AN EXAMINATION OF AGRICULTURAL EDUCATION INSTRUCTORS' PERSPECTIVES OF THE CASE STUDY INSTRUCTIONAL TECHNIQUE

A Dissertation

by

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ABSTRACT

In an effort to evaluate the current use of case studies as a teaching technique across postsecondary agricultural education, a qualitative study was conducted to explore the current use of case studies to determine the effectiveness of the technique, and to understand technology skills of the instructor in order to develop a model for integrating technologies into the case study technique (CST).

Study findings revealed benefits and limitations to the use of CST within postsecondary agricultural education as well as methods for integrating technology into the process. Benefits of CST included a) preparing students for real world application, b) developing higher-order thinking skills, and c) improving communication skills. Limitations of CST included a) students' lack of prior experience, b) difficulty for instructors to find quality cases, and c) the need for skilled facilitators. Several methods of integrating technology to address the limitations were identified through the research. Research findings provided a foundation for the development of a model in which technology can be integrated with CST. While further research is needed to confirm effectiveness of the model, implications exist that the use of the resulting model could increase the use of CST and also improve effectiveness through a technology-integrated approach.

DEDICATION

To my “Kun Ta”(grandfather), as promised, this is for you.

“I didn’t finish first grade, but I will have a grandchild who has a PhD!”

~ Sumpao Chittieng, A Loving Grandfather, (1930-2016)

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INTRODUCTION

This chapter provides an overview of the evolution of education and an introduction to teaching methods with a specific focus on the case study technique (CST). In addition, the background of the study, the statement of the problem, purpose, objectives, scope of the study, significance of the study and limitations are provided. The author's lived experience and definition of terms conclude the chapter.

Since ancient Greek and Roman times, education has been the foundation for the development and spread of civilization through the teaching of ideas, practices, and philosophies (Cubberly, 1920). In the recent century, the main method of teaching has been what we call the 'lecture.' Previously, the Bible was the textbook, and education was offered through churches and missionaries. As individuals strayed away from religious teachings and as the development of other disciplines such as law, math, and medicine, and other vocational education disciplines became much more relevant, an improved way to teach was sought (Cubberley, 1920).

During the 20th century, philosophers and educators developed various teaching methods as a response to studies on the condition of human learning. Teaching methods primarily fell into two approaches: *teacher-centered* and *student-centered* (Committee on Academic Programs and Teaching Learner-Centered Task Force, 2005). An education reform movement in the United States emphasized "the effort to develop

student-centered approaches to teaching and learning" (Deboer, 2002, p. 405). Several educational philosophers, such as Piaget, believed the student-centered approach was much more effective than the teacher-centered approach, as students would be able to develop personal meaning through relating the knowledge to real world situations and discussion with others to make evidence-based decisions (Deboer, 2002).

One student-centered approach that has been used across academic disciplines such as business, law, and health was CST (Kimball, 2006; Peuse, 1989). CST originated at Harvard Law School in 1870 (Kimball, 2006) and utilized actual instances, situations, problems, or events that had been reported or recorded as a teaching tool. The technique was often used to develop critical thinking skills, as the learners would be able to apply the learning concept in real situations as they analyzed the issues, developed an evidence-based solution, and made reasonable, informed decisions (Smith, n.d., para. 2). In summary, applying real-world concepts allowed learners to think through complex situations and plan based on evidence from past cases. Active learning occurred when learners could make a connection between knowledge and practical application. Therefore, to ensure students received an active learning experience, the use of case studies would help students make a connection between knowledge gained in class and real-world practices based on evidence from cases (Davis & Wilcock, 2003). Commonly, instructors used CST in conjunction with the traditional lecture as CST had the capability to assist in the development of procedural knowledge situation (Kindle & Schmidt, 2011). CST also allowed learners to build their own knowledge through

assessing a situation (Kindle & Schmidt, 2011), identifying issues, and solving problems simulating real-life situations (Baeten, Dochy, & Struyven, 2013).

