Strategy for Expanding Nutrition Professionals' Competency: A Pilot Case Study in Dissemination and Implementation Science Training

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Abstract

Dissemination and Implementation (D&I) science trainings are essential to build knowledge for a variety of current and future health professionals. The objective of this study was to pilot-test and assess implementation of a nutrition-specific D&I science training. Participants (students enrolled in nutrition and public health programs) completed pre/post surveys and exit interviews. We used descriptive statistics and qualitative thematic analysis with deductive coding, in which coding and theme development were directed by existing concepts. Initial coding was completed by one researcher and validated by an additional researcher to describe and provide examples of the categories of the Kirkpatrick Model and Implementation Outcomes Framework. The evaluation of training was positively supported through the Kirkpatrick Scale results (mean scores between 6.94 ± 1.7 (Learning) and 7.35 ± 1.9 (Reaction)) and qualitative findings (increased confidence in D&I science and positive feedback on active learning strategies (application-based learning, mentorship, and discussions). Participants ($n = 8$) described the learning activities (case studies, discussions, projects), the structure of the course (flipped classroom, content, learning strategies), the setting (hybrid, online), and mentorship (continuous feedback on assignments) as enabling effective implementation, which reflect with positive Implementation Outcome findings (3.59 ± 1.26, appropriateness score 3.94 ± 0.85, and feasibility score of 4.09 ± 0.67). These findings support positive implementation feasibility and program evaluation. Future studies need to compare changes in knowledge, attitudes, and beliefs among current or future nutrition professionals before and after completing this training.

Keywords: Dissemination and Implementation, Training, Nutrition Professionals, Curriculum Development, Capacity Building

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Introduction

Nutrition education interventions, typically facilitated by nutrition professionals, such as hospital clinicians (Registered Dietitians), education specialists (Cooperative Extension or Public Health Departments), and academics and researchers, show positive behavioral modification adaptation and health outcomes (e.g., increased fruit and vegetable consumption, decreased blood pressure, and decreased visceral and body fat levels) (Brace et al., 2018; da Silva Lopes et al., 2017; Gwynn et al., 2019). However, many of these studies lack evaluation of implementation outcomes, which can affect implementation challenges cited in nutrition intervention research (Brace et al., 2018; da Silva Lopes et al., 2017; Gwynn et al., 2019).

Implementation outcomes describe strategies that contribute to the effectiveness of an intervention to address health behaviors and clinical outcomes of interest (Proctor et al., 2010; Weiner et al., 2017). Differentiating between implementation effectiveness and treatment effectiveness is a critical component of dissemination and implementation (D&I) science (Proctor et al., 2010). D&I science seeks to understand and overcome barriers to adoption and sustainability, as well as methodological issues of interventions that address complex problems (Walker et al., 2021). This makes D&I trainings essential to build capacity in the workforce, and to increase participants' self-efficacy, motivation, confidence, and intentions to use (Park et al., 2018).

Some researchers suggests that the cited implementation challenges, for example, lack of reported implementation outcomes, sustainability, longevity, replicability, and adaptability of nutrition education interventions are influenced by the lack of available nutrition-specific D&I trainings (Koorts et al., 2020; Walker et al., 2021). The absence of a nutrition-specific D&I science training (Davis & D'Lima, 2020) challenges nutrition professionals to use D&I science because they do not have opportunities to increase their self-efficacy (Koorts et al., 2020; Walker et al., 2021). Therefore, this hinders use and confidence among nutrition academics, clinicians, and education specialists in D&I Science and affects the effective implementation of nutrition interventions. Nutrition professionals (academics, clinicians, nutrition education specialists) should be concerned and want to explore potential participation in a nutrition-specific, D&I science training to further align with evidence-based and outcomes-focused education (Kris-Etherton et al., 2014). Therefore, the purpose of this pilot study was to assess the implementation of a nutrition-specific D&I science training among future nutrition professionals.

