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Doctor of Education in Organizational Leadership

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Community Health Educators' Perspectives on Curriculum Resources in Newly Adapted Virtual
Diabetes Cooking Classes

A dissertation submitted in partial satisfaction
of the requirements for the degree of
Doctor of Education in Organizational Leadership

by
Rusty Ranay Hohlt

April 2022

Dedication

This dissertation is dedicated to my husband, Jason, and daughters, Brynnly and Bree, for the love, grace, and support they have shown me throughout this doctoral program. I love you more than words can say.

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This dissertation is the compilation of support from so many in my life. Thank you to my family for being supportive of my time and energy spent in school, writing, and doing research.

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I have also been blessed with encouraging communities at Abilene Christian University including professors, classmates, my dissertation chair and committee, and the team at the writing center. The continued encouragement and education from these groups has been a source of inspiration through this educational journey – thank you.

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Abstract

The COVID-19 pandemic forced educators with Cooperative Extension to shift in-person delivery of community health education programs to virtual delivery. One such program, a diabetes cooking class, was developed for in-person programming and included hands-on activities like recipe demonstrations as an important resource for increasing participants' behavioral skills. The diabetes cooking class also provided opportunities for participants' social support. The problem in this study is that it is not known if the tools and resources from the in-person diabetes cooking class curriculum are impactful when used in virtual delivery. This study was developed to assess educators' implementation of the diabetes cooking class in a virtual setting and collect their recommendations for impactful tools and resources. The mixed methods study was designed to conduct a formative evaluation of the diabetes cooking class curriculum while assessing implementation of the virtual program and ability to support social cognitive theory approaches. Community educators who implemented the program virtually in 2020 or 2021 were the participants eligible to respond to a Qualtrics survey. Findings from the seven research questions were reported using the RE-AIM framework. Results of this study revealed that educators do plan to continue some use of virtual program delivery going forward, thus warranting the need for modifications to the teaching resources in the curriculum. Overall, curriculum components were rated higher for impact on learning than they were for engaging participants. Engaging audience members was also most frequently reported as the biggest challenge in virtual classes. The study gathered educators' feedback on tools and resources that could be created to foster participant engagement in virtual program delivery.

Keywords: diabetes cooking classes, virtual education, RE-AIM, formative evaluation

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Chapter 1: Introduction

Community health educators provide much-needed health education, resources, and services to rural and urban communities. Through health education programs, community health educators use teaching tools and resources to promote chronic disease self-management and prevention. These community-based educational programs are often held in person and provide hands-on activities to increase participants' knowledge, skills, and confidence on topics like preparing healthy meals and being physically active. During the COVID-19 pandemic, in-person educational activities were halted in light of the need for social distancing. Community health educators were able to continue meeting the needs of their community by using the in-person educational curriculum and shifting face-to-face programs to virtual delivery.

Health, wellness, and chronic disease prevention education are greatly needed. Currently, the chronic disease burden in the United States is reducing the quality of life for residents and costing states money. For example, according to Minton et al. (2017), health care is one of the costliest expenses to the state of Texas, and costs are associated with several factors, including chronic diseases like diabetes, heart disease, and stroke. Diabetes is prevalent and a factor in increased healthcare costs. The Centers for Disease Control and Prevention (n.d.-a) has reported that “more than 37 million people in the United States have diabetes” (para. 1). According to the American Diabetes Association (n.d.-a) “people with diabetes have medical expenses approximately 2.3 times higher than those who do not have diabetes” (para. 3).

While managing diabetes is complex and includes multiple factors, the American Diabetes Association (n.d.-b) describes a healthy diet and physical activity as two ways for people to help manage type 2 diabetes. Support for moving toward a healthy diet can be found in

diabetes nutrition education programs, cooking classes, as well as other health and wellness educational programs.

In response to the need for diabetes nutrition education, Cooperative Extension (also referred to as Extension) offers community-based nutrition and diabetes management programs to help people learn ways to prepare healthy meals and follow portion control guidelines to improve their health. Extension brings education programs and health services to communities that support people living healthier lives. Trained staff in counties provide Extension educational programs (e.g., diabetes management, weight management, food safety, and healthy cooking practices) for people, so they gain knowledge and skills to make healthy behavior changes.

Prior to COVID-19, interest was growing in strengthening health education programs in Extension through digital education. With a global pandemic and the need to socially distance, e-Learning programs were deemed necessary to continue providing education for community members while staying safely apart. Combining public health education with technology to reach people is one avenue toward helping people adopt healthy lifestyle behaviors.

To continue increasing the reach of Extension educational programs, health education programs must be delivered in various formats, including digital learning platforms, web-based meeting platforms, and face-to-face education. The diversity in program delivery methods allows Extension to meet a range of adult learner preferences for different educational strategies and supports the organization's ability to pivot to virtual program delivery. To maximize access to education, both synchronous and asynchronous delivery of programs must be utilized to meet the needs of various audience members. While e-Learning programs provide valuable content, program curriculum and resources previously used in face-to-face education are now being utilized in virtual education due to quick educational pivots caused by COVID-19. Program

assessments need to be conducted to determine if the curriculum and its resources are relevant for virtual instructional settings.

Background

Community-based health education can be supported through the commitment of an organization, like Extension, that has trained staff located in communities with the tools and resources to locally implement research-based interventions. The study site's website explains that Extension educators can access science-based programs for local implementation in communities. Rodgers and Braun (2015) identified Extension's important role in community-based health education by stating, "with its network and expertise, Extension can address health and influence the social, economic and environmental determinates of healthy people across the life span" (p. 1). This demonstrates that the role of Extension educators in communities is valuable in the delivery of programs focused on helping people live healthier.

Overview of Cooperative Extension

Established in 1914, Cooperative Extension programs have subject matter experts and locally placed educators who work in each state through the Land-Grant University System and coordinate with local, state, and federal partners. Cooperative Extension is

an educational network that addresses public needs by providing non-formal higher education and learning activities to farmers, ranchers, communities, youth, and families throughout the nation. With an organization that has been operating for over a century, CES is well positioned to efficiently get needed tools and knowledge into the hands of the people who need them. (U.S. Department of Agriculture National Institute of Food and Agriculture, n.d.-b, para. 4)

Cooperative Extension has a long history of experience connecting community education with local residents and partners on various important topics, including public health.

Health Programs in Cooperative Extension

Extension staff members work to positively impact communities through community-based interventions focused on health and nutrition. Extension programs are important for communities, especially those in rural areas that may have limited access to human services like community health education (Gutter, 2016). These informal educational programs are dependent on local educators and trained volunteers to provide quality educational opportunities to the community that may otherwise not exist locally. The valuable contribution that online education can provide in communities where a nutrition educator is not present was noted by Franzen-Castle and Versch (2014). As a result, Extension can extend the reach of educational programs to more people through virtual program delivery and online nutrition education.

Statement of Problem

Little is known about whether a face-to-face diabetes cooking class curriculum is the best tool for virtual program delivery formats, which is a significant problem for educators delivering the program and participants who are learning from the program. Currently, extension health and nutrition programs are conducted through multiple instructional settings, including face-to-face educational sessions, online self-paced education, web-based educational sessions with a live instructor, and educational content delivered through social media and websites. With the shift to reduce face-to-face programming and increase virtual programming to support continuing health programs at a distance through COVID-19, virtual diabetes cooking classes have been offered synchronously with a live instructor leading the class and participant-paced through an asynchronous course on a learning management platform. However, it is not clear how effective

these delivery methods are. Assessing educators' perspectives on the best tools and resources to increase participant engagement is needed to modify and continually develop educational programs for virtual delivery.

Purpose Statement

The purpose of this mixed methods research study was to determine educators' perspectives about the engagement and impact of the face-to-face curriculum components for virtual program participants in a diabetes cooking class. This study assessed educators' intent to continue using virtual instructional settings as they returned to face-to-face programming. Information was gathered on transitioning a face-to-face curriculum to a virtual delivery format to strengthen future virtual curriculums and programs. In addition to the seven research questions below, the mixed methods design was used to describe program reach, virtual implementation strategies (i.e., delivered as a team or individual, platform used), and compile recommended tools and resources requested by educators.

Research Questions

- **RQ1.** What are educators' perspectives on the most impactful curriculum components for virtual implementation?
- **RQ2.** What are educators' perspectives on the least impactful curriculum components in virtual implementation?
- **RQ3.** What are educators' perspectives on the most engaging curriculum components for participants in virtual implementation?
- **RQ4.** What are educators' perspectives on the least engaging curriculum components for participants in virtual implementation?
- **RQ5.** What do educators' feel is the biggest challenge to implementing a virtual diabetes

cooking class?

- **RQ6:** What are educators' implementation plans going forward in program delivery once COVID-19 restrictions are lifted?
- **RQ7:** What recommendations do educators have for additional tools and resources to support virtual program implementation?

Definition of Terms

Asynchronous. e-Learning led by the participant, without an instructor, and can be completed at any time (Piskurich, 2015).

Cooperative Extension. A national network of subject matter experts and locally placed educators who work in each state through the Land-Grant University System and in coordination with local, state, and federal partners (U.S. Department of Agriculture National Institute of Food and Agriculture, n.d.-b, para. 4).

e-Learning. Using the internet to deliver educational programs or training (Piskurich, 2015).

