Health
How can we use personal data to make healthful food and activity choices?
Lesson 10: Energy In
Lesson 11: Energy Out
Lesson 12: Selecting Food Goals
Lesson 13: How to Add Steps

Unit 4: Body Science
Why are healthful food and activity choices important for our bodies?
Lesson 14: Keeping It Pumping
Lesson 15: Keeping the Flow
Lesson 16: Fighting Diabetes
Lesson 17: Telling Others Why to Do It

Unit 5: Maintaining Competence
How can I maintain my skills as a competent eater and mover?
Lesson 18: Bringing it All Together
Lesson 19: Sharing the Health

Choice, Control, & Change
How can we use scientific evidence to help us make healthful food and activity choices?
Learn scientific evidence for why and skills in how to make healthful food and activity choices.
For students to become competent eaters and movers.
Choice, Control & Change

Teacher professional development

• A 6.5 hour workshop at Teachers College
• On-going teacher support throughout
Choice, Control & Change
Choice, Control & Change

Outcome evaluation results

Behaviors

- Decreased sweetened drinks and packaged snacks intakes
- Chose smaller sizes of fast food
- Increased intentional walking for exercise
- Decreased recreational screen time
- No increases in water, fruits, and vegetables.

Psychosocial variables

Showed substantial increases in

- Positive outcome expectations about the behaviors
- Self-efficacy
- Intention to change
- Autonomous motivation: competence, and autonomy.

Purpose of the current study

to examine the implementation of Choice, Control & Change intervention, using a conceptual model derived from the literature.
Choice, Control & Change

Process evaluation components

Teacher Professional Development
- Workshops
- On-going teacher support

Teacher Implementation
- Faithfulness
- Completion

Student Reception
- Student engagement
- Classroom management
- Student satisfaction

Competing programs
External factors / school context

Teacher characteristics
Teachers’ curriculum evaluation
Teacher satisfaction with teaching the curriculum
<table>
<thead>
<tr>
<th>Process components</th>
<th>Measures</th>
<th>Timing of data collection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teacher professional development</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workshops</td>
<td>First workshop: evaluation form</td>
<td>Right after the workshop</td>
</tr>
<tr>
<td></td>
<td>The second workshop: Teachers’ online survey</td>
<td>Post intervention</td>
</tr>
<tr>
<td>On-going teacher support</td>
<td>Teachers’ online survey</td>
<td>Post intervention</td>
</tr>
<tr>
<td><strong>Teacher implementation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faithfulness</td>
<td>Classroom observation form</td>
<td>Throughout the intervention</td>
</tr>
<tr>
<td>Completion</td>
<td>Lesson completion form</td>
<td>Weekly during intervention</td>
</tr>
<tr>
<td><strong>Student reception</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student engagement</td>
<td>Classroom observation form</td>
<td>Throughout the intervention</td>
</tr>
<tr>
<td>Classroom management</td>
<td>Classroom observation form</td>
<td></td>
</tr>
<tr>
<td>Student satisfaction</td>
<td>Student survey</td>
<td>Post intervention</td>
</tr>
<tr>
<td><strong>Barriers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teachers’ online survey</td>
<td>Post intervention</td>
</tr>
<tr>
<td><strong>Competing programs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Student survey</td>
<td>Post intervention</td>
</tr>
<tr>
<td><strong>External factors / school context</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="http://www.insideschools.org">www.insideschools.org</a></td>
<td>Beginning of the intervention</td>
</tr>
<tr>
<td><strong>Teacher characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teachers’ online survey</td>
<td>Post intervention</td>
</tr>
<tr>
<td><strong>Teachers’ curriculum evaluation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teachers’ online survey</td>
<td>Post intervention</td>
</tr>
<tr>
<td><strong>Teacher satisfaction with teaching the curriculum</strong></td>
<td>Teachers’ online survey</td>
<td>Post intervention</td>
</tr>
</tbody>
</table>
Teacher professional development workshop evaluation

