Peter Hawes,
Erin Cassar,
Soula Servello,
Elisabeth Fornaro,
Catherine Tkatch,
and Ebru Erdem

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THE SCHOOL DISTRICT OF PHILADELPHIA

SNAP-Ed Funded School-Community Partnerships: Supporting Implementation

Summary

This report is part of a series of four reports resulting from a case study process evaluation of the SNAP-Ed nutrition education partnership, Eat Right Philly (ERP), in 2018-19. The reports focus on the implementation and effectiveness of SNAP-Ed community partnerships. Additional reports from the evaluation can be found at philasd.org/research.

This report focuses on the mid-stages of program implementation. We asked: what implementation challenges and successes do ERP partners encounter in their schools? We found that communication was a key factor in program implementation. Yet, a lack of clearly defined roles and staff turnover were major obstacles to effective communication. Persistent and proactive communication helped to overcome other challenges and had the potential to change the context for program implementation. Findings suggest that in order to facilitate program implementation, ERP should prioritize factors that lead to deep and consistent relationships. In other words, the depth of key relationships seemed more important than the breadth of program activities.

Contents

Overview

This report is the second in a series of four reports on SNAP-Ed funded school-community partnership implementation and success.[1] The four reports focus on (1) cultivating readiness, (2) supporting implementation (this report), (3) sustaining partnerships, and (4) measuring implementation for collective impact.[2] These reports resulted from a case study process evaluation of the SNAP-Ed nutrition education partnership, Eat Right Philly, in 2018-19. Through an in-depth exploration of school community partnerships within one district-wide nutrition program, this case study project provides a nuanced understanding of how schools and community partners can better collaborate to address complex problems, such as malnutrition.

Nutrition is an important consideration in engagement, achievement, and the gap between low-income and higher-income students.[3, 4] Students' mental, social, and emotional needs cannot be "rigidly compartmentalized" or separated from their physical needs.[5] Students who are food-insecure or malnourished, have inadequate water consumption, or lack opportunities to move their bodies through physical activity have a harder time paying attention in class. In fact, a recent study found that children who are non-active and have unhealthy nutrition habits scored lower on standardized test scores when compared with children who are active with healthy nutrition habits.[6] The link between health and academics is especially clear for students living in poverty, who may not have their basic needs met at home. High-poverty schools often require assistance in helping meet the needs of school-dependent students.[7, 8, 9] Assistance often comes through school-community partnerships. Engaging stakeholders at both the school and community level is an effective way to deliver the resources and support schools need[10] and is vital to improving student nutrition.[11]

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[1] The series of four reports resulting from the 2018-19 Case Studies project defines "implementation" using implementation science. For more information on implementation science see Appendix A.
[2] Additional reports from the evaluation can be found at philasd.org/research.
[3] Charles E. Basch, "Healthier Students are Better Learners: A Missing Link in School Reforms to Close the Achievement Gap," *Journal of School Health* 81, no.10 (2011): 593-598.
[4] Alicia Fedewa and Jennifer Hoffman, "Nutrition and Physical Activity as Protective Factors in Eliminating the Achievement Gap," *Communique* 42, no. 1 (2013): 1-12.
[5] Nell Noddings, "What Does it Mean to Educate the Whole Child?" *Educational Leadership* 63, no.1 (2005): 5.
[6] Fiona M. Asigbee, Stephen D. Whitney and Catherine E Peterson, "The Link Between Nutrition and Physical Activity in Increasing Academic Achievement," *Journal of School Health* 88, no. 6: 407-415.
[7] Lisa Delpit, Multiplication is for White People: Raising Expectations for Other People's Children (New York: New Press, 2012).
[8] H. Richard Milner IV, "Understanding Urban Education from the Outside In and Inside Out," *Urban Education* 47, no. 6 (2012): 1019-1024.
[9] Pedro A. Noguera and Lauren Wells, "The Politics of School Reform: A Broader and Bolder Approach for Newark," *Berkeley Review of Education* 2, no. 1 (2011): 5-25.
[10] Pedro A. Noguera and Lauren Wells, "The Politics of School Reform: A Broader and Bolder Approach for Newark," *Berkeley Review of Education* 2, no. 1 (2011): 5-25.
[11] Ying-Ying Goh et al., "Using Community-based Participatory Research to Identify Potential Interventions to Overcome Barriers to Adolescents' Healthy Eating and Physical Activity," *Journal of Behavioral Medicine* 32, no. 5 (2009): 491-502.

SNAP-Ed and Eat Right Philly (ERP)

The United States Department of Agriculture (USDA) Supplemental Nutrition Assistance Program Education (SNAP-Ed) provides nutrition education to SNAP-eligible low-income individuals and families. In Philadelphia, SNAP-Ed provides federal funding to seven community partners[12] to implement a nutrition education program known as Eat Right Philly (ERP) in 214 School District of Philadelphia (SDP) schools.

Key Terms

Direct education: Nutrition education lessons delivered through a SNAP-Ed approved curriculum and delivered either by ERP nutrition educators or classroom teachers with support from ERP staff.

ERP partners: Refers to the group of seven community partners that implement Eat Right Philly programming in SDP schools.

ERP programming: The overall set of program components Eat Right Philly delivers to a school or set of schools. Programming is typically made up of either direct education or work related to Policy, Systems, and Environment (PSE).

ERP staff: All staff members who work for Eat Right Philly partners to deliver or manage programming in schools. This includes seven ERP Directors who manage the program at the ERP Partner level, as well as ERP nutrition educators who deliver programming within schools.

Policy, Systems, and Environment (PSE): Interventions meant to facilitate people to act on their education by making healthy choices easier and preferable.

School staff: Refers to all employees who work at a particular school. For the purposes of the case study, we have grouped school staff into four main categories: 1) Administrators (principals and assistant principals), 2) Classroom teachers, 3) Other school staff (climate staff, nurses, counselors, food service managers), and 4) Partnership coordinators (anyone at the school whose key role is to manage partnerships, for example Community School Coordinators or VISTA staff).

SNAP-Ed: The United States Department of Agriculture (USDA) Supplemental Nutrition Assistance Program Education (SNAP-Ed) provides funding for nutrition education to SNAP-eligible low-income individuals and families.

ERP provides a range of programming to schools related to nutrition and physical activity to align with the SNAP-Ed requirement of using a combination of approaches. These approaches include direct nutrition education, social marketing, and Policy, Systems, and Environmental (PSE) change

[12] The seven community partners are the School District of Philadelphia, Drexel University, Agatson Urban Nutrition Initiative, Einstein Medical Center, Vetri Community Partnership, The Food Trust, and Health Promotion Council.

interventions. PSE changes facilitate people to act on their education by making healthier choices easier and preferable.

The goal of SNAP-Ed programming is to provide consultation and technical assistance to schools so that staff and administration make changes at the school level. While ERP partners provide direct programming and work with schools to implement a variety of initiatives, the school itself is "ultimately responsible for adopting, maintaining, and enforcing the PSE change."[13] Examples of school-level PSE changes include: writing a policy in the parent handbook to limit the amount of unhealthy snacks brought in for school celebrations, adopting a new intervention to increase physical activity during recess, or removing a vending machine that sells ice cream from the cafeteria.

ERP 2018-19 Case Study Project

The School District of Philadelphia (SDP) Office of Research and Evaluation (ORE) conducted a year-long case study project during the 2018-19 school year, which included 19 schools, 119 interviews of school and program staff, 7 focus groups with 41 students, document analysis, 138 hours of participant observation, and analysis of SDP District-Wide Survey (DWS) and School Support Census data.[14][15] The goal of the case study project was to: (1) understand the extent to which contexts (i.e., policies and environments, communities, and interpersonal connections) influence successful implementation of ERP programming, and (2) uncover how the seven community partners who implement SNAP-Ed nutrition education in the SDP can better coordinate programming, elevate the importance of their work to SDP administration and the public, and collect shared measures that will show the collective impact of their work over time. Collective impact is when stakeholders commit to a common agenda for solving a complex social problem that no single organization can solve alone.[16,17]

The series of reports that summarize the findings from the case study project answer four main research questions:

1. What are the factors that facilitate the initial implementation of policy, systems, and environment (PSE) changes? ("Cultivating Readiness")
2. What implementation challenges and successes do ERP partners encounter in their schools? (This report, "Supporting Implementation")

[13] Supplemental Nutrition Assistance Program Education, FY 2019 SNAP-Ed Plan Guidance (Alexandria: VA, United States Department of Agriculture, 2018), 18.
[14] Analysis of the SDP District-Wide teacher survey was used to inform findings in report one of this series of four reports, "SNAP-Ed Funded School-Community Partnerships: Cultivating Readiness." For more information on the District-Wide teacher survey and our analysis see Appendix C.
[15] Analysis of the SDP School Support Census was used to inform report three of this series of four reports, "SNAP-Ed Funded School-Community Partnerships: Sustaining Partnerships." For more information on the SDP School Support Census and our analysis see Appendix C.
[16] John Kania and Mark Kramer, "Collective Impact," *Stanford Social Innovation Review* 9, no. 1 (2011):36-41.
[17] For more information on Collective Impact see Appendix B.