Synchronous. e-Learning that removes the physical classroom for instruction but still includes instructors to facilitate instruction and interaction among participants (Piskurich, 2015).

Summary

As demonstrated, the chronic disease burden is great, and there is a need to provide education to more residents about healthy behaviors. Reducing barriers to education, understanding the reach of technology, and examining the outcomes of online programs are critical areas for continuing to expand health programs. Chapter 2 will review the use of mixed methods assessments to identify issues in interventions and the RE-AIM framework for program assessment. Additionally, a review of literature will provide a background on previous research

in diabetes cooking classes and the use of Cooperative Extension as a public health program delivery network.

Chapter 2: Literature Review

This study is designed to gather information on tools and resources needed when transitioning a face-to-face diabetes cooking class curriculum to a virtual delivery format. Managing type 2 diabetes is complex; however, the American Diabetes Association (n.d.-b) describes a healthy diet and physical activity as two ways for people to help manage type 2 diabetes. Community education, like diabetes self-management education (DSME) classes and community-based diabetes cooking classes led by Extension health educators, can help support people with diabetes in moving toward a healthy diet. While these classes provide support, they are usually conducted in person, which can present barriers to attendance, including time and travel. Digital education, e-Learning, or virtual education programs provide an instructional setting that reduces barriers to attending in-person education and helps extend health and diabetes education to more people.

There have been several studies about transitioning face-to-face health and nutrition education to online formats; however, as a result of the COVID-19 pandemic, traditional in-person education programs were quickly transitioned to virtual delivery methods. There is a need to look at educators' perceptions of curriculum adaptations and needed resources to continue this method of delivery. Extension educators are local leaders in community health and wellness and provide oversight for the implementation of these programs in their communities. An examination of their perceptions of the tools and resources that were helpful or additional tools and resources needed will be valuable in strengthening the virtual program delivery. The review of literature includes background information on participatory action research and the RE-AIM framework, an overview of elements of social cognitive theory, the importance of diabetes self-

management education and cooking classes, and the role of Cooperative Extension in public health education, and the need for virtual program formats.

Literature Search Methods

To further identify the importance of assessing the educational components of this online health program, I have engaged in collecting, analyzing, and synthesizing literature. The primary location for the literature search was ACU OneSearch through the distance learning portal of the Margaret and Herman Brown Library at Abilene Christian University. The search primarily included peer-reviewed journal articles published within the last five years. However, for critical context, an article published prior to 5 years ago may have been included. Key search topics included specific keywords or phrases: *online nutrition education, diabetes self-management education, cooperative extension diabetes education, diabetes cooking class, online diabetes cooking class, online cooking education, RE-AIM, RE-AIM and diabetes, cooperative extension agents as leaders, participatory action research with leaders, and social cognitive theory.*

Conceptual Framework

This research study conducted participatory action research using a mixed methods approach focusing on community educators' perceptions of the adaptation and implementation of a diabetes cooking class curriculum created for in-person educational settings and then utilized for virtual educational settings at the onset of the COVID-19 pandemic. The diabetes cooking class includes elements of social cognitive theory embedded in the program delivery. This study was guided using the RE-AIM framework in data analysis.

Participatory Action Research

Local educators leading virtual and face-to-face diabetes cooking classes and other community wellness programs have firsthand knowledge and experiences in recognizing

curriculum resources that are valuable and where gaps exist in resources available. Through participatory action research, the participants in the research study, who are local educators, are viewed as collaborators in identifying issues and making recommendations for change (Saldana & Omasta, 2018). Participatory action research can bring together their experiences to provide recommendations for modifying the current curriculum.

RE-AIM Framework

The RE-AIM framework “emphasizes the reach and representativeness in both participants and settings” (Glasgow et al., 1999, p. 1322). RE-AIM methodology measures the reach, efficacy, adoption, implementation, and maintenance (Glasgow et al., 1999) of a public health intervention. Reach measures participation and demographic descriptions of participants in the program (Glasgow et al., 1999). Efficacy refers to “assessing both positive and negative consequences of programs and the need to include behavioral, quality of life, and participant satisfaction” (Glasgow et al., 1999, p. 1323) in the program evaluation. Glasgow et al. (1999) described adoption as the “proportion and representativeness” (p. 1323) of those who participate in the program. Implementation describes the fidelity of consistent program implementation (Glasgow et al., 1999). Finally, maintenance refers to the extent to which the program continues to impact the individual or community (Glasgow et al., 1999). The use of the RE-AIM framework with the diabetes cooking classes will guide the discussion of the results from the study. This data can help provide decision-makers with more information for determining future implementation strategies for virtual diabetes cooking class programs and identifying tools and resources needed to maintain a presence in online diabetes education.

Social Cognitive Theory

I identified social cognitive theory approaches embedded in the research study intervention as components of the diabetes cooking classes. Bandura (2004) described social cognitive approaches as a method to “promote effective self-management of health habits that keep people healthy through their life span” (p. 144). In the diabetes cooking classes, social cognitive approaches include goals to increase behavioral skills and social support. This study will examine if these social cognitive approaches are supported by the current curriculum by asking of the tools and resources available, which are identified by educators as the most impactful and least impactful. Understanding if curriculum components are impactful or not impactful at meeting program objectives of helping participants gain behavioral skills can provide valuable feedback on the curriculum and resources. Additionally, measuring the perceived level of engagement for each curriculum component can help the researcher better understand which components foster social support in the virtual setting.

Diabetes

Diabetes is a chronic disease affecting millions in the United States. The Centers for Disease Control and Prevention (CDC, n.d.-b) revealed several things people diagnosed with diabetes can do to help manage their diabetes, including healthy eating and being physically active, along with losing weight. People diagnosed with diabetes may also take medicine to control their diabetes and should work with their health care provider to manage this chronic condition. The CDC (n.d.-c) identified three types of diabetes, including type 1 diabetes, type 2 diabetes, and diabetes during pregnancy called gestational diabetes.

Type 2 Diabetes

Type 2 diabetes is the most prevalent of the three types of diabetes. According to the CDC (n.d.-c) “about 90-95% of people with diabetes have type 2” (para. 7). People with type 2 diabetes can manage diabetes to prevent complications, and people at risk for diabetes can prevent or delay developing type 2 diabetes. The CDC (n.d.-b) provides a list of risk factors for developing type 2 diabetes, including being overweight and being physically active less than three days a week, and states that people can prevent or delay developing diabetes by making healthy lifestyle choices related to healthy eating and physical activity. The importance of physical activity and nutrition in preventing and managing type 2 diabetes shows why the curriculum in this study is so important to learn more about.

Community Health Education

Cooperative Extension is an important contributor to community health education. Extension educators are local program leaders, and they each are empowered to work with community partners and other stakeholders to implement health programs that are appropriate for their community.

Overview of Cooperative Extension

The Cooperative Extension System was officially established in 1914 with the national Smith-Lever Act (U.S. Department of Agriculture National Institute of Food and Agriculture, n.d.-a) as a “nationwide educational and outreach network” (U.S. Department of Agriculture National Institute of Food and Agriculture, n.d.-a, para. 2). Cooperative Extension programs work in each state through the Land-Grant University System and have local, state, and federal partners. The U.S. Department of Agriculture National Institute of Food and Agriculture (n.d.-b) describes the value of Cooperative Extension programs to provide community-level reach and

address “public needs by providing non-formal higher education and learning activities to farmers, ranchers, communities, youth, and families throughout the nation” with a network and more than 100 years’ experience to be “well positioned to efficiently get needed tools and knowledge into the hands of the people who need them” (para. 4). Cooperative Extension has subject matter experts and educators “in or near most of the nation's approximately 3,000 counties” (U.S. Department of Agriculture National Institute of Food and Agriculture, n.d.-b, para. 5) who can “help farmers grow crops, homeowners plan and maintain their homes, and youth learn skills to become tomorrow's leaders” (U.S. Department of Agriculture National Institute of Food and Agriculture, n.d.-b, para. 5). Subject matter experts and local educators in the family and consumer science or family and community health discipline often provide local health education programs to help community members live healthier lives.

Extension Agents as Local Leaders

Cooperative Extension provides a delivery system for rural and urban communities to receive needed community health education. At the local level, Extension agents or educators are leading intervention programs. To lead a local program, the educators participate in a train-the-trainer training approach where subject matter experts and experienced peers provide training on the implementation of the program. Local extension staff provide program leadership in their communities by securing volunteers to support the program, marketing and recruiting participants, and leading the implementation and evaluation of the program. Studies have examined the importance of leadership skills in Extension agents as the local Extension program leader. For example, Hall and Broyles (2016) described the common role of agents from any state and serving as an educator in all disciplines to be the role of a leader. Hall and Broyles (2016) declared “in order to be an effective Extension agent, one must also have the necessary

leadership skills that enable him/her to carry out the various aspects of the job” (p. 188). In addition to leading the local program, it is also critical that as the program implementer, Extension educators provide feedback on curriculum implementation, adaptations needed, and audience engagement. Implementer feedback can provide firsthand observations of the tools and resources that are most impactful and engaging for program participants. This feedback can also identify additional curriculum resources needed for future implementation.