Choice, Control, and Change (C3)
Professional Development Evaluation Form

Your Name: ____________________ Your School: ____________________

1. C3 Curriculum overview: Introduction and C3 concept:
<table>
<thead>
<tr>
<th>Poor</th>
<th>Not so good</th>
<th>Satisfactory</th>
<th>Good</th>
<th>Excellent</th>
<th>NA</th>
</tr>
</thead>
</table>
   a. Clarity         | 1  | 2   | 3   | 4   | 5   | 0  |
   b. Held your attention | 1  | 2   | 3   | 4   | 3   | 0  |
   c. Provided you with new information | 1  | 2   | 3   | 4   | 5   | 0  |
   d. Provided you with useful practice opportunities | 1  | 2   | 3   | 4   | 5   | 0  |

2. Curriculum activities:
<table>
<thead>
<tr>
<th>Poor</th>
<th>Not so good</th>
<th>Satisfactory</th>
<th>Good</th>
<th>Excellent</th>
<th>NA</th>
</tr>
</thead>
</table>
   a. Clarity         | 1  | 2   | 3   | 4   | 5   | 0  |
   b. Held your attention | 1  | 2   | 3   | 4   | 5   | 0  |
   c. Provided you with new information | 1  | 2   | 3   | 4   | 5   | 0  |
   d. Provided you with useful practice opportunities | 1  | 2   | 3   | 4   | 5   | 0  |

3. Curriculum materials:
<table>
<thead>
<tr>
<th>Poor</th>
<th>Not so good</th>
<th>Satisfactory</th>
<th>Good</th>
<th>Excellent</th>
<th>NA</th>
</tr>
</thead>
</table>
   a. Clarity         | 1  | 2   | 3   | 4   | 5   | 0  |
   b. Held your attention | 1  | 2   | 3   | 4   | 5   | 0  |
   c. Provided you with new information | 1  | 2   | 3   | 4   | 5   | 0  |
   d. Provided you with useful practice opportunities | 1  | 2   | 3   | 4   | 5   | 0  |

4. Overall of the professional development session:
<table>
<thead>
<tr>
<th>Poor</th>
<th>Not so good</th>
<th>Satisfactory</th>
<th>Good</th>
<th>Excellent</th>
<th>NA</th>
</tr>
</thead>
</table>
   a. Quality of Presentation | 1  | 2   | 3   | 4   | 5   | 0  |
   b. Organization of Day | 1  | 2   | 3   | 4   | 5   | 0  |
   c. Length of the session | 1  | 2   | 3   | 4   | 5   | 0  |

5. Comments:
   ____________________
   ____________________
   ____________________
### Classroom Observation Form

**Teachers College, Columbia University**

**Choice, Control and Change (C3) Lesson Observation Form**

<table>
<thead>
<tr>
<th>Unit 4, Lesson 16: Taste</th>
<th>Observer(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date 11/16/06</td>
<td>Start time 9:45</td>
</tr>
<tr>
<td>School</td>
<td>Class 7th grade</td>
</tr>
</tbody>
</table>

**What do you think the students really got from lesson 16?**

 Aim: To examine biological taste preferences. (Check if the aim was achieved)

 They didn’t get to the point of talking about biology, but I’m assuming she will continue this next class and address that point, since she assigned questions and reading for HW.

**Key Science and Nutrition Concepts Covered**

(List and describe. Please note concepts students or teacher seem to have trouble with)

- Taste preferences

**Check off one in each section**

<table>
<thead>
<tr>
<th>FAITHFULNESS TO CURRICULUM</th>
<th></th>
<th>Augmentation</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>X</em> Altered sequence</td>
<td></td>
<td>Did as part of DoNow, also did step counts</td>
</tr>
<tr>
<td><em>X</em> Omitted materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>X</em> Inserted materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>X</em> Replacement of more authentic assessments with conventional tests</td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Score = 5 - number of checks on the list = 4 *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Will continue with this lesson next class?</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Notes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**If anything was not completed, how did the teacher make choices about what to do, what to leave out?**

**Student Engagement**

<table>
<thead>
<tr>
<th>Logistics (1)</th>
<th>Uninterested (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Few/Some involved (2)</td>
<td></td>
</tr>
<tr>
<td>- Most of them involved (3)</td>
<td></td>
</tr>
<tr>
<td>- All actively involved (4)</td>
<td></td>
</tr>
</tbody>
</table>

**Classroom Process**

<table>
<thead>
<tr>
<th>Logistics (1)</th>
<th>Major problems (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Minor problems (2)</td>
<td></td>
</tr>
<tr>
<td>- No problems (3)</td>
<td></td>
</tr>
</tbody>
</table>

**Notes**

- Describe specific situations to explain your choice.

