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Online Course Management System for WIC Nutrition Education and Study of Its Effectiveness in Behavioral and Attitude Changes

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Online Course Management System for WIC Nutrition

Education and Study of Its Effectiveness in

Behavioral and Attitude Changes

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ABSTRACT

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Education and Study of its Effectiveness in
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Social media has been used in a variety of contexts to connect people of varying backgrounds and as a method of teaching. This thesis collaborated with the Utah County Women, Infants, and Children (WIC) department to develop an online course management system that facilitated research to evaluate the effectiveness of social media on nutrition behavior and attitude changes among WIC clients. We created a toddler themed Facebook page in conjunction with the online nutrition classes and provided the opportunity for clients to use them. Previous social media research used individuals that had agreed to participate in the social media experiment whereas this research let them choose whether or not to participate. The Facebook intervention proved ineffective. In response, we developed surveys to gather the criteria and strategies from WIC clients and existing WIC themed Facebook pages that could be used for a best-case social media intervention.

ACKNOWLEDGEMENTS

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1 INTRODUCTION

Social Media is a common platform that provides entities with a variety of ways to engage with large groups and individuals to improve branding and disseminate information. This thesis partnered with the Utah County Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) to evaluate the effectiveness of using social media as a method of learning to improve nutrition attitudes and behaviors.

1.1 Background

WIC is a government funded supplemental nutrition program aimed at helping women and children under the age of five meet their basic nutritional needs. WIC provides vouchers for pregnant and breastfeeding women, as well as children up to age five, which can be redeemed at almost any grocery store for basic food items such as milk, cereal, cheese, and legumes. In order to qualify for WIC assistance, clients' incomes must be between 100% and 185% of the federal poverty income standard and they must meet one of the "nutrition risk" criteria such as being underweight or having low blood levels. In addition to the income requirement, WIC clients must continue to participate in nutrition education classes one to two times a year to qualify for the vouchers. Without any online classes available, WIC clients are required to attend an hour-long class in their local WIC office. Fulfilling the educational requirement can be burdensome and prevents some women from qualifying for the vouchers.

WIC offers classes in their office throughout the week, on a variety of topics that meet the requirement for continued nutritional education. However, some women do not attend these classes because of inconvenient class times and busy schedules. With an increasing number of WIC clients who have access to the Internet, we offered an online version of the classes available in the Utah County WIC offices. These online classes were designed and authored by nutritional professionals who ensured that the online content met the same learning objectives as the classes offered at the WIC office.

This online system enabled Utah County WIC clients to attend online classes on their own schedule and meet the nutrition education requirements to qualify for assistance. WIC clients who used the online system appreciated that the classes could be taken on their own time and did not require large continuous blocks of time to complete. One disadvantage of the online classes, however, was that WIC clients could not benefit from other clients' questions and comments, which may have affected their learning outcomes.

1.2 Problem Statement

The online version of the WIC classes does not offer the same level of interpersonal learning that the in-person classes provide because they do not allow WIC clients to interact, provide support, and learn from each other, which may reduce the classes' effectiveness. This thesis details the creation of an online course management system that was used to evaluate the effectiveness of using Facebook pages as a supplement to the online courses on WIC client's nutrition attitudes and behaviors.

1.3 Hypothesis

WIC clients who engage in nutrition-themed Facebook pages will show a greater improvement in nutrition attitudes and behaviors than clients who only participate in the online courses.

1.4 Significance

The purpose of this study is to determine whether Facebook pages are effective in helping WIC clients improve their nutritional behavior and enable them to live healthier lives. WIC's goal is to do more than just feed its clients, but to also educate them so that they can make healthier choices—thus, helping reduce dependence on other government programs caused by poor eating habits.

In April 2010, there were more than 10 million people enrolled in the WIC program (USDA, 2012). Approximately 50% of all children born in the United States use WIC services at some time between birth and age five (Olivera, 2009). An effective online solution would enable those users to access nutritional information 24 hours a day rather than 1 hour every 3 months like the in-person classes. Facebook pages could always be available to answer questions and help support others trying to meet their goals. If effective, this system could reduce the burden of teaching classes on WIC offices while increasing opportunities for WIC clients to learn, enabling WIC offices to expand their services.

2 REVIEW OF LITERATURE

2.1 Elements of a Nutrition Education Website

This study is not the first to make nutrition classes available online. A careful study of what other entities have done could be helpful in determining the best way to help WIC patrons. MyPyramid.gov was a government-sponsored nutrition website that had a section called "MyPyramid for Moms" that contained interactive tools and menu planners aimed at helping pregnant women gain the recommended amount of weight during pregnancy. One of the sites interactive tools is MyPyramid Tracker which tracks daily nutrition intake and physical activity, then analyzes food intakes based on the different food groups and nutrients that moms need. MyPyramid.gov was successful in helping pregnant women meet their gestational nutrition needs because their content was written at an 8th grade reading level, was easy to navigate, and interactive (Shieh, 2010).

A study performed by Zoellner et al. (2010) interviewed adults in the Mississippi Delta region and found that individual factors such as culture and upbringing were contributing factors for not adhering to MyPyramid.gov's recommendations. The study showed that diet and nutrition choices could be influenced by culture and other social factors, indicating that if a group decided to improve together they could limit the negative influences of their environment.

2.2　WICOnline V1 Overview

A prototype system that was a predecessor to this study, known as WICOnline V1, was developed at Brigham Young University (BYU) in conjunction with Utah County WIC clinics. It consisted of a web interface and a database backend that enabled WIC administrators to author and publish course content, track user progress, and evaluate the system usage (Teng et al 2009). This V1 system started in January 2010 and continued until November 2012 when it was replaced with WICOnline V2 as part of this study.

Utah County WIC clinics serve approximately eight thousand households, which are 80% English speaking and 16% Spanish speaking. The participants typically stay with the program for a period of two years. During the pregnancy phase, they usually attend the in-person breastfeeding class in the clinics instead of taking the online course. During the year following childbirth, participants are required to take one to two additional courses between follow-up visits to the WIC clinics to maintain eligibility for food vouchers.

WICOnline V1 had over 7800 registered users completing more than 12,700 courses between the time it started in January 2010 and November 2012 when it was upgraded. Roughly 40% of users take more than one course, with an average of 1.6 courses per user, which is consistent with the usage pattern described previously. According to the Provo WIC office, virtually all the required educational courses are completed online for English speaking participants, and the classes have been well received. Based on surveys conducted in 2011, we found that many of the users appreciated the flexibility of attending classes on their own schedule without having to travel to the clinics. One benefit provided by the online classes is that a user could start a class, get interrupted, and return to finish at their convenience, reducing the amount of time spent at the WIC office.

As 60% of the users only complete one course, it would seem that many WIC clients see WICOnline as a method for fulfilling a requirement to qualify for food vouchers rather than a resource for useful information that could help them with their pregnancy, childbirth, and infant and toddler nutrition. The lack of follow up and engagement after completing courses in WICOnline V1 could contribute to this current usage pattern.

WICOnline V1 is the basis for this project and its goal is to find a way to encourage the WIC clients to come back to the site and learn more because they find the website to be helpful, rather than a means to fulfill a requirement. This study focused on the effectiveness of social media in engaging users and helping them improve their motivation to establish a healthier lifestyle.

The usage of WICOnline by Utah County WIC patrons is higher than nearby Salt Lake County's use of a paid WIC nutrition education site, WicHealth.org(WICHealth.org, 2013). Both WICOnline and WicHealth.org saw similar numbers of WIC patrons using the site to complete their education requirements, but Salt Lake County has twice as many WIC clients as Utah County, showing that a higher percentage of Utah County WIC participants use online education than Salt Lake County(Galvez, 2013). Some of the difference may be attributed to different approaches to nutrition education. However, it is unlikely that the entire difference could be attributed to WIC office preferences, and shows that WICOnline has been well used and is an excellent test bed for further research.

2.3   Effects of Social Groups on Behavior Change

Studies have shown the positive effects of support groups in initiating change; Hildebrant analyzed the effectiveness of support groups for gastric bypass patients (1998) and found that the patients who attended support sessions were more likely to lose weight.

Furthermore, the probability of weight loss increased with the number of support sessions the patients attended. Group support sessions enabled members to meet their goals by sharing information, offering support and hope, and learning from other members of the group. While this study was conducted with in-person meetings, the question remains: how effective would online support groups be in influencing improvements diet and nutritional behavior?

2.4   Social Media Usage in Behavior Change

Facebook profiles can influence users' self-esteem. A study performed by Gonzales, et al. (2011) helped determine the effects on self-esteem of looking at your own Facebook profile by putting a person in a room with one of three interventions: looking at themselves in the mirror, access to a computer with the instructions to log on to Facebook and view their profile, or sit in the room without either intervention. After a few minutes each person was given a test to determine his or her level of self-esteem. The study found that people who viewed their profile showed higher self-esteem than those who looked in the mirror or sat in the room with no intervention. They also found that users who modified their profile or created a new post had a larger increase in self-esteem than those who only viewed their profile. The increase in self-esteem stemmed from the user's opportunity to practice selective self-presentation, which is limiting posted content and details that others see to show the best version of yourself (Gonzales, 2011)

Participation in WIC may have a negative stigma associated with it because it indicates that the client may be of a lower socioeconomic class. While some users are not concerned if others know they are part of the WIC program, others may not be willing to join the Facebook groups if it allows others to know their WIC status. In order to help the group of people who are likely to practice self-presentation, this project will market the Facebook pages as general health

pages rather than being WIC specific. This tactic produces a secondary benefit of encouraging non-WIC participants to join the groups we are studying.

Several other researchers have studied ways that social media technology could be used to influence people to make good nutrition choices. In research performed by Baumer, et al. (2012), participants were provided with an android cell phone app (Vera) that allowed them to capture and upload images of health decisions, both good and bad, that they made throughout the day. Once uploaded, the photos were available for others to add comments and words of encouragement. The study found that interacting with others led some participants to follow others' bad examples, but many were encouraged by the good examples of others' health decisions. Overall, the participants felt a need to do something healthy that they wouldn't ordinarily do so they could post it to the app for others to view. They also chose not to make poor health decisions because they knew that other people were watching what they were doing (Baumer, 2012). This study is encouraging to our research because it shows that people are willing to interact with others and be influenced by their decisions through social media.

In 2011, Mayer and Harrison conducted research to determine whether a social media based intervention was effective in improving young adults food safety knowledge, attitudes, and practices. They recruited students from an introductory food science and nutrition class and split them into two groups—one group attended lectures only, while the other group attended lectures and had access to a Facebook group that discussed topics taught in class. The researchers found that while both groups improved their food safety attitudes, the group that had access to the food safety Facebook group had significantly greater improvement, indicating that Facebook can be a viable method for improving attitudes regarding food. The students who participated in the Facebook page also had greater improvements in both their food safety knowledge and practices.

More than 50% of the students receiving the Facebook intervention indicated that they learned more from the Facebook page and found it more enjoyable than their time in lecture (Mayer, 2011).

One drawback of the study is that the sample of students may not be representative of the rest of the young adult population. The researchers' initial test and control groups were as homogenous as possible, indicating that their changes were consistent among college students. Although the food safety lectures improved knowledge, most of the general population could not be reached through a classroom. This research suggests that sharing information on Facebook could be an alternative to more traditional teaching methods (Mayer, 2011). More research should be performed to determine if groups other than college students could have similar changes in attitudes, knowledge, and practices by participating in Facebook groups.