Not only did CST enable theory-practice connections among students, it also encouraged active learning that provided students with a variety of vital skills such as problem-solving, critical reasoning, and analytical skills (Popil, 2011). In health professional education, such as nursing, case studies were a teaching tool to promote critical thinking because critical thinking encouraged nurses to be purposeful and outcome-driven, as they needed to always consider the needs of the patients (Popil, 2011). In academia, communication and collaboration were essential learning tools for active learning. Case studies have been considered powerful teaching and learning tools that encouraged collaboration between the instructor and learners. Compared to using traditional paper assignments to assess students' knowledge, the use of CST suggested students improved greatly in their communication skills (Noblitt, Vance, & DePoy Smith, 2010). This teaching technique encouraged interaction between the instructor and student through incidental feedback, which came from daily interaction (Sadler, 2012). CST allowed students to be involved in class activities and tasks while the instructor gained an immediate insight into students' understanding of the content (Sadler, 2012).

Background of the Study

The integration of technology became an interesting maneuver in the search for improving CST. As educators endeavored to find ways to improve teaching techniques in the ever-present technology-driven world, technologies proved to have significant

impacts on how people learn today (Altun, 2015). In recent decades, computer technology and online communication has grown in popularity. The emergence of technologies such as smartphones, mobile devices, computer notebooks, and tablets enabled e-learning to provide students with better access to learning content regardless of geographical locations, addressing the need for flexibility and access (Dooley, Lindner, & Dooley, 2005). Learning has also become more personalized as e-learning allowed students to manage and direct their own learning at their own pace and in their own time (Robinson & Sebba, 2010). The advantages of CST proved to be worth exploring in the hope of finding ways to improve CST.

Statement of the Problem

While there were positive outcomes to using case studies as a teaching technique found in literature, research also showed that whereas case studies had been used in multiple disciplines, instructors in the field of agricultural education still perceived their skills in using CST to be low when compared to skills in traditional teaching methods such as lectures (Wardlow & Johnson, 1999). In addition, further examination of the integration of technology with teaching among instructors of agricultural education revealed that instructors perceived their technology skills to be inefficient (Wingenbach & Ladner, 2002). Given that technology has proven to be effective when combined with other teaching methods, it was believed that the integration of technology could benefit CST. Therefore, further examination of the use of CST across postsecondary agricultural

education was needed to gain a better understanding of the current use of CST, the use of technology with CST, and the impact of CST through instructor member's perspectives. Guiding questions for this study were:

a) How are instructors using the CST in their instruction?
b) How is technology being used to enhance the use of CST?
c) What are the instructors' perceptions of the impact that CST has on student learning outcomes?

Purpose

The purpose of this phenomenological study was to investigate the phenomenon of the CST by examining the experiences of instructors in postsecondary agricultural education who utilize the CST for instruction in both traditional and technology-integrated classes. The goal of this research was to develop a model for using CST that can be used across postsecondary agricultural education, broadly speaking.

Objectives

The purpose was supported by the following objectives:

a) Describe instructors' experiences with the current method of using the case study as a teaching technique,
b) Describe instructors' experiences using technology to enhance CST, and
c) Identify technology skills needed by instructor in order to effectively enhance CST with technology use.

Scope of the Study

The study included instructors from colleges of agriculture, specifically in departments of agricultural education, communication, and leadership. Participants were identified based on their association (as an instructor) with courses that utilized case studies. To find this association, the researcher reviewed syllabi that were available on publicly accessible department of agricultural education's websites to identify potential participants. The criteria for choosing the institution were based on Birkenholz and Simonsen (2011)'s paper, "Characteristics of Distinguished Programs in Agricultural Education.*"* Ten of the most distinguished programs in agricultural education were selected, including "the University of Florida, Texas A&M University, The Ohio State University, University of Missouri, Iowa State University, Oklahoma State University, North Carolina State University, The Pennsylvania State University, Texas Tech University, and the University of Arizona" (Birkenholz & Simonsen, 2011, p. 16). The scope of the study was later extended to include instructors who held a membership with the American Association for Agricultural Education. A recruitment email was sent via the listserv of the association requesting that instructor or instructors who utilized the case study approach and were willing to be interviewed make themselves known so that they could be contacted. Interviews were conducted in the months of April and May 2017, through either a phone interview or face-to-face interview depending upon the location of the participant.