Nutrition Education and Cooking Classes

Healthy eating is an important part of community health education and diabetes management; however, there are several perceived barriers to healthy eating, including lack of time, desire for food that is convenient, food preferences by family members, and cost of food (Palmer et al., 2020). To address barriers, Palmer et al. (2020) recommended that “interventions such as cooking classes should address how to use healthy foods in easily adaptable ways that are quick, budget friendly, and account for current household preferences, tastes, and practices” (p. 13). The interventions with cooking classes embedded can provide an avenue for people to learn important educational concepts related to nutrition and can also serve as a time to practice making healthy substitutions, share ideas with other classmates, and taste healthier recipe alternatives.

Online Nutrition and Health Education

While valuable for participants, face-to-face education has limitations on the number of people who can be reached due to facility capacity, educator time, and participant conflicts with program time and location. Buys and Rennekamp (2020) described the opportunity Extension has to provide digital education in connection to land-grant universities, and growing literature has demonstrated the desire for online nutrition education (Bensley et al., 2014; Loehmer et al.,

2017), thus providing an opportunity for exploring potential impacts of virtual diabetes education delivered by Extension.

Barriers to Face-to-Face Education. Virtual health education programs can address barriers to face-to-face programs and help make nutrition and diabetes education accessible to a larger number of people. However, opposition to online health and nutrition programs must be addressed. Greenblatt et al. (2016) discovered three major reasons participants disliked the current nutrition education classes they were attending. Those barriers included unsupervised children having a negative effect on education, outdated educational materials, and clients preferring more engaging education through videos or hands-on demonstrations. When distractions in the physical environment, educational materials, or desire for different teaching methods exist, participants may not be as willing to continue participating in the education. By providing alternative educational programs through virtual synchronous or asynchronous education, in-person program barriers can be eliminated.

Reducing participant barriers is not the only factor to consider. Other barriers to in-person education include physician and educator time. In addition to limited participant time to attend programs, limited time by physicians to provide education in a clinical setting is another important aspect of the need to provide virtual education (Pagoto et al., 2013). Local Extension educators can connect with physicians to address the barrier of physician time and promote local face-to-face classes to support patients' diabetes self-management education needs; however, physicians must have confidence in the community health program. Khan et al. (2020) and Tired et al. (2019) found that healthcare providers need to understand the effectiveness of the program that they are connecting patients to. Thus, Extension diabetes classes must demonstrate effectiveness in helping patients gain knowledge and skills to manage diabetes. Additionally,

funding for additional educators and educator time can limit the number of face-to-face educational programs they can host, thus limiting the number of opportunities for participants to enroll. Providing effective virtual diabetes education and cooking classes could reduce the barriers of in-person education for participants, and physician and educator capacity, to help reach a greater number of people.

Combating Opposition to Online Programs. Online diabetes, health, and nutrition programs can reduce barriers to face-to-face education; however, concerns exist about virtual programs compared to face-to-face education. Opposition to online health and nutrition programs exists for several reasons, including questions about the effectiveness of the program and concerns about participant access to the internet (Neuenschwander et al., 2013). Therefore, to combat opposition to developing online programs, program staff should conduct an internal review of target audiences to demonstrate that many people have access to the internet and online courses. For example, limited resource audiences have access to and use the internet through various means, including computers and cell phones (Bensley et al., 2014; Case et al., 2011; Loehmer et al., 2017). Additionally, limited resource audiences also have demonstrated a desire to engage in virtual learning for nutrition education (Au et al., 2016; Bensley et al., 2014; Loehmer et al., 2017). Past study participants have also indicated an interest in receiving nutrition education through web-based options, social media, text messages, video chats, and email (Bensley et al., 2014; Loehmer et al., 2017). While these studies provide evidence of the interest in online education and the ability to connect with limited resource audiences, it is critical to understand if program developers should expect similar interest in virtual programs from people with diabetes.

Need and Desire for Online Programs. While face-to-face community health education

will always be important, online programs can meet a growing need and expand reach. Expanding the understanding of different audiences' interest in virtual programs and the best ways to develop virtual programs for different public health topics is an important next step. Limited resource audiences have a preference for a mix of online and in-person nutrition education, and future studies can examine if this preference is maintained in similar topic areas (e.g., health, childhood obesity, etc.; Au et al., 2016). Furthermore, Kim and Xie (2017) concluded in their review of literature related to electronic health information that "the growing dependence on technology for self-care and self-management requires more research and programmatic efforts" (p. 1074). By examining the impact of virtual synchronous and asynchronous diabetes cooking classes, this body of research can provide valuable data for future development of virtual programs and evaluate participant changes.

In addition to formative evaluations of programs to assess implementation, summative evaluations are also needed to determine program impact on participants. Recent studies with limited resource audiences have also found that online and face-to-face education about reducing salt in the diet improves participants' knowledge, self-efficacy, and behaviors (Au et al., 2017). Determining if similar impacts exist in online and face-to-face nutrition programs can provide valuable data for the future development of programs.

Diabetes Education and Cooking Classes

One of the key recommendations from the American Diabetes Association (n.d.-b) for helping manage diabetes is a healthy diet. Diabetes nutrition cooking classes can support healthy eating by teaching participants skills needed to modify their eating behaviors. Archuleta et al. (2012) found that participants in diabetes cooking classes reported an intent to adopt healthier meal and food preparation methods and reported an increased use in measuring portions and

using the 50/50 plate method. Additionally, a separate research study found positive movement in dietary habits and cooking confidence by participants in in-person multiple session diabetes cooking classes; however, it was not to a statistically significant value, warranting further research in this area (Black et al., 2019). However, positive clinical markers have been found by other research groups evaluating diabetes cooking classes. Byrne et al. (2017) determined that diabetes healthy cooking classes following a diabetes self-management education program may lower participants' A1C (diabetes clinical marker). Misra and Fitch (2020) found that participants in a 5-session diabetes cooking and education class led by Extension educators had significant improvement in healthy eating and cooking behaviors. A similar Extension-led diabetes cooking and education program found that participants increased their variety of fruit and vegetable consumption (measured in days) and days they spent 20 or more minutes being physically active (Griffie et al., 2018). Diabetes cooking classes play an important role in helping participants improve healthy eating habits and food preparation skills.

In Extension, key components of cooking schools generally include participant hands-on participation, either helping with food preparation or tasting the dish. Working with an educator to prepare a recipe and taste it is not easily adaptable to virtual educational settings, thus warranting a review and evaluation of diabetes cooking classes using face-to-face curriculum components in online delivery.

Previous Diabetes Cooking Class Study

The program being evaluated was previously part of a research study, where program impacts were examined in the face-to-face delivery method and based on participant data from 2005 to 2009. The diabetes cooking class presented in the proposed research has been updated and the leadership of the program has changed. Updates to the curriculum, changes in program

leadership, and a different instructional delivery method (virtual in place of face-to-face) all necessitate an updated evaluation of the diabetes cooking class curriculum from the local leaders' perspective.

Summary

Examining if a diabetes cooking class curriculum developed for face-to-face implementation can be transferred to virtual instructional settings and what modifications are needed from an educators' perspective is a critical next step in providing quality online education. Furthermore, Hingle and Patrick (2016) described the need for further research by stating, "less is known about for people for whom technology-based interventions are likely to be particularly effective and how best to engage those individuals in such interventions" (p. 214). Online educational programs have been met with resistance due to a lack of understanding of clientele's connectivity to the internet, lack of understanding of clientele's desire for online education, and perceived differences in the impact of online versus face-to-face programs. However, due to the COVID-19 pandemic, many face-to-face educational programs changed to online program delivery. Thus, the timing is well-aligned to further study these programs. COVID-19 has forced a shift to virtual program delivery; however, even when in-person programs are resumed, educators should not be quick to return to face-to-face education only and ignore the many benefits of online education. Reducing barriers to education, understanding the reach of technology, and examining the impact of both face-to-face education and online programs are critical areas for continuing to expand health programs.

Chapter 3: Research Method

This research study used a mixed methods approach to participatory action research to determine local class leaders' perspectives on a diabetes cooking curriculum developed for face-to-face implementation and adapted to a virtual instructional setting. Research on this topic is critical because the delivery of the traditional face-to-face cooking school in 2020 and 2021 was largely moved to virtual program delivery due to the COVID-19 pandemic. The RE-AIM framework was used to conduct the evaluation of the virtual delivery program to provide valuable information and knowledge about how to best utilize the cooking school curriculum going forward. Even as communities transition to in-person community-based health education, it is important to understand if virtual program delivery can continue to be a resource for expanding program reach. It is also important to determine if curriculum specific to face-to-face implementation can be adapted for virtual settings or if new curriculum options designed for virtual instructional settings need to be developed.

In this chapter, an overview of the virtual cooking program is provided with a description of the research methodology for the mixed methods study using the RE-AIM framework. The population and study sample are further delineated, and the instruments used to collect data are defined. Finally, ethical considerations are discussed, and the assumption and limitations of this study are reviewed.

Research Design and Method

In this participatory action research study, a mixed methods approach invited local program leaders to share the strengths and needs of the virtual diabetes cooking class curriculum from their perspective with the goal of using the findings of this study to enhance a virtual diabetes cooking class curriculum for Extension. A fixed convergent mixed methods study was

used to assess the adaptations made to the diabetes cooking class curriculum instructional setting (face-to-face transition to virtual). This study of the diabetes cooking class was grounded in social cognitive theory, and the curriculum was created for in-person educational settings and then presented online at the onset of the COVID-19 pandemic.