Several different social media websites have been used to influence and analyze health behaviors by improving social support: Facebook has been used to improve and evaluate health knowledge and attitudes (West, et al. 2010), Twitter for problem drinking (West, et al. 2013), and YouTube for distracted driving (Steadman, et al. 2010). A recent study by the USDA FNS Western Region WIC Electronic Technology Project found that 46% of WIC clients have a desire to communicate with other WIC parents through social media (USDA, 2012). The combination of the potential for social media to influence health behaviors, and WIC clients' desire to interact as a group suggests the possibility that a social media based intervention for WIC could be effective.

2.5 Purpose of This Study

The research cited in this chapter regarding social media use in education used a captive audience and involved class projects or a group of individuals who were compensated for their

participation in the social media research. This shows that social media can be an effective learning tool if participants are willing to use it. Our study aimed to evaluate the effectiveness of a real-world approach where participants could elect to join in social media as part of the learning process.

3 METHODOLOGY

The purpose of this study was to conduct preliminary research on the effectiveness of using social media to improve WIC client's nutritional behavior and attitudes after taking classes on the related subjects. The research platform was built on an existing system, version 1.0 of the WICOnline project, which was designed to provide an online nutritional education website where Utah County WIC patrons could fulfill their nutrition education requirements (Teng et al. 2009). Based on the number of users who completed courses shown in Table 3-1, the WICOnline V1 system has proven to be an effective option for WIC client's educational needs. However, the same usage statistics also showed that users might have viewed the website as a place to fulfill requirements rather than a source for valuable information or motivation for a healthier life style. In order to mitigate this deficiency, a Facebook group was integrated into version 2 of the WICOnline website to engage the users after they completed a related online course. The following summarizes the design and implementation of this study, which will be discussed in detail in the remainder of this chapter.

Table 3-1: WICOnline Course Completions by Year

Course	2011	2012	2013
Folic Acid	74	99	218
Healthy Weight Gain During Pregnancy	178	168	224
Nutrition During Pregnancy	136	113	135
Caffeine and Herbal Supplements	268	261	71
Exercising and Breastfeeding	369	312	281
Nutrition and Breastfeeding	317	276	248
Smoking, Drugs, and Alcohol	69	72	82
Asthma, You, and Your Family: What You Need to Know	322	325	335
Fruits and Vegetables	668	542	356
Exercising During Pregnancy	171	177	155
Eating Habits & Your Growing Preschooler	480	438	368
Preschooler Feeding Concerns & Problem-Solving Ideas	279	242	226
Eating Habits & Your Growing Toddler	815	653	659
Toddler Feeding Concerns & Ideas	472	424	324
Total	**4618**	**4102**	**3682**

3.1 Design and Build WICOnline V2 Website

3.1.1 Problems Experienced by WICOnline V1 Website

The WICOnline V1 website was constructed quickly without any time to test for usability issues and ran for a period of two years before it was replaced with the current V2 system specifically built for this study. Focus groups showed that WIC clients preferred using the

WICOnline V1 website to sitting in classes at the WIC office, but some found it hard to use. Additionally, adding the required social media features for this study would have been difficult because the V1 code base lacked necessary organization and cohesion between the pages. The rewrite was necessary to integrate Facebook with the site and provide the functionality necessary to evaluate the Facebook pilot by splitting participants into test and control groups and assigning pre- and post-surveys.

The original site's usability problems included forgotten logins and difficulty navigating due to complex menus. The WICOnline V2 website helped reduce login problems by changing the username label from "MyWIC ID" to "email" and integrating Facebook logins so that users could sign up and authenticate to the site without having to remember any username and password. Once users logged in, they were greeted by simpler menu items because we removed redundant options and the dead end links from the V1 website.

One of the biggest problems with the V1 website is that the administrative interface was so complex that simple tasks like fixing minor typos or out-of-order course slides was difficult and was rarely performed. Additionally, there were two distinct groups that administered the site, which had very different tasks and needs: the course administrators needed access to modify the course content and to create new courses, while the WIC administrators needed to verify course completion of WIC clients. The V1 website had a confidentiality concern because course content creators had access to WIC client data, which was stored in the same database as the course content.

3.1.2 WICOnline V2 Design Overview

In order to resolve these issues, we split the V2 website into two distinct, yet confluent parts designed to provide a seamless experience for the user. The first part is a custom-built course management system that keeps track of user registrations, course completions, and the user's course goals. The second part contains all of the course content, slides, images, and quizzes which are managed by the content management system WordPress as shown in Figure 3-1.

Built For WIC Staff

Course Management System

-- Stores WIC User Data

-- Stores Course Completions & Goals for Education Verification

-- Stores Links to Courses in WordPress

Built For Course Content Editors

WordPress

-- Course Content Management

-- Course Presentation
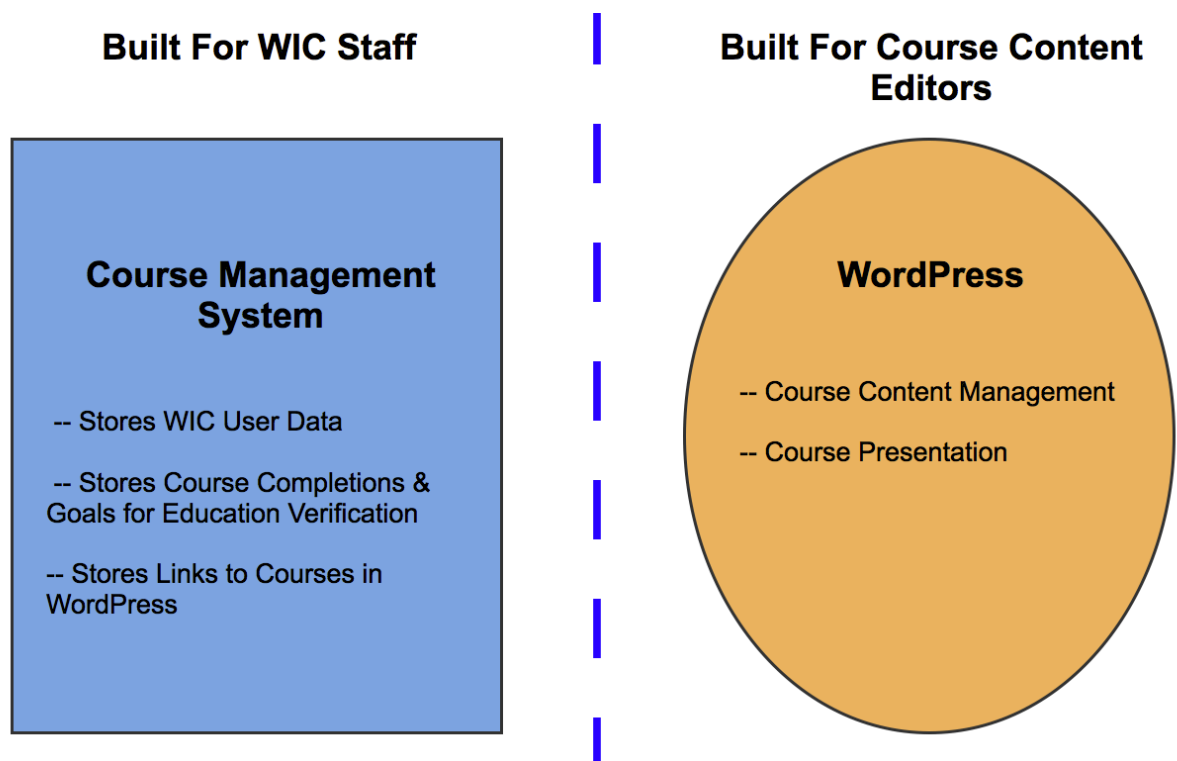
Figure 3-1: WICOnline V2 Overview

The custom-built course management system stores all of the user data including registrations, contact info, completed course certificates, and course goals set at the completion of each course. It was completely rewritten for the project in order to facilitate quick

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development for future enhancements by centralizing and reusing common code rather than having each individual page store the logic required to generate it. This centralized architecture enabled a web designer to redesign the site and keep a consistent look and feel between the pages. Although the user experience was improved as an effect of the site rewrite, the main goal of the update was to facilitate research opportunities on the site.

The V1 administrative site utilized an application called PHPrunner which created custom code designed to run the course website. Unfortunately, the generated code wasn't customizable and produced a complex Content Management System (CMS) that required more IT skills than the average course content creator possessed. The new system needed to be intuitive to someone with basic computer literacy and require little training. We chose the open-source CMS WordPress because of its popularity and wide range of plugins, which extend the functionality and features required to manage the course content. WordPress is a mature product with many active developers, which will help maintain the CMS and provide better security in the future. The following plugins were used to enhance its functionality:

Next Page provided page-to-page navigation within WordPress that enabled users to move to the next course page or return to previous pages to review the content. We modified the functionality of the plugin so that the first page returned back to the course list and the last page returned them to the course management's course completion and certificate page.

Figure 3-2: Next Page Example

My Page Order enabled course administrators to easily order course pages by dragging and dropping them into the correct sequence. This plugin resolved the biggest complaint of course administrators who wanted a simple way to add a page in the middle of a course without having to manually change the page order on each page database record like what was required in V1.
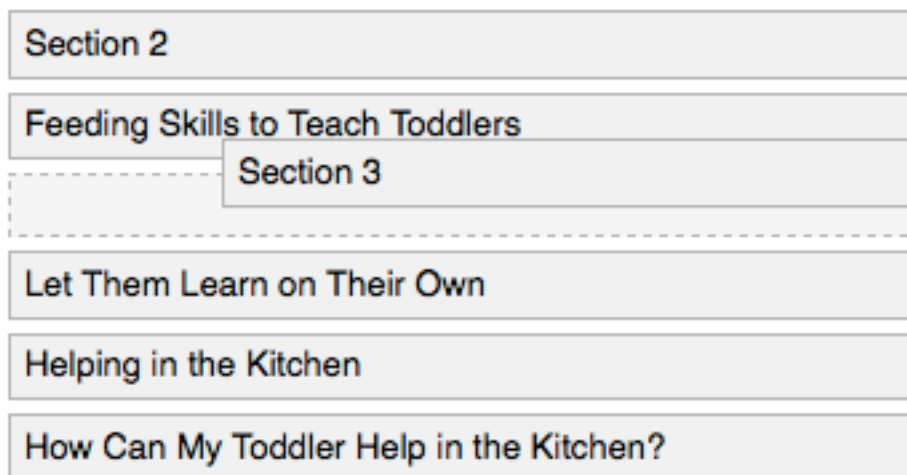
Figure 3-3:My Page Order Drag and Drop Functionality

Quizzin provides the ability to add quiz questions to a course page so that a user can test their knowledge about the course content and review the page if they haven't learned the course concepts.

Which of these snacks is not healthy?

⊙ Orange Slices
◯ Peanut Butter spread thinly on bread
◯ Cookies
◯ Smoothies made with fruit and milk or yogurt

Show Results

Which of these snacks is not healthy?
- **Orange Slices** ✗
- Peanut Butter spread thinly on bread
- Cookies ✓
- Smoothies made with fruit and milk or yogurt

Figure 3-4: Quizzin Sample Question

The WordPress instance used in this project utilized the MultiSite Network functionality which segmented courses and provided granular rights on a course-by-course basis so that a content creator could be granted access to an individual course, protecting the other courses from unauthorized changes. MultiSite also segmented WordPress functionality and made it possible to make plugin and theme decisions individually so that each course could use its own WIC color scheme based on its target audience. Content creators who used both systems indicated that using the WordPress CMS was more intuitive than the previous system and helped them fix typos and update the content to align with current best practices.