Significance of the Study

Despite its efficiency, CST has been documented as not being implemented adequately (Popil, 2011). Due to its criticism for not being an effective teaching method due to the method's reliance on *retrospective reports* to generate knowledge and the lack of contextual content to teach concrete concepts (Ozdilek, 2014), this research aimed to identify ways to improve CST. As technology has played a significant role in today's education (Altun, 2015), the integration of technology became an interesting consideration. Not only do face-to-face classes utilize cutting-edge technology to create an active learning environment, but also content could be presented in a way that supports all learning styles. As technologies have the capability to help instructors enhance CST, an exploration of this topic would facilitate a better understanding of the effective integration of technology.

Limitations

This study was subject to the following limitations:

a) Only individuals who provided their syllabi on publicly accessible websites or who were a member of the Association for Agricultural Education were able to be considered for participation.
b) This study focused on the use of case study in agricultural education, agriculture communication, and agriculture leadership curriculum at the postsecondary level. Therefore, any models developed, as part of this study might not be transferable to other disciplines.

Author's Lived Experience

The primary author has a Master of Education degree in Curriculum and Instruction. She has been working as an instructional designer for over five years. She is passionate about improving instructional methods. After a first-hand experience of the use of case studies as a teaching technique at Harvard University, which is well known for being the pioneer in the use of case studies as teaching technique (Kimball, 2006), she became interested in the technique and determined to develop a model in which the technique can be applied within postsecondary agricultural education.

Definition of Terms

The following are terms that were used throughout this study.

a) CBL – Case-based learning. An instructional approach that creates a student-driven learning environment that cases serve as the focal point for a particular learning objective (Kinuthia, Brantley-Dias, & Clarke, 2010).
b) Constructivism – A learning theory, which explains that people learn by actively constructing their own knowledge through interacting with the environment (Von Glasersfeld, 1987).
c) CST – Case Study Technique. An instructional technique that utilizes instances or events involving real situations and problems that have been reported or recorded as a teaching tool. The technique is often used to develop critical thinking skills as the learners would be able to apply the learning concept in real situations where they can analyze the problems,

develop an evidence-based solution, and make reasonable informed-decisions (Smith, n.d., para. 2).

d) Higher-order thinking – The ability to think critically, analyze situations, synthesize information, reflect, and problem-solve with reasoned and justified solutions (VanSickle & Hoge, 1991).

e) Student-centered – A pedagogical approach that encourages the development of autonomous individuals who have the skills to function effectively in society. This approach allows students to develop personal meaning for themselves, making learning authentic, meaningful and enjoyable (Deboer, 2002).

CHAPTER II

LITERATURE REVIEW

This chapter explores previous literature regarding the use of the case study technique (CST) for teaching. Even though the literature review revealed advantages to using the CST, issues associated with the technique also emerged, which prompted a further review on how technology could be integrated into the CST to address the issues. Further review of the literature revealed technologies that could be used effectively to enhance the CST.

The advantages of the CST have been highlighted in many studies due to its ability to create an active learning environment (Chen, Wu, & Yang, 2008; Fawcett, 2017; Giacalone, 2016; Gravett, de Beer, Odendaal-Kroon, & Merseth, 2017; Yadav, Shaver, & Meckl, 2010). The literature review identified three major advantages of using CST for teaching, which include enabling students' to make the theory-practice connection (Davis & Wilcock, 2003; Marsh & Stock, 2006), providing a simulated experience that encourages higher-order thinking (Popil, 2011), and increasing communication and team building skills (Noblitt et al., 2010). These skills are relevant in today's workplace, as employers are searching for those who are well equipped with strong critical thinking, communication, and knowledge application skills (Stasz, 1997).

Advantages of the Case Study Technique

Regarding the theory-practice connection, studies suggest that CST has the capability to empower students to make connections between what they are learning and its real-world application (Davis & Wilcock, 2003). This advantage of CST is relevant to creating an active learning environment because it increases information retention (Chowdhury, 2013; Kindle & Schmidt, 2011). Knowledge retention leads to stronger skills and, consequently, application of those skills, as individuals can recall useful information when facing a real-world situation (Marsh & Stock, 2006).

In addition, CST can also be used to create a learning experience that encourages higher order or cognitive thinking (Popil, 2011). Cognitive thinking includes the ability to think critically, analyze situations, synthesize information, and problem-solve with reasoned and justified solutions (VanSickle & Hoge, 1991). Using CST, students can develop personal meaning for their knowledge by relating the knowledge to real-world situations. Students are provided with the opportunity to practice their analytical skills and synthesize information as they review the case studies (Popil, 2011). Additionally, as students engage in discussion with others, they will be able to make decisions based on collected knowledge and evidence from those discussions (Deboer, 2002). The ability to make a reasoned and justified decision is a life-long skill that students should obtain before entering the workforce (Stasz, 1997; Stuhler, 1994).