A fixed mixed methods study identifies the qualitative and quantitative methods at the start of the study (Creswell et al., 2011); therefore, a convergent design refers to the use of both qualitative and quantitative research methods (Creswell et al., 2011). This study used a survey to collect both qualitative and quantitative data. Research findings from the fixed convergent mixed methods study are reported using the RE-AIM framework.

Program Description

This study evaluated educators' perspectives on curriculum components of a virtual diabetes cooking class modified from an in-person delivery method. The delivery method was altered due to COVID-19 and used a digital platform for hosting the lessons in place of hosting lessons in a community setting. The curriculum featured four lessons of educational content with educational objectives, PowerPoint presentations, activities, recipe demonstrations, and educational handouts. The web-based platform chosen to host classes varied by site and was based on the educator's comfort level with the platform and ease of access for participants. Platforms traditionally used include Zoom, Microsoft Teams, or a private Facebook group. In addition to having the same in-person teaching materials, educators also had access to a guide to support virtual implementation. To assess program participant outcomes, educators were encouraged to share an online Qualtrics pretest and posttest with participants through email. Participants received a link to complete the online pretest following their registration for the

program and received a link to complete the online posttest following the end of the fourth educational session.

Table 1 shows some of the educational tools and activities for each lesson. The tools and activities included a set of recipes that supported the educational components from the PowerPoint lesson, handouts to be used as at-home references, and in-class activities that reinforced teaching points.

Table 1

Examples of Educational Content by Lesson

Lesson #	PowerPoint lesson	Recipes	Handouts	Class activities
1	Yes	6 options	Carbohydrate Choices How to Read the Nutrition Label Artificial Sweeteners	More or less carbohydrates? food sort
2	Yes	6 options	Types of Fat Healthy Substitutions	Comparing two products food labels
3	Yes	6 options	Tips for Reducing Sodium Tips for Increasing Fiber	Demonstration of average American salt consumption
4	Yes	7 options	Healthy Celebrations: Tips and Tricks	Review tips for celebrating

RE-AIM Framework

The RE-AIM framework was used to report the findings of the online survey about the transition of a community-based diabetes cooking class to a virtual delivery format and provided an examination of the successes and challenges of retrofitting a curriculum designed for face-to-face implementation for use in digital learning. Such evaluations provide decision-makers with

more information for determining future implementation strategies for digital community health programs.

The research study was reported on all five elements of the RE-AIM framework (i.e., reach, efficacy/effectiveness, adoption, implementation, and maintenance). Jung et al. (2018) described the reason for reporting each of the RE-AIM elements as enabling “health professionals to compare findings across interventions and establish the receptivity and sustainability of a program, enabling informed decisions about future public health initiatives” (p. 2). Glasgow et al. (1999) introduced the RE-AIM framework as a method for evaluating public health programs among five dimensions: reach, efficacy/effectiveness, adoption, implementation, and maintenance. In addition to evaluating the five dimensions of a program, Reilly et al. (2020) emphasized the importance of the RE-AIM framework at different levels by describing:

the framework includes dissemination outcomes at the individual (i.e., patient, reach) and organizational (i.e., adoption) levels. It also includes implementation outcomes that are operationalized at the organizational level (i.e., implementation and organizational maintenance). Finally, clinical outcomes are operationalized at the patient/participant level (i.e., effectiveness, maintenance). (p. 2)

Reporting on the five elements of the RE-AIM framework provides a complete look at various elements of the diabetes cooking class in this study to make recommendations about future adaptation and use.

Before the COVID-19 pandemic, it was important to implement program evaluation measures as described in RE-AIM among participant and organizational levels; however, in the current pandemic in 2022, it is additionally valuable to assess program transitions in a timely

manner. RE-AIM can “assist researchers and practitioners to identify changes in health-related outcomes and indicators over time and compare differences between interventions pre- and post-pandemic (in terms of their reach, adoption, implementation, effectiveness, and maintenance)” (Smith & Harden, 2021, p. 2). Smith and Harden (2021) described the RE-AIM model as a valuable tool for health interventions during and post COVID-19 as programs were adjusting to pandemic restrictions. It is important because transitions made as a result of COVID-19, like increased use of technology in community health program delivery, will likely have a long-term impact on the way programs are implemented, and it is ideal to begin understanding that impact in a timely manner.

Population

This study population included community educators in local leadership roles that would be able to offer the diabetes cooking class. An email was sent to all educators inviting them to participate in the research study. The study was only open to those educators who had conducted virtual diabetes cooking classes in 2020 or 2021.

Study Sample

The goal of this study was to gain feedback from community health educators who implemented the diabetes cooking classes virtually. All community health educators within the organization were invited to participate in the survey; however, data related to program effectiveness were based on those participants who implemented the program virtually in 2020 or 2021. A total of 23 educators participated fully in the study. The study was intended to focus on program enhancement by identifying impactful program components and tools and resources that were missing. Thus, a smaller sample size of educators who have implemented the program was best able to provide this data.

Materials/Instruments

An online Qualtrics survey about program implementation was developed for this study and then completed by the participants. The survey questions and prompts (see Appendix A) were developed following Chen's (2015) recommended steps for a formative evaluation of interventions, including a review of program materials, program elements, and identifying potential problems for the diabetes cooking school curriculum. An analysis of the curriculum components available for each lesson (see Table 1) was conducted as part of the program materials review. In addition to reviewing the program materials, I compiled commonly heard challenges to virtual implementation to develop a question asking about potential problems with virtual implementation. Furthermore, it is important to understand if educators have suggestions for what additional resources could help address challenges to virtual implementation; therefore, an open-ended question about tools and resources needed was created. Questions were also developed to investigate the program implementation styles, including what platforms were used for implementation and if the program was implemented as a team or individual.

Survey questions and educator response prompts were developed specific to the research questions in this study and informed by a published study of a previous formative evaluation looking at educators' experience implementing an Extension led curriculum (Duke & Scott, 2017). Duke and Scott (2017) used a formative evaluation to assess educators' perspectives on the implementation and impact of lessons in youth curriculum and described modifying the curriculum lessons based on that feedback. The use of formative evaluation for this study aims to also assess educators' perspectives but with a focus on curriculum components and teaching tools to better understand what is needed to help educators implement future programs in a virtual setting. An earlier study of a variation of this curriculum from staff at the study site had

determined that the program, when implemented face-to-face, was successful at helping participants gain knowledge and adopt healthy food preparation practices; thus, one of the objectives of this study was to look beyond the curriculum lessons to the program components that are consistent across each lesson. While the educational objectives for the program remain the same for classes implemented in-person or virtually, the components that teach those objectives may need to be adapted for virtual implementation, thus the need to assess the component impact on learning and engagement with participants based on the educators' observations and experience. To assess educators' perspectives on the curriculum components, two prompts were created to have educators rate the impact curriculum components had on participant learning and engagement. Assessing the program implementers' perceptions of the effectiveness of each curriculum component was important for evaluating which components support the social cognitive approaches in the diabetes cooking classes; including which of the curriculum components foster social support (i.e., measured through participants' engagement) and if the curriculum components support participants gaining behavioral skills (i.e., measured through impact on learning).

To determine that all curriculum components, implementation styles, and potential problems were addressed in the newly developed survey, a draft of the survey questions was reviewed by a program development leader and subject matter expert. Recommended revisions by the two reviewers were accepted, and modifications to the survey were made.

Data Collection and Analysis Procedures

Data collection focused on educators' perspectives, and data analysis followed reporting categories from the RE-AIM framework and was planned for the five components in this study. Qualtrics was used to administer the survey for Extension community educators. The following

sections further discuss each component of RE-AIM and questions that guided data analysis within that section, and Table 2 provides an overview of the RE-AIM component, evaluation questions, and research question answered.

Reach

To assess the reach of the virtual diabetes cooking class, this study examined program participation in perspective to educators who implemented the program in 2020 or 2021 virtually (survey Q1) by asking, “Did you implement XXXXXXXXXX in 2020 or 2021?” The question includes a yes or no response so that educators who did not offer the diabetes cooking class exited the survey and did not provide evaluation responses. The response for “yes” included an expanded response to determine if the program was implemented face-to-face or virtually. The reach component used descriptive statistics (measure of frequency) to describe the potential reach of the program when transitioning to a virtual instructional setting.

Effectiveness

To assess the efficacy of the virtual diabetes cooking class, two prompts were provided on the survey for community educators to determine the effectiveness of curriculum components.

- Q4 From your perspective as the educator, rate the XXXXXXXXXX program components below based on the level of impact they had on participant’s learning outcomes through virtual program delivery. 1 = not impactful at all, 5 = very impactful, or choose did not use this program component if it was not part of your virtual implementation.
- Q5 From your perspective as the educator, rate the XXXXXXXXXX program components below based on the level of interaction they generated from virtual program participants (interaction may include verbal questions or comments; or text chat questions or

comments). 1 = no engagement at all, 5 = high level of engagement, or choose did not use this program component if it was not part of your virtual implementation.