  Students participated in tasting activity enthusiastically and cooperatively, completed independent work (building theories questions) with focus and diligence, and answered questions eagerly during whole class discussions.

- Students did exactly what was asked of them the whole class. No problems.
Teachers College, Columbia University

Choice, Control and Change (C3) Lesson Observation Form

Unit 4. Lesson 16: Taste

Date: 11/16/06
Start time: 9:45
End time: 10:30

School: [ ]
Class: 7th grade
Teacher: [ ]

What do you think the students really got from lesson 16?
Aims: To examine biological taste preferences.

They didn’t get to the point of talking about biology, but I’m assuming she will continue this next class and address that point, since she assigned questions and reading for HW.

Key Science and Nutrition Concepts Covered
(List and describe. Please note concepts students or teacher seem to have trouble with)

Taste preferences:

Check off one in each section

<table>
<thead>
<tr>
<th>Faithfulness to curriculum</th>
<th>√</th>
<th>Augmentation</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Altered sequence</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>x</em> Omitted materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>x</em> Inserted materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>x</em> Replacement of more authentic assessments with conventional tests</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Score = 5 - number of checks on the list (1, 4 or 5).
* Will continue with this lesson next class?
Yes _x_ / No __

1. HOW TO Tracker Discussion: Did as part of Do Now, also did step counts
2. Review Module and Unit Questions
3. Analyzing Favorite Foods
4. Recording Taste Responses
   - Using the instructions on the How Does it Taste activity sheet
5. Using data to build theories
   - Do the Building Theories about Taste activity sheet
6. Reading about the Biology of Taste (homework)
   - Assigned for HW
   - Read and discuss The Biology of Taste student reading

Student engagement

<table>
<thead>
<tr>
<th>Uninterested (1)</th>
<th>Few/Somewhat involved (2)</th>
<th>Most of them involved (3)</th>
<th>All actively involved (4)</th>
</tr>
</thead>
</table>

Classroom process

<table>
<thead>
<tr>
<th>Major problems (1)</th>
<th>Minor problems (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>x</em> No problems (3)</td>
<td></td>
</tr>
</tbody>
</table>

Notes

Describe specific situations to explain your choice.

Students participated in tasting activity enthusiastically and cooperatively, completed independent work (building theories questions) with focus and diligence, and answered questions eagerly during whole class discussions.

Students did exactly what was asked of them the whole class. No problems.
**Classroom Observation Form**

---

**Teachers College, Columbia University**  
*Choice, Control and Change (C3) Lesson Observation Form*

<table>
<thead>
<tr>
<th>Unit 4. Lesson 16: Taste</th>
<th>Observer(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date 11/16/06</td>
<td></td>
</tr>
<tr>
<td>Start time 9:45</td>
<td>End time 10:30</td>
</tr>
<tr>
<td>School</td>
<td>Class 7th grade</td>
</tr>
<tr>
<td>Teacher</td>
<td></td>
</tr>
</tbody>
</table>

**What do you think the students really got from lesson 16?**  
* Aim: To examine biological taste preferences  
  (Check if the aim was achieved)  
  They didn’t get to the point of talking about biology, but I’m assuming she will continue this next class and address that point, since she assigned questions and reading for HW.*

**Key Science and Nutrition Concepts Covered**  
(List and describe. Please note concepts students or teacher seem to have trouble with)  
*taste preferences*