3.1.3   WICOnline V2 User Experience

The two systems integrate together seamlessly so that the WIC clients are not aware that that they have used more than one application. The system creates a PHP session when the user first logs in—the key to making the course management system and WordPress work together. When a user selects a course, that session is updated with the associated course key before she is redirected to the course. The user then proceeds through the course pages on the WordPress website until she reaches the final page and clicks on the next page arrow.   At that point, the user leaves the WordPress website and returns to the course management system, where it retrieves the course key from the session so that it can identify the user and the course they completed.   The user then sets a goal and her course completion is stored in the database for retrieval by the WIC staff or printed as a completion certificate. The entire process is continuous for the user despite jumping between the two systems.
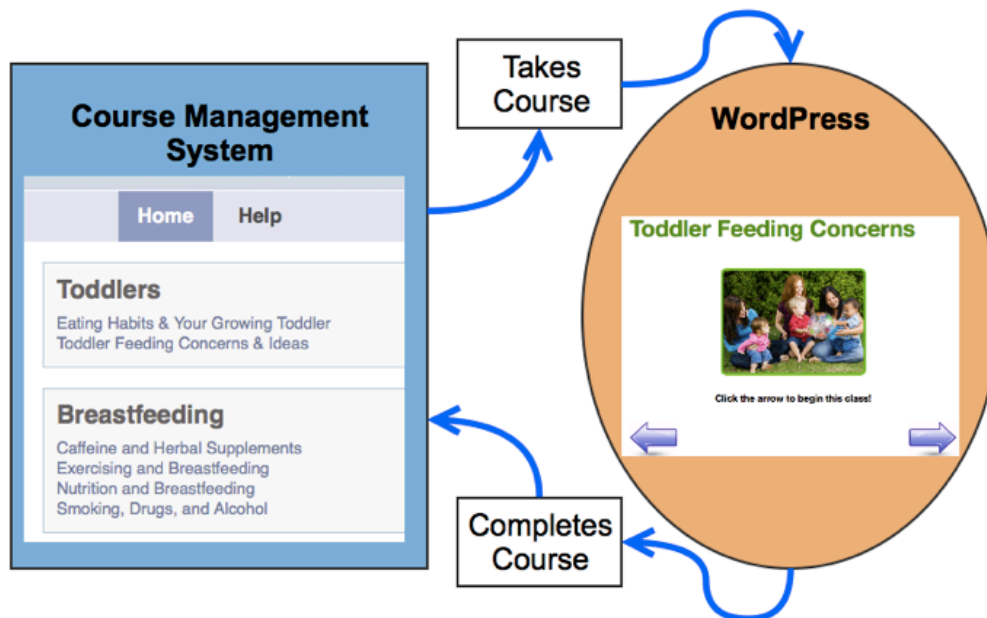
Figure 3-5: Course Management System and WordPress Flow Chart

3.2   Create Surveys and Validate Them With the Target Population

In order to determine whether the Facebook intervention is more effective than the online courses alone, the study required an assessment of the participant's attitudes and behaviors on the subject of toddler nutrition. We created a thirty-question survey, which was administered to fifteen WIC clients at the Provo, UT, and Orem, UT, WIC offices through a test-retest method. Participants received the same survey twice, a week apart, and their answers were compared for reliability. Participants were compensated with a $30 gift card at the completion of the second survey, which was funded by a research account in the Department of Nutrition, Dietetics, and Food Science at Brigham Young University (BYU). The survey can be found in Appendix A and a visual representation of the process can be found in Figure 3-6.

```
┌─────────────────────────────┐
│     1. Create test survey    │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│      2. Administer survey    │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│        3. Wait 7 days        │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│  4. Administer survey and    │
│      compensate subject      │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│ 5. Analyze the difference    │
│    between the two responses │
│    to validate question      │
│    reliability               │
└─────────────────────────────┘
```
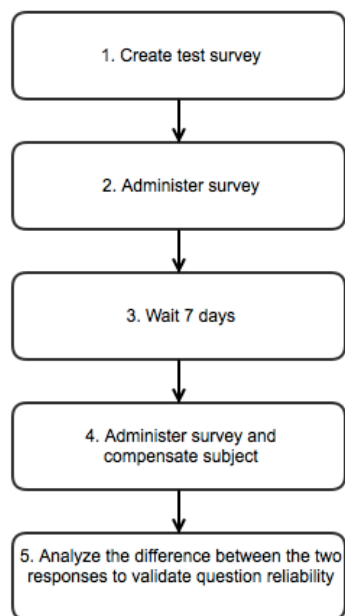
Figure 3-6: Survey Verification Procedure

The data from the pilot survey showed that a sample size of 50 participants was necessary in order to statistically prove a difference between the group averages of the test and control

groups. The sample size was established using the standard deviation of 8.5 derived from the survey verification phase to show a difference of five points between the two group averages, with an alpha of .05 and a beta of .2 which gave a power of .8. The survey validation and Facebook intervention received approval from the BYU Internal Review Board in 2013.

3.3   Integrate Social Media and Facebook Groups

Integrating a Facebook Page into the WICOnline system was critical for the study's success. Facebook was integrated into the site in two ways. First, users had the ability to log in to the WIC nutrition site using their Facebook account, which helped reduce account confusion by allowing users to use Facebook's authentication system instead of having to remember a unique login for the WIC site. Second, study participants had the opportunity to join a Facebook group that is based on the topics learned on the WIC nutrition site.

3.3.1   Facebook Authentication Integration

Facebook authentication was integrated into the WICOnline V2 site using the Facebook developer API on the login page. It enabled both new and returning users to sign up and authenticate to WICOnline using their Facebook credentials. This feature eliminated the need to remember a separate password and username to access the site, reducing password resets. Most new WICOnline users did not utilize the Facebook login feature where only 6.3% of new users elected to authenticate using Facebook. However, 8.6% of returning users who signed up before Facebook authentication was available elected to use it when given the option as seen in Table 3-2.

Table 3-2: Facebook Authentication Utilization Rates

Group	%	Total Users
New users	6.3	2291
Returning users	8.6	1066

3.3.2 Creation of the Facebook Group

We decided to limit the scope of the project to one Facebook group to test the feasibility of using social media in conjunction with the online courses. The "toddlers" category of courses had 1077 course completions in 2012, which was approximately twice the usage of other categories and was determined to be the best choice for Facebook integration because it had the potential to reach the largest population of WIC clients.

We created the Facebook page as a "Local Business or Place" so that we could include the location in the page description to help recruit participants from Utah County. The Facebook page was titled "Toddlers Food for Thought" and did not include an endorsement from Utah County WIC or other government organization so it would not reveal that those who 'liked' the page were WIC clients and it would encourage non-WIC clients to join the conversation. We selected freely usable images from Wikimedia that included toddlers in various feeding situations. The page appeared as shown in Figure 3-7.

Figure 3-7: Toddlers Food for Thought Cover Photo

The Facebook page was moderated by faculty and a student research assistant from the Nutrition, Dietetics, and Food Science department at BYU who posted new content and responded to user comments to ensure that information presented on the page was based on sound nutrition principles. Updates were posted to the Facebook page approximately three times a week with an emphasis on Mondays, Wednesdays, and Saturdays during the afternoon. These windows of time were selected based on statistics of course completion times on the WICOnline website when the target population was more likely to be online. The posts included toddler nutrition tips using a variety of mediums such as images and links to reputable nutrition sites where the user could find out more about the topics presented. An example of an item posted to the Facebook group is shown in Figure 3-8.

Figure 3-8: Toddlers Food for Thought Example Post

Approximately 50% of the WICOnline website users who took a course in toddler nutrition were presented with the opportunity to "like" the Toddlers Food for Thought Facebook page. The separation was necessary to limit the possibility of a selection bias, where users who were excited about or interested in the toddler nutrition topics would also be more likely to "like" the Facebook page and implement what they learned. Having two randomly assigned groups is designed to increase the likelihood that the groups of people who see the Facebook groups and those who do not would be made up of a homogenous selection of participants.

3.4   Gather Pre and Posttest Data Over a Period of Three Months

We collected data and maintained the Toddlers Food for Thought Facebook page during September–December 2013.   During that time, WIC clients who elected to take either the "Eating Habits & Your Growing Toddler" or "Toddler Feeding Concerns & Ideas" course were asked if they would like to participate in a research study to determine the effects of online learning on their thoughts about feeding toddlers, and had the opportunity to consent to the study or refuse and go directly to the toddler nutrition course.   Clients who consented to participate in the study were sent to a short online survey found in Appendix A.   Upon completion of the survey, the control group was sent back to the toddler course of their choosing and the test group was sent to a welcome page as shown in Figure 3-9 that encouraged them to "like" the Toddlers Food for Thought Facebook page before continuing on to the toddler course.
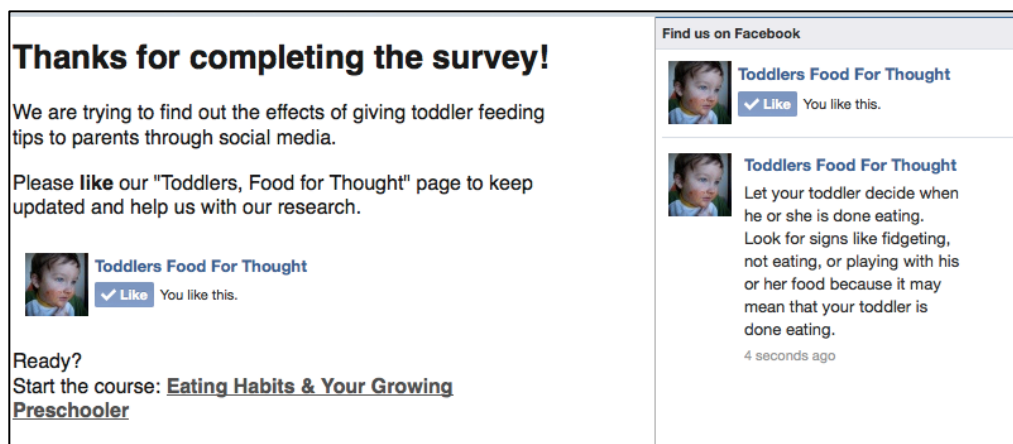
Figure 3-9: Toddlers Food for Thought Welcome Page

The participants received an email four weeks after they completed the first survey asking them to take the post-test survey which contained the same questions as the first, with additional questions concerning how much help and social support they received from the WIC office and

the online courses they completed. The Facebook test group evaluated additional statements such as, "I can relate with the members of the Toddlers Food for Thought page," to evaluate the level of social support provided by the Toddlers Food for Thought page and its members. The full survey can be found in Appendix A. See the visualization of the process in Figure 3-10.