Methods

Study Design

We conducted a pilot test case study approach to an eight-week intervention during the 2021-2022 academic year. A pilot test case study approach allows for in-depth, multifaceted explorations of complex topics in a real-world setting (Crowe et al., 2011). This approach obtains intervention information in a realistic setting (Crowe et al., 2011). We recruited high-standing undergraduate students or graduate students at West Virginia University with an interest in health and nutrition interventions during class enrollment periods (March 2021 and October 2021) via email, flyers, and academic advisors in nutrition and public health. The aim was to assess if a nutrition-specific D&I curriculum was positively evaluated and implemented. The authors' hypothesized that the specific intervention practices (learning strategies, structure, content, delivery/setting) would positively influence the success of implementation (acceptability, feasibility, and appropriability) and program evaluation (reaction to, learning from, behavior change, and results of the training). Overall, we aimed to illuminate key areas of feasibility, acceptability, and appropriability, and offer detailed information for future adaptation and scalability.

Description of the Nutrition-specific D&I Science Training

A detailed expert review and samples of the nutrition-specific D&I science training are described in a separate publication (Walker et al., 2023) and synthesized here. Participants enrolled in public health,

nutrition, and exercise science majors at West Virginia University were enrolled in an eight-week training. These participants were included in this study based on prior research that requests for more D&I science training among this population (Koorts et al., 2020; Walker et al., 2021). The sample size for pilot studies is typically 8-12 participants; however it can vary depending on the main objective of the study (Lewis et al., 2021). Therefore, the target sample size for this study was 8-12 participants.

An eight-week intervention that met asynchronously once a week (60-minute session) and participants accessed all training material through an online learning management system (Blackboard). One trained instructor facilitated the eight-week intervention.

To frame the training modules, an adapted version of the *design-focus framework* was applied (Ramaswamy et al., 2019). The training framework included four major training modules including design and planning, sustainability and equity, intervention and implementation, and evaluation and adaptation. Over half of the training material aligns with the validated D&I competencies (Walker et al., 2023), which guided the weekly objectives and learning materials (Padek et al., 2015). The training's learning and teaching strategies were situated around the Theory of Planned Behavior (Ajzen, 1985) to target attitudes, perceived behavioral control, and normative beliefs through increasing knowledge (Walker et al., 2023). One meta-analysis described that real-world interventions using the Theory of Planned Behavior can expect higher changes in one or some of the theory constructs when compared to individual interventions (Steinmetz et al., 2016), which makes it a useful theory to guide a novel training. The learning strategies are derived from inquiry-based and problem-based learning designed to enhance behavior

change and adoption. Students engaged in peer-led mentorship and collaborative learning through guided discussions (Appendix A) and case studies (Appendix B). Students submitted weekly discussion questions, case studies, research projects, and a final implementation plan (Appendix C).

Evaluation of the Pilot Nutrition-specific D&I Science Training Curriculum

The training was evaluated in two areas: (1) participant reaction, learning, and behavior change after partaking in curriculum (2) and assessing the feasibility, appropriateness, and acceptability of the training program. Data were collected via a pre/post survey online, via Qualtrics, and 20-min Zoom interviews. Consent was obtained via email prior to the start of the training program.

Behavioral Outcome Survey Development and Data Collection

Surveys included a 40-item pre survey and a 42-item post survey. Results only report the Kirkpatrick learning outcomes, implementation outcomes, and demographics. Demographic variables including race, gender, and level of education were quantitatively reported by self-selecting relevant information. Age and study or program area were self-reported.

Participant Learning Survey Development and Data Collection

The Kirkpatrick Model is the best known model for analyzing and evaluating the results of training and educational programs through four constructs – reaction, learning, behavior, and results (Kirkpatrick & Kirkpatrick, 2016). Level 1, *reaction* describes the degree to which participants find the training favorable, engaging, and

relevant. Level 2, *learning*, describes the degree to which participants acquire intended knowledge. Level 3, *behavior*, is the degree to which participants apply what they learn to their career. Level 4, *results*, is the extent to which target outcomes (learning objectives) are reached as a result of the training (Kirkpatrick & Kirkpatrick, 2016). Survey measurements were centered on previous Kirkpatrick learning assessments (Kirkpatrick & Kirkpatrick, 2016). The pre-survey contained 6 questions that asked participants to self-rank their current D&I science confidence, commitment, career application, achievement, and previous learning on a 10-point Likert scale. The post-survey contained the same self-ranking questions with an additional question for participants to rank reaction, learning, behavior, and results as a product of the training to evaluate Kirkpatrick constructs on a 10-point Likert scale. Associated survey questions and responses were averaged for an overall mean score for each level.