3. How can ERP implement policy, systems, and environment (PSE) changes that can be sustained over time? ("Sustaining Partnerships")
4. What opportunities exist for ERP partners to measure, align, and coordinate programming? ("Measuring Implementation for Collective Impact")

Research Questions Guiding this Report

This report answers one of the research questions that guided the larger case study project: What implementation challenges and successes do ERP partners encounter in their schools? To help us answer the larger question, we considered four more focused questions about communciation:

1. How is communication related to implementation of the ERP program?
2. What do participants identify as the main barrier(s) to communication and coordination?
3. How do participants suggest ERP partners mitigate logistical barriers such as scheduling?
4. How do participants suggest that ERP partners strengthen communication with schools?

Methods

Case studies are especially useful when it is impossible to separate variables from the context, and understanding multiple perspectives is required.[18, 19] The aim of case study research is "particularization," not generalization.[20] Thus, randomized sampling is not desirable for this method; rather, the aim should be to examine a "strategic selection of cases." Instead of examining the "typical case," we looked for "critical cases" that represent different levels of ERP presence or programming at a school.[21] To that end, we created a tiering system to categorize all partners' schools into three tiers based on 2017-18 data, data from the year before we began data collection. We quantified available qualitative data on nutrition lessons and PSE programming in each school to categorize schools into one of three tiers:

Tier 1: Schools with an intensive ERP presence
Tier 2: Schools with less intensive ERP programming
Tier 3: Schools with limited ERP presence

We then chose one "critical case" for each tier and each partner for a total of 19 schools. Schools were selected based on their tier level to ensure the inclusion of one school per tier and per partner. The study schools had a variety of other characteristics, including grades served, enrollment, geography, and demographics.

[18] Robert K. Yin, *Case Study Research: Design and Methods 4th Ed*. (Thousand Oaks: Sage Publications, 2008).
[19] Helen Simons, *Case Study Research in Practice* (London: Sage Publications, 2009).
[20] Sharan Merriam, *Qualitative Research: A Guide to Design and Implementation* (San Francisco: Jossey-Bass, 2009), 24.
[21] Bent Flyvbjerg, "Five Misunderstandings About Case-study Research," *Qualitative Inquiry* 12, no. 2 (2006): 229.

The researchers collected data from various stakeholders at the 19 schools in our sample including 119 interviews of school and program staff, 7 focus groups with 41 students, document analysis, and 138 hours of participant observation.[22] All data was coded by one team member and checked by a second team member using Dedoose.[23, 24] Disagreements about code application were discussed until a consensus was reached.

As part of the larger case study project 2018-19 on SNAP-Ed funded school-community partnership implementation and effectiveness described above, this specific report focuses on the second research question: "What implementation challenges and successes do ERP partners encounter in their schools?" To analyze the data in relation to this research question we used implementation outcomes and theories of communication.

Analytical Framework

This report operationalizes implementation using implementation science, which focuses on implementation outcomes.[25] Implementation outcomes are the effects of purposeful actions to implement new programming.[26] Implementation outcomes are useful in evaluations that need to account for the influence of contextual factors when adopting and sustaining interventions in community settings.[27, 28]

This report specifically focuses on challenges and successes related to communication, coordination, and logistical barriers (e.g., scheduling). Communication has long been understood to be critical in program implementation.[29] Theories of communication have identified two distinct yet related definitions that can be applied in our context. The first, "transactional" communication, provides the means to transfer specific pieces of information from one person to another. In the second definition, "transformational" communication, communication serves as a tool for building relationships and shared understanding.[30,31]

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[22] A detailed description of the project methods is provided in Appendix C.
[23] Dedoose Version 8.0.35, web application for managing, analyzing, and presenting qualitative and mixed method research data (2018). Los Angeles, CA: SocioCultural Research Consultants, LLC www.dedoose.com.
[24] For our complete codebook see Appendix D.
[25] For more information on implementation science and implementation outcomes see Appendix A.
[26] Enola Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 65-76.
[27] Rachel E. Blaine et al., "Using School Staff Members to Implement a Childhood Obesity Prevention Intervention in Low-Income School Districts: The Massachusetts Childhood Obesity Research Demonstration (MA-CORD Project), 2012-2014," *Preventing Chronic Disease* 14, no. 3 (2017): 2.
[28] For a detailed explanation of implementation science and implementation outcomes see the Literature Review in Appendix C.
[29] Elizabeth Dayton and Kerm Henriksen, "Communication Failure: Basic Components, Contributing Factors, and the Call for Structure," *The Joint Commission Journal on Quality and Patient Safety* 33, no. 1 (2007): 34-47.
[30]Milisa Manojlovich, Janet E. Squires, Barbara Davies, and Ian D. Graham, "Hiding in Plain Sight: Communication Theory in Implementation Science" *Implementation Science* 10, no. 58 (2015): 1-11.
[31] For more information on theories of communication see Appendix E.

Existing literature on communication in the context of program implementation suggests that communication is both critical to adoption and uptake of proven interventions[32,33] and a tool for developing shared understanding and relationships.[34] Shared priorities are most likely to develop through sustained, iterative communication.[35] Repeated interactions help to build relationships and visibility, establish shared norms, and facilitate transformational changes.[36] Repeated communication, and the relationships that develop through it, may significantly impact the success or failure of program implementation.[37] Theories of communication helped understand how communication was used to share information (e.g., logistics), the extent to which it built relationships, and the extent to which communication established shared understandings during program implementation. Theories of communication also helped us understand the extent to which persistent and proactive communication led to transformational changes, such as changing school priorities and culture.

Findings

How is communication related to implementation of the ERP program?

The first question we examined using case study data from 19 schools focused on the relationship between communication and ERP program implementation. As in the existing literature on implementation,[38, 39] our participants found communication to be a key factor in making ERP programming easy or difficult to implement and frequently discussed four communication-related concerns in conjunction with the ease or difficulty of ERP program implementation: (1) coordination and communication around ERP programming; (2) a lack of awareness or confusion around the ERP program and what ERP programming entails; (3) relationships between ERP and school staff; and (4) the importance of ERP staff being at school frequently and being visible within the school. Participants considered communication to be a primary challenge for implementation.

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[32] Elizabeth Dayton and Kerm Henriksen, "Communication Failure: Basic Components, Contributing Factors, and the Call for Structure," *The Joint Commission Journal on Quality and Patient Safety* 33, no. 1 (2007): 34-47.

[33] Heather L. Gainforth et al., "The Role of Interpersonal Communication in the Process of Knowledge Mobilization Within a Community-Based Organization: A Network Analysis," *Implementation Science* 9, no. 59 (2014): 1-8.

[34] Milisa Manojlovich, Janet E. Squires, Barbara Davies, and Ian D. Graham, "Hiding in Plain Sight: Communication Theory in Implementation Science" *Implementation Science* 10, no. 58 (2015): 1-11.

[35] Milisa Manojlovich, Janet E. Squires, Barbara Davies, and Ian D. Graham, "Hiding in Plain Sight: Communication Theory in Implementation Science" *Implementation Science* 10, no. 58 (2015): 1-11.

[36] Milisa Manojlovich, Janet E. Squires, Barbara Davies, and Ian D. Graham, "Hiding in Plain Sight: Communication Theory in Implementation Science" *Implementation Science* 10, no. 58 (2015): 1-11.

[37] For a detailed explanation of theories of communication see the Literature Review in Appendix C.

[38] Elizabeth Dayton and Kerm Henriksen, "Communication Failure: Basic Components, Contributing Factors, and the Call for Structure," *The Joint Commission Journal on Quality and Patient Safety* 33, no. 1 (2007): 34-47.

[39] Heather L. Gainforth et al., "The Role of Interpersonal Communication in the Process of Knowledge Mobilization Within a Community-Based Organization: A Network Analysis," *Implementation Science* 9, no. 59 (2014): 1-8.

Communication challenges ranged from delayed emails or phone calls to misunderstandings about the purpose of ERP programming.

Communication was an important factor for program implementation in the ERP context

During case study interviews, communication-related concerns emerged as a major theme, which we defined in our codebook: (1) coordination and communication around ERP programming (coded as "coordination/communication"); (2) a lack of awareness or confusion around the ERP program and what ERP programming entails (coded as "lack of awareness/communication"); (3) relationships between ERP and school staff (coded as "relationships"); and (4) the importance of ERP staff being at school frequently and being visible within the school (coded as "importance of frequency/visibility"). Communication emerged as an important factor for program implementation in the ERP context as demonstrated by the number of participants who referenced communication in their interviews.

Participants frequently described both challenges and opportunities related to communication, identifying it as a critical factor for implementing ERP in the school context. Among interview excerpts that referenced the ease or difficulty of program implementation (coded as "ease/difficulty of implementation"), 28% also referenced, or co-occurred with, one or more of the four communication-related themes listed above. Although other codes in our codebook also co-occurred with the "ease/difficulty of implementation" code, communication-related codes co-occurred more frequently than any other topic. In other words, when talking about the ease or difficulty of program implementation, participants also talked about communication-related themes more frequently than other themes.

Participants in our study confirmed the importance of communication for ERP in particular and identified specific examples of the types of barriers and opportunities that emerge during the implementation of ERP programming, as discussed in the sections below.