The purpose of the second survey was to compare the subject's attitudes and behaviors immediately before and after the intervention period and to determine whether any change took place. The additional questions in the second survey were used to determine if the social media site helped participants to receive additional social support and to determine the level of social support received from the WIC office.
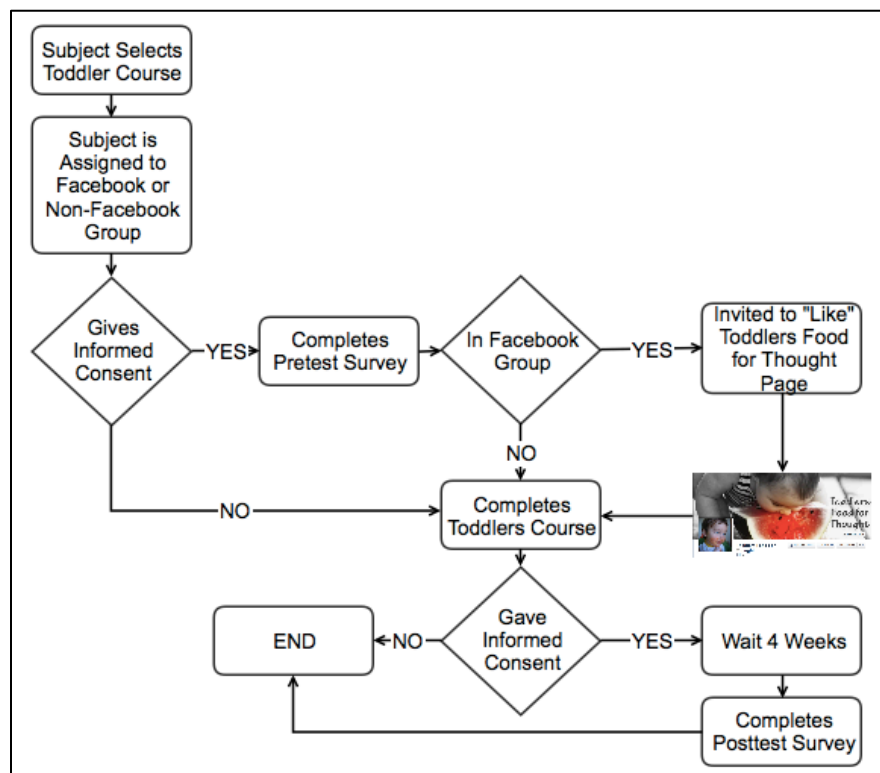
Figure 3-10: Survey Data Gathering Methodology

3.5   Administer a Social Media Use Survey to WIC Clients

The Facebook intervention did not receive enough participants to statistically determine whether it was an effective method for improving nutritional attitudes and behaviors.   We created a survey to WIC client's desire to communicate with others and receive tips via social media. The purpose of the survey was to discover reasons why the Facebook intervention may have failed and what should be done in the future. The survey can be found in Appendix A.

WIC staff at the Provo, Payson, and Orem, UT offices administered the four-question paper survey during client's consultation visits. The WIC staff administered 134 surveys over a period of three weeks during December 2013.

3.6   Evaluate WIC Themed Facebook Pages

The top five WIC Themed Facebook pages, based on the number of "likes," were evaluated to help identify metrics and strategies that could increase the probability that a Facebook intervention would be successful.   The metrics included gathering data such as post frequency, the average number of comments, "likes," and "shares" as well as discussed topics. A complete list of metrics used in the evaluation and their purpose can be found in Table 3-3. The most important metric is the number "talking about this" because it extends beyond passive views and measures the sites ability to engage users in a variety of ways. A high level of engagement shows that people are paying attention to the content and find it valuable enough to "like" or "share" it with their friends.   A successful Facebook page will likely have a high percentage of engaged users, which could increase the probability that they would implement items they've learned from the page. These metrics were gathered over a three-month window from September 2013-January 2014.

Table 3-3: Facebook Page Evaluation Metrics

Metric	Purpose
Like Count	Show the total number of people who have the potential to see the site's posts
Average Posts Per Month	Determine the best post frequency to keep users engaged
Average Likes Per Post	Shows average post engagement and can be used to identify the most popular posts
Average Comments Per Post	Shows post engagement at a higher level because people think about and respond to the post
Average Shares Per Post	Shows that people like or find the content useful enough to share with their friends
Greater Than 5 People Commenting	Identify pages that either have a small network or have a small group of seeders
Talking About This	Shows engagement and is the number of people who have shared, liked, or commented on page in the last week.
Page Topics	Shows topics and themes that may be more apt to engage users

3.7 Analyze Results and Test Hypothesis

The study resulted in only one subject who "liked" the Toddlers Food for Thought page on Facebook and missed the target of fifty subjects in the test and control groups needed to determine if the results were statistically significant. As a result, the researchers combined the two groups of subjects, those who were in the control group that did not have the opportunity to like the Facebook page with the group of subjects who were given the opportunity to like the page and engage in Facebook, but chose not to. The individual's answers for each survey question were scored on a Likert scale of one to five with one representing "strongly disagree"

and five representing "strongly agree." Next, the scores for each question were added together to compute the individuals overall score. Finally, the average overall score was computed for the pre-test and the averages from the pre-test were compared to the averages from the post-test using a paired t-test to determine statistical significance. This process was repeated for the one subject who "liked" the Toddlers Food for Thought page except for the paired t-test which was not performed because of the small sample size.

The intervention lacked the participation necessary to determine if the results were significant. However, if the intervention had achieved sufficient participation it would have been analyzed using a paired t-test comparing the values of net change between the Facebook and Non-Facebook groups. Using the data from the survey verification phase in Section 3.2, a sample size of 50 participants in each of the two groups would be necessary to detect a difference of five points between the two group averages with a power of .8.

All survey questions that did not have a corresponding pre-test and post-test, such as the social support questions and the WIC social media survey outlined in section 3.5, were evaluated by determining the margin of error of the survey based on the variability and sample size. The margin of error was used to determine if the differences between responses were great enough to be significant.

4   RESULTS AND DATA ANALYSIS

This chapter details results from the various studies that were performed using the WICOnline V2 site discussed in chapter three including:

- We launched the Facebook page, Toddlers Food for Thought, in September 2013 and provided WICOnline users the option to participate in the study. The intervention period ended in December 2013 when 37 people had chosen to participate in the study. However, only one participant "liked" the Toddlers Food for Thought page.

- We created a survey to determine reasons why WIC clients may not participate in WIC themed social media and to determine the probability that they would participate if one were available.   The surveys were administered by WIC staff in three WIC offices in Utah County to 134 clients between December 2013 and January 2014

Data was collected and analyzed according to the methodology presented in Chapter 3.

4.1   Intervention Survey Analysis

The following data was collected by administering a pretest immediately before a subject took an online course on toddler nutrition and a posttest 4 weeks after the initial visit. The pre and posttest data were compared using a paired t-test to determine any differences during the intervention period and differences between the Facebook intervention group and the control group that did not have access to the Toddlers Food for Thought Facebook page. Unfortunately,

the Facebook group had limited participation and did not have enough subjects to be statistically significant. As such, we used the posttest surveys to determine the reasons why subjects were not interested in participating in the Facebook Toddlers Food for Thought page. The results of this analysis are discussed in section 4.1.2

4.1.1 Non-Facebook Intervention

The non-Facebook intervention group had twenty-four subjects complete both surveys. We combined the data from this group and the Facebook intervention subjects who chose not to like the Toddler Food for Thought page for a total of thirty-six. The purpose of combining the subjects was to get a bigger sample to determine if there were any changes in nutritional attitudes and behaviors between the two time periods irrespective of the group they were originally assigned to because both groups had completed the online course and neither had "liked" the Facebook page.

Subjects were asked ten questions to rate how strongly they agreed with a statement on a Likert scale of one to five. Some statements had a negative connotation and responses to those questions were inverted so that a five always represented the best response. The post-test answers were compared to corresponding pretest answers in order to determine whether any changes had occurred over the intervention period.

Every question showed a slight improvement in subjects' attitudes and behaviors except for the statement "I feed my toddler foods from all the food groups" which decreased slightly. Despite the increase in average scores, most of the questions had a relatively small change of +/- .1 and many participants answered those questions the same way they did before the intervention. See Table 4-1 for further details. The pre and post-test data were analyzed using a paired t-test that compared the composite change between the two time periods, which was

calculated by aggregating the responses to each question and comparing the group's average total scores from the pre and post-test. The results from the paired t-test showed a p value of .18, indicating that the results are not statistically significant. Additionally, the respondents in the initial survey verification phase saw similar increases in the test-retest analysis, indicating that the intervention of asking the questions may have been responsible for some of the difference in scores and that the online courses had little effect on improving nutrition attitudes and behaviors at four weeks after completing the course. Additional research may be needed to determine if the courses improve attitudes immediately after taking the course to determine if there is an initial effect that decreases over time.

Table 4-1: Non Facebook Response Changes Before and After Intervention

Statement	Change
It is important to me to provide healthy snacks for my toddler.	0.21
Feeding my toddler more food than he or she wants to eat will help my toddler grow.	0.26
I feed my toddler snacks from food groups that were missed at meals or snacks earlier in the day.	0.17
I let my toddler help me prepare food in the kitchen for mealtimes or snacks.	0.31
I feed my toddler foods from all the food groups.	-0.03
I think about choking hazards when preparing meals and snacks for my toddler.	0.06
I let my toddler decide how much to eat.	0.06
I let my toddler decide when he or she is done eating	0.20
I give my toddler candy or desserts when he or she does something good.	0.03
I give my toddler fruit and/or vegetables when he or she does something good.	0.03
I leave my toddler alone while he or she eats.	0.09

4.1.2 Facebook Intervention

Subjects in the Facebook intervention group and the general non-Facebook group had differing participation rates in the study. We found that the non-Facebook group had a study participation rate of 19% while the Facebook group had a lower participation rate of 15%. The only difference between the two groups up to that point was the Facebook group implied consent form included the verbiage that indicated the purpose of the study was to find out the effect of Facebook groups on learning outcomes while the other group was told that the purpose of the study was to find out the effects of online learning. This statistic implies that something as simple as mentioning Facebook could discourage people from participating in a research study, but this observation is likely not statistically significant.

The Facebook intervention group had twelve participants complete both tests, but only had one person "like" the Toddlers Food for Thought Facebook page. When the remaining subjects were asked in the posttest why they did not "like" the Facebook page and four of the eight participants indicated that they do not use Facebook, and one participant indicated that she uses Facebook, but not for the purpose of learning about toddler nutrition. The one subject who "liked" the Facebook page scored the exact same in the pre- and post-tests with the exception of improving by one point on a scale of one to five on two questions, including "Feeding my toddler more food than he or she wants to eat will help my toddler grow." See Table 4-2 for full net response change.

Table 4-2: Facebook Response Changes Before and After Intervention

Statement	Change
It is important to me to provide healthy snacks for my toddler.	0
Feeding my toddler more food than he or she wants to eat will help my toddler grow.	1
I feed my toddler snacks from food groups that were missed at meals or snacks earlier in the day.	0
I let my toddler help me prepare food in the kitchen for mealtimes or snacks.	0
I feed my toddler foods from all the food groups.	0
I think about choking hazards when preparing meals and snacks for my toddler.	0
I let my toddler decide how much to eat.	0
I let my toddler decide when he or she is done eating	0
I give my toddler candy or desserts when he or she does something good.	0
I give my toddler fruit and/or vegetables when he or she does something good.	1

The topic of letting a toddler decide how much to eat was discussed in several posts during the intervention and may or may not have had some influence on the subject's posttest response. An example of one of the posts can be found in Figure 4-1. The subject used Facebook for 30-60 minutes a day and indicated that she preferred the online courses to the Toddlers Food for Thought page.

Toddlers Food For Thought
November 10, 2013

Let your toddler decide when he or she is done eating.
Look for signs like fidgeting, not eating, or playing with
his or her food because it may mean that your toddler is
done eating.
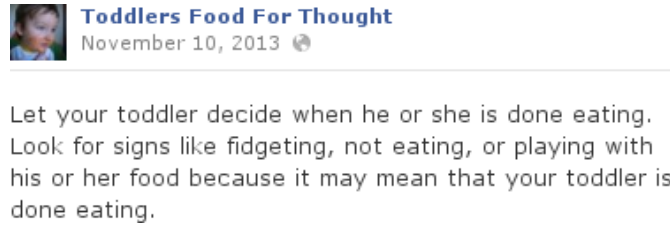
Figure 4-1: Toddlers Food for Thought Sample Post

4.1.3   Social Support

One of the goals of this study was to evaluate the level of social support and satisfaction with the WICOnline V2 website using the evaluation statements sent to both the Facebook and non-Facebook groups with a total sample size of thirty-six participants.   The statements were evaluated on a Likert scale of one to five where one represented strongly disagree and five represented strongly agree.   The results were as follows:

Table 4-3: Social Support Question Answers

Answer	Average	Margin of Error
I get the information I need from the online toddler courses.	3.44	+/- .23
I can relate with the information of the online toddler courses.	3.83	+/- .18
I trust the information given in the online courses site.	4.02	+/- .22
I enjoy using the online toddler courses.	3.91	+/- .27
The online toddler course has been helpful to me.	4.02	+/- .18

WIC clients agreed that the online toddler courses have been helpful and that they trusted the provided information.   The results of this portion of the study were encouraging because they

implied that WIC clients enjoy using the WICOnline V2 website and found it to be helpful, which is the first step in helping clients learn.