The prompts examined if educators perceived face-to-face curriculum components as impactful on virtual participant learning outcomes and if they generated engagement on the virtual platform. Elements of the effectiveness portion of the survey examined perceptions of impact and engagement by program components (i.e., PowerPoint, handouts, activities, recipes, pretest posttest, etc.). For each prompt, participants rated the level of impact or engagement based on response options using a Likert scale, or they could indicate that they did not use that program component. The Likert scale produced ordinal data ranking program components from 1 (not very engaging or impactful) to 5 (very engaging or impactful). Data were analyzed using mean and standard deviation to identify themes for impactful, not impactful, engaging, and not engaging curriculum components.

Adoption

Adoption of the virtual diabetes cooking class evaluated organizational adoption of program delivery by comparing the number of educators indicating implementing the virtual program in the same manner as to reach.

Implementation

This evaluation looked to describe the use of a face-to-face program that has been adapted for virtual implementation. To evaluate implementation, this study examined educators' implementation strategies and platform (Q2 – Q3) and perceived challenges (Q6) to virtual implementation. Educator's implementation as a team or individual was described using the measure of frequency, as well as a platform of choice. Educators were also given the opportunity to identify the platform used if they used a digital platform other than Zoom, Microsoft Teams,

or Social Media (Q2a). Perceived challenges were identified using measures of frequency reported for each challenge. Educators were given options of commonly expressed challenges to choose from and the option for selecting Other and describing those challenges in Q6a. To align with Chen's (2015) emphasis on the importance of determining strategies to address program problems, a question seeking to identify additional tools and resources needed for virtual implementation (Q8) was asked. Responses for Q8 were classified by themes that emerged from the responses to the open-ended question. The following questions were asked:

- Q2 What distance delivery platform did you use for the virtual XXXXXXXXXXXX program? Select all that apply.
- Q3 Did you offer the virtual XXXXXXXXXXXX program as part of a team of agents or individually?
- Q6 What was the biggest challenge to implementing the XXXXXXXXXXXX program virtually?
- Q8 What program components were not included that would have been helpful for virtual program delivery, or what components did you have to develop or create for virtual program delivery?

Maintenance

Diabetes cooking class virtual program implementation began rapidly in 2020 at the onset of COVID-19 in response to the need for social distancing and restricting in-person education, and there is a need to determine if virtual programs will be maintained by educators once they begin in-person programs again. As a result, program maintenance was measured by intent to continue delivery of virtual programs or hybrid options in Q7 and reported by frequency of response. Question 7 was, "When you are able to deliver programs face-to-face in your

community again, will you continue to use virtual delivery for XXXXXXXXXXXX as an option?"

Table 2 provides a summary of the RE-AIM components and methodology.

Table 2

Summary of RE-AIM Components and Evaluation Measures

RE-AIM component	Measure or indicator	Data source	RQ
Reach/Adoption: Comparison of virtual program implementation.	Program reach	Q1	
Effectiveness: Effectiveness for virtual program as an option to face-to-face and identification of components that are well-received by participants and educators in virtual implementation	Program component impact on participants learning outcomes	Q4	1 & 2
	Program component impact on interaction with participants	Q5	3 & 4
Implementation: Identify implementation strategies, examine themes for challenges to virtual implementation and tools and resources needed to help alleviate challenges	Implementation platform chosen	Q2	
	Individual or team implementation	Q3	
	Challenges to virtual adaptation	Q6	5
	Additional tools and resources needed	Q8	7
Maintenance: identify future plans for continuing virtual programming	Intent to continue virtual implementation	Q7	6

Ethical Considerations

Ethical considerations include my professional connection to study participants. As the researcher, I am a colleague of the community health educators and the administrative leader for the unit that oversees the diabetes cooking program. Through this research study, it was critical

to protect the identity of educator respondents. A deidentified online survey was used to provide stronger anonymity for feedback and reduce bias.

Assumptions

The diabetes cooking class was hosted on a virtual platform and required the use of a computer, tablet, or cell phone with access to the internet. Therefore, it was assumed that program participants had the tools to access digital learning, including reliable internet access and that educators had the tools to offer this program virtually.

Limitations

Limitations in the study exist due to the implementation of the program and the variety of formats used. Due to the COVID-19 pandemic, instructional settings for the diabetes cooking class quickly transitioned from face-to-face in early 2020. Community health educators made decisions for virtual or in-person program delivery based on organization and local guidelines. Additionally, the use of digital platforms varied based on educator and participant access. It is important to note that these transitions to digital happened locally and at a rapid pace based on individual educators. Digital delivery of the diabetes cooking class had not been used widely prior to the COVID-19 pandemic. These limitations should be considered when reviewing the program evaluation and would not be generalizable to other transitions in community health education settings.

Delimitations

This study was delimited to examine a single diabetes cooking program offered as selected by community health educators and was designed to strengthen the virtual implementation of that program.

Summary

Understanding the impact of transitioning a face-to-face program to virtual delivery methods for participants and educators is critical in determining if the program continues to meet its specified objectives. The RE-AIM framework provided a model that looked beyond individual participant outcomes and included organizational elements. This research study was designed to provide a template for evaluating other Extension programs that were flipped to virtual program delivery during the COVID-19 pandemic and can identify ways the program was successful in continuing program reach during a time when face-to-face programs were not an option. Finally, the results of this study identified areas of improvement for the virtual diabetes cooking class delivery to enhance future program delivery and reach more audience members.

Chapter 4: Results

The purpose of this study was to examine community health educators' use and perspectives on a diabetes cooking class curriculum developed for in-person delivery but then utilized in virtual delivery methods. The study also looked at the educators' implementation of the virtual program, including their intent to continue using virtual programs post pandemic, challenges with virtual delivery of the curriculum, and additional tools and resources needed.

Qualitative and quantitative data were collected through a Qualtrics survey to answer the following research questions:

- **RQ1.** What are educators' perspectives on the most impactful curriculum components for virtual implementation?
- **RQ2.** What are educators' perspectives on the least impactful curriculum components in virtual implementation?
- **RQ3.** What are educators' perspectives on the most engaging curriculum components for participants in virtual implementation?
- **RQ4.** What are educators' perspectives on the least engaging curriculum components for participants in virtual implementation?
- **RQ5.** What do educators' feel is the biggest challenge to implementing a virtual diabetes cooking class?
- **RQ6:** What are educators' implementation plans going forward in program delivery once COVID-19 restrictions are lifted?
- **RQ7:** What recommendations do educators have for additional tools and resources to support virtual program implementation?

This chapter describes the study sample and reports the quantitative and qualitative findings of the Qualtrics survey using the RE-AIM framework to answer the seven research questions. The RE-AIM framework was employed to categorize the results of the data in a method that evaluates the overall virtual diabetes cooking class curriculum. The categories reported in the RE-AIM framework are reach, effectiveness, adoption, implementation, and maintenance.

Study Sample

Participation in this study was voluntary, and the study was approved by the Abilene Christian University Institutional Review Board (see Appendix B). The study opportunity, including survey link and consent, was sent by email to community health educators by a leader for health programs. To avoid researcher bias, I was not included in the recruitment email to potential participants. Potential study participants had a two-week window to respond to the survey. Participant consent indicated that participants could choose to quit the survey at any time. A total of 29 educators accessed the consent form, began the survey or completed the survey. By using the Qualtrics filter for finished surveys, 23 participants completed the responses they were presented. The survey was branched so that participants only responded to survey questions necessary to collect data relevant to the virtual implementation of the program in 2020 and 2021. For example, only those study participants who implemented the diabetes cooking curriculum virtually in 2020 or 2021 were included in the full program evaluation data analysis beyond reach. Participants who indicated they did not implement the program in 2020 or 2021 exited the survey following the consent and survey Question 1. Participants who selected they only offered the program in-person in 2020 and 2021 in Question 1a; therefore, not having virtual implementation experience, exited the survey following that question. Following these

early screening questions to determine participant eligibility for participating in the study, it was determined that 15 of the individuals had offered the program virtually in 2020 or 2021.

Findings

A Qualtrics survey was developed as the study instrument and included questions with multiple-choice, open-ended response, and Likert scales to capture the qualitative and quantitative data. The findings from that data are reported by RE-AIM components below in coordination with the research questions identified at the onset of the study.

Reach/Adoption

Reach and adoption data for the evaluation of the diabetes cooking school is reported by the number of community educators who responded that they had offered the diabetes cooking class virtually in 2020 or 2021. These data describe the study population who provided input and responses to the study survey and are intended to report only on the experiences of virtual delivery of the program. This study had 23 participants who responded to the survey (see Table 3).

Table 3

Responses to Survey Question 1 About Implementation of Diabetes Cooking Class in 2020 and/or 2021

Response	<i>n</i>	%
Yes	17	73.91
No	6	26.09

Following the initial question about the implementation of the diabetes cooking class curriculum, six respondents exited the survey because they had not implemented the program.

The remaining 17 respondents received a second question about the implementation of the program in 2020 and 2021 to determine who had experience implementing the program in a virtual format. Results showed two respondents did not implement the program virtually (see Table 4). Those respondents exited the survey. The remaining 15 participants were provided with the full survey following these questions.