Both school-based and program staff considered communication to be a potential barrier to implementation

In case study interviews, respondents frequently noted implementation challenges related to communication. The types of challenges ranged from uncertainty about who should be coordinating activities to delayed emails or phone calls. One ERP staff member, when asked about communication directly, described an inability to "connect with the right person" at the school:

> We've had no contact from the principal, we've gone to the site, we've emailed, we've called, we've left messages, we've talked to the assistant principal… You want them to see the value and when they don't give you that 5 minutes of time you're just like, what am I doing here?

> ...a lot of times at the school there's plenty of interest from teachers and whatnot so it's like, how do you connect with the right person and all that.

In this case, the ERP staff member described a lack of communication as a major barrier to ERP program implementation. The example demonstrates that communication has multiple purposes and that communication barriers can have multiple negative effects. The first negative effect is that, despite "interest from teachers," the ERP staff member is unable to exchange basic information about the program with School Staff. The second negative effect is that the ERP staff member interprets the lack of a response from School Staff as a negative signal about the value of the program, asking, "What am I doing here?" In the literature on communication theory, these barriers are related to the definitions of "transactional" and "transformational" communication respectively. In other words, communication barriers can have immediate, practical consequences as well as longer-term consequences that affect shared understanding, priorities, and relationships. The deep relationships between ERP staff and key school staff that facilitate programming involve responsiveness. A deep relationship is one that has been developed over time, involves mutual respect, and is responsive. A key relationship is one between ERP staff and school staff who allow access to the school, communicate with ERP about school events and ERP programming, program champions and school staff who deliver ERP programming such as direct education.

Similar concerns were identified by many respondents, including school staff. When asked about implementation barriers, one school administrator identified their own communication delays as a barrier that "stands in the way" of program implementation:

> Maybe one barrier that stands in the way of a program like Eat Right [Philly] is my ability to get back to people quickly. Sometimes it's a several day delay in my response, just by default of the volume and emails and the things that I'm responding to.

The school administrator describes their own capacity as being limited by "the volume" of communications for which they are responsible. Later in the interview, this respondent also mentioned several other related coordination challenges (such as difficulty in scheduling lessons). Taken together, these two excerpts illustrate that similar concerns were shared by respondents in many different roles, including school-based and program staff. Respondents frequently linked their concerns about communication directly to challenges in ERP program implementation.

Multiple stakeholders reported communication barriers, such as uncertainty and delays, which can limit program uptake. Such barriers made it more difficult to share concrete information such as scheduling details (transactional communication) as well as to sustain relationships and develop the shared values that are necessary for systemic changes (transformational communication).

What do participants identify as the main barrier(s) to communication and coordination?

The second question we examined using case study data from 19 schools focused on barriers to communication and coordination of ERP programming. Participants identified several specific barriers related to communication and coordination, including decisions made by school leaders, the absence of a well-defined coordinator role within schools, and frequent turnover of both school-based and program staff. In addition to describing these challenges, participants also provided examples of successful coordination and communication in each area.

School leaders had the ability to promote or impede effective communication

ERP staff had frequent communication with a variety of school staff, including teachers, nurses, and school support staff. However, ERP staff frequently understood communication to be occurring within a context established by school leadership. ERP staff reported that principals and other administrators played a key role in determining the frequency and quality of communication – either by handling most coordination themselves or by delegating the coordination role to other school staff.

One ERP staff member described examples of different approaches taken by school principals, with different implications for ERP program implementation:

> The principal is — it's kind of nice because at some schools, principals can be really controlling and they really want to know exactly when you're going to be there and when you're not going to be there and what you're going to do and what's your plan, but she's pretty hands off which is nice and she defers to... the community partnerships guy… anything you want to do that has to do with community organizations or outreach to care givers or community members, just defer to him.

It could be that some principals chose to be involved very directly in day-to-day program coordination. Some respondents described such a situation as an obstacle if the principal had limited capacity for frequent communication, while others found it helpful if the principal was willing and able to communicate frequently and develop strong relationships with ERP staff.

On the other hand, some principals may defer to others. As another ERP staff explains, their principal "defers to… the [partnership coordinator]." Principals may also defer to someone else on their staff to handle day-to-day coordination. Participants described this approach as enabling better communication, but only when the designated partnership coordinator's role was clearly defined and that person had sufficient capacity and autonomy to make decisions about partnerships. Partnerships coordinators can increase a school's capacity to participate in successful external partnerships by being the main point of contact communicate about day-to-day

programming, facilitate scheduling, and supporting or leading programming at the school. For example, a partnerships coordinator could lead a PSE change such as a healthy fundraiser at a school.

Participants reported many different methods for coordination, depending on the context of the individual school and the interest and availability of school staff. Some ERP staff were able to coordinate effectively with a dedicated partnership coordinator, while others worked closely with teachers or other support staff. However, a common element was that principals largely determined who ERP staff coordinated with at their school. As a result, participants considered principals' decisions to be important for enabling or disrupting effective communication.

School-based Partnership Coordinators improved communication if their roles were clearly defined and they had sufficient capacity

In some schools, the presence of a dedicated Partnership Coordinator helped to clarify roles and responsibilities. This Partnership Coordinator role varied substantially, including Community School Coordinators, VISTA members assigned to a school, parent volunteers, or another school-based staff person. In other cases, coordination with ERP staff occurred more informally or was more fragmented, with support from multiple school-based staff but without a clearly designated coordinator. If a Partnership Coordinator role was clearly defined, ERP staff typically worked closely with that person to handle both day-to-day and long-term planning.

When asked about the role of school-based coordinators, one ERP staff member described how a coordinator enabled communication and supported program goals:

> Some schools have this person you're talking about, this connector that we're able to utilize, and some schools don't. It truly does vary by school. In [this school] we really have a great relationship with the [partnership coordinator].... Also we've worked with [this coordinator] prior to [their] role as that. [They're] someone we could trust.

The speaker described the partnership coordinator, with whom they had previously worked, as "someone we could trust." Their emphasis on the quality of the relationship suggests that partnership coordinators may be uniquely situated to develop sustained communication and shared values with ERP staff. In schools without partnership coordinators, respondents often identified confusion about roles or simply a lack of communication as major barriers. However, the presence of a partnership coordinator was not always considered positive, and was seen as a barrier in certain situations. The ERP staff member quoted above went on to say that working with a partnership coordinator could present its own challenges: "there's a point person in general that's going to be the easiest way because there's a connector. However, sometimes it's not. Sometimes that person can be a not-connector. More of a hinderance." This ERP staff member felt that working with a partnership coordinator can facilitate or challenge communication, depending on the relationship.

The idea that the designated partnership coordinator could be a "not-connector" suggests that a requirement to work with a particular person was considered a barrier if that person was unresponsive or lacked sufficient capacity due to other responsibilities. For example, in another instance, ERP staff were asked to coordinate with a particular member of the school staff but were unable to make progress because that person had other competing priorities. In such cases, the assignment of the partnership coordinator as the main point of contact partnership was seen as a barrier that prevented other, more effective relationships from emerging.

In a similar example, a parent volunteer served in a partnership coordinator role. In this case, an ERP staff member questioned why there was an extra step in the communication process with the principal. During an observation, the ERP staff member was frustrated that planning was "on hold" until they could speak with the new principal, and gain approvals. They complained that multiple emails would be sent to a principal, but the parent coordinator would respond instead, telling them they had to talk about it with the principal, and then there was no follow-up.

In a follow-up interview, the same ERP staff person went on to describe being unable to coordinate effectively with the parent volunteer because they were rarely at the school at the same time and had difficulty communicating only over email. Despite the presence of a designated partnership coordinator, the coordinator role was not clearly defined because the parent volunteer did not have authority to make programming decisions (the principal was the key decision maker). Additionally, the limited capacity of the volunteer made communication more challenging. In some cases, the partnership coordinator hindered ERP program implementation because they were not responsive, lacked capacity, or lack autonomy to make decisions.

Staff turnover disrupted relationships and interfered with communication

Some situations where participants reported communication barriers occurred after a key staff person left their position. Such examples reflect a broader understanding that ongoing relationships are important for successful programming. Although participants were typically able to continue with some level of communication after turnover, it was perceived as a major barrier when it occurred.

One ERP staff member described the need to build a new relationship after their point of contact left their position at the school:

> At the beginning of the year there was another school nurse that was supposed to be my point of contact, and [they] were the point of contact previously, but then they switched out into a new nurse. I haven't really made a relationship with [them] quite yet, but moving forward I will definitely contact [them] because I think [they're] interested for classes, I don't know.

The speaker describes being uncertain about the person who is new to their role. The ERP staff person plans to "definitely contact [the new nurse]" but isn't sure whether they're "interested for classes." Any shared understanding that has developed over time has been lost and must be re-established.

Nutrition educators that worked in the same locations over several years reported stronger relationships and fewer obstacles. For example, one ERP staff member described the importance of building relationships over a long time period: "I know everybody at [the school]. I've been there for almost six years... Being there and learning the people is really why I feel like I'm so successful here" (ERP Staff, 10-29-18). Although staff turnover is inevitable to some extent, the importance of ongoing relationships suggests that avoiding turnover may yield benefits. Because it may not be possible for every staff member to remain in the same role for "almost six years," or a similarly substantial length of time, it may be useful to anticipate and prepare for turnover where it cannot be controlled. ERP staff that relied on a single school staff contact had greater difficulty when that person left, while ERP staff with multiple strong relationships had less difficulty.