**Check off one in each section**  
<table>
<thead>
<tr>
<th>Faithfulness to curriculum</th>
<th>Augmentation</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Altered sequence</em></td>
<td></td>
</tr>
<tr>
<td><em>x</em> Omitted materials</td>
<td></td>
</tr>
<tr>
<td><em>x</em> Inserted materials</td>
<td></td>
</tr>
<tr>
<td><em>x</em> Replacement of more authentic assessments with conventional tests</td>
<td></td>
</tr>
<tr>
<td>* Score = 5 - number of checks on the list - <em>x</em></td>
<td></td>
</tr>
<tr>
<td>* Will continue with this lesson next class? Yes <em>x</em>/ No <em>x</em></td>
<td></td>
</tr>
</tbody>
</table>

**If anything was not completed, how did the teacher make choices about what to do, what to leave out?**

---

**Student engagement**  
*Uninterested (1)*  
*Few/Somewhat involved (2)*  
*Most of them involved (3)*  
*All actively involved (4)*

**Classroom process**  
*Major problems (1)*  
*Minor problems (2)*  
*x No problems (3)*

---

**Notes**  

---

*Students participated in tasting activity enthusiastically and cooperatively, completed independent work (building theories questions) with focus and diligence, and answered questions eagerly during whole class discussions.*  
*Students did clearly what was asked of them the whole class. No problems.*
### Classroom Observation Form

#### Teachers College, Columbia University
**Choice, Control and Change (C3) Lesson Observation Form**

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#### What do you think the students really got from lesson 16?
- To examine biological taste preferences (Check if the aim was achieved)
- They didn't get to the point of talking about biology, but I'm assuming she will continue this next class and address that point, since she assigned questions and reading for HW.

#### Key Science and Nutrition Concepts Covered
- List and describe. Please note concepts students or teacher seem to have trouble with:
- taste preferences

#### Check off one in each section
- **Faithfulness to curriculum**
  - _Altered sequence_
  - _x_ Omitted materials
  - _x_ Inserted materials
  - _x_ Replacement of more authentic assessments with conventional tests
  - * Score = 5 - number of checks on the list = __4__
  - * Will continue with this lesson next class?
    - Yes _x_ / No _

#### Augmentation
- Did as part of DoNow, also did step counts
- Did a Do Now. What is taste to you?
- Using the instructions on the How Does it Taste activity sheet
- Do the Building Theories about Taste activity sheet
- Assigned for HW

#### If anything was not completed, how did the teacher make choices about what to do, what to leave out?

#### Student engagement
- _Uninterested (1)_
- _Few/Some involved (2)_
- _Most of them involved (3)_
- _x_ All actively involved (4)

#### Classroom process
- _Major problems (1)_
- _Minor problems (2)_
- _x_ No problems (3)

#### Notes
Describe specific situations to explain your choice.

Students participated in tasting activity enthusiastically and cooperatively, completed independent work (building theories questions) with focus and diligence, and answered questions eagerly during whole class discussions.

Students did exactly what was asked of them the whole class. No problems.
Lesson completion form

<table>
<thead>
<tr>
<th>Lesson completion</th>
<th>Notes/Augmentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>None (1)</td>
<td>Projects on body systems and diseases that can affect them.</td>
</tr>
<tr>
<td>Small portion (2)</td>
<td></td>
</tr>
<tr>
<td>Half (3)</td>
<td></td>
</tr>
<tr>
<td>Most sections (4)</td>
<td></td>
</tr>
<tr>
<td>All (5)</td>
<td>Some students did not have time to finish this.</td>
</tr>
</tbody>
</table>

Lesson 1: Body Smart

1. Introduce Module and Unit Questions
2. Discuss Body Function
3. Heart Rate Experiment: Relaxation
   • Record their data on the Collecting Data activity sheet
4. Heart Rate Experiment: Exercise
5. Muscle Contracting Experiment
   • Record specific observations on the Collecting Data activity sheet
6. Researching Hearts and Muscles
   • Do the Hearts and Muscles student reading
7. Introduce QuESTA
8. Developing Theories
9. Wondering About My Body (Homework)