Table 4

Responses to Survey Question 1a About Virtual Implementation in 2020 and/or 2021

Response	<i>n</i>	%
Yes, offered virtually in 2020 or 2021	10	58.82
No, only offered in-person, face-to-face in 2020 or 2021	2	11.76
Offered both face-to-face, in-person and virtually in 2020 and 2021	5	29.41

Effectiveness

The participants were the local leaders and implementers of the diabetes cooking class program and the primary users of the curriculum. To determine program effectiveness, this study assessed their perspectives on the face-to-face curriculum in virtual delivery related to impact on participant learning outcomes and participant engagement to answer Research Questions 1, 2, 3, and 4.

Impact of Curriculum Components. Data to assess the impact of curriculum components on program participant learning outcomes were analyzed to answer RQ1 and RQ2. Research Question 1 was asked to examine educators' perspectives on the most impactful curriculum components for virtual implementation. Research Question 2 was asked to determine educators' perspectives on the least impactful curriculum components in virtual implementation. Study participants reported perspectives on the most impactful and least impactful curriculum

components for virtual program implementation by rating the level of impact curriculum components had on participant learning outcomes using a Likert scale to provide ordinal data derived from 1 = *least impactful* and 5 = *most impactful* and are reported as a mean for each component with the standard deviation (see Table 6). Study respondents could also choose if they did not use a curriculum component in their virtual implementation, and those numbers are reviewed in Table 5. The curriculum components rated included PowerPoint presentations, discussions, recipe demonstrations, teaching activities or demonstrations with educational resources, educational handouts, participant registration forms, participant pretest, and participant posttest.

Table 5

Curriculum Components Not Used as Measured in Q4

Components	<i>n</i>	%
PowerPoint presentations	0	0
Discussions	2	13.33
Recipe demonstrations	1	6.67
Teaching activity or demonstration with educational resources (food models, measuring cups, portion plates, etc.)	2	13.33
Educational handouts	0	0
Participant registration form	2	13.33
Participant pretest	1	6.67
Participant posttest	1	6.67

Table 6*Mean and Standard Deviations for Curriculum Component Effectiveness*

Components	<i>M</i>	<i>SD</i>
PowerPoint presentations	3.60	0.83
Discussions	3.54	1.33
Recipe demonstrations	4.36	0.84
Teaching activity or demonstration with educational resources (food models, measuring cups, portion plates, etc.)	3.85	1.07
Educational handouts	3.40	1.06
Participant registration form	3.46	1.13
Participant pretest	3.00	0.96
Participant posttest	3.00	0.96

Engagement of Curriculum Components. Engagement of curriculum components was measured to assess the educators' perspectives on how curriculum components encouraged audience interaction in the virtual programs. Interaction was described in the survey as could include verbal questions or comments or questions or comments in the chat. Research Question 3 was used to examine educators' perspectives on the most engaging curriculum components for virtual implementation. Research Question 4 was asked to investigate educators' perspectives on the least engaging curriculum components in virtual implementation. Perceived engagement was reported using a Likert scale to produce ordinal data obtained from 1 = *least engaging* and 5 = *most engaging* and the mean and standard deviation are reported in Table 8. The curriculum components measured were the same as those measuring impact, and study respondents could again choose did not use if they did not use a curriculum component in their virtual

implementation (see Table 7).

Table 7

Curriculum Components Not Used as Measured in Q5

Components	<i>n</i>	%
PowerPoint presentations	0	0
Discussions	1	6.67
Recipe demonstrations	2	13.33
Teaching activity or demonstration with educational resources (food models, measuring cups, portion plates, etc.)	1	6.67
Educational handouts	1	6.67
Participant registration form	3	20.00
Participant pretest	1	6.67
Participant posttest	1	6.67

Table 8*Mean and Standard Deviations for Curriculum Component Engagement*

Components	<i>M</i>	<i>SD</i>
PowerPoint presentations	3.20	1.15
Discussions	3.00	1.30
Recipe demonstrations	3.62	1.33
Teaching activity or demonstration with educational resources (food models, measuring cups, portion plates, etc.)	3.29	1.27
Educational handouts	3.14	1.10
Participant registration form	3.00	1.28
Participant pretest	2.50	1.02
Participant posttest	2.43	1.02

Implementation

The diabetes cooking class curriculum in this study was designed for implementation in a face-to-face setting. Due to the COVID-19 pandemic, community health educators moved to deliver the curriculum virtually, which altered the implementation of the program. To assess implementation, educators described their implementation setting to investigate the virtual platforms used. Several commonly known virtual platforms were provided as multiple-choice responses, and the option of Other was included if they implemented using a different platform (see Table 9). For those who chose Other, an additional question with text entry was provided for them to name the other platforms used. Educators were asked to select all that apply to account for educators who may have delivered the class using different formats at different times over the 2 years.

Table 9*Distance Delivery Platforms Used*

Response	<i>n</i>	%
Microsoft Teams	7	43.75
Zoom	1	6.25
Social media	7	43.75
Other	1	6.25

One response was recorded for Other, and the respondent provided a text response to describe the distance delivery platform used. The text response was that they used “YouTube and Zoom for live Q&A.”

To describe virtual implementation strategies further, the study aimed to describe if educators taught the virtual class alone or used a team-teaching approach (see Table 10).

Table 10*Implementation of Virtual Program as an Individual or Team*

Response	<i>n</i>	%
Team	13	86.67
Individual	2	13.33

Research Question 5 was asked to determine what educators identified as the biggest challenge to implementing the program virtually. Commonly identified challenges were listed as multiple-choice responses for the educators, and the option of Other was included if they experienced a challenge not listed (see Table 11). For those who chose Other, an additional question with text entry was provided to them to describe the challenge of hosting a virtual program.

Table 11*Biggest Challenge to Implementing Virtually*

Response	<i>n</i>	%
Technology connections for participants	3	20.00
Technology connections for agents	0	0
Engaging with the audience	4	26.67
Recruiting participants	1	6.67
Creating additional content needed (filming videos, social media graphics, etc.)	3	20.00
Other, please describe in the next question	4	26.67

A summary of each of the four Other text responses is highlighted below. These are a summary that has broken out the challenge expressed or ideas for new curriculum development:

- Prerecording PowerPoints to play and then educators being available to the audience online to answer questions, but should have divided PowerPoint recordings into smaller sections.
- Challenges with directing participants to a closed Facebook group and being able to identify how many participants were accessing all parts of the class.
- Curriculum does not have opportunities for participants to test the skill or knowledge they learned.
- The PowerPoints are long and should be customized to a virtual platform.
- There should be a library of recipe demonstrations that participants can search based on preference.
- Include preprepared food options in the recipe selections for demonstration.

- Participants completing the posttest for feedback.

The final research question (RQ7) for implementation was asked to identify the additional resources that educators need to more effectively continue the virtual implementation of the diabetes cooking class. Educators were asked to list program components that were needed or components they created locally. A response was requested from respondents but did not require a response to complete the survey. Eleven respondents provided useable responses. Those responses were categorized into themes using content analysis and a summative frequency for each theme:

- interactive elements for virtual audience (game-based testing or Q&A with provider; $n = 3$)
- library of short videos (diabetes related topics, recipe demonstrations; $n = 3$)
- new method for collecting pre/post class survey ($n = 2$)
- educator equipment for implementing virtual programs ($n = 2$)
- links for education in place of handouts ($n = 1$)
- social media elements for education and promotion ($n = 1$)

Maintenance

To describe the maintenance of virtual diabetes cooking classes and answer Research Question 6, educators were asked about future delivery plans for the diabetes cooking classes. Respondents were asked if when they were able to deliver programs face-to-face in their community, would they continue using virtual delivery as an option for the diabetes cooking classes. Responses included yes, maybe, and no (see Table 12).

Table 12*Future Plans to Continue to Use Virtual Delivery*

Response	<i>n</i>	%
Yes	7	46.67
Maybe	5	33.33
No	3	20.00

Summary

This chapter reviewed the research questions, RE-AIM framework, study sample, and reported the findings from a Qualtrics survey. The Qualtrics survey produced quantitative and qualitative data related to the adaption and implementation of a community-based virtual diabetes cooking school. In Chapter 5, findings from the survey will be further discussed within the elements of the RE-AIM framework, and recommendations for the future of the curriculum with virtual delivery will be reviewed.

Chapter 5: Discussion, Conclusions, and Recommendations

This study identified the need for a program evaluation of a diabetes cooking class curriculum that was developed for in-person instruction; however, the course was implemented virtually during the COVID-19 pandemic. The purpose of the participatory action research study was to examine educators' perspectives about implementing the curriculum virtually while also examining the implementation strategies, challenges, and resources still needed. Data were gathered through an anonymous Qualtrics survey that included multiple-choice responses, Likert scale responses about the effectiveness and engagement of curriculum components, and text responses. Limitations of the research were identified prior to beginning the study and included the variety of implementation strategies used by local program leaders and the rapid onset of virtual implementation of the program during a global pandemic. Chapter 5 will use data from Chapter 4 to discuss the findings for the seven research questions, examine additional study limitations, and make recommendations for the use of these findings.