How do participants suggest ERP partners mitigate logistical barriers such as scheduling?

The third question we examined focused on the ways in which ERP partners can mitigate logistical barriers, such as scheduling, when implementing ERP programming. Participants suggested that strong relationships and effective communication helped them to manage logistical barriers such as scheduling ERP programming at schools with block or alternating-day schedules.

This section applies two different definitions of communication. In the first definition, communication provides the means to transfer specific pieces of information from one person to another ("transactional" communication). In the second definition, communication serves as a tool for building relationships and shared understanding ("transformational" communication).[40] It highlights the fact that both transactional and transformational communication is needed to overcome logistical barriers to ERP program implementation.

Effective communication is key to managing logistical barriers successfully

Participants frequently reported that strong relationships and effective communication helped them to resolve other types of barriers, especially logistical issues related to direct education. Participants generally encountered difficulty when scheduling direct education lessons – and those

[40]Milisa Manojlovich, Janet E. Squires, Barbara Davies, and Ian D. Graham, "Hiding in Plain Sight: Communication Theory in Implementation Science" *Implementation Science* 10, no. 58 (2015): 1-11.

concerns were exacerbated at schools using block or A/B scheduling. When participants reported solutions to such challenges, they almost always emphasized the importance of communication or identified specific coordination strategies.

Block scheduling was described as problematic because nutrition lessons can be disruptive during longer blocks or interfere with already-limited class time. The following quotation from a school administrator succinctly illustrates both issues: "...you don't want a nutrition lesson just randomly happening in the middle of your [block]...those blocks are just 90 minutes. It's really hard to carve out time within that week to give [ERP]... Scheduling is the most complex thing…" The concern about a nutrition lesson happening "in the middle" of a block creates an additional layer of scheduling complexity – especially when nutrition educators are attempting to schedule back-to-back lessons throughout the school day. Participants also described block time as being particularly valuable for academic instruction (especially in math and literacy). School staff therefore found it difficult to give up block time for nutrition lessons. They found it necessary, in some cases, to spread the time out across multiple subject blocks to avoid setting students back in a particular subject area.

A/B days provide additional complexity and could be a source of confusion, as in the following example. An ERP staff member commented:

> A day is Monday, B day is Tuesday—we have different kids. And so it's hard to have any continuity when our only—you won't see them but Monday and Wednesday, or Tuesday and Thursday, and the A and B was a very difficult circuit. They're confused as well as us, getting used to it as well.

This ERP staff member identified several issues related to A/B scheduling. First, "continuity" was disrupted because different students are attending different classes on different days. Second, there was a general sense of confusion. Other participants identified similar concerns, including missed lessons due to scheduling uncertainty. A/B schedules created an additional layer of complexity – with reduced flexibility and more opportunities for scheduling errors.

Participants consistently reported that such challenges made effective communication even more important. For example, one school administrator described that spreading nutrition lessons across multiple blocks required active coordination with more stakeholders:

> Back and forth with myself and my teacher leader, and working with teachers and pretty much saying look, we know the children need 90 minutes of the math block in fifth grade, two and a half hours in literacy, can we work around this? Can we steal 30 minutes here, can we take it from our specialist program. Everybody gets involved in it and we, because we want it to happen, I think everybody's flexible in giving up time and saying, yeah, I can give 15 minutes here, this teacher will give 15 minutes and that will give us the 30 minute or 45 minutes period that we need.

This quotation emphasizes that the solution was available because "we want it to happen" and "everybody's flexible in giving up time." Shared priorities, such as prioritizing nutrition education during class time, are most likely to develop through sustained, iterative communication. Thus, scheduling complexity appears to require more intensive communication both in terms of simple information exchange ("transactional" communication) and sustained relationships ("transformational" communication).

Other scheduling challenges were related to confusion, unplanned changes, or competing priorities. Unplanned changes or competing priorities were also identified as scheduling barriers. For example, nutrition lessons were canceled or postponed at the last minute due to testing, assemblies, field trips, and other special events. Whether anticipating unexpected changes or navigating complex bell schedules, participants that were able to schedule lessons effectively usually attributed their success to specific communication strategies or generally strong relationships. One strategy identified as effective by an ERP staff member was regular, direct communication with teachers:

> That's how it works best. I initiate with administration, but it's – that kind of gets the ball rolling, but then going forward, it seems like, to interact directly is the most efficient way to schedule… I send everybody an individual e-mail and just make sure the schedules work out and that we're all good.

In this case, the ERP staff member managed multiple relationships to "initiate with administration" but also "interact directly" with teachers. This approach reflects the importance of coordinating at multiple levels in order to ensure consistent program implementation. Another ERP staff member utilized a similar approach using shared Google documents:

> What I do is I have a Google spreadsheet that I email out to the teachers once a month to remind them to sign up for the times or to change the times. I default to keeping the same times each week, but I send out a reminder to have them change something if they have something going on, that they can always just go in and do that.

Both approaches provide potential solutions to the overall difficulty around scheduling, especially with regard to missed lessons or miscommunication with teachers. While participants identified many such strategies, all involved frequent, direct communication with all stakeholders (not just the designated contact person or the principal). In addition to keeping lesson schedules on-track, such frequent interaction may support the overall visibility of the program within the school by strengthening relationships between school-based and program staff over time.

How do participants suggest that ERP partners strengthen communication with schools?

The fourth question we examined focused on how to strengthen communication with schools. While ERP staff found there were specific strategies that worked best in a particular school context, they also found that proactive, persistent communication was vital in every school context. Repeated interactions helped to build relationships and visibility, establish shared norms, and facilitate transformational changes such as shifting school priorities towards health and wellness or changing the school culture to promote healthy eating.

Persistent and proactive communication can overcome obstacles and change the context for program implementation

ERP staff described a number of communication strategies that they felt were most effective in the context of a particular school. Those who described successful implementation noted that their decision to utilize a particular strategy (such as emailing teachers directly, using text messages, coordinating with a point person, etc.) were based on their interpersonal knowledge and ongoing relationships developed in that school context. However, there was one approach that was described as being helpful in almost every situation: proactive, persistent communication on the part of the nutrition educator or other ERP staff member.

One school administrator described such an approach as "very positive," noting that the ERP staff member took initiative to identify opportunities for ERP activities at the school:

> They don't wait for me to come to them and say "Parents are coming in next week, what can you do?" They're always reaching out. We see that parents are going to be here for this, can we do that? Very positive.

Given the communication constraints described throughout this report (e.g., uncertainty about who should be coordinating partnerships, leadership capacity, staff turnover, and scheduling), ERP staff reported being more successful when they paid close attention to school calendars and other sources of information in order to identify opportunities that might be missed by routine communication. In some cases, proactive efforts yielded results only after several repeated attempts, as in this example from an ERP staff member:

> Because we've had a situation with a principal like, "No. You can't. We don't want any food in a classroom..." But then as time goes on it's like, "OK. Let's see." ...So, how to demonstrate that we're not taking away from the school but we're adding something to it. That just takes meeting and hype, and that's normally how we do that.

Although the principal was unwilling at first to allow food in the classroom, the ERP staff member was able to change their understanding through "meeting and hype." This outcome reflects a common theme that proactive, persistent communication could change the context for program implementation, in part by helping to establish shared values and beliefs.

Respondents identified persistent and proactive communication as the most effective way to overcome obstacles, especially in situations where school staff were unresponsive or unsupportive. Repeated interactions helped facilitate transformational communication – building relationships and visibility, establishing shared norms, and enabling cultural changes to take place within the school community. Persistence also helped some ERP staff identify different people for different types of communication – for example, some found that forming relationships with secretaries and teachers was important even if another person was designated as the point-of-contact.

Conclusion/Recommendations

This report identifies communication as an important factor affecting implementation outcomes in the context of ERP programming. For instance, participants described the importance of communication as a tool for overcoming logistical barriers, such as scheduling. Effective communication was considered critical when dealing with complex scheduling challenges, and many program staff found it helpful to work directly with teachers as well as a designated coordinator or administrator. Both school staff and ERP staff frequently described communication challenges as a major barrier, but also found effective strategies to overcome those barriers.

Participants described several types of situations where communication barriers were more likely to occur, or created substantial barriers to program implementation:

- When school leaders lacked capacity for regular communication but preferred to be closely involved in program decisions,
- When roles were unclear or no designated coordinator role existed,
- When designated coordinators had limited capacity or limited involvement in decision-making,
- When staff turnover disrupted relationships.

Findings suggest that in order to facilitate program implementation, ERP should prioritize factors that lead to deep and consistent relationships. A deep relationship is one that has been developed over time, involves mutual respect, and is responsive. In other words, the depth of key relationships between ERP staff and school staff who allow access to the school, communicate with ERP about school events and ERP programming, program champions and school staff who deliver ERP programming such as direct education, seemed more important than the breadth of program activities.