The final advantage found in the review of literature is the increase in communication and team building skills (Noblitt et al., 2010). For CST to be effective,

collaboration is required both among students and between the instructors and students, which has the capability to assist in the development of procedural knowledge (Kindle & Schmidt, 2011). Instructors must facilitate discussion and provide students with questions and feedback that allow students to think critically and synthesize the information from case studies to generate a meaningful discussion (Sadler, 2012). During this process, students can build teamwork skills as they collaborate and make collective decisions. Finally, students in a case-based course improved greatly in their communication skills (Noblitt et al., 2010). Furthermore, students have the opportunity to practice both oral and written communication as they present their position and justify their answers (Noblitt et al., 2010). Additionally, being able to work in teams is an employable skill that empowers individuals to work in any job setting (Andrews & Higson, 2008). Individuals who can communicate effectively and work with people from various backgrounds will have greater opportunity to grow in their career field

Issues Associated with the Case Study Technique

Besides the advantages, the review also revealed issues associated with CST including the lack of foundational concept delivery, the need for a skilled facilitator, and the influence of the format and structure of the approach on learning. Kimball (2006) argued that the CST has a long history of criticism since its use as an instructional method at Harvard Law School in 1870. Such an argument was raised by other educational institutions, which considered the technique to be ineffective when preparing students for practice. For instance, a research study by Ozdilek (2014) suggested that the

CST was not an effective teaching method to teach a concrete concept because learners must rely on retrospective reports to generate knowledge. Effective delivery of the CST of instruction requires instructors to have good reasoning and questioning skills (Ozdilek, 2014) as the lack of real connection could lead to students' inability to grasp the learning concepts, which results in an ineffective class discussion. According to Pavan (1996), becoming a skilled facilitator means an extensive preparation for each case to enable functional group discussions.

An earlier study by Kim et al. (2006), focused on a conceptual framework for developing teaching cases, found issues with CST in terms of the format and the structure of cases. The study indicated that students have difficulty analyzing problems presented in cases as they are provided with "limited information, and making decisions on uncertain, ambiguous and conflicting issues" (p. 867). Furthermore, a study by Baeten et al. (2013) shows case-based learning alone cannot enhance students' learning and must be used in conjunction with other methods of teaching. In addition, because CST explores the application of ideas, methods, models, interventions, outcomes, etc. to help learners understand the real-world application of the knowledge, it is crucial that instructors facilitate the learning process by posing high-quality questions that allow students to think, analyze, and synthesize the cases to generate their conclusions or solutions. This concern implies that the power of CST lies in instructors who are experts in facilitating discussion and unpacking learning content (Kim et al., 2006). Another issue also identified was the lack of foundational knowledge found to be the factor in

ensuring effectiveness of CST. Lack of connection between the cases and foundational concepts prevents students from engaging in active learning (Ozdilek, 2014). This concern implies that students need to be introduced to the concept prior to CST implementation. Without proper facilitation and consideration of learners' prior knowledge of the ideas, methods, models, and other resources used in the cases, CST alone proves to be inadequate in delivering concrete knowledge. Therefore, students will not be able to make use of the case studies (Baeten et al., 2013).

Formats of the Case Study Technique

The influence of the case study approach's format and structure on learning has been identified in the literature (Baeten et al., 2013; Kim et al., 2006). Poorly constructed cases affect the quality of case analysis. Kim et al. (2006) identified core attributes of high-quality case studies, these included the following: relevant, realistic, engaging, challenging, and instructional. For disciplines including medicine, education, business, nursing, engineering, law, etc., these attributed an overarching strategy to utilize when developing cases that are problem-based (Sudzina, 1997). First, a "relevant" case should reflect the diversity of learners, address the goals and objectives of both learners and instructors, and be set in a practical situation to simulate real-life experiences (Kim et al., 2006, p. 869). Regarding the "realistic" attribute, the cases should be authentic by allowing learners to "experience complex and unpredictable decision-making process" (Kim et al., 2006, p. 870). The cases should present all sides of the information so that student could distinguish the essential elements in a situation