However, the survey responses indicate that some feel they do not get all of the information they need from the online courses (WICOnline V2). Subjects were asked what they would like to learn about on the online courses site and their responses centered around common toddler feeding concerns such as healthy snack ideas and real-world tactics to cope with picky eaters. Another concern was introducing infants to solid foods, which is a course currently in development. Previous portions of this study showed that the online courses may not be effective at changing nutritional attitudes and behaviors; however, the subjects' responses to this question will help the course creators tailor the classes to WIC clients' needs, thus increasing the chance in improving nutrition outcomes. This intervention may have benefitted from asking these questions and performing market research before the intervention so it could be tailored to the needs and wants of the target population.

Although WIC clients enjoyed using the WICOnline V2 website, they did not feel as connected to the creators of the class as they did to the WIC staff. Part of their concern may be caused by the static course content, which is updated and enhanced infrequently. If social support is a necessary component to changing nutritional behaviors, future research should evaluate ways to increase social support through other means.

Table 4-4: Comparison of Online Class Support and WIC Staff

Answer	Average	Margin of Error
The creators of the online toddler class care about my learning.	3.75	+/- .22
The WIC staff cares about the questions I ask related to the online toddler course.	3.97	+/- .18

4.2 Survey on WIC Client's Use of Social Media

As discussed in Section 3.5, the lack of participation in the Toddlers Food for Thought page led us to ask more questions about WIC clients' social media preferences. We created a 4-question survey to evaluate what technology they had, which methods of social media they would prefer, why they wouldn't want to receive nutrition facts through social media, and which author would they prefer to receive the information from. WIC staff in the Orem, Provo, and Payson, Utah WIC Offices administered the survey to 134 WIC clients. The results from the survey are found in the remainder of this section.

4.2.1 Social Media Preferences Among WIC Clients

Question 2: Would you be interested in learning about food/nutrition topics through any of the following places? (Check all that apply)

- Finding: WIC clients have an interest in learning about nutrition topics through Pinterest, YouTube, and text messages.

- Finding: WIC clients are most likely to participate in interventions that use Facebook

Table 4-5: Social Media Preferences Among WIC Clients

Answer	Response	%	Margin of Error
Facebook	61	46%	+/- 8%
Pinterest	37	28%	+/- 8%
YouTube	35	26%	+/- 7%
Cell Phone Apps	31	23%	+/- 7%
Text Messages	26	19%	+/- 6%
Google+	22	16%	+/- 6%
Twitter	3	2%	+/- 2%
I would not be interested in using social media, apps, or texting.	37	28%	+/- 8%

Knowing which social media environments WIC clients are interested in using can help researchers focus their efforts in areas that have an increased chance of success. Some of the social media sites not used in this study, like Pinterest, ranked high because of its popularity among the WIC demographic. YouTube also ranked high, indicating that there is an interest in receiving the information through video. Text messages and cell phone apps did not rank as high, but they could be useful in future intervention because they could provide a more private environment for one-on-one communication.

Facebook was the top choice among WIC clients, with 46% saying they would be interested in using it to learn about nutrition topics, but the Facebook group in this study experienced much lower participation rates. The remaining two questions provide insight as to why the intervention may have failed.

4.2.2 Detractors to Social Media Use Among WIC Clients

Question 3:What reason, if any, would keep you from using social media to receive food / nutrition information? (Check all that apply)

- Finding: Privacy is WIC clients biggest concern for using social media to learn about nutrition.

- Finding: WIC Clients prefer in-person contact over social media

- Finding: Social media is not the preferred method for learning among WIC clients

Table 4-6: Detractors to Social Media Use Among WIC Clients

Answer	Response	%	Margin of Error
Nothing would keep me from using social media to learn about food/nutrition	52	41%	+/- 8%
I am concerned about my privacy	26	20%	+/-7%
I prefer in-person contact	25	20%	+/- 7%
I do not want to learn about food/nutrition through social media	16	13%	+/- 5%
I do not use social media	14	11%	+/- 5%
The topics do not interest me	11	9%	+/- 5%

The responses to this question shows that 41% of WIC clients had no reason not to use social media which is a similar percentage to those who indicated they would be interested in using Facebook for this purpose, but our study experienced Facebook participation rates of one out of twelve or 8%. One cause for the difference could be that privacy is a common concern among social media users and it is possible that joining a WIC-themed Facebook group may

show that they are a WIC client which they may want to keep private. The list of Facebook "likes" and group memberships are viewable by a user's friends and Facebook users who practice selective self-presentation may not "like" a page because of others' perceptions. If someone is concerned with privacy, an app like VERA that has a private group or anonymous usernames might be a better choice, although perhaps less likely because it is less familiar.

One purpose of this research was to determine whether social media would help WIC clients feel more connected to the WIC office and others in the same demographic to make up for the lost in-person contact as a result of moving WIC education from live classes in the WIC office to a website. 20% of respondents indicated that they prefer in-person contact over using social media. This shows that even though social media could help keep them connected with more people, they would prefer to discuss the topics face-to-face with someone they trust. Social media cannot offer the same level of interaction as face-to-face communication.

Social media may not be the place WIC clients want or expect to receive nutrition information, as shown by the 13% of respondents who said they did "Not want to learn about food/nutrition through social media." Several of the free response answers to this question show that clients want to use social media to connect with friends. They can easily find answers to their questions by searching online, and it is hard to verify the validity of the information on social media if it is not from an authoritative source. The final question in the survey helps establish sources they might trust.

4.2.3   Trusted Social Media Sources Among WIC Clients

Question 4: How likely would you be to use a social media site if the group listed had one about food/nutrition topics?

- Finding: WIC clients are more likely to participate in a social media site if it is endorsed by WIC than other sources.

Table 4-7: Trusted Social Media Sources Among WIC Clients

Answer	Average Value	Margin of Error
Women, Infants, and Children (WIC)	3.78	+/- .20
Moms in the general public	3.20	+/- .24
Other local/state health agency	3.16	+/- .22
A university	2.92	+/- .23

The author of a social media site may have an effect on how much WIC clients trust the information. The data from this question indicates that WIC clients would be more likely to use a social media site if the WIC office authored it, showing that they trust information they've received from WIC. It should be noted however, that the survey was administered in the WIC office by WIC staff which may have some effect on the responses.

The intervention for this study was clearly marked as being a research study performed by BYU, but the Facebook site had no indication of the author. The original research plan for the intervention included keeping the verbiage "Utah County WIC" or "WIC" in the title, but we were forbidden to do so because of a standing Utah Health Department policy that prohibits using anything that could affect WIC client confidentiality. Based on this data the intervention may have been more successful if it had used a trusted source like WIC as an endorsement on the page rather than a university, which WIC clients were least likely to use. The distance between the values of WIC and a university is further beyond the margin of error, indicating that it is significant with a 95% confidence level.

4.2.4 Evaluation of Group With Privacy Concerns

The data from the survey on WIC clients' use of social media was split into two groups based on the response to the question "What reason, if any, would keep you from using social media?" Those who answered that they were concerned about privacy were put into one group to be compared with the remaining subject. The purpose of the evaluation is to determine if there were any differences in the groups' responses that could be used to address the concern about privacy.

The largest difference between the two groups' preferences for social media involves YouTube, where those who were concerned about privacy indicated that they were more interested in learning about nutrition through that medium. YouTube does not share a user's video viewing history unless the user elects to comment on the video. This method could be seen as more private than Facebook, which by default publishes your likes and subscriptions publicly. Cell phone apps also saw an increase and may be a viable option. These results are observations and may not be significant because the percentages are within the margin of error.

Table 4-8: Comparison of Social Media Preferences and Privacy Concerns

Social Media Preference	Facebook	YouTube	Cell Phone Apps
Concerned About Privacy	42%	35%	27%
Not Concerned About Privacy	46%	24%	22%
Margin of Error	+/- 8%	+/- 7%	+/- 7%

4.3 Evaluation of Popular WIC Pages

As discussed in section 3.6, five WIC themed Facebook pages were evaluated between October 2013 to January 2014 to determine which metrics might indicate that a Facebook page is successful and to evaluate the strategies they employ. Only one page, WIC Breastfeeding Peer Helper Stephanie, had a "talking about" number of over 5%, and it ranged between 11% – 48% during the evaluation period. Other sites such as the National WIC Association and the California WIC Association had good interaction rates of 5% and 3%, but the pages' content indicated that they aimed to interact with WIC professionals rather than WIC clients and were not suitable candidates for this study.

Table 4-9: WIC Themed Facebook Page Statistics

WIC Themed Facebook Site	Likes	Talking About Percentage
WIC Breastfeeding Peer Helper Stephanie	4,515	48%
National WIC Association	1,564	3%
WIC Wonders	1,255	0%
California WIC Association	1,233	5%
PHFE WIC Program (Official)	1,114	4%

The original five pages were reduced to two based on the following criteria: 1) the page aimed to interact with WIC clients and 2) their interaction rate was at least 3%. We continued to investigate the Breast Feeding Peer Helper Stephanie and PHFE WIC Program pages to evaluate the strategies that they used in posts. PHFE WIC Program posts were designed to provide information such as office hours, recipes, online classes, and holiday themes, whereas

Breastfeeding Peer Helper Stephanie used entertaining posts that advocated breastfeeding mixed with posts about the importance and benefits of breastfeeding. The Breastfeeding Peer Helper Stephanie page had much higher interaction rates, which could be attributed to the entertaining nature of the content.

The interaction rates of the Breastfeeding Peer Helper Stephanie page are encouraging because they show that the WIC demographic could engage in discussions of WIC topics through Facebook. Future Facebook interventions should attempt to mirror the strategies used on Stephanie's page such as including engaging images or video in every post and seeking to entertain the audience as they are being taught. The majority of Stephanie's posts aim to entertain, yet maintain the site's focus on increasing breastfeeding rates. These entertaining posts help establish breastfeeding as a natural process and foster an engaged audience that will view the posts aimed at educating. The PHFE WIC Program site also shares educational posts, but does not seek to entertain and has much lower interaction rates. It should be noted however, that a full qualitative analysis evaluating the entertaining value of posts was not performed in this study, but major themes and topics were observed and identified. Future research could be performed on the Breastfeeding Peer Helper Stephanie page and similar pages to determine the relationship between entertaining posts and user engagement.

The Breastfeeding Peer Helper Stephanie page was effective in getting users engaged in the topic. However, some WIC offices may not be willing or able to post entertaining images if the practice is too distant from their branding as an authoritative government organization. Future research ought to be performed to determine if Stephanie's method of entertainment is effective at increasing breastfeeding rates among her followers or if the only value they receive

is entertainment. If her method is found to be effective, the data could be used to encourage

WIC offices to use untraditional methods of educating their target demographic.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Overview

Previous research has shown that social media can be effective in changing attitudes and behaviors among participants, but these studies used captive audiences where participants knew that they would participate in social media and could elect to not take part in the study. This thesis details the creation of an online course management system that provided the framework to research WIC clients desire to connect with others through social media and identified concerns they may have had. The hypothesis that WIC clients who participated in social media were more likely to improve their nutrition attitudes and behaviors was shown to be false on two counts: first, the subjects who participated in the Toddlers Food for Thought page did not improve more than the control group, and second, the majority of subjects chose not to "like" the page and participate in the intervention. While the original hypothesis of this study could be deemed a failure, the study did identify strategies that do not work and helped identify the best-case option for future interventions using social media.