Implementation Evaluation: Optimizing the Validated Implementation Outcomes Measures

These measures advance understanding of the implementation process, which provides a pathway for further effectiveness research (Lewis et al., 2015). Implementation outcomes (acceptability, appropriateness, and feasibility) were measured for this study to identify components of the implementation that assist with or hindered behavioral outcomes. Acceptability, appropriateness, and feasibility of intervention implementation were measured on a five-point Likert scale using validated, psychometric measurements (Weiner et al., 2017). Survey responses were averaged for an overall mean score for each measure.

Exit Interviews

Exit interviews were conducted in 20-minute Zoom sessions with each individual who emailed and signed the written consent to participate. The interview guide was framed to provide exploratory data that would describe and align key aspects of the training with the Implementation Outcomes, and the Kirkpatrick Learning quantitative outcomes and categories. Participants were asked to give examples of the course context, content, material, structure, and assignments and how they were/were not satisfactory, compatible, or feasible. Interviews were conducted by one trained facilitator the week after the training was completed.

Data Analysis

Quantitative data were analyzed in JMP software (version pro 14, SAS Institute Inc, Cary, NC) and included descriptive statistics and frequency analysis. Likert items were scored by averaging associated responses, which follows previous validated analyses (Francis et al., 2004; Kirkpatrick & Kirkpatrick, 2016; Weiner et al., 2017).

Qualitative thematic analysis used deductive coding; in which coding and theme development are directed by existing concepts (Daly et al., 1997). Initial coding was analyzed by one researcher (AEW), who has previous experience in qualitative analysis (Walker et al., 2021). Each interview response was coded to categories in the Kirkpatrick Learning Model and the Implementation Outcomes Framework. Then, data were validated by an additional author (EAC) to ensure provided examples of course material and outcomes aligned to the Kirkpatrick Model and Implementation Outcomes Framework categories. Coding occurred using NVivo Pro 12 (QSR International). Biases were reduced by authors approving interview guides, using

Table 1
Demographics

Categories	Subcategories	N (%) or M(SD)
Age		22.3± 2.1
Gender	Male	1 (12.5)
	Female	7 (87.5)
Hispanic	Hispanic	0 (0)
	Non-Hispanic	8 (100)
Race	White	5 (62.5)
	Black/African American	1(12.5)
	Asian	2 (25)
Education	Some college with no degree	5 (62.5)

deductive coding, and assuring that the questions corresponded with the theoretical underpinnings.

Results

Demographics

Table 1 provides demographic information about the eight participants that completed all study procedures. Participants' majors included exercise physiology ($n = 2$), public health ($n = 4$) and human nutrition ($n = 2$).

Mixed-Methods Results of Implementation Outcomes and Kirkpatrick Evaluation

Table 2 summarizes the Kirkpatrick Likert scale mean score (lowest 1 and highest 10) for the four constructs and associated qualitative categories. Participants ($n = 8$) positively evaluated their learning after completing the training. Table 2 also shows implementation outcomes (lowest 1 and highest 5) for each of the three constructs and associated qualitative categories. Overall, participants found the training to be feasible, acceptable, and appropriate for the given setting and population. The narrative below provides more detail on each category and the

qualitative examples that supported or deterred participant evaluation.

Kirkpatrick Model Qualitative Results

Application-based learning (case studies, intervention implementation plan projects), inquiry-based learning (research and problem solving), discussion-based learning (discussion forums), mentorship (building relationships with facilitator and discussion of feedback), problem-based learning (case studies), and building off previous assignments (continuous feedback) were all enabling learning strategies in their experience. Regarding student *reaction*, some reported that the delivery and length of this course (eight weeks) deterred them from having an in-depth understanding of the course material. Similarly, participants indicated that the course language was at first difficult to grasp, further, that instruction could improve student reaction.