to make informed actions (Pearce, 2002). Lastly, the "realism" of the case can be increased by providing progressive disclosure of content (Kim et al., 2006, p. 870). Progressively disclosing information according to timeline or stages helps to sustain learners' interest. Regarding engagement, the cases should be rich in content to allow learners to think through and create multiple levels of analysis and interpretation (Pearce, 2002). Moreover, resources, assignments and activities beyond the cases should be available for learners to elicit information from a variety of perspectives. To allow learners to explore appropriate decision-making actions, cases should provide multiple outcomes depending on the decision of the learners. The outcomes need to be measured by activities and assignments that feature authentic tasks calling for problem solving or critical thinking (Sudzina, 1997; Mitchem et al., 2008). Experiencing consequences that resulted from decisions may allow learners to understand the system of cause-and-effect. Next, an effective case must be sufficiently complex, ambiguous, and challenging (Pearce, 2002). Challenge is another attribute that encourages higher-order thinking skills. The degree of content difficulty and the rareness of the cases simulate real-world situations that prompt the learners to expand beyond their foundational knowledge. The last attribute, instruction, focuses on the methods for improving the process of case-based learning by building up learners' prior knowledge, assessing learning, and providing feedback that is usable for supporting learning beyond the cases (Kim et al., 2006).

These findings imply that for CST to work effectively as a teaching method, three factors need to be considered: a) cases used in CST need to be well formatted and structured, b) instructors need to facilitate CST by preparing high-quality questions, c) foundational concepts need to be introduced before CST sessions, and d) CST needs to be used in conjunction with other methods to ensure students understanding of the context.

Uses of Instructional Technology in Teaching

In an effort to improve CST, the integration of technology became a part of some efforts to use CST. As educators find ways to improve teaching techniques in the ever-present technology-driven world, technology has proven to have significant impacts on how people learn today (Altun, 2015). Over the past decades, computer technology and online communication have grown in popularity, and the emergence of technologies such as mobile devices, computer notebooks, tablets, and others enables e-learning to provide students with better access to learning content regardless of geographical locations, addressing the need for flexibility and access (Dooley et al., 2005). Learning has become more personalized as e-learning allows students to manage and direct their own learning at their pace and in their own time (Robinson & Sebba, 2010). In summary, studies identified the benefits of instructional technology in enhancing teaching and learning. Potential uses of instructional technology were also identified through studies of technology including digital devices, social media, and video modules, and e-learning.

Digital devices such as smart phones, tablets, and digital voting systems have been used to facilitate anonymous and non-anonymous tests in addition to instruction as described previously (Mathiasen, 2015). A study on digital voting systems and communication in classroom lectures by Mathiasen (2015) suggested digital voting systems are a much broader resource than simply a device for facilitating non-anonymous tests, control and allocation of grading. These devices are often used in situations where feedback is essential for learning (Mathiasen, 2015). When using CST, feedback is essential for instructors to facilitate an effective learning environment. Digital devices allow learners to reflect on their learning and provide immediate feedback on their thinking, which helps inform the instructors of students' understanding, which is important for planning activities (Mathiasen, 2015). Masikunas, Panayiotidis, and Burke (2007) also studied the use of digital voting systems and found them to have the ability to "overcome many of the barriers to student learning associated with the large classes taught in the traditional lecture format" (p. 18). The study by Lane (2007) on how digital technologies can be successfully incorporated into traditional teaching programs to support the learning of a new generation of learners confirms this finding. Lane (2007) explained that digital technologies could be successfully incorporated into traditional teaching techniques to support the learning of digital-age learners. With this learner group, educators have an opportunity to use a wide range of new instructional methods. The challenge is identifying how new methods or techniques

of teaching can be best utilized to "benefit our learners and meet demands of learning and thinking in a digital age" (Lane, 2007, p. 37).