NOTES: If anything was not completed, how did the teacher make choices about what to do, what to leave out? Some students did not finish answering the “theorizing” section, but the class covered all parts of the lesson. Confusion about multiple numbers in student packet – maybe student page number can be highlighted or in color to reduce this problem? Additionally, students made posters to encourage others to stay fit, exercise and eat healthy.
Data Analysis

- Descriptive statistics
- Content analysis for qualitative data
- Chi-square, Spearman’s rho correlation for non-parametric statistics
- Software: SPSS v.17
## Results: Demographics

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Schools</strong></td>
<td>n=5</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td>31.0% African American, 67.0% Hispanic</td>
</tr>
<tr>
<td>% free and reduced lunch</td>
<td>82.8%</td>
</tr>
<tr>
<td>Reading score (1-5)</td>
<td>1.6 (.5)</td>
</tr>
<tr>
<td><strong>Students</strong></td>
<td>n=562</td>
</tr>
<tr>
<td>Grades</td>
<td>9% 6th grade, 91% 7th grade</td>
</tr>
<tr>
<td>Gender</td>
<td>51% boys</td>
</tr>
</tbody>
</table>

Reading scoring systems represent proportion of students who met standards on the state tests: 1 = 0-19%, 2 = 20-39%, 3 = 40-59%, 4 = 60-79%, 5 = more than 80%
Values represent mean (standard deviation)
## Results: PD evaluation

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C3 curriculum overview: introduction and C3 concepts</td>
<td>4.8 (.4)</td>
</tr>
<tr>
<td>Curriculum activities</td>
<td>4.7 (.5)</td>
</tr>
<tr>
<td>Curriculum materials</td>
<td>4.7 (.5)</td>
</tr>
<tr>
<td>Overall of the professional development session</td>
<td>4.7 (.4)</td>
</tr>
</tbody>
</table>

a. Response options: 1 = Poor; 2 = Not so good; 3 = Satisfactory; 4 = Good; 5 = Excellent; 6 = N/A
Results: On-going teacher support

“…The implementation coordinator helped me focused and on track with the program and the implementation of the activities..”
Results: On-going teacher support

“The continued development and support from the implementation coordinator was an invaluable asset to the classroom. C3 would not have been successful without the implementation coordinator’s help…”
## Results: Teacher implementation

<table>
<thead>
<tr>
<th>Measure</th>
<th>Range</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faithfulness to the curriculum (1-5) (^{a})</td>
<td>3.1 - 4.7</td>
<td>3.8 (.4)</td>
</tr>
<tr>
<td></td>
<td>62 - 93%</td>
<td>76%</td>
</tr>
<tr>
<td>Lesson Completion (%)</td>
<td>60 - 93%</td>
<td>70%</td>
</tr>
</tbody>
</table>

Scoring system: 5 = if nothing was changed; the number of cases subtracted when any of following cases happened: teachers altered sequence of the curriculum, omitted materials, inserted materials, or had replacement of authentic assessments with conventional tests.
## Results: Student reception

<table>
<thead>
<tr>
<th>Measure</th>
<th>Range (%)</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student Engagement (1-4)</strong></td>
<td>2 - 4</td>
<td>2.9 (.6)</td>
</tr>
<tr>
<td></td>
<td>(48.8 - 100%)</td>
<td>72.3%</td>
</tr>
<tr>
<td><strong>Classroom process (1-3)</strong></td>
<td>1 - 3</td>
<td>2.0 (.6)</td>
</tr>
<tr>
<td></td>
<td>(33.3 - 100%)</td>
<td>66.5%</td>
</tr>
<tr>
<td><strong>Student satisfaction (1-4)</strong></td>
<td>1-4</td>
<td>2.9 (.9)</td>
</tr>
</tbody>
</table>

a. Scoring system: 1 = uninterested, 2 = few/some involved, 3 = most of them involved, 4 = all actively involved  
b. Scoring system: 1 = major problem , 2 = minor problems, 3 = no problems  
c. Response options: 1 = not at all; 2 = a little; 3 = somewhat; 4 = mostly
## Results:
### Teacher characteristics