5.2 Recommendations for Action and Study

This thesis acted as a pilot study to a grant proposal authored by the Department of Nutrition, Dietetics & Food Science, the School of Health Sciences, and the School of Technology at BYU. As a result of these findings, the researchers decided to drop the Facebook

intervention from their proposal and focus their efforts on online cooking classes for moms and online storybooks aiming to address feeding concerns and ways to involve children in the cooking process. However, a more successful attempt could be made using the following recommendations from our research:

1. **Social Media content should be authored or endorsed by the local WIC office**. As discussed in section 4.2.4, this study used a Facebook page authored by a university which was the source that WIC clients indicated they would be least likely to trust. However, the surveys indicated that clients would be more likely to participate if the sites were authored by their local WIC office, demonstrating that they trust the information WIC provides.

2. **Facebook interventions should be entertaining in an attempt to engage users.** WIC Peer Helper Stephanie established a strong engagement among her followers by seeking first to entertain and then to educate. Future researchers should determine if her entertain-first strategy is effective at facilitating nutritional behavior improvement.

3. **Interventions may have success using other social media platforms such as Pinterest or YouTube.** As discussed in 4.2.2, WIC clients indicated that Facebook was for keeping in touch with friends and not learning about toddler nutrition. The intervention may have improved its results by varying posted content and including YouTube videos to reach a larger audience. Additionally, Pinterest has a different use case that may be more conducive to posting recipes and project ideas for young children.

4. **Text messages and cell phone apps may help overcome privacy concerns.** As discussed in section 4.2.2, the biggest concern for using social media is protecting

privacy. Text messages are private conversations and could be used to send tips of the day and remind clients of goals they have set.

5. **Find out what information the audience wants and fill the need.** As discussed in section 4.1.1, this study asked clients what they wished they could see on Facebook and the online courses site after the intervention had been completed; the most common requests were for toddler snack ideas and tactics to work with picky eaters. The study may have had higher participation rates if clients felt that the Facebook page met their specific needs.

The online courses have been well received and most of the clients said that the site has been helpful to them. However, the courses provide an elementary overview of nutrition topics that may not be as useful for those with advanced nutrition knowledge. To help mitigate this deficiency, new courses could be created to include beginner, intermediate, and advanced courses, thus providing content for all levels of learning and enabling beginners to advance their knowledge beyond the basics.

5.3   Closing

Public health initiatives play a larger role in the lives of people than they may realize. Although this thesis did not directly identify a successful intervention to improve WIC clients' health, it helped find suggestions for future attempts and helped researchers pursue other research opportunities and ideas. Research in this area should continue as it has the possibility of improving the health outcomes of the 50% of the children born in the United States who participate in the WIC program.

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APPENDICES

APPENDIX A.   SURVEYS

A.1   Survey for Survey Validation

(Knowledge Questions)

Which of these foods is a choking hazard for toddlers?
- A. Grapes cut into small pieces
- B. Potato or Corn Chips
- C. Cooked Carrots
- D. Peanut butter spread thin on bread

Toddlers should not drink more than _____ of juice per day.
- A. ¼ - 1/3 cup
- B. ½ - 2/3 cup
- C. ¾ - 1 cup
- D. 1 ½ cup – 2 cups

One recommendation is to serve your toddler about _____of each food served for each year of his or her life at mealtimes or snacks.
- A. 1 teaspoon
- B. 1 tablespoon
- C. 1 ounce
- D. ½ cup

For each sentence below, please select if you strongly disagree (SD), disagree (D), neither agree nor disagree or don't know (N, DK), agree (A), or strongly agree (SA) with the sentence. Please select only one answer for each sentence.

(Attitude Questions)
Note: Food Groups has to be defined.

It is important to me to provide healthy snacks for my toddler.
SD D N/DK A SA

It is important to me that my toddler snacks from food groups that were missed at meals or snacks earlier in the day.
SD D N/DK A SA

Feeding my toddler more food than he or she wants to eat will help my toddler grow.
 SD D N/DK A SA

It is important to me that my toddler help prepare food in the kitchen for mealtimes or snacks.
SD D N/DK A SA

Toddlers should be given candy or desserts when they do something good.
SD D N/DK A SA

Toddlers should be given fruit and/or vegetables when they do something good.
SD D N/DK A SA

Toddlers should be left alone while they eat.
SD D N/DK A SA

(Behavior Questions)

I feed my toddler snacks from food groups that were missed at meals or snacks earlier in the day.
SD D N/DK A SA

I let my toddler help me prepare food in the kitchen for mealtimes or snacks.
SD D N/DK A SA

I feed my toddler foods from all the food groups.
SD D N/DK A SA

I am mindful of choking hazards when preparing meals and snacks for my toddler.
SD D N/DK A SA

I let my toddler decide how much to eat.
SD D N/DK A SA

I let my toddler decide when he or she is done eating.
SD D N/DK A SA

I give my toddler candy or desserts when he or she does something good.
SD D N/DK A SA

I give my toddler fruit and/or vegetables when he or she does something good.
SD D N/DK A SA

I leave my toddler alone while he or she eats.
SD D N/DK A SA

<u>Demographics</u>

How much time do you spend on the Internet **per day**? (all users)
    A. 0 – 15 minutes
    B. 16- 30 minutes
    C. 31 minutes – 1 hour
    D. Between 1 – 2 hours
    E. More than 2 hours

How much time do you spend on Facebook **per day**?
    A. 0 – 15 minutes
    B. 16- 30 minutes
    C. 31 minutes – 1 hour
    D. Between 1 – 2 hours
    E. More than 2 hours

How much time did you spend looking at the Utah County Toddlers Facebook Page **per week**? (Facebook Users only)
    A. 0 – 15 minutes
    B. 16- 30 minutes
    C. 31 minutes – 1 hour
    D. Between 1 – 2 hours
    E. More than 2 hours

Which method did you prefer for learning about toddlers' eating habits? (Facebook group only)
    A. Utah County Toddlers Facebook
    B. Online courses
    C. Liked equally

What do you wish you could see on the Utah County Toddlers Page? (Facebook group only)
(Open Response)

What do you wish you could learn about on the online courses site? (all study groups)
(Open Response)

What is your age?
    A. 18 – 24 years
    B. 25 – 30 years
    C. 31 – 35 years
    D. 35 – 40 years
    E. 41 – 45 years

What is your race / ethnicity?
    A. White
    B. African American / Black
    C. Hispanic
    D. Asian or Pacific Islander
    E. Native American
    F. Other (Specify) _____

What is your city of residence?
(Open Response)

A.2 Pretest Non-Facebook Group

Q15 For each sentence below, please select if you strongly disagree (SD), disagree (D), neither agree nor disagree or don't know (N, DK), agree (A), or strongly agree (SA) with the sentence. Please select only one answer for each sentence.

Q4 It is important to me to provide healthy snacks for my toddler.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q7 Feeding my toddler more food than he or she wants to eat will help my toddler grow.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q14 For each sentence below, please select if it is something you never do (N), rarely do (R), sometimes do (S), often do (O), or always do (A). Please select only one answer for each sentence.

Q12 I feed my toddler snacks from food groups that were missed at meals or snacks earlier in the day.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q16 I let my toddler help me prepare food in the kitchen for mealtimes or snacks.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q17 I feed my toddler foods from all the food groups.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q18 I think about choking hazards when preparing meals and snacks for my toddler.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q19 I let my toddler decide how much to eat.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q20 I let my toddler decide when he or she is done eating
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q21 I give my toddler candy or desserts when he or she does something good.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q22 I give my toddler fruit and/or vegetables when he or she does something good.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
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Q23 I leave my toddler alone while he or she eats.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q5 How much time do you spend on the Internet per day either on a computer or on a mobile device?
- ○ 0 - 15 minutes (1)
- ○ 16 - 30 minutes (2)
- ○ 31 minutes - 1 hour (3)
- ○ Between 1 - 2 hours (4)
- ○ More than 2 hours (5)

Q26 How much time do you spend on Facebook per day either on a computer or on a mobile device?
- ❍ 0 - 15 minutes (1)
- ❍ 16 - 30 minutes (2)
- ❍ 31 minutes - 1 hour (3)
- ❍ Between 1 - 2 hours (4)
- ❍ More than 2 hours (5)

Q27 What is your age?
- ❍ 18 - 24 years (1)
- ❍ 25 - 30 years (2)
- ❍ 31 - 40 years (3)
- ❍ 41 - 50 years (4)
- ❍ 51 - 60 years (5)
- ❍ 60+ years (6)

Q28 What is your race / ethnicity?
- ❍ White (1)
- ❍ African American / Black (2)
- ❍ Hispanic (3)
- ❍ Asian or Pacific Islander (4)
- ❍ Native American (5)
- ❍ Other (Specify) (6) _____

Q29 What is your city of residence?

A.3 Posttest Survey Non-Facebook Group

Q15 For each sentence below, please select if you strongly disagree (SD), disagree (D), neither agree nor disagree or don't know (N, DK), agree (A), or strongly agree (SA) with the sentence. Please select only one answer for each sentence.

Q4 It is important to me to provide healthy snacks for my toddler.
- ❍ Strongly Disagree (1)
- ❍ Disagree (2)
- ❍ Neither Agree nor Disagree (3)
- ❍ Agree (4)
- ❍ Strongly Agree (5)

Q7 Feeding my toddler more food than he or she wants to eat will help my toddler grow.
- ○ Strongly Disagree (1)
- ○ Disagree (2)
- ○ Neither Agree nor Disagree (3)
- ○ Agree (4)
- ○ Strongly Agree (5)

Q14 For each sentence below, please select if it is something you never do (N), rarely do (R), sometimes do (S), often do (O), or always do (A). Please select only one answer for each sentence.

Q12 I feed my toddler snacks from food groups that were missed at meals or snacks earlier in the day.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
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- ○ Always (5)

Q16 I let my toddler help me prepare food in the kitchen for mealtimes or snacks.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q17 I feed my toddler foods from all the food groups.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q18 I think about choking hazards when preparing meals and snacks for my toddler.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q19 I let my toddler decide how much to eat.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
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- ○ Always (5)

Q20 I let my toddler decide when he or she is done eating
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q21 I give my toddler candy or desserts when he or she does something good.
- ○ Never (1)
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- ○ Never (1)
- ○ Rarely (2)
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- ○ Often (4)
- ○ Always (5)

Q23 I leave my toddler alone while he or she eats.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q30 For each sentence below, please select if you strongly disagree (SD), disagree (D), neither agree nor disagree or don't know (N, DK), agree (A), or strongly agree (SA) with the sentence. Please select only one answer for each sentence.