Social media technologies have also been utilized as mediums to support effective learning. Research by Kivunja (2015) on the use of social media in higher education showed when students were provided with Google+ Discussion Circles (GDCs), the majority were able to take advantage of the academic, social and structural dynamics in ways that supported their learning, assessment activities, and overall academic outcomes. Research revealed the benefits of using social media for communication in e-learning included high participation rates, enhancing the levels of interpersonal interactions between instructors and students, enabling peer mentoring, decreasing anxiety, and increasing motivation (Kivunja, 2015). Chen et al. (2008) studied the use of a blog as a tool for discussing case studies. They believed that CST allowed students to engage actively in in-depth discussions with others. Blogs have the capability to create such an environment, which they believed may result in more discussion due to social influence. Their findings also suggested that, in order to integrate technology into CST, educators need to consider the users' intention to adopt weblog. This finding raised the concern of students' adaptation of any technologies that would be used to support the case study technique.

In addition to social media, video modules were also identified in the literature as widely used to deliver learning in higher education. Howlett et al. (2009) studied the use of online video modules or e-modules to deliver learning content. They found e-

modules to have the capability to improve learning delivery, increase information accessibility, and accommodate multiple learning styles. Also, the use of video modules enables students to engage and focus on learning, which can be incorporated into CST to combine active student-centered learning with learning content (Herreid, 2006). Another study by Herreid and Schiller (2013) discussed how case studies are used as a teaching method. They described an inability to engage students and develop critical thinking skills due to students' resistance to the new learning method. The researcher further discussed the flipped classroom method, which was expressed as having the potential to enhance CST teaching. This method is attractive to the technology-oriented current generation of students because most in-class activities are conducted using electronic devices or software. The authors discussed how to incorporate technology into the flipped classroom technique by having students read the content "before coming to class and then engag[ing] in class in active learning using case studies, labs, games, simulations, or experiments" (Herreid & Schiller, 2013, p. 62). In this study, the flexibility of the flipped classroom allowed students to move at their own pace; instructors were provided with insight into student difficulties and learning styles, classes are customized and based on learning theory, which in turn increased productivity. The article further discussed the use of video learning modules for an at-home activity that would prepare students for future in-class activities. The instructional video(s) were recommended as a supplement to classroom instruction; one example could be using tutorial videos on particularly difficult concepts. The content from these

videos could be accessed through students' homework. Instructional videos may also include specific knowledge or key concepts that students could review at any time. Herreid and Schiller (2013)'s article ended with a discussion on the future of the flipped classroom. With its use of videos that engage and focus students' learning, the flipped classroom offers today's educators a new model for case study teaching, combining active, student-centered learning with the content mastery that can be "applied to solving real-world problems" (p. 65).

Lastly, e-learning has been widely used for delivering learning content. In e-learning, content delivery requires a platform that allows learners to access content regardless of their location. Platforms are known as Learning Management Systems (LMS), software applications or web-based platforms that allow course builders to facilitate learning in an online environment (Howlett et al., 2009). Within an LMS, instructors have the ability to post video lectures, audio, presentations, assignments, tests, and other resources for students to access (Howlett et al., 2009) As e-learning allows for technology to aid in teaching and learning, instructors utilize these software applications and tools to help students learn the material. According to Bouhnik and Carmi (2012), several studies (Resnick, 2002; Salomon, 1983) have suggested that learning and interacting with instructors and peers through technology have shown statistically significant effects on students' higher-order thinking (Bouhnik & Carmi, 2012). In the study by Bouhnik and Carmi (2012), researchers evaluated the effects of teaching in e-learning on students' cognition. The results show studying through

technologies (tools), interacting with instructors and peers through online tasks, and working on class activities through the online interactive system had a positive impact on students' cognition. In e-learning, the learning content is presented in various ways, including text, audio, and video, allowing new interactions that affect the learning process (Meishar-Tal, Kurtz, & Pieterse, 2012). The use of multimedia permits deeper use of brain functions and encourages activities that include cooperative and intellectual challenges (Bouhnik & Carmi, 2012). Supporting this suggestion is a study by Prodromou (2015), which suggested that technology tools can support analytical thinking. Software that consists of dynamic functions provides a learning environment that allows learners to "make sense of data, draw inferences and develop an understanding of statistical concepts" (p. 35). The software allows students to communicate mathematical concepts using quick, computerized, interactive technologies, which enables them to develop an ability to critically evaluate the data and make evidence-based decisions (Prodromou, 2015).

In addition to improving students' cognition, e-learning also allows for the use of multimedia to address the lack of engagement and motivation in an online learning environment (Pereira & Wahi, 2017). For the past decade, e-learning has advanced in innovation, usability, and user-friendliness to meet the needs of both instructors and learners (Chen et al., 2008). The goals of bringing education to more audiences and increasing student engagement have pushed this effort forward more than ever before. These technological tools such as software applications and multimedia are helping the

instructors design the content that fits various audiences while the learners have more access to learning.