With respect to *learning*, students qualitatively reported their increased confidence and commitment to using D&I after completing this course and were able to synthesize and formulate an understanding of D&I concepts. Again, participants indicated that the course language was challenging at first. Furthermore, many responded that the timing and workload of the course affected their absorption of information. Students identified the importance of accountability and participation in the course and many stated that intrinsic motivation facilitated their learning.

Regarding *behavior*, students reported that they gained new insight and strategies they can apply in the public health and nutrition work force. They indicated an increase to intention to use and confidence in independent learning. Again, timing and workload of the course affected application of information for some. Additionally, intrinsic motivation and accountability impact student behavior and learning.

From the qualitative *results*, all student reported achieving and learning aspects of each of the five student learning outcomes as shown below:

- Apply D&I beginner competencies and systems thinking perspectives in designing, planning, and evaluating nutrition education interventions.
- Analyze and summarize benefits and challenges of current nutrition education interventions through D&I frameworks and evaluation tools.
- Utilize understanding of systems thinking by identifying barriers and facilitators of implementation of nutrition education interventions through causal-loop diagramming.
- Identify, describe, analyze, and construct a narrative in ways to incorporate D&I strategies in adapting current nutrition education interventions.
- Demonstrate complex nutrition intervention implementation problem solving in case studies scenarios and guided discussions.

Again, students mentioned the importance of intrinsic motivation and participation in the course to see results.

AIM Implementation Outcomes Qualitative Results

The current curriculum was deemed moderately *acceptable* (3.59 ± 1.26) with learning activities (case studies, discussions, implementation planning projects) and learning strategies (application-based learning, inquiry-based learning, discussion-based learning, mentorship, problem-based learning, and building off previous assignments) facilitating satisfaction. Qualitative results were mixed about the delivery mode (hybrid, flipped classroom,

Table 2

Implementation and learning outcomes among training participants (N = 8)

	Definition of Category	Kirkpatrick Likert Scale Mean Score (N = 8)	Supporting Qualitative Categories (N = 8)	Deterring Qualitative Categories (N = 8)
Reaction	The degree to which participants find the training favorable, engaging, and relevant to their jobs	7.35 ± 1.9 Min: 4.4 Max: 10	1.Application-Based Learning 2.Discussion-Based Learning 3.Inquiry-Based Learning 4.Building Upon Previous Assignments 5. Mentorship 6. Scenario-Based Learning	1.Delivery Mode (online) 2.Time (8-weeks) 3. D&I Language 4.Clarification on assignments
Learning	The degree to which participants acquire the intended knowledge, skills, attitude, confidence, and commitment based on their participation in the training	6.94 ± 1.7 Min: 4.3 Max: 10	1.Increased confidence and commitment 2. Ability to formulate and synthesize D&I Science	1.Workload impacted absorption and application 2.D&I science language 3. Accountability and participation
Behavior	The degree to which participants apply what they learned during training when they are back on the job	7.04 ± 2.2 Min: 3 Max: 10	1.Increased intention to use 2.Independent Learning 3.Gained strategies to apply in work force	1.Workload impacted absorption and application 2.Accountability and participation
Results	The degree to which targeted outcomes occur as a result of the training and the support and accountability package	7.13 ± 1.9 Min: 4.25 Max: 10	1.Student Learning outcomes achieved	1.Accountability and participation

	Definition of Category	AIM Likert Scale Mean Score (N=8)	Enabling Qualitative Categories (N=8)	Deterring Qualitative Categories (N=8)
Acceptability	perception among participants that a given treatment, service, practice, or innovation is agreeable, palatable, or satisfactory	3.59 ± 1.26 Min: 1 Max: 5	1.Learning Activities (i.e., case studies, discussions, projects) 2.Palatable for academia (i.e., training structure, content, learning strategies)	1. Delivery Mode (online) 2.Time (8-weeks) 3. Lack of detail
Appropriateness	is the perceived fit, relevance, or compatibility of the innovation or evidence-based practice for a given practice setting, provider, or consumer; and/or perceived fit of the innovation to address an issue or problem.	3.94 ± 0.85 Min: 2.5 Max: 5	1.Problem-Based Learning 2.Setting (hybrid) 3.Mentorship 4. Inquiry-Based Learning	1.Delivery dependent on current skill set
Feasibility	is defined as the extent to which a new treatment, or an innovation, can be successfully used or carried out within a given agency or setting.	4.09 ± 0.67 Min: 3.25 Max: 5	1. Reinforcing learning by workflow 2. Delivery (hybrid) 3. Teaching strategies 4. Mentorship 5. Setting (nutrition and academic)	1. Assignment needed clarification 2. Directive approaches 3. 8-week structure