Q29 I get the information I need from the online toddler courses.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q31 I can relate with the information of the online toddler courses.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q32 The creators of the online toddler class care about my learning.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q33 The WIC staff cares about the questions I ask related to the online toddler course.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q34 I trust the information given in the online courses site.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q35 I enjoy using the online toddler courses.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q36 The online toddler course has been helpful to me.
- ○ Strongly Disagree (1)
- ○ Disagree (2)
- ○ Neither Agree nor Disagree (3)
- ○ Agree (4)
- ○ Strongly Agree (5)

Q37 Members of my household support the ideas given on the online toddler course.
- ○ Strongly Disagree (1)
- ○ Disagree (2)
- ○ Neither Agree nor Disagree (3)
- ○ Agree (4)
- ○ Strongly Agree (5)

Q5 How much time do you spend on the Internet per day either on a computer or on a mobile device?
- ○ 0 - 15 minutes (1)
- ○ 16 - 30 minutes (2)
- ○ 31 minutes - 1 hour (3)
- ○ Between 1 - 2 hours (4)
- ○ More than 2 hours (5)

Q26 How much time do you spend on Facebook per day either on a computer or on a mobile device?
- ○ 0 - 15 minutes (1)
- ○ 16 - 30 minutes (2)
- ○ 31 minutes - 1 hour (3)
- ○ Between 1 - 2 hours (4)
- ○ More than 2 hours (5)

Q39 What do you wish you could learn about on the online courses site?

Q57 Did you "Like" the Toddlers Food for Thought Facebook Page?
- ○ Yes (1)
- ○ No (2)

Q40 For each sentence below, please select if you strongly disagree (SD), disagree (D), neither agree nor disagree or don't know (N, DK), agree (A), or strongly agree (SA) with the sentence. Please select only one answer for each sentence.

Q41 I get the information I need from the people who make the Toddlers Food for Thought Facebook Page
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q42 I can relate with the members on the Toddlers Food for Thought Facebook Page.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q43 I can relate with the people who manage the Toddlers Food for Thought Facebook Page.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q44 Members of the Toddlers Food for Thought Facebook Page care about my learning.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q45 The people who manage the Toddlers Food for Thought Facebook Page care about my learning.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q46 Members of the Toddlers Food for Thought Facebook Page care about the questions posted on the Page.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q47 The people who manage the Toddlers Food for Thought Facebook Page care about the questions posted on the Page.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q48 I trust the information given on the Toddlers Food for Thought Facebook Page.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q49 I trust the information given on the Toddlers Food for Thought Facebook Page.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q50 I enjoy using the Toddlers Food for Thought Facebook Page.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q51The Toddlers Food for Thought Facebook Page has been helpful to me.
- ○ Strongly Disagree (1)
- ○ Disagree (2)
- ○ Neither Agree nor Disagree (3)
- ○ Agree (4)
- ○ Strongly Agree (5)

Q52 Members of my household support the ideas given on the Toddlers Food for Thought Facebook Page.
- ○ Strongly Disagree (1)
- ○ Disagree (2)
- ○ Neither Agree nor Disagree (3)
- ○ Agree (4)
- ○ Strongly Agree (5)

Q53
The Toddlers Food for Thought Facebook Page offers me the support I needed to help my toddler eat in a healthy way.
- ○ Strongly Disagree (1)
- ○ Disagree (2)
- ○ Neither Agree nor Disagree (3)
- ○ Agree (4)
- ○ Strongly Agree (5)

Q56 Which method did you prefer for learning about toddlers' eating habits?
- ○ Toddlers Food for Thought Facebook Page (1)
- ○ Online Courses (2)
- ○ Liked both equally (3)

Q55 How much time did you spend looking at the Toddlers Food for Thought Facebook Page per week?
- ○ 0 - 15 minutes (1)
- ○ 16 - 30 minutes (2)
- ○ 31 minutes - 1 hour (3)
- ○ Between 1 - 2 hours (4)
- ○ More than 2 hours (5)

Q54 What do you wish you could see on the Toddlers Food for Thought Page?

Q59 Why didn't you "Like" the Toddlers Food For Thought Page?

❍ I do not use Facebook (1)
❍ I am concerned about privacy (2)
❍ The topics on the page do not interest me (3)
❍ Very few people "liked" the page (4)
❍ Other (Please Specify) (5) _____

Q61 Is there anything about toddler nutrition you'd like to see on Facebook?

Q27 What is your age?
❍ 18 - 24 years (1)
❍ 25 - 30 years (2)
❍ 31 - 40 years (3)
❍ 41 - 50 years (4)
❍ 51 - 60 years (5)
❍ 60+ years (6)

Q28 What is your race / ethnicity?
❍ White (1)
❍ African American / Black (2)
❍ Hispanic (3)
❍ Asian or Pacific Islander (4)
❍ Native American (5)
❍ Other (Specify) (6) _____

Q29 What is your city of residence?

A.4 Pretest Facebook Group

Q15 For each sentence below, please select if you strongly disagree (SD), disagree (D), neither agree nor disagree or don't know (N, DK), agree (A), or strongly agree (SA) with the sentence. Please select only one answer for each sentence.

Q4 It is important to me to provide healthy snacks for my toddler.
❍ Strongly Disagree (1)
❍ Disagree (2)
❍ Neither Agree nor Disagree (3)
❍ Agree (4)
❍ Strongly Agree (5)

Q7 Feeding my toddler more food than he or she wants to eat will help my toddler grow.
- ○ Strongly Disagree (1)
- ○ Disagree (2)
- ○ Neither Agree nor Disagree (3)
- ○ Agree (4)
- ○ Strongly Agree (5)

Q14 For each sentence below, please select if it is something you never do (N), rarely do (R), sometimes do (S), often do (O), or always do (A). Please select only one answer for each sentence.

Q12 I feed my toddler snacks from food groups that were missed at meals or snacks earlier in the day.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q16 I let my toddler help me prepare food in the kitchen for mealtimes or snacks.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q17 I feed my toddler foods from all the food groups.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q18 I think about choking hazards when preparing meals and snacks for my toddler.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q19 I let my toddler decide how much to eat.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q20 I let my toddler decide when he or she is done eating
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q21 I give my toddler candy or desserts when he or she does something good.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q22 I give my toddler fruit and/or vegetables when he or she does something good.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q23 I leave my toddler alone while he or she eats.
- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Always (5)

Q5 How much time do you spend on the Internet per day either on a computer or on a mobile device?
- ❍ 0 - 15 minutes (1)
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- ❍ 31 minutes - 1 hour (3)
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- ❍ 31 minutes - 1 hour (3)
- ❍ Between 1 - 2 hours (4)
- ❍ More than 2 hours (5)

Q27 What is your age?
- ❍ 18 - 24 years (1)
- ❍ 25 - 30 years (2)
- ❍ 31 - 40 years (3)
- ❍ 41 - 50 years (4)
- ❍ 51 - 60 years (5)
- ❍ 60+ years (6)

Q28 What is your race / ethnicity?
- ❍ White (1)
- ❍ African American / Black (2)
- ❍ Hispanic (3)
- ❍ Asian or Pacific Islander (4)
- ❍ Native American (5)
- ❍ Other (Specify) (6) _____

Q29 What is your city of residence?

A.5   Posttest Facebook Group

Q15 For each sentence below, please select if you strongly disagree (SD), disagree (D), neither agree nor disagree or don't know (N, DK), agree (A), or strongly agree (SA) with the sentence. Please select only one answer for each sentence.

Q4 It is important to me to provide healthy snacks for my toddler.
- ❍ Strongly Disagree (1)
- ❍ Disagree (2)
- ❍ Neither Agree nor Disagree (3)
- ❍ Agree (4)
- ❍ Strongly Agree (5)

Q7 Feeding my toddler more food than he or she wants to eat will help my toddler grow.
- ❍ Strongly Disagree (1)
- ❍ Disagree (2)
- ❍ Neither Agree nor Disagree (3)
- ❍ Agree (4)
- ❍ Strongly Agree (5)

Q14 For each sentence below, please select if it is something you never do (N), rarely do (R), sometimes do (S), often do (O), or always do (A). Please select only one answer for each sentence.

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- ❍ Never (1)
- ❍ Rarely (2)
- ❍ Sometimes (3)
- ❍ Often (4)
- ❍ Always (5)

Q16 I let my toddler help me prepare food in the kitchen for mealtimes or snacks.
- ❍ Never (1)
- ❍ Rarely (2)
- ❍ Sometimes (3)
- ❍ Often (4)
- ❍ Always (5)

Q17 I feed my toddler foods from all the food groups.
- ❍ Never (1)
- ❍ Rarely (2)
- ❍ Sometimes (3)
- ❍ Often (4)
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- ◯ Never (1)
- ◯ Rarely (2)
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- ◯ Always (5)

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Q23 I leave my toddler alone while he or she eats.
- ◯ Never (1)
- ◯ Rarely (2)
- ◯ Sometimes (3)
- ◯ Often (4)
- ◯ Always (5)

Q30 For each sentence below, please select if you strongly disagree (SD), disagree (D), neither agree nor disagree or don't know (N, DK), agree (A), or strongly agree (SA) with the sentence. Please select only one answer for each sentence.

Q29 I get the information I need from the online toddler courses.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q31 I can relate with the information of the online toddler courses.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q32 The creators of the online toddler class care about my learning.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q33 The WIC staff cares about the questions I ask related to the online toddler course.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q34 I trust the information given in the online courses site.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q35 I enjoy using the online toddler courses.
- ○ Strongly Disagree (1)
- ○ Disagree (2)
- ○ Neither Agree nor Disagree (3)
- ○ Agree (4)
- ○ Strongly Agree (5)

Q36 The online toddler course has been helpful to me.
- ○ Strongly Disagree (1)
- ○ Disagree (2)
- ○ Neither Agree nor Disagree (3)
- ○ Agree (4)
- ○ Strongly Agree (5)

Q37 Members of my household support the ideas given on the online toddler course.
- ○ Strongly Disagree (1)
- ○ Disagree (2)
- ○ Neither Agree nor Disagree (3)
- ○ Agree (4)
- ○ Strongly Agree (5)

Q5 How much time do you spend on the Internet per day either on a computer or on a mobile device?
- ○ 0 - 15 minutes (1)
- ○ 16 - 30 minutes (2)
- ○ 31 minutes - 1 hour (3)
- ○ Between 1 - 2 hours (4)
- ○ More than 2 hours (5)

Q26 How much time do you spend on Facebook per day either on a computer or on a mobile device?
- ○ 0 - 15 minutes (1)
- ○ 16 - 30 minutes (2)
- ○ 31 minutes - 1 hour (3)
- ○ Between 1 - 2 hours (4)
- ○ More than 2 hours (5)

Q39 What do you wish you could learn about on the online courses site?

Q57 Did you "Like" the Toddlers Food for Thought Facebook Page?
- ❍ Yes (1)
- ❍ No (2)

Q40 For each sentence below, please select if you strongly disagree (SD), disagree (D), neither agree nor disagree or don't know (N, DK), agree (A), or strongly agree (SA) with the sentence. Please select only one answer for each sentence.