The recommendations listed below should be considered when trying to improve communication, strengthen relationships, and support more robust program implementation. We also present these recommendations by report research question and related findings (Table 2):

- School and ERP staff should communicate about communicating.
    - Because the concern about communication is largely shared by stakeholders in multiple roles, it may be helpful to have regular conversations about the quality of communication. This would help to eliminate unintended signals (e.g. that the ERP program is not valued by the school) and establish shared expectations for timeliness and channels of communication.
- School leaders should consider their own communication preferences and delegate authority if appropriate.
    - Some administrators had the capacity and interest to be involved regularly in decisions about ERP programming. Others had more limited capacity and chose to delegate some authority to a coordinator or other role. Problems emerged when leaders adopted a strategy inconsistent with their own preferences or capacity for regular communication.
- Schools should consider whether a designated partnership coordinator would help them achieve their goals. Schools that already have a designated coordinator should make sure that roles are clearly defined and that person has the capacity for regular involvement in programming.
    - Although it may require additional resources, the presence of a designated coordinator was often considered very helpful in improving communication and thereby strengthening program implementation. Various options exist for such a role, including VISTA roles, the Community Schools program, or regular paid positions.
    - Parent volunteers or others with limited capacity for involvement should be considered carefully, as their involvement can be a barrier if they are unable to attend meetings or other key functions.
- Both schools and ERP partners should anticipate staff turnover and develop plans for continuity of relationships.
    - One successful strategy is for ERP staff to intentionally develop relationships with multiple school staff (and vice versa). If they work closely with a single person, that relationship creates a more serious risk of discontinuity when that person leaves their role.
- When dealing with complex schedules or other logistical barriers, more frequent and in-depth communication is likely to help.
    - ERP staff often found it helpful to engage directly with many people at the school, including administrators, secretaries, and teachers, in order to better understand schedules and keep each person aware of the timing of lessons and other activities.
- In almost every situation, ERP staff may be able to better achieve their goals through an intentional strategy of proactive, persistent communication.

- ERP Staff that responded to communication challenges with renewed efforts at communication reported much greater success. Such strategies included more frequent or persistent communication, as well as communication with a greater variety of stakeholders at the school. The case study data suggests that such strategies not only overcame communication barriers in many cases, but also changed the context for programming and helped to develop stronger shared approaches.

Table 2. Report research questions, key findings, and recommendations for trying to improve communication, strengthen relationships, and support more robust ERP program implementation

Research Question	Finding	Recommendation
• How is communication related to implementation of the ERP program?	• ERP staff that responded to communication challenges with renewed efforts at communication reported much greater success. Such strategies included more frequent or persistent communication, as well as communication with a greater variety of stakeholders at the school. The case study data suggests that such strategies not only overcame communication barriers in many cases, but also changed the context for programming and helped to develop stronger shared approaches.	• In almost every situation, ERP staff may be able to better achieve their goals through an intentional strategy of proactive, persistent communication.
• What do participants identify as the main barrier(s) to communication and coordination?	• Some administrators had the capacity and interest to be involved regularly in decisions about ERP programming. Others had more limited capacity and chose to delegate some authority to a coordinator or other role. Problems emerged when leaders adopted a strategy inconsistent with their own preferences or capacity for regular communication.	• School leaders should consider their own communication preferences and delegate authority if appropriate.
	• Staff turnover disrupted relationships.	• Both schools and ERP partners should anticipate staff turnover and develop plans for continuity of relationships. • One successful strategy is for ERP staff to intentionally develop relationships with multiple school staff (and vice versa).

Research Question	Finding	Recommendation

• How do participants suggest ERP partners mitigate logistical barriers such as scheduling?	• Although it may require additional resources, the presence of a designated coordinator was often considered very helpful in improving communication and thereby strengthening program implementation.	• Schools should consider whether a designated partnership coordinator would help them achieve their goals. Schools that already have a designated coordinator should make sure that roles are clearly defined and that person has the capacity for regular involvement in programming.
		  ○ Various options exist for such a role, including VISTA roles, the Community Schools program, or regular paid positions.
		  ○ Parent volunteers or others with limited capacity for involvement should be considered carefully, as their involvement can be a barrier if they are unable to attend meetings or other key functions.

• How do participants suggest that ERP partners strengthen communication with schools?	• Persistent and proactive communication can overcome obstacles and change the context for program implementation	• School and ERP staff should communicate about communicating. • Because the concern about communication is largely shared by stakeholders in multiple roles, it may be helpful to have regular conversations about the quality of communication. This would help to eliminate unintended signals (e.g. that the ERP program is not valued by the school) and establish shared expectations for timeliness and channels of communication.

Appendix A

This appendix, Appendix A on Implementation Science, can be found in all four reports in this series on SNAP-Ed funded school-community partnerships.

Implementation Science

As a field of research, implementation science promotes the adoption and uptake of evidence-based practices. Rather than focus on traditional outcomes of interventions or practices, implementation science tries to figure out why an evidence-based intervention is not being implemented (i.e., the barriers and facilitators of implementation).

Implementation outcomes, the effects of purposeful actions to implement new programming,[41] are useful in evaluations that need to account for the influence of contextual factors when implementing change: "Examining implementation outcomes (e.g., extent to which an intervention is adopted by teachers) provides context for intervention outcomes (e.g., change in children's BMI) and is needed to ensure that interventions are effectively adopted, translated, and sustained in community settings."[42] Implementation outcomes are based in the larger field of implementation science, focused on the uptake of evidence-based practices in real-world settings.[43]

With its roots in health-care and public health, implementation outcomes are used increasingly in research on health and nutrition interventions in K12 schools. Implementation Science has been applied in public health and educational research studies on nutrition lessons and related activities[44] as well as PSE changes, such as school food policies[45] and food backpack programs.[46] Prior research has highlighted factors in implementation outcomes, such as the presence of

[41]Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 65-76.
[42] Rachel E. Blaine et al., "Using School Staff Members to Implement a Childhood Obesity Prevention Intervention in Low-Income School Districts: The Massachusetts Childhood Obesity Research Demonstration (MA-CORD Project), 2012-2014," *Preventing Chronic Disease* 14, no. 3 (2017): 2.
[43] Martin P. Eccles and Brian S. Mittman, "Welcome to *Implementation Science," Implementation Science* 1, no. 1 (2006): 1-3.
[44] Rachel E. Blaine et al., "Using School Staff Members to Implement a Childhood Obesity Prevention Intervention in Low-Income School Districts: The Massachusetts Childhood Obesity Research Demonstration (MA-CORD Project), 2012-2014," *Preventing Chronic Disease* 14, no. 3 (2017): 1-14.
[45] Claudia-Santi F. Fernandes et al., "Educator Perspectives: Selected Barriers to Implementation of School-Level Nutrition Policies," *Journal of Nutrition Education and Behavior* 51, no. 7 (2019): 843-849.
[46] Russell E. Glasgow, Thomas M. Vogt, and Sean M. Boles, "Evaluating the Public Health Impact of Health Interventions: The RE-AIM Framework," *American Journal of Public Health* 89, no. 9 (1999): 1322-1327.

supportive school staff that can serve as "champions" for the intervention.[47, 48] Prior research has also examined the ways in which implementation outcomes interact, such as higher penetration leading to long-term sustainability.[49]

There are eight conceptually distinct implementation outcomes: acceptability, adoption, appropriateness, feasibility, fidelity, implementation cost, penetration, and sustainability.[50] These outcome categories provide useful short- and medium-term indicators for the successful implementation of ERP programming, which in turn can provide context for evaluations of the effectiveness of the intervention itself. Each of the outcomes is described below.

Acceptability

Acceptability is the perception among stakeholders that an intervention is agreeable, palatable, or satisfactory. Acceptability refers to specific aspects of an intervention, while satisfaction references a general experience. Acceptability is dynamic and should be assessed based on stakeholder knowledge of, or experience with, various dimensions of an intervention, such as its content or complexity.[51] Factors found to influence acceptability include pre-existing wellness activities, parental involvement, strong principal support, and sensitivity to the community.[52, 53]Moreover, acceptability is impacted by changing administrative priorities (e.g., towards standardized testing) that compete with health and nutrition initiatives.[54] As an outcome, acceptability can occur throughout implementation. It needs to occur early for intervention adoption, must be ongoing to facilitate penetration, and must occur late into implementation to allow for sustainability.[55]

[47] Rachel E. Blaine et al., "Using School Staff Members to Implement a Childhood Obesity Prevention Intervention in Low-Income School Districts: The Massachusetts Childhood Obesity Research Demonstration (MA-CORD Project), 2012-2014," *Preventing Chronic Disease* 14, no. 3 (2017): 1-14.

[48] Carmen Byker Shanks and Samantha Harden, "A Reach, Effectiveness, Adoption, Implementation, Maintenance Evaluation of Weekend Backpack Food Assistance Programs," American Journal of Health Promotion 30, no. 7 (2016): 511-520.

[49]Enola Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 65-76.

[50]Enola Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 65-76.

[51]Enola Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 65-76.

[52] Rachel E. Blaine et al., "Using School Staff Members to Implement a Childhood Obesity Prevention Intervention in Low-Income School Districts: The Massachusetts Childhood Obesity Research Demonstration (MA-CORD Project), 2012-2014," *Preventing Chronic Disease* 14, no. 3 (2017): 1-14.

[53] Claudia-Santi F. Fernandes et al., "Educator Perspectives: Selected Barriers to Implementation of School-Level Nutrition Policies," *Journal of Nutrition Education and Behavior* 51, no. 7 (2019): 843-849.