However, to ensure engagement and motivation, instructors must structure the presentation and organize the learning content in strategic ways. In a study by Al-Samarraie, Teo, and Abbas (2013), the researchers assessed their e-learning model focusing on the structured representation of content. The results indicated structured representation of content had a direct effect on students' motivation, attention, interactivity, higher-order thinking skills, and understanding of the content. In addition to delivering the content, research shows that using multimedia for communication has proven to have a positive impact on students' engagement and motivation. In e-learning, communication tools are arguably the most essential as they determine students' level of engagement (Lee, Lee, Liu, Bonk, & Magjuka, 2009). How well learners and instructors can communicate with each other greatly fosters learners' motivation to learn. In addition, communication tools also allow learners to collaborate in group projects and discussion. Communication in synchronous discussion environments such as live chat and video-conference are likely to be more engaging and animating than asynchronous communication methods such as email. Small-group, peer-guided discussions can also offer more opportunities for students to be active participants in the discussion.

Technology Use within the Case Study Technique

The review of literature related to how instructional technology could be integrated into CST was substantial. The studies revealed that CST instruction should include well-designed and managed activities that simulate real world situations and should use technologies such as online video modules. Mitchem et al. (2009) investigated the perceptions of how students learn and the effects of implementing multimedia case-based instruction (CBI) with technology support. Findings suggested that, when using the CST, activities should simulate real-world applications. In addition to simulating real-world application, the CST must be carefully designed and managed. In the study by Lee et al. (2009), the findings further suggested that positive perceptions students have of CST in online environments was the result of "a well-designed and managed case study the technique of instruction" (p. 185).

Two particular technologies that were mentioned in the literature included online video modules, used to deliver case studies, and the use of online learning environments to create accessibility. Video case modeling was reported as helpful, and studies revealed video cases can be used to enhance learning through modeling behaviors and demonstrating practices. It is imperative to continue to "use video cases in this manner to model curricular ideas" (Kurz & Batarelo, 2010, p. 50). In addition, making cases available in an online environment can promote students' in-class participation because classes are always in session and available (Chen, Rong-An Shang, & Harris, 2006). A study by Kim et al. (2006) examined research on technology

integrated case-based learning and found that several studies integrated interactive media such as video and audio to simulate real world encounters. Some studies used computer log files to track learners' decision-making patterns. "The web-based case-learning environment makes it possible to generate patterns of case work-up by learners and compare them with pathways generated by subsets of students and or experts" (p. 873). Even though case study teaching has a long history, the scientific base of theory and evidence shows a lack in the design, use, and evaluation of teaching with the use of cases. The growth of online resources provides an opportunity to mold cases into a new delivery format (e-learning) that support the instructional attributes of cases and ensure accountability and student learning (Lee et al., 2009).

Use of the Case Study Technique within the Agricultural Context

Case studies have been used as a teaching tool in the field of agriculture for various subjects such as Agricultural Policy (Stuhler, 1994), Wildlife Ecology (Hiller & Tyre, 2009), Food Safety (Pleitner et al., 2015), Pest Management (Stewart, 2015), and Equine Nutrition (Gilbert, Burns, Djira, Koch, & Bott, 2016). Studies supported the concept that, in the field of agriculture, CST allows more complex content to be taught (Stuhler, 1994), facilitates the connection of theory-to-practice (Gilbert et al., 2016), enables real-world application (Hiller & Tyre, 2009), and exercises critical thinking skills (Pleitner et al., 2015).

Regarding use of technology within the CST, a study by Pleitner et al. (2015) assessed the use of an online case-based course for students interested in food safety.

The purpose of the study was to develop a successful model for a case-based course. The results showed that the use of multiple technologies to support CST can result in a significant learning change and an increase in food safety expertise. Supporting this notion, another study on the use of online case studies to teach pest management for New Zealand practitioners found that web-based technologies and a case-based approach are useful and convenient as "[CST] can now be done inexpensively anywhere and at any time" (Stewart, 2015, p. 418).