Q41 I get the information I need from the people who make the Toddlers Food for Thought Facebook Page
- ❍ Strongly Disagree (1)
- ❍ Disagree (2)
- ❍ Neither Agree nor Disagree (3)
- ❍ Agree (4)
- ❍ Strongly Agree (5)

Q42 I can relate with the members on the Toddlers Food for Thought Facebook Page.
- ❍ Strongly Disagree (1)
- ❍ Disagree (2)
- ❍ Neither Agree nor Disagree (3)
- ❍ Agree (4)
- ❍ Strongly Agree (5)

Q43 I can relate with the people who manage the Toddlers Food for Thought Facebook Page.
- ❍ Strongly Disagree (1)
- ❍ Disagree (2)
- ❍ Neither Agree nor Disagree (3)
- ❍ Agree (4)
- ❍ Strongly Agree (5)

Q44 Members of the Toddlers Food for Thought Facebook Page care about my learning.
- ❍ Strongly Disagree (1)
- ❍ Disagree (2)
- ❍ Neither Agree nor Disagree (3)
- ❍ Agree (4)
- ❍ Strongly Agree (5)

Q45 The people who manage the Toddlers Food for Thought Facebook Page care about my learning.
❍ Strongly Disagree (1)
❍ Disagree (2)
❍ Neither Agree nor Disagree (3)
❍ Agree (4)
❍ Strongly Agree (5)

Q46 Members of the Toddlers Food for Thought Facebook Page care about the questions posted on the Page.
❍ Strongly Disagree (1)
❍ Disagree (2)
❍ Neither Agree nor Disagree (3)
❍ Agree (4)
❍ Strongly Agree (5)

Q47 The people who manage the Toddlers Food for Thought Facebook Page care about the questions posted on the Page.
❍ Strongly Disagree (1)
❍ Disagree (2)
❍ Neither Agree nor Disagree (3)
❍ Agree (4)
❍ Strongly Agree (5)

Q48 I trust the information given on the Toddlers Food for Thought Facebook Page.
❍ Strongly Disagree (1)
❍ Disagree (2)
❍ Neither Agree nor Disagree (3)
❍ Agree (4)
❍ Strongly Agree (5)

Q49 I trust the information given on the Toddlers Food for Thought Facebook Page.
❍ Strongly Disagree (1)
❍ Disagree (2)
❍ Neither Agree nor Disagree (3)
❍ Agree (4)
❍ Strongly Agree (5)

Q50 I enjoy using the Toddlers Food for Thought Facebook Page.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q51 The Toddlers Food for Thought Facebook Page has been helpful to me.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q52 Members of my household support the ideas given on the Toddlers Food for Thought Facebook Page.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q53 The Toddlers Food for Thought Facebook Page offers me the support I needed to help my toddler eat in a healthy way.
○ Strongly Disagree (1)
○ Disagree (2)
○ Neither Agree nor Disagree (3)
○ Agree (4)
○ Strongly Agree (5)

Q56 Which method did you prefer for learning about toddlers' eating habits?
○ Toddlers Food for Thought Facebook Page (1)
○ Online Courses (2)
○ Liked both equally (3)

Q55 How much time did you spend looking at the Toddlers Food for Thought Facebook Page per week?
- ○ 0 - 15 minutes (1)
- ○ 16 - 30 minutes (2)
- ○ 31 minutes - 1 hour (3)
- ○ Between 1 - 2 hours (4)
- ○ More than 2 hours (5)

Q54 What do you wish you could see on the Toddlers Food for Thought Page?

Q59 Why didn't you "Like" the Toddlers Food For Thought Page?
- ○ I do not use Facebook (1)
- ○ I am concerned about privacy (2)
- ○ The topics on the page do not interest me (3)
- ○ Very few people "liked" the page (4)
- ○ Other (Please Specify) (5) _____

Q61 Is there anything about toddler nutrition you'd like to see on Facebook?

Q27 What is your age?
- ○ 18 - 24 years (1)
- ○ 25 - 30 years (2)
- ○ 31 - 40 years (3)
- ○ 41 - 50 years (4)
- ○ 51 - 60 years (5)
- ○ 60+ years (6)

Q28 What is your race / ethnicity?
- ○ White (1)
- ○ African American / Black (2)
- ○ Hispanic (3)
- ○ Asian or Pacific Islander (4)
- ○ Native American (5)
- ○ Other (Specify) (6) _____

Q29 What is your city of residence?

A.6 Social Media Use Survey

Q1 Do you use any of the following items? (Check all that apply)
- ❑ Desktop / Laptop Computer (1)
- ❑ iPad (2)
- ❑ Android tablet (3)
- ❑ iPhone (4)
- ❑ Android Phone (5)
- ❑ Phone-calls only cell phone (non-smartphone) (6)
- ❑ Texting and phone calls cell phone (non-smartphone) (7)
- ❑ I do not use any of the items listed in this question (8)

Q2 Would you be interested in learning about food/nutrition topics through any of the following places? (Check all that apply)
- ❑ Twitter (1)
- ❑ Facebook (2)
- ❑ Pinterest (3)
- ❑ Google+ (4)
- ❑ YouTube (5)
- ❑ Cell Phone Apps (6)
- ❑ Text Messages (7)
- ❑ I would not be interested in using social media, apps, or texting to learn about food / nutrition topics (8)

Q3 What reason, if any, would keep you from using social media (Facebook, Twitter, Pinterest) to receive food / nutrition information? (Check all that apply)
- ❑ I do not use social media (1)
- ❑ I am conerned about my privacy (2)
- ❑ The topics do not interest me (3)
- ❑ I prefer in-person contact (4)
- ❑ I do not want to learn about food/nutrition through social media (5)
- ❑ Nothing would keep me from using social media to learn about food/nutrition (6)
- ❑ Other (Please Specifiy): (7) _____

Q4 How likely would you be to use a social media site if the group listed had on about food/nutrition topics? (Please circle one option per line) 1 Not at all likely or 5 very likely

_____ Moms in the general public (1)

_____ A University (2)

_____ Women, Infants, and Children (WIC (3)

_____ Other local/state health agency (4)

APPENDIX B.   CONSENT FORMS AND RECRUITMENT FLYERS

B.1   Facebook Group Implied Consent Form

My name is Ryan Amy, I am a graduate student at Brigham Young University and I am conducting a research study under the supervision of Professor Rickelle Richards, from the Department of Nutrition, Dietetics, and Food Science. The purpose of this study to find out the effects of giving toddler feeding tips to parents through social media. You are being invited to take part in this research study because you have shown an interest in toddler nutrition. You are eligible to take part in this study if you are a primary caregiver of a toddler between 1 – 3 years of age.

Taking part in this study will require filling out   an online survey. This will be given before you take this course and should take approximately 10 - 15 minutes of your time. You will receive an email in one month asking you to complete a second survey. You will not be contacted again in the future. You will be entered into a drawing for an Android Tablet upon completion of the second survey, with an approximate chance of winning of 1 in 100. This survey involves minimal risk to you. The benefits, however, may impact society by increasing knowledge about social media's effect on toddler nutrition education.

You do not have to be in this study if you do not want to be. You do not have to answer any question that you do not want to answer for any reason. We will be happy to answer any questions you have about this study. If you have further questions about this project or if you have a research-related problem you may contact me, Ryan Amy at (801) 210 – 0139, Ryan_Amy@byu.edu or my advisor, Rickelle Richards at Rickelle_Richards@byu.edu.

If you have any questions about your rights as a research participant you may contact the IRB Administrator at A-285 ASB, Brigham Young University, Provo, UT 84602; irb@byu.edu; (801) 422-1461. The IRB is a group of people who review research studies to protect the rights and welfare of research participants.

The completion of this survey implies your consent to participate. If you choose to participate, please click next to begin the survey.

B.2 Non-Facebook Group Implied Consent Form

My name is Ryan Amy, I am a graduate student at Brigham Young University and I am conducting a research study under the supervision of Professor Rickelle Richards, from the Department of Nutrition, Dietetics, and Food Science. The purpose of this study is to find out the effects of online learning on your thoughts about feeding toddlers. You are being invited to take part in this research study because you have shown an interest in toddler nutrition. You are eligible to take part in this study if you are a primary caregiver of a toddler between 1 – 3 years of age.

Taking part in this study will require filling out an online survey. This will be given before you take this course and should take approximately 10 - 15 minutes of your time. You will receive an email in one month asking you to complete a second survey. You will not be contacted again in the future. You will be entered into a drawing for an Android Tablet upon completion of the second survey, with an approximate chance of winning of 1 in 100. This survey involves minimal risk to you. The benefits, however, may impact society by finding better ways to share information about toddler nutrition.

You do not have to be in this study if you do not want to be. You do not have to answer any question that you do not want to answer for any reason. We will be happy to answer any questions you have about this study. If you have further questions about this project or if you have a research-related problem you may contact me, Ryan Amy at (801) 210 – 0139, Ryan_Amy@byu.edu or my advisor, Rickelle Richards at Rickelle_Richards@byu.edu.

If you have any questions about your rights as a research participant you may contact the IRB Administrator at A-285 ASB, Brigham Young University, Provo, UT 84602; irb@byu.edu; (801) 422-1461. The IRB is a group of people who review research studies to protect the rights and welfare of research participants.

The completion of this survey implies your consent to participate. If you choose to participate, please click next to begin the survey.

B.3 Survey Verification Implied Consent Form

My name is Ryan Amy, I am a graduate student at Brigham Young University and I am conducting this research under the supervision of Professor Rickelle Richards , from the Department of Nutrition, Dietics, and Food Science. You are being invited to participate in this research study of The Effects of Social Media on WIC Nutrition Education.

Your participation in this study will require the completion of this online survey. This should take approximately 15 -20 minutes of your time. Your participation will be anonymous and you will not be contacted again in the future. You will be given a $30 Wal-Mart gift card upon completion of the second survey. This survey involves minimal risk to you. The benefits, however, may impact society by helping increase knowledge about Social Media's affect on toddler's nutrition.

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You do not have to be in this study if you do not want to be. You do not have to answer any question that you do not want to answer for any reason. We will be happy to answer any questions you have about this study. If you have further questions about this project or if you have a research-related problem you may contact me, Ryan Amy at (801) 210 – 0139, Ryan_Amy@byu.edu or my advisor, Rickelle Richards at Rickelle_Richards@byu.edu.

If you have any questions about your rights as a research participant you may contact the IRB Administrator at A-285 ASB, Brigham Young University, Provo, UT 84602; irb@byu.edu; (801) 422-1461. The IRB is a group of people who review research studies to protect the rights and welfare of research participants.

The completion of this survey implies your consent to participate. If you choose to participate, please click next to begin the survey.

Would you be willing to fill out a survey about food?

Are you female between the ages of
18 and 45
and have a child between
the ages 1 and 3?

...then you may qualify for a research study.

We are asking women to fill out a food survey that will be used on the Utah County Women, Infants, and Children's (WIC) website. We also want to find out your thoughts about the wording of the questions on the survey.

You will be asked to fill out the survey two times, one week apart.

You will be reimbursed for your time: $30 Wal-Mart Gift card for filling out both surveys.

For more information or to sign up, contact Ryan Amy at 801-210-0139 or email: Ryan_Amy@byu.edu.

This project is being conducted by Dr. Chia-Chi Teng and Graduate Student Ryan Amy from the School of Technology and Dr. Rickelle Richards from the Department of Nutrition, Dietetics, and Food Science at Brigham Young University.

APPENDIX C.   **WIC FACEBOOK PAGE ANALYSIS DATA**

WIC Associated Facebook Site	Like Count	Average # of posts/month	Average # likes/post	Averave # comments/post	Average # shares/post
WIC Breastfeeding Peer Helper Stephanie	4,515	11	84.91	6.57	20.95
National WIC Association	1,564	6	17.74	1.11	9.37
WIC Wonders	1,255	7	0.09	0	0
California WIC Association	1,233	6.86	13.33	1	5.42
PHFE WIC Program (Official)	1,114	7.7	20.33	0.78	2.59

WIC Associated Facebook Site	> 5 of the same people posting	Talking About This	Talking About This Percentage	Page Topics
WIC Breastfeeding Peer Helper Stephanie	yes	2,178	48%	Breastmilk benefits, Breastfeeding in public and public perception, Breastmilk pumps,
National WIC Association	yes	54	3%	WIC policy update, 40th anniversary for WIC, Medicaid coverage for breastfeeding, Affordable Care Act, Government Shutdoen
WIC Wonders	no	0	0%	Recipes, Whelch's grape juice, Folic acid
California WIC Association	yes	56	5%	WIC workers, Health tips, WIC funding, Holiday eating, New years resolutions
PHFE WIC Program (Official)	no	50	4%	WIC hours, Online classes, Governement Shutdown, Recipes, Holiday posts