eight-week course). Some suggested it was helpful to have it truncated to help with learning, whereas others said the lack of time affected their ability to comprehend material.

The current curriculum was deemed *appropriate* (3.94 ± 0.85) with learning activities case studies, discussions, implementation planning projects) and learning strategies (application-based learning, inquiry-based learning, discussion-based learning, mentorship, problem-based learning, and building off previous assignments) facilitating perceived fit to academia. A major appropriateness factor to address is how to deliver the course based on the current skill set of each individual student to make it more compatible with scholar needs.

The current curriculum was deemed *feasible* (4.09 ± 0.67) with learning strategies (application-based learning, inquiry-based learning, discussion-based learning, mentorship, problem-based learning, and building off previous assignments (reinforcing learning by workflow)), setting (nutrition department in higher education), and delivery (hybrid, flipped classroom) successfully used in a university setting. For higher feasibility, students suggested more clarification (and more directions on assignments), more structured (and mandatory) in-person class time, and a full semester course.

Discussion

This study provides translatable information for the implementation of a nutrition-specific D&I training and informs a strategy to increase competence among nutrition professionals, which is a primary focus of the Society of Nutrition Education and Behavior (Society of Nutrition Education and Behavior, 2016). Findings express a solution to prepare more nutrition D&I experts through real-world training.

Collecting mixed-methods data using the Kirkpatrick Learning Model bolstered findings by triangulating data to improve understanding of students' quantitative outcomes *and* qualitative perceptions. The qualitative results support the current learning strategies (i.e., application-based learning, inquiry-based learning, discussion-based learning, mentorship, problem-based learning, and building off previous assignments) of the curriculum, which were suggested by previous research to be beneficial (Walker et al., 2021) and recommended by experts (Walker et al., 2023). Likewise, students reported gaining confidence in all student learning outcomes, which supports the training implementation strategies used for instruction.

This study is comparable to many of the teaching and learning strategies of previous courses. For example, one of the first D&I science trainings for researchers in Canada used mentorship through group activities and discussion (Kho et al., 2009). Additionally, the same training incorporated similar learning activities to the current curriculum, such as developing an implementation plan so students could understand the process and proper evaluation of health interventions (Kho et al., 2009). Furthermore, participants found other activities (group projects and discussions) to be impactful on learning. The evaluation outcomes of this training suggested the importance of mentorship, continuous discussion of feedback, and content that facilitates learning, elements comparable to our results.

Since then, competencies for D&I Science trainings have been developed and studied to streamline learning outcomes (Padek et al., 2015). Trainings that used the D&I Science competencies illustrate positive student learning outcomes from baseline to 18 months after training (Padek et al., 2018). Similarly, our results express that the content of the course, which was mapped to align

with the D&I competencies in a previous study (Walker et al., 2023), had positive outcomes in learning, reaction, behavior, and results for participants.

Additional trainings use active-learning strategies (practicing skills, solving problems, proposing solutions) to instruct workshop content based on the D&I competencies, which saw positively affects student learning outcomes (Morrato et al., 2015). Overall, mentorship, competency-based content, and active learning strategies seem to be important aspects of D&I training curricula and student learning outcomes, which are similar to our findings.

In contrast to previous research, we targeted a population of nutrition and public health undergraduate and graduate students, which is an underrepresented population. Many studies have identified a critical knowledge gap among nutrition professionals in D&I science (Koorts et al., 2020; Walker et al., 2021; Warren et al., 2020), yet no nutrition-specific D&I science training exists (Davis & D'Lima, 2020). Therefore, our study provides an initial foundation for D&I science training for nutrition.