[54] Rachel E. Blaine et al., "Using School Staff Members to Implement a Childhood Obesity Prevention Intervention in Low-Income School Districts: The Massachusetts Childhood Obesity Research Demonstration (MA-CORD Project), 2012-2014," *Preventing Chronic Disease* 14, no. 3 (2017): 1-14.

[55]Enola Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 65-76.

Adoption

Adoption refers to the intention, initial decision, or action to try an intervention at the beginning to middle stages of implementation.[56]Supportive school staff that are invested in the intervention, often called "champions," can facilitate adoption by coordinating logistics and garnering school support. The presence of a champion is a critical factor in adoption.[57]It is important to assess adoption readiness at both leadership and staff levels.[58]

Appropriateness

Appropriateness is the perceived fit, relevance, or compatibility of an intervention for a given setting, provider, or consumer and/or the perceived fit of the intervention to address a particular issue or problem. It is salient in early implementation, prior to adoption.[59] Appropriateness is important for understanding pushback to implementation, such as when stakeholders feel an intervention doesn't fit with the mission of a setting or is inconsistent with their role. As an example, research has found educators to be less motivated to implement school food policies intended to encourage healthy eating behaviors because they found the policies incompatible with the culture of the students and families in their school.[60]

Feasibility

Feasibility is the extent to which a new intervention can be successfully used or carried out within a given setting. This outcome is salient early in implementation, during adoption, because an intervention may be appropriate for a setting but not feasible due to a lack of resources.[61] Quality training, competing priorities, and burnout are factors that can impact feasibility. As with acceptability, competing priorities have been found to impact feasibility.[62]

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[56]Enola Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 65-76.

[57] Carmen Byker Shanks and Samantha Harden, "A Reach, Effectiveness, Adoption, Implementation, Maintenance Evaluation of Weekend Backpack Food Assistance Programs," *American Journal of Health Promotion* 30, no. 7 (2016): 511-520.

[58] Rachel E. Blaine et al., "Using School Staff Members to Implement a Childhood Obesity Prevention Intervention in Low-Income School Districts: The Massachusetts Childhood Obesity Research Demonstration (MA-CORD Project), 2012-2014," *Preventing Chronic Disease* 14, no. 3 (2017): 1-14.

[59]Enola Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 65-76.

[60] Claudia-Santi F. Fernandes et al., "Educator Perspectives: Selected Barriers to Implementation of School-Level Nutrition Policies," *Journal of Nutrition Education and Behavior* 51, no. 7 (2019): 843-849.

[61]Enola Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 65-76.

[62] Rachel E. Blaine et al., "Using School Staff Members to Implement a Childhood Obesity Prevention Intervention in Low-Income School Districts: The Massachusetts Childhood Obesity Research Demonstration (MA-CORD Project), 2012-2014," *Preventing Chronic Disease* 14, no. 3 (2017): 1-14.

Fidelity

Fidelity is the degree to which an intervention was implemented as intended and is apparent during the early to middle stages of implementation.[63] SNAP-Ed evaluation materials refer to fidelity as the extent to which the nutrition education program is being implemented as designed.[64] It involves adherence to protocol, the amount of program delivered, and the quality of delivery. It is measured through self-reporting and observations.[65] Fidelity is impacted by administrative changes and turnover.[66]

Implementation Cost

The cost of an implementation effort varies according to (1) treatment complexity, (2) implementation strategy complexity, and (3) setting. Cost-effectiveness is salient throughout implementation: early for adoption and feasibility, middle for penetration, and late for sustainability.[67]

Penetration

Penetration is the integration of a practice within a setting during the middle to late stages of implementation, and is necessary for an intervention to be successful in terms of reach.[68] Reach is defined as the percentage and risk characteristics of persons who receive or are affected by a policy or program.[69] SNAP-Ed evaluation materials refer to reach as helping to quantify the proportion of the target population participating in a program.[70] Penetration is often measured quantitatively as the number of providers who deliver the intervention out of the total number of providers expected to deliver the intervention. Higher penetration may lead to greater long-term sustainability.[71]

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[63]Enola Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 65-76.

[64] Altarum Institute and RTI International for the U.S .Department of Agriculture, *Addressing the Challenges of Conducting Effective Supplemental Nutrition Assistance Program Education (SNAP-Ed) Evaluations: A Step-by-Step Guide*. Sheryl Cates, et al. 2014. http://www.fns.usda.gov/research-and-analysis

[65]Enola Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 65-76.

[66] Rachel E. Blaine et al., "Using School Staff Members to Implement a Childhood Obesity Prevention Intervention in Low-Income School Districts: The Massachusetts Childhood Obesity Research Demonstration (MA-CORD Project), 2012-2014," *Preventing Chronic Disease* 14, no. 3 (2017): 1-14.

[67]Enola Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 65-76.

[68]Enola Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 65-76.

[69]Russell E. Glasgow, Thomas M. Vogt, and Sean M. Boles, "Evaluating the Public Health Impact of Health Promotion Interventions: The RE-AIM Framework," *American Journal of Public Health* 89, no. 9 (1999): 1322-1327.

[70] Altarum Institute and RTI International for the U.S. Department of Agriculture, *Addressing the Challenges of Conducting Effective Supplemental Nutrition Assistance Program Education (SNAP-Ed) Evaluations: A Step-by-Step Guide*. Sheryl Cates, et al. 2014. http://www.fns.usda.gov/research-and-analysis

[71]Enola Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 65-76.

Sustainability

Sustainability is the extent to which an intervention is maintained or institutionalized within a setting's ongoing operations. It is marked in the late stages of implementation by (1) a transition from temporary to permanent funding, (2) repetitive reinforcement of the intervention through inclusion in organizational or community procedures and behaviors, and/or (3) integration into all subsystems of an organization.[72] Barriers to long term sustainability include staff turnover, lack of leadership from principals, and lack of a champion.[73]

Implementation Science served as a particularly useful framework for this project for three reasons. First, this study takes place in a district where schools take on a variety of educational models and serve a diverse population of students. Implementation outcomes are useful in evaluations that need to account for the variation in school and community contexts: "Examining implementation outcomes (e.g., extent to which an intervention is adopted by teachers) provides context for intervention outcomes (e.g., change in children's BMI) and is needed to ensure that interventions are effectively adopted, translated, and sustained in community settings."[74] Second, this project employs qualitative case study methods, which are used in conjunction with Implementation Science: "qualitative data, reflecting language used by various stakeholders as they think and talk about implementation processes, is important for validating implementation outcome constructs."[75] Across the literature, qualitative methods often include semi-structured interviews to capture the language used by various stakeholders, which can aid in validating implementation outcome constructs.[76] Finally, SNAP-Ed guidance suggests that formative research, process studies, and outcome assessments are useful for evaluating different phases of health and nutrition programming and can inform the ongoing improvement of health and nutrition programming. Formative research develops the implementation of intervention programs and process studies measure the implementation of intervention programs, while outcome assessments examine the extent to which an intervention program achieves its goals.[77] Outcome assessments of an intervention will not show positive outcomes if the intervention was not implemented well.

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[72]Enola Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 65-76.

[73] Rachel E. Blaine et al., "Using School Staff Members to Implement a Childhood Obesity Prevention Intervention in Low-Income School Districts: The Massachusetts Childhood Obesity Research Demonstration (MA-CORD Project), 2012-2014," *Preventing Chronic Disease* 14, no. 3 (2017): 1-14.

[74] Rachel E. Blaine et al., "Using School Staff Members to Implement a Childhood Obesity Prevention Intervention in Low-Income School Districts: The Massachusetts Childhood Obesity Research Demonstration (MA-CORD Project), 2012-2014," *Preventing Chronic Disease* 14, no. 3 (2017): 2.

[75]Enola Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 71.

[76]Enola Proctor et al., "Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda," *Administration and Policy in Mental Health and Mental Health Services Research* 38, no. 2 (2011): 65-76.

[77]Altarum Institute and RTI International for the U. S. Department of Agriculture, *Addressing the Challenges of Conducting Effective Supplemental Nutrition Assistance Program Education (SNAP-Ed) Evaluations: A Step-by-Step Guide*. Sheryl Cates, et al. 2014. http://www.fns.usda.gov/research-and-analysis

Appendix B

This appendix, Appendix B on Collective Impact, can be found in all four reports in this series on SNAP-Ed funded school-community partnerships.

Collective Impact

Collective impact addresses complex problems where the answer is not known and no single entity holds the resources or authority to drive the required change.[78] The concept of collective impact stems from the idea that "large-scale social change comes from better cross-sector coordination rather than from the isolated intervention of individual organizations."[79] There are five conditions of collective impact:[80]

(1) A common agenda that includes a shared vision for change, a shared understanding of the problem and goal, and a joint approach for problem solving.
(2) Shared measurements that involve measuring results based on the same criteria. This facilitates identifying patterns and coming to solutions.
(3) Mutually reinforcing participant activities that are different from, but supportive of and coordinated with, the actions of other participants. In other words, each participant plays a different role based on what they are capable of and where they excel.
(4) Continuous and frequent communication that serves to develop trust among differing organizations and build common vocabulary.
(5) Backbone support organizations that manage the collaboration of participating organizations; for example, handling logistical and administrative details.

The literature on collective impact has helped shape our understanding of the long-term vision of the overall Case Studies project, particularly how shared measurements can be defined and used,[81] as well as common challenges to achieving collective impact among partnership organizations. This literature has also informed how we designed the study, our interview and observation protocols, and our analysis.