<table>
<thead>
<tr>
<th>Measure</th>
<th>Range (%)</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (1-4) (^a)</td>
<td>1-3</td>
<td>1.4 (.8)</td>
</tr>
<tr>
<td>Total years of teaching (1-5) (^b)</td>
<td>1 - 5</td>
<td>2.3 (1.6)</td>
</tr>
<tr>
<td>Number of times attending professional development activities (1-5) (^c)</td>
<td>1-5</td>
<td>2.6 (1.6)</td>
</tr>
</tbody>
</table>

- \(^a\) Response options: 1 = 20-29; 2 = 30-39; 3 = 40-49; 4 = 50+
- \(^b\) Response options: 1 = ~1 year; 2 = 2 years; 3 = 3 years; 4 = 4 years; 5 = 5 years+
- \(^c\) Response options: 1 = none; 2 = 1 to 2 per year; 3 = 3 to several times per year; 4 = once per month; 5 = more than twice per month
## Results: Teachers’ curriculum evaluation

Compare the C3 program with other science curricula you have taught in the following areas

| Connections to the science content standards you needed to cover for your grade | Range (1-5) | Mean (SD) | Spearman’s rho correlation coefficients |
|---|---|---|---|---|
|  | 1-4 | 2.71 (1.1) | -.46 | -.02 | -.32 |
| Quality of student worksheets | 3-4 | 3.43 (.5) | -.14 | .43 | .07 |
| Quality of student reading material | 2-4 | 3.29 (1.0) | .18 | .18 | .26 |
| Amount of class discussions | 3-5 | 3.57 (.8) | .12 | .12 | -.06 |
| Number of student presentations | 1-5 | 3.29 (1.3) | -.11 | -.11 | -.26 |
| Amount of individual work (worksheets and writing) | 1-5 | 2.86 (1.2) | -.81* | -.34 | -.80* |
| Number of discipline issues that occurred during lessons | 1-3 | 3.29 (.8) | -.41 | -.41 | -.41 |

*a. Response options 1 to 5: 1=less than others; 3=same as others; 5=more than others

* p < .05
## Results: Teacher satisfaction with teaching the curriculum

<table>
<thead>
<tr>
<th>Measure</th>
<th>Range</th>
<th>Mean (SD)</th>
<th>Teacher implementation</th>
<th>Student reception</th>
<th>Student satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you like teaching C3 curriculum in your class(es)?</td>
<td>3-5</td>
<td>4.0 (.8)</td>
<td>.57</td>
<td>.38</td>
<td>.76*</td>
</tr>
</tbody>
</table>

c. Response options: 1 = not at all; 2 = a little; 3 = somewhat; 4 = mostly; 5 = completely

* p < .05
Results:
Other Factors

• Implementation barriers:
  o Behavioral issues in class
  o Time conflicts with other schedules
  o Students’ language barriers (Spanish speaking)

• Competing programs: no competing program

• External factors / School context:
  o Schools with higher African American population showed higher implementation and student satisfaction rates (p<.01) (opposite direction with Hispanic, p<.05)
Results:
Field notes analysis

• Students were highly engaged in hands-on activities, but less so in reading, writing, or discussions
• Teachers’ classroom management styles influenced the implementation process
Conclusion

• A systematic conceptual model provides better understanding about the intervention pathway and interactive relationships among process components

• Teacher workshops and on-going teacher support are important to maintain the curriculum implementation

• Both quantitative and qualitative process data in the Choice, Control & Change study provided useful information on implementation process and helped us to better understand the intervention outcomes
The findings of the current study…

- Provide valuable information to refine the curriculum for dissemination
- Provide an evaluation model for school-based nutrition education programs in similar classroom settings

Further research is needed to determine mediating / moderating process evaluation components on intervention outcome data
Become an SNEB member!

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• Associate Member - $95 per year
• Student Member - $60 per year
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• Free access to live and recorded webinars
• Deepest discount to attend the SNEB Annual Conference
• Membership in an SNEB specialty division
• Connection to other professionals through SNEB listserv
• www.sneb.org/join