Similarly, assessing the implementation outcomes of the training improved facilitator knowledge on what was and was not feasible, appropriate, and acceptable, which is reflective of current nutrition implementation outcomes research (Soto et al., 2018; Thomson et al., 2018; Whatnall et al., 2019). For example, Thomson et al. (2018) reported high satisfaction, high retention rates, and increased knowledge and understanding among participants who completed an online nutrition education intervention. Inversely, Soto et al. (2018) describe that the retention rate of their nutrition education intervention was low because targeted strategies were not appropriate or acceptable for their audience (low-income, minority women), which identified areas for improvement and implementation adaptations. Evaluating and reporting implementation outcomes provides preconditions for attaining patient-centered outcomes, effects of processes, and identifies adaptations to enhance effectiveness (Weiner et al., 2017). This study was one of the first nutrition interventions to use validated psychometric implementation outcomes measurements (Weiner et al., 2017), which improved overall conceptual clarity of what to monitor during intervention implementation. Participants ($n = 8$) described the learning activities (case studies, discussions, projects), the structure of the course (flipped classroom, content, learning strategies), the setting (hybrid, online), and mentorship (continuous feedback on assignments) as enabling effective implementation, which reflect with positive Implementation Outcome findings (3.59 ± 1.26, appropriateness score 3.94 ± 0.85, and feasibility score of 4.09 ± 0.67). Assessing acceptability, appropriability, and feasibility improves the likelihood of effective future implementation.

Limitations

This study is not without its limitations. Because the recruitment strategy was through academic advisors and course registration, we did experience course withdrawals and incompletes, which limited our statistical power and the statistical testing that could be done. Similarly, a small sample size affects the generalizability of the findings. Therefore, we can only report program evaluation and implementation outcomes, which are relevant and needed for future studies. Additionally, the course had to comply with COVID-19 protocols, which required some additional maneuvering such as transitioning the course online, which did not allow for as much mentorship initially expected.

Implications for Health Behavior Theory

The absence of a nutrition-focused D&I science curriculum creates a knowledge capacity barrier among professionals and students, which hinders involvement, ultimately affecting the ability to develop, implement, and evaluate complex nutrition interventions on changing health behaviors. Evaluating the training, based on the Kirkpatrick Learning model, identified essential components of the curriculum (content based on the D&I competencies, active learning strategies, and mentorship) and suggest an initial foundation for D&I science training for nutrition.

Additionally, by assessing implementation outcomes, facilitator knowledge on what was and was not feasible, appropriate, and acceptable improved. This can improve the likelihood of effective future implementation such as higher retention, adoption, expansion, and sustainability of the program. Ultimately, this pilot case study exhibits a much needed feasible, acceptable, and appropriate resource for nutrition in D&I science.

Discussion Questions

Our findings suggest that a theory-based curriculum improves knowledge among participants. What are teaching strategies that should be researched to see if they change knowledge behavior?

What are some barriers that would prevent professionals from participating in this training on a national level?

Ethical Approval Statement

This study was approved by West Virginia University (WVU) Institutional Review Board (protocol # 2106336074).

Conflict of Interest

The authors declare no conflicts of interest.

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Appendix A
Guided discussion example

For the readings for week 6: Please put your first and last name, assignment information and answers in a different color when you submit this assignment (as a word document):

1. What are the differences between implementation outcomes, service outcomes, and client outcomes?
2. What is the taxonomy of implementation outcomes? Define each.
3. In Smith et al. what framework did they use and why?
4. Smith et al. seek to answer four main questions (please provide an answer for each):
   a. What range of proven practices are being implemented in rural settings?
   b. What dynamics affect translation and implementation?
   c. How and why are evidence-based and promising practices adapted to rural contexts?
   d. What resources support selection, adaptation and implementation in rural environments?
5. Did Smith et al assess implementation outcomes, service outcomes, and/or client outcomes?