[78] John Kania and Mark Kramer, "Collective Impact," *Stanford Social Innovation Review* Winter (2011): 36-41.
[79] John Kania and Mark Kramer, "Collective Impact," *Stanford Social Innovation Review* Winter (2011): 38.
[80] John Kania and Mark Kramer, "Collective Impact," *Stanford Social Innovation Review* Winter (2011): 36-41.
[81] For more information on how shared measurements can be defined and used related to the Eat Right Philly program see report four of this series of four reports, "Measuring Implementation for Collective Impact," located at www.philasd.org/research.

Appendix C

This appendix, Appendix C on the methods and data used in the ERP 2018-19 case study project, can be found in all four reports in this series on SNAP-Ed funded school-community partnerships.

Methods and Data

The ERP community partners seek to understand how to leverage programming and resources to better achieve SNAP-Ed goals given the factors that hinder or facilitate implementation. Case studies are especially useful for this purpose when it is impossible to separate variables from the context and understanding multiple perspectives is required.[82, 83] Case studies are also helpful to understand and explore "the process and dynamics of change."[84]

The aim of case study research is "particularization," not generalization.[85] Thus, randomized sampling is not desirable for this research method; rather, the aim should be to examine a "strategic selection of cases."[86] Instead of examining the "typical case," we should look for "critical cases" that are rich in detail.[87] To that end, we created a tiering system to categorize all partners' schools into three tiers, quantifying the available qualitative data on nutrition lessons and other programming in each school. We then chose one "critical case" for each tier for each partner, for a total of 19 schools.

We created an initial tiering system to ensure that the schools where we conducted research had varying levels of programming. Tier 1 schools were schools with an intensive ERP presence, including in-class nutrition lessons as well as additional programming such as produce stands, lessons offered to parents/caregivers, backpack programs, health fairs, after-school cooking clubs, and school breakfast promotions. Tier 2 schools had less intensive programming, and Tier 3 schools had the most limited ERP presence. Schools were selected based on their tier level to ensure the inclusion of one school per tier and per partner. Our study schools had a variety of other characteristics, including grades served, enrollment, geography, and demographics.

We collected qualitative data from a variety of stakeholders at the 19 schools in our sample during the 2018-19 school year. First, we conducted semi-structured interviews with three to seven key staff per site (e.g., classroom teachers, principals, cafeteria staff, nurses, and health and PE teachers) and ERP program staff, for a total of 119 interviews. Additionally, a total of 41 fourth-grade and fifth-grade students participated in seven focus groups in Tier 1 schools. We also observed 138

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[82] Robert K. Yin, Case Study Research: Design and Methods, 4th ed. (Thousand Oaks: Sage Publications, 2008).
[83] Helen Simons, Case Study Research in Practice (London: Sage Publications, 2009).
[84] Helen Simons, Case Study Research in Practice (London: Sage Publications, 2009). 23.
[85] Sharan Merriam, Qualitative Research: A Guide to Design and Implementation (San Francisco: Jossey-Bass, 2009), 24.
[86] Bent Flyvbjerg, "Five Misunderstandings About Case-study Research," Qualitative Inquiry 12, no. 2 (2006): 229.
[87] Bent Flyvbjerg, "Five Misunderstandings About Case-study Research," Qualitative Inquiry 12, no. 2 (2006): 229.

hours of nutrition lessons, recess, lunchtime, and school events. Finally, we conducted a document analysis of statements of work, budgets, grant reporting data, tracking and fidelity tools, and curricula.

We composed analytic memos and met regularly to discuss common codes, categories, concepts, and themes[88] emerging from the data at all stages of data collection. In the first stage of data analysis, we coded interview transcripts using open coding, where any code ideas were recorded to capture all insights and connections.[89] We then developed and revised a working codebook through several iterations of focused and open coding of interview data, resulting in a final codebook of 19 root codes and 25 subcodes.[90] We mapped implementation outcomes onto the codes we saw emerge from the data when applicable.[91] The codebook included a definition and examples for each code to increase inter-rater reliability.

In the second stage of data analysis, we imported our codebook into web-based data analysis software[92] and began focused coding of interview data from Tier 1 schools, revising the codebook as needed. Focused coding takes a more deductive approach, applying codes that represent pre-defined categories.[93]We took a case study approach to coding,[94] treating each tier as a case in order to compare findings across tiers. When a variety of interview transcripts had been coded representing different participant roles (e.g, school nurse, teacher, ERP staff, school administrator) we began to establish inter-rater reliability through Dedoose's training feature as measured by a pooled Cohen's Kappa between 0.6 and 0.8. Research suggests that a pooled Kappa of 0.61–0.8, which constitutes good agreement.[95,96] Each coding team member completed several rounds of training tests using excerpts from a variety of interview transcripts until inter-rater reliability was established. The team discussed results and made changes to the codes, codebook descriptions, definitions, and examples after every test until saturation, when we felt we were no longer making changes to the codebook that moved our data analysis forward.

In the third stage of data analysis, all data across all three tiers was coded by two team members for relevant themes using Dedoose, starting with interview data, followed by observational and focus

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[88] Marilyn Lichtman, *Qualitative Research in Education: A User's Guide,* 3rd ed. (Los Angeles: Sage Publications, 2013).
[89] Robert M. Emerson, Rachel I. Fretz, and Linda L. Shaw. *Writing Ethnographic Fieldnotes*, (Chicago: University of Chicago Press, 2011).
[90] Robert M. Emerson, Rachel I. Fretz, and Linda L. Shaw. *Writing Ethnographic Fieldnotes*, (Chicago: University of Chicago Press, 2011).
[91] For more information on Implementation Science see Appendix A.
[92] Dedoose Version 8.0.35, web application for managing, analyzing, and presenting qualitative and mixed method research data (2018). Los Angeles, CA: SocioCultural Research Consultants, LLC www.dedoose.com.
[93] Robert M. Emerson, Rachel I. Fretz, and Linda L. Shaw. *Writing Ethnographic Fieldnotes*, (Chicago: University of Chicago Press, 2011).
[94] Marilyn Lichtman, *Qualitative Research in Education: A User's Guide,* 3rd ed. (Los Angeles: Sage Publications, 2013).
[95] Richard J. Landis, and Gary G. Koch. "The Measurement of Observer Agreement for Categorical Data." *Biometrics* 33, no. 1(1977): 159-174.
[96]Joseph L. Fleiss, "Measuring Nominal Scale Agreement Among Many Raters." *Psychological Bulletin* 76, no. 5 (1971): 378-382.

group data. The team discussed codes and made changes to the codebook throughout the coding process, collapsing codes or creating new codes as needed. In addition, we used Dedoose's qualitative analysis tools to identify salient categories that needed to be further divided into concepts, or subcodes, for analysis. Initially data were analyzed across the three tiers of schools to identify common implementation outcomes or other common concepts and to develop themes in analytic memos. The team met regularly to discuss our memos and list salient topics for an integrative report that would clarify and relate the analytic memos.[97]

To focus specifically on PSE implementation, we realized that to compare schools with similar levels of PSE programming, we would need to re-tier the 19 case study schools based only on the current data on PSE programming during the 2018-19 school year (which are somewhat different from the original tiers because those included both Direct Education and PSE programming, and used the previous year's data). We separated the schools into four groups based on each schools' level of programming and support/buy-in from school staff and administration. At this point in the data analysis process, we presented our methods, codebook, and findings from our analytic memos to ERP directors and staff. This served as a form of member checking as ERP was invited to ask probing questions and provide feedback.

Integrative report writing was an iterative process of individual and collaborative interpretation and writing. Each team member drafted a report section based on related themes. We drafted our sections individually, but in shared documents where we could provide feedback to team members throughout the writing process. We met regularly to share drafts and provide feedback, which "confirmed and crosschecked" our decisions.[98] After we had established drafts, we again presented our findings to ERP directors and staff for feedback, which was incorporated into this final report. Finally, this report was read by SDP Office of Research and Evaluation staff outside of the Health and Nutrition team who provided critical feedback. The following is a summary of the phases of data collection and analysis.

Phase I: Tiering and Case Study School Selection (Summer 2018)

In order to help ERP community partners understand how to leverage programming and resources to better achieve SNAP-Ed goals, we quantified available qualitative data on nutrition lessons and PSE programming in each school to categorize schools into one of three tiers:

Tier 1: Schools with an intensive ERP presence
Tier 2: Schools with less intensive ERP programming
Tier 3: Schools with limited ERP presence

[97] Robert M. Emerson, Rachel I. Fretz, and Linda L. Shaw. *Writing Ethnographic Fieldnotes*, (Chicago: University of Chicago Press, 2011).
[98] Trena M. Paulus, Marianne Woodside, and Mary F. Ziegler, ""I Tell You, It's a Journey, Isn't It?" Understanding Collaborative Meaning Making in Qualitative Research," *Qualitative Inquiry* 16, no. 10 (2010): 858.

We then chose one "critical case" for each tier and each partner for a total of 19 schools. Schools were selected based on their tier level to ensure the inclusion of one school per tier and per partner. The study schools had a variety of other characteristics, including grades served, enrollment, geography, and demographics.