Discussion of the Findings in Relation to Past Literature

People with type 2 diabetes or those at risk for developing type 2 diabetes need educational resources on creating healthy nutrition habits. Extension has local community educators who can provide these resources and lead local programs like the diabetes cooking classes discussed in this study. Traditional face-to-face Extension diabetes education and cooking classes have demonstrated success in participants' improved healthy eating and cooking behaviors (Misra & Fitch, 2020) and participants increased consumption of a variety of fruit and vegetables (Griffie et al., 2018). The COVID-19 pandemic halted many in-person activities, like Cooperative Extension programs, and resulted in traditional face-to-face education shifting to online platforms. This shift has led to an opportunity for Extension programs to develop more

online educational opportunities for clients who may have a growing interest in virtual classes. The findings presented in this chapter start to examine what resources are needed in one Extension diabetes cooking class series to provide effective education that meets program objectives and is engaging for audience members. The study also examined implementation strategies for virtual program delivery, challenges to virtual program delivery, and additional resources needed to continue effectively offering diabetes cooking classes in online settings.

Research Questions 1 and 2: Discussion of Findings

The first research question in this study was about educators' perspectives on the most impactful diabetes cooking class curriculum components when used in implementing the class virtually. It was important to identify which curriculum components educators perceived to have the largest impact on learning to demonstrate how the social cognitive approach of increasing behavioral skills for participants was being implemented in the diabetes cooking class. Research Question 2 was about educators' perspectives on the least impactful diabetes cooking class curriculum components when used in virtual implementation. The results for RQ1 and RQ2 were analyzed by creating a mean score for each curriculum resource based on responses to a Likert scale of 1 (*least impactful*) to 5 (*most impactful*). Participants also had the choice to answer that they did not use that specific curriculum component in their virtual implementation of the course (see Table 5). Mean scores for each curriculum component do not include the "did not use" responses and were reported in Table 6. Curriculum components that rated the highest in terms of mean score were considered most impactful on participants learning outcomes as determined by the local program leaders. Recipe demonstrations were the highest rated curriculum component for effectiveness on learning outcomes ($M = 4.36$). Teaching activities or demonstrations with educational resources were also highly rated ($M = 3.85$).

Curriculum components with the lowest mean scores were considered least impactful on participants' learning outcomes as determined by the local program leaders. The curriculum components that were described as least impactful were participant pretests ($M = 3.0$) and participant posttests ($M = 3.0$). The neutral score on these curriculum components demonstrates that the educators do not perceive them to be as impactful on participant learning outcomes as other curriculum components.

Research Questions 3 and 4: Discussion of Findings

Research Question 3 was designed to examine educators' perspectives on the most engaging curriculum components of the virtual diabetes cooking classes. Determining engagement demonstrates which curriculum components are fostering social support as a social-cognitive approach. Research Question 4 was about educators' perspectives on the least engaging diabetes cooking class curriculum components when used in virtual implementation. The results for RQ3 and RQ4 (see Table 8) were analyzed by creating a mean score for each curriculum resource based on a Likert scale of 1 (*least engaging*) to 5 (*most engaging*). As with the previous question, participants could choose that they did not use that specific curriculum component in their virtual implementation (see Table 7). Curriculum components with the highest mean scores were considered to have generated the most engagement, as determined by the local program leaders. The curriculum components that were described as most engaging were the same as those described as the most impactful (RQ1), the recipe demonstrations ($M = 3.62$), and teaching activities or demonstrations with educational resources ($M = 3.29$).

Curriculum components with the lowest mean scores are described as having generated the least engagement. The curriculum components that were described as least engaging were

also those described as being the least effective or impactful (RQ2), participant pretest ($M = 2.50$), and posttest ($M = 2.43$).

Research Question 5: Discussion of Findings

Research Question 5 was about what educators felt were the biggest challenges to implementing a virtual diabetes cooking school. Educators were able to choose from a list of multiple-choice options or choose Other and then describe the challenge in a text box. The data were analyzed in two methods. First, the frequency of each challenge was reported in Table 11. For the text responses to Other, the responses were reviewed, and challenges were pulled from the responses. The biggest challenges to virtual implementation of the diabetes cooking classes reported by local program leaders were engaging with the audience ($n = 4$), navigating technology connections for participants ($n = 3$), and creating additional content needed ($n = 3$). Other notable responses to the open-ended question about challenges to offering the virtual diabetes cooking class included navigating challenges with the PowerPoint presentations, which were created for an in-person educational event, being able to determine what pieces of the curriculum participants were viewing, and getting feedback on the program.

Research Question 6: Discussion of Findings

The sixth research question in this study was about educators' implementation plans once they were able to return to in-person activities in their community. Throughout the pandemic, local educators worked with their local community leaders to determine if classes should be held in person or should be held online. Decisions for implementation varied. The data were reported and analyzed by frequency of response (see Table 12) to whether educators would continue using virtual implementation as a strategy in diabetes cooking classes. From the data, it was determined that almost half (47%) of the educators would continue to use virtual delivery as a

tool for the diabetes cooking class program ($n = 7$), and another 33% ($n = 5$) might continue the use of virtual implementation.

Research Question 7: Discussion of Findings

The final research question in this study was about recommendations educators had for additional tools or resources to support future virtual implementation of the program. The question in the study was open-ended and aimed to compile a list of resources that should be made widely available by asking what resources educators would like to have had or what resources they had to create to implement the program. The responses were studied and categorized into themes using content analysis and then listed with the frequency of response. To complete the content analysis, I prepared the data by retrieving responses to the question and conducting an initial review. Following this, the responses were hand-coded to classify responses into categories. The categories were studied to determine if any could be combined. Those themes and categories are presented based on the number of times the response occurred. The most frequently identified resources needed centered on curriculum components that were engaging and interactive, including interactive elements ($n = 3$) and a library of short videos ($n = 3$). Another theme that could be included in the interactive elements is links for educational resources in place of handouts ($n = 1$). Other identified needs included a new method for collecting pre and posttests ($n = 2$), educator equipment for implementing the class virtually ($n = 2$), and social media content ($n = 1$).

Limitations

While this study has the potential for improving the virtual implementation of a diabetes cooking class curriculum, there are some limitations to consider when reviewing the results. One important limitation is that the study examined responses for one specific curriculum from a

small group of educators. It was important to limit the responses to those educators who had implemented the program virtually in 2020 and 2021 to get their feedback on the curriculum and implementation; however, this study does not consider why other educators may have chosen not to implement the program and if they would implement it in the future if updates were made. An additional restriction of the study is that educators had different experiences implementing the program based on the digital platform they chose to use and the equipment and resources they had locally to use for the virtual implementation. A final constraint of this study is that it did not assess educators' experience with teaching the curriculum or their experience with using technology to provide education. While these limitations exist and the findings of this study are not generalizable to other curriculums that were implemented virtually, the results of the study have produced some important recommendations for the virtual diabetes cooking classes going forward.

Recommendations of Findings in the RE-AIM Framework

The RE-AIM framework provided a process for evaluating the diabetes cooking class curriculum for reach, effectiveness, adoption, implementation, and maintenance. Chapter 4 reported the data for seven research questions through the RE-AIM elements. While each RE-AIM element provides important program feedback, Research Question 6, about program maintenance and educators' intent to continue offering the program virtually, demonstrates why the findings of the study are important. Most of the participants responded that they would (47%) continue to implement the program virtually, or they may (33%) continue to implement the program virtually. Since most educators who responded have an intent to continue with virtual delivery of the diabetes cooking class, it is important that program effectiveness, participant engagement, and virtual program challenges be examined and addressed.

To identify areas of opportunity for strengthening the diabetes cooking curriculum for virtual delivery, program developers should examine the findings of the effectiveness and implementation elements of the RE-AIM framework. The effectiveness of the program was reviewed through answers to Research Questions 1, 2, 3, and 4. These research questions determined the impact curriculum components had on the audiences' learning and the impact the curriculum had on the audiences' engagement in the class, thus supporting the social cognitive approaches of learning behavioral skills and fostering social support. Additionally, in the implementation section of RE-AIM, it is important to consider the educators' feedback on what challenges exist to the virtual implementation of this program and what additional resources are needed. By reviewing the results of these two RE-AIM components together, several recommendations have resulted from the study.

A review of the data provides evidence that audience engagement in the virtual delivery of the diabetes class needs to be further developed. When comparing the results of Research Questions 1, 2, 3, and 4, it was determined that the mean score for each curriculum component was higher in impact on learning than for audience engagement. The two highest-rated curriculum components for engagement and impact were recipe demonstrations and teaching activities with educational resources; however, in both components, the mean score for engagement (recipe demonstrations $M = 3.62$; teaching activities $M = 3.29$) was lower than the mean score for impact (recipe demonstrations $M = 4.36$; teaching activities $M = 3.85$). Table 13 is provided to show the consistently lower mean score for curriculum component engagement when compared to curriculum component effectiveness.