Appendix B
Case study example

You recently got a job working as a program developer and evaluator at a local health department in Huntington, West Virginia. When you received the job your supervisor said that the primary focus for you was to lower the obesity rate in Huntington, West Virginia. He wants you to continue with the program that the previous employee was using within the same population because "he wants to continue to see successful results to continue receiving funding." Further, you note that the obesity rates in Cabell County are on the rise again and want to start thinking about how to address this effectively. However, you find minimal evaluation on said program and what you do find the population seemed to be of a normal BMI, no change reported in BMI, high income, and highly educated Marshall employees. Additionally, the program initially was supposed to target low-income, obese individuals who were on the Supplemental Nutrition Assistance program. You realize then that the said program is supposed to be the SNAP-Ed curriculum. You start reaching out to other health departments in the area who are supervised under the same administration, and you see that many of your fellow co-workers are implementing SNAP-Ed curriculums without the most updated curriculums and ignoring key parts of the intervention. Many of your co-workers mention that "we have to make corrections to the curriculum to fit the population- sometimes that means not always discussing every aspect of the program. It seems like the SNAP-Ed curriculum does not understand Appalachian food culture, which makes it really hard to give recipes to our real target audience."

To start you want to evaluate the current implementation of SNAP-Ed in your area using RE-AIM. Please start this case study by filling out the table below.

Dimension	
Reach	Number, percentage and representativeness of eligible patients who participated in the intervention. •Is the intervention reaching the target population? Those most in need?
Effectiveness	Intervention effects on targeted outcomes, •Does the intervention accomplish its goals?
Adoption	Number, percentage and representativeness of participating settings and providers. •To what extent are those targeted to deliver the intervention participating?
Implementation	The extent to which the intervention was consistently implemented by staff members.
Maintenance	The extent to which an intervention becomes part of routine organizational practices, and maintains effectiveness.

Glasgow, www.re-aim.org

REACH	
EFFECTIVENESS	
ADOPTION	
IMPLEMENTATION	
MAINTENANCE	

After you finish this evaluation you start to think about how to take your findings to your supervisor who is determined to keep the program as is. **You decide that the best way to do this is to build a systems map to show how the program is currently working and the missing pieces, which are actually hurting your chances for funding.**

Group A: You find out that the systems map worked, and your supervisor wants you **to come up with strategies to reach your target population. What implementation strategy/strategies do you think would work best for this?**

Group B: You find out that the systems map worked, and your supervisor wants you to address the issues with implementation among your other program developers. **What implementation strategy/strategies do you think would work best for this?**

Group C: You find out that the systems map worked, and your supervisor wants you to address the issues with cultural adaptation to Appalachia. **What implementation strategy/strategies do you think would work best for this?**

As a class: each group report and then: You find that your implementation strategies seemed to have increased attendance among your target population, you see program developers implementing the program with higher fidelity and the adaptations to the curricula for cultural relevance seemed to be maintainable. ***Now, redo the RE-AIM table and see what changed.***

REACH	
EFFECTIVENESS	
ADOPTION	
IMPLEMENTATION	
MAINTENANCE	

Appendix C
Implementation plan

A great template for your final is listed below. Your final should be written in AMA or Vancouver reference style.

1. An introduction to the problem that tells the story and reasoning for you aims and research questions
2. Your aim, objective and/or research questions
3. A literature review, which should provide the evidence-base for your intervention. Therefore, if you are using (scaling or de-implementing) an established program, policy, etc., then you should describe it here.
4. A systems map. You must include a systems map that displays the multitude of factors that could potentially benefit or challenge the intervention.
5. The proposed D&I nutrition intervention
   a. What theory and/or framework is guiding your research?
   b. What is the intervention?
      i. What is evidence-based?
      ii. What effectiveness and fidelity?
      iii. Program drift or positive defiance?
      iv. practice-based research?
   c. What are the CORE elements?
   d. What are YOU suggesting to do?
      i. Adapt? If so, WHY and HOW?
      ii. Conduct formative research? If so, WHY and HOW?
      iii. Implement as intended. If so, WHY and HOW?
      iv. De-implement? If so, WHY and HOW?
   e. What are the strategies you plan on using?
   f. What research methods are you using? What framework?
6. Proposed results or implications
7. References should be in Vancouver or AMA formatting