Phase II: Data Collection (2018-19)

We collected qualitative data from a variety of stakeholders at the 19 schools in our sample during the 2018-19 school year. Table 1 provides an overview of data collected, including details of participants and activities.

Table C1. Data collection

Data Collection Activity	Participants and Activities
Semi-Structured Interviews (119)	• 3-7 key staff per site (e.g., classroom teachers, principals, cafeteria staff, nurses, and health and PE teachers) • ERP Nutrition Educators and Directors
Focus Groups (7)	• 41 fourth-grade and fifth grade students
Observations (138 Hours)	• Nutrition Education Lessons • PSE Activities • School Activities (e.g., recess, breakfast/lunch, physical education classes)
Document Analysis	• Statements of Work • Grant Reporting Data • Tracking and Fidelity Tools • Curricula
Other Data	• District-wide Survey 2018-19 • Support Census 2019

Phase III: Codebook Creation and Data Analysis (Fall 2019)

We composed analytic memos and met regularly to discuss common themes emerging from the data at all stages of data collection. We developed and revised a working codebook through several iterations of coding and discussions, resulting in a codebook of 19 root codes and 25 subcodes. The codebook included a definition and examples for each code to increase inter-rater reliability.

After finalizing the codebook and importing it into web-based data analysis software (Dedoose Version 7.0.23), we began to establish inter-rater reliability through Dedoose's training feature as

measured by a pooled Cohen's Kappa between 0.6 and 0.8, which constitutes good agreement.[99, 100] Each coding team member completed several rounds of training tests using excerpts from a variety of interview transcripts until inter-rater reliability was established.

Finally, the team coded all available data and continued to write analytic memos to explore common concepts and themes. The team met regularly to discuss our memos and list salient topics for a final integrative report, and presented our methods, codebook, and preliminary findings to ERP directors and staff for feedback.

PSE Grouping and Analysis

After data collection and preliminary analysis, we realized that in order to compare schools with similar levels of programming, we would need to group the 19 case study schools based on actual ERP programming during the 2018-19 school year. The 19 case study schools were selected as critical cases from three tiers based on 2017-18 data. Thus, after considering the amount of ERP programming, as well as the level of involvement of school staff in implementing program components in 2018-19, we separated the schools into four groups (Table 2).

Table C2. The groups representing levels of PSE programming in the 19 case study schools

Group	Description	# Schools
Group 1	Schools with a high level of programming and support/buy-in from staff and administration. These are schools where staff members take on a larger role in programming, and the schools have more potential to make PSE changes because of the level of staff involvement.	5
Group 2	Schools with a medium to high level of programming. Programs are mostly ERP-led and have less involvement from school staff, which means there is less potential for PSE changes.	4
Group 3	Schools with a medium to low level of programming. Programming is mostly Direct Education, and any PSE is ERP-led with little to no staff involvement. ERP staff report actively trying to increase programming in these schools and struggle to increase engagement and buy-in.	5
Group 4	Schools with little to no programming, and ERP is not trying to increase activities due to a lack of capacity, ERP staff turnover, or other higher-level programming decisions.	5

[99] Richard J. Landis and Gary G. Koch. "The Measurement of Observer Agreement for Categorical Data." *Biometrics* 33, no. 1(1977): 159-174.

[100] Joseph L. Fleiss, "Measuring Nominal Scale Agreement Among Many Raters." *Psychological Bulletin* 76, no. 5 (1971): 378-382.

2018-19 District-Wide teacher survey

In addition to case study interview data with ERP and school staff, ORE used data from the 2018-19 District-Wide teacher survey[101] to analyze differences in the school culture, leadership, and staff capacity that determined the ability of the school to implement *any* interventions across and between schools and PSE Groups. We selected three District-Wide teacher survey questions to highlight key factors that might influence a school's ability to implement innovations, including student behavior, principal leadership, and staff time constraints:

1. To what extent is student behavior a challenge to student learning at your school? (*A great challenge, a moderate challenge, a slight challenge, not a challenge*)
2. The principal at this school creates buy-in among faculty. (*Strongly Agree, Agree, Disagree, Strongly Disagree)*
3. To what extent is the lack of teacher planning time built into the school day a challenge to student learning at your school? *(A great challenge, a moderate challenge, a slight challenge, not a challenge)*

These three District-Wide teacher survey questions were used to look at differences in question responses by school and by PSE Group in order to determine the extent to which attributes of a school (student behavior, principal leadership, and teacher planning time) affect their capacity to implement new programming.

2018-19 School Support Census

We used the School Support Census to understand (1) how visible ERP is across the District and in the 19 case study schools and (2) how many schools identified health and wellness as an area where their school needs support. In the fall of each school year, the School Support Census asks principals of 215 SDP schools (excluding charter schools) to confirm which partners from the previous school year are maintaining support in the current school year and what new partners are working in their schools. The School Support Census also asks principals to select from a list of general need areas (e.g., health and wellness supports, behavior supports, or support with sports) and indicate if their school is in current need of support in that area. Principals identify each area on a scale of "no need" to "slight" to "moderate" to "critical."[102] In the School Support Census, nutrition is grouped together with other health and wellness issues, such as sexual health. In 2018-19, 207 Principals responded to The School Support Census. There are limitations to the School Support Census data. While a principal not identifying ERP as a partner might indicate that ERP is not as visible in that school, it could also be a one-time oversight by that principal or an indication

[101] The District-Wide teacher survey asks SDP teachers their perspective on numerous topics related to their work. For more information on the SDP District-Wide teacher survey see https://www.philasd.org/research/programsservices/district-wide-surveys/.

[102] For more information on The SDP School Support Census see https://www.philasd.org/research/programsservices/projects/school-support-census/.

that ERP communicates more with other staff at that school. In addition, because nutrition is grouped together with other health and wellness issues, such as sexual health, principal responses may indicate a need for support related to other health issues at their school, apart from nutrition.

Appendix D

This appendix, Appendix D listing the Codebook used in the ERP 2018-19 case study project, can be found in all four reports in this series on SNAP-Ed funded school-community partnerships.

Codebook

Category/Code	Subcodes
Key Quote	N/A
Program Structure	Importance of Frequency/Visibility Lack of Awareness/Confusion Decision Making Description Staffing
Coordination/Communication (School Level)	N/A
Direct Education	N/A
PSE	Activities (What ERP is Doing): *Hydration* *Movement Breaks* *Produce Stands* *Backpacks* *Event Tabling* *Healthy Fundraisers* *Healthy Celebrations* *Gardening* *Promotion*
ERP Parent/Family Engagement	N/A
Taste Test	N/A
Opportunities (What ERP Could Do)	N/A
Successful Outcomes	N/A
Ease/Difficulty of Implementation	N/A
Family/ Neighborhood Context for Health/Nutrition	N/A

School/District Context	School Climate Competing Priorities Parent Engagement School Staff Turnover
Health/ Nutrition Context	District Food Service Wellness: School Wellness Teams, SHI, Wellness Policy School: *Health/PE class* *Recess/Movement breaks*
School Staff	School Staff Roles Satisfaction/Acceptability School Staff Buy-in
Relationships	N/A
Student Reactions to ERP	Engagement Acceptability Awareness
Resources/ Materials	N/A
Nutrition Educator Delivery	N/A
Sustainability	N/A

Appendix E

Theories of Communication

Communication has long been understood to be critical in program implementation. For example, one study notes that communication failures may cause adverse events or failures to adopt proven interventions.[103] Theories of communication have identified two distinct yet related definitions that can be applied in our context: "(1) communication as a transactional process responsible for information exchange, and (2) communication as a transformational process responsible for causing change."[104] In the first definition, communication provides the means to transfer specific pieces of information from one person to another. In the second definition, communication serves as a tool for building relationships and shared understanding. Both of these definitions may be important for establishing and sustaining ERP programming. Nutrition educators may wish to share specific instructions or nutrition-related content with classroom teachers ("transactional"); at the same time, they may seek to develop or reinforce shared beliefs about the importance of nutrition education within the entire school environment ("transformational").

Furthermore, prior research emphasizes the importance of relationship-building for effective communication and "back-and-forth, iterative dialogue."[105] Communication may be considered a tool for "developing shared understanding which emerges by establishing, testing, and *maintaining relationships* between communicators" (emphasis added).[106] Such definitions suggest that repeated communication, and the relationships that develop through it, are appropriate considerations that may significantly impact the success or failure of program implementation.

[103] Elizabeth Dayton and Kerm Henriksen, "Communication Failure: Basic Components, Contributing Factors, and the Call for Structure," The Joint Commission Journal on Quality and Patient Safety 33, no. 1 (2007): 34-47.
[104] Milisa Manojlovich, Janet E. Squires, Barbara Davies, and Ian D. Graham, "Hiding in Plain Sight: Communication Theory in Implementation Science" Implementation Science 10, no. 58 (2015): 1-11.
[105] Milisa Manojlovich, Janet E. Squires, Barbara Davies, and Ian D. Graham, "Hiding in Plain Sight: Communication Theory in Implementation Science" Implementation Science 10, no. 58 (2015): 1-11.
[106] Milisa Manojlovich, Janet E. Squires, Barbara Davies, and Ian D. Graham, "Hiding in Plain Sight: Communication Theory in Implementation Science" Implementation Science 10, no. 58 (2015): 1-11.