Table 13*Comparison of the Mean for Curriculum Component Effectiveness and Engagement*

Component	<i>M</i> effectiveness	<i>M</i> engagement
PowerPoint presentations	3.60	3.20
Discussions	3.54	3.00
Recipe demonstrations	4.36	3.62
Teaching activity or demonstration with educational resources (food models, measuring cups, portion plates, etc.)	3.85	3.29
Educational handouts	3.40	3.14
Participant registration form	3.46	3.00
Participant pretest	3.00	2.50
Participant posttest	3.00	2.43

This comparison and the need for engaging content in the curriculum is also supported by the answer to Research Question 5, which looked at the biggest challenges to implementing virtual diabetes cooking classes. Engaging with the audience was most frequently reported as the biggest challenge ($n = 4$). Creating additional content, like filming videos or creating social media graphics, was also a frequent challenge ($n = 3$) reported, further demonstrating that educators identified the need for creating more engaging content for audience members. This was also supported in Research Question 7, where educators' responses provided recommendations for what resources are needed in the virtual implementation of the diabetes cooking classes. The most frequent themes for resources educators created or desired included interactive elements, like game-based testing of skills or question and answer time with a

healthcare provider and a library of short videos that could be diabetes topic-specific or recipe demonstrations.

It was also revealed in Research Questions 2 and 4 that the current participant pretest and posttest method was rated as the lowest curriculum components for both impact and engagement with participants. Getting participants to respond to the pretest and posttest was described as a challenge, and implementing a new method for collecting these was a recommendation from educators in response to Research Question 7. Collecting participant pretest and posttest responses is an important component in evaluating the impact the program has on participants' knowledge gain and behavior change; therefore, it is important to capture the challenges and recommendations associated with it.

Seeking educator feedback on program implementation is important to improving the curriculum and providing high-quality educational experiences to participants. Based on the findings of this study, it is recommended that the curriculum team for the diabetes cooking class develop a suite of audience engagement tools and resources for educators who plan to continue virtual program implementation. Suggested resources to be developed include:

- interactive virtual methods for participants to test newly acquired skills (game-based interactions as a possible option);
- a library of electronic resources for participants to access or educators to post on social media for recruitment, including videos of recipe demonstrations using a variety of foods and preparation techniques (including prepared food items), ask the expert Q&A videos featuring subject matter experts and health care professionals, and web links to featured sites in place of PDF handouts;

- an educator resource toolbox to provide guidance on choosing a virtual platform and creating an engaging virtual class within that platform, tips on helping participants connect with technology and the platform selected, and technology equipment needed to host the program virtually; and
- develop a new method of evaluating the program's impacts on participant knowledge gain and behavior change.

With enhanced curriculum components, educators should receive training on the new resources, best practices, and lessons learned in hosting virtual diabetes cooking classes and using technology to connect with audiences.

Conclusions

The results of this study determined that the educators reported curriculum components for the diabetes cooking class curriculum were more impactful on participant learning than engaging. This curriculum was developed for in-person education and includes elements that may be more engaging in that instructional setting like PowerPoint presentations, discussions, and hands-on activities (e.g., recipe demonstrations and teaching activities). These components can still provide a positive impact on participants learning important concepts, but they are harder to foster engagement in a virtual instructional setting.

The purpose of the study was to complete a program evaluation using feedback from the local educators who led the program implementation. The results of the study provide recommendations for what areas of the curriculum can be enhanced specifically for virtual program implementation. While the findings from the study are specific to this diabetes cooking class curriculum and not generalizable to other virtual programs, it does provide a guide for how

other Cooperative Extension programs can seek educator input and feedback to adapt the curriculum for virtual settings.

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Appendix A: Evaluation Questions for Educators

- 1) Did you implement XXXXXXXXXXXX in 2020 or 2021?
 - a) Yes
 - b) No (*if no, survey ends*)

- 1a) Did you offer the XXXXXXXXXXXX program virtually in 2020 or 2021?
 - a) Yes, I offered XXXXXXXXXXXX virtually in 2020 or 2021.
 - b) No, I only offered XXXXXXXXXXXX in-person, face-to-face in 2020 or 2021. (*if this is selected survey ends*)
 - c) I have offered XXXXXXXXXXXX both face-to-face, in-person and virtually in 2020 and 2021.

- 2) What distance delivery platform did you use for the virtual XXXXXXXXXXXX program? Select all that apply.
 - a) Microsoft Teams
 - b) Zoom
 - c) Social media
 - d) Other

- 2a) If you used a distance delivery platform other than those listed, please specify which platform. (*this only appears if other was selected in Q2*)

- 3) Did you offer the virtual XXXXXXXXXXXX program as part of a team of agents or individually?
 - a) Team
 - b) Individual

- 4) From your perspective as the educator, rate the XXXXXXXXXXXX program components below based on the level of impact they had on participant's learning outcomes through virtual program delivery.
1 = not impactful at all, 5 = very impactful, or choose did not use this program component if it was not part of your virtual implementation.

PowerPoint presentations	1	2	3	4	5	Did not use this program component
Discussions	1	2	3	4	5	Did not use this program component
Recipe demonstrations	1	2	3	4	5	Did not use this program component
Teaching activity or demonstration with educational resources (food models, measuring cups, portion plate, etc.)	1	2	3	4	5	Did not use this program component
Educational handouts	1	2	3	4	5	Did not use this program component
Participant registration form	1	2	3	4	5	Did not use this program component
Participant pretest	1	2	3	4	5	Did not use this program component
Participant posttest	1	2	3	4	5	Did not use this program component

- 5) From your perspective as the educator, rate the XXXXXXXXXX program components below based on the level of interaction they generated from virtual program participants (interaction may include verbal questions or comment; or text chat questions or comments). 1 = no engagement at all, 5 = high level of engagement, or choose did not use this program component if it was not part of your virtual implementation.

PowerPoint presentations	1	2	3	4	5	Did not use this program component
Discussions	1	2	3	4	5	Did not use this program component
Recipe demonstrations	1	2	3	4	5	Did not use this program component
Teaching activity or demonstration with educational resources (food models, measuring cups, portion plate, etc.)	1	2	3	4	5	Did not use this program component
Educational handouts	1	2	3	4	5	Did not use this program component
Participant registration form	1	2	3	4	5	Did not use this program component
Participant pretest	1	2	3	4	5	Did not use this program component

Participant posttest	1	2	3	4	5	Did not use this program component
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- 6) What was the biggest challenge to implementing the XXXXXXXXXX program virtually? (select one)
- Technology connections for participants
 - Technology connections for agents
 - Engaging with the audience
 - Recruiting participants
 - Creating additional content needed (filming videos, social media graphics, etc.)
 - Other, please describe in the next question
- 6a) What was the biggest challenge to implementing XXXXXXXXXX program virtually? (*open-ended response that appears if other is selected in Q6*)
- 7) When you are able to deliver programs face-to-face in your community again, will you continue to use virtual delivery for XXXXXXXXXX as an option?
- Yes
 - Maybe
 - No
- 8) What program components were not included that would have been helpful for virtual program delivery or what components did you have to develop or create for virtual program delivery? (*Open-ended for qualitative response*)

Appendix B: IRB Approval

ABILENE CHRISTIAN UNIVERSITY

Educating Students for Christian Service and Leadership Throughout the World

Office of Research and Sponsored Programs
320 Hardin Administration Building, ACU Box 29103, Abilene, Texas 79699-9103
325-674-2885

December 10, 2021

Rusty Hohlt
Department of Graduate and Professional Studies
Abilene Christian University



Dear Rusty,

On behalf of the Institutional Review Board, I am pleased to inform you that your project titled "Community Health Educators' Perspectives on Curriculum Resources in Newly Adapted Virtual Diabetes Cooking Classes",

(IRB# 21-154) is exempt from review under Federal Policy for the Protection of Human Subjects.

If at any time the details of this project change, please resubmit to the IRB so the committee can determine whether or not the exempt status is still applicable.

I wish you well with your work.

Sincerely,

Megan Roth

Megan Roth, Ph.D.
Director of Research and Sponsored Programs

Additional Approvals/Instructions:

WAIVER OF DOCUMENTATION OF CONSENT, based on the following justification:

* The only record linking the subject and the research would be the consent document, and the principal risk would be potential harm resulting from breach of confidentiality.

The following are all responsibilities of the Primary Investigator (PI). Violation of these responsibilities may result in suspension or termination of research by the Institutional Review Board. If the Primary Investigator is a student and fails to fulfil any of these responsibilities, the Faculty Advisor then becomes responsible for completing or upholding any and all of the following:

- If there are any changes in the research (including but not limited to change in location, members of the research team, research procedures, number of participants, target population of participants, compensation, or risk), these changes **must be approved by the IRB prior to implementation**.
- Report any protocol deviations or unanticipated problems to the IRB promptly according to IRB policy.
- Should the research continue past the expiration date, submit a Continuing Review Form, along with a copy of the current consent form and a *new* Signature Assurance Form approximately 30 days before the expiration date.
- When the research is completed, inform the Office of Research and Sponsored Programs. If your study is Expedited or Full Board, submit an Inactivation Request Form and a *new* Signature Assurance Form. If your study is Exempt, Non-Research, or Non-Human Research, email orsp@acu.edu to indicate that the research has finished.
- According to ACU policy, research data must be stored on ACU campus (or electronically) for 3 years from inactivation of the study, in a manner that is secure but accessible should the IRB request access.
- It is the Investigator's responsibility to maintain a general environment of safety for all research participants and all members of the research team. All risks to physical, mental, and emotional well-being as well as any risks to confidentiality should be minimized.

For additional information on the policies and procedures above, please visit the IRB website <http://www.acu.edu/community/offices/academic/orsp/human-research/overview.html>

or email orsp@acu.edu with your questions.