However, regarding the evaluation of CST teaching skills and technology skills of instructors, studies by Wardlow and Johnson (1999) and Wingenbach and Ladner (2002) suggested instructors within agricultural education perceived their skills of using non-traditional methods such as CST and emerging technology (e.g., interactive video, videoconference, and the internet) to be lower than traditional methods such as lectures. These studies implied the needs for training in instructional areas, especially CST. Bylund et al. (2008) found training on communication skills helped instructors become more confident in facilitating group discussion. In addition to training, peer support groups have been shown as a viable tool to encourage instructors to try new teaching methods. Sjoer and Meirink (2016) suggested the interaction between teachers creates a learning community where they can encourage each other on various aspects (Sjoer & Meirink, 2015). A socio-psychological factor explaining the need for interaction is the social stage of Maslow's hierarchy of need, stating “human motives emerge in a sequential pattern according to a hierarchy of five need levels that include physiological,

safety, social, achievement, and self-actualization" (Hall & Nougaim, 1968, p. 13). In addition, further study is needed that focuses on determining instructors' use of CST, identifying emerging technologies that instructors would use in this digital age, and documenting how they currently perceive their technology skills.

Instructional Design

The goal of this study was to develop a model that could be used in designing a technology-integrated CST for instruction. To inform the development and the delivery of the model, an instructional model called the ADDIE model was used as a reference. This model is popularly used to guide the development of the instruction as steps include "Analyze needs, design instruction, develop materials, implement activities, and evaluate participant progress and instructional effectiveness" (Dooley, 2005, p. 107). The Analysis step includes performance analysis, goal analysis, task analysis, and needs analysis. This step captures the big pictures of educational goals. The Design step includes audience analysis, learning objectives, skill hierarchies, and course prerequisites. The Development step includes tests, relevant practice, content, delivery system section, and pilot testing. The Implementation step includes the instruction as well as the training system put in place. The Evaluation step is the last step in the ADDIE model which includes assessing the learning outcomes using formative and summative assessment methods.

Adopter Categories

Rogers (2003) categorized five ideal types of individuals who adopt an innovation in "an over-time sequence" (p. 267). Ranging from the adoption pace of quickest to slowest, these categories are arranged in the order of innovators, early adopters, early majority, late majority and laggards, respectively. As this research attempted to identify technology skills of instructors in the broad area of agricultural education, including leadership, communication, and education, these categories were used to describe participants, as these terms are common in the field.

Overview of the Literature Review

There are positive outcomes to the use of case studies as a teaching technique based upon the review of literature. However, the literature review also found that while case studies have been used in multiple disciplines, the technique had not been studied thoroughly in the area of postsecondary agricultural education. We need to explore the use of case studies in other disciplines to understand how case studies could be used in agricultural education. Further, the review of literature revealed noteworthy concepts associated with the use of CST, including:

a) Learners must rely on retrospective reports to generate knowledge (Ozdilek, 2014),
b) Teaching a concrete concept can be difficult to teach effectively with CST (Kimball, 2006), and

c) To deliver the case study method of instruction effectively, instructors must have good reasoning and questioning skills as the lack of real connection could lead to students' inability to grasp the learning concepts, which can result in an ineffective class discussion (Herreid & Schiller 2013).

Because technology has proven to be effective when combined with other teaching methods, we need to determine how technology is being used within CST, and more specifically within CST across postsecondary agricultural education. Learning about the relationship between CST and technology integration can better prepare agricultural education graduates for the workforce.

Theoretical Framework/Conceptual Framework

The theoretical framework of this study was based on constructivism, a learning theory that explains how people construct knowledge. There are various positions on constructivism including Piaget's (1967) personal constructivism and Von Glasersfeld's (1987) radical constructivism. However, Vygotsky's social constructivism was determined to be the most fitting theoretical framework for this study due to its great impact on instructional design and current educational approaches (Jones & Brader-Araje, 2002).

Vygotsky (Vygotskii & Kozulin, 1986) explained that people form knowledge by experiencing events in a social context, reflecting on those experiences, and discussing such experiences with others. Such social interaction allows people to

interpret the world and form their own understanding. CST is one instructional approach that impacts constructivist learning, as it requires learners to immerse themselves in real life experiences (Davis & Wilcock, 2003). These experiences allow learners to think critically, analyze the situation, discuss the experiences with others, and form an understanding that leads them to make informed decisions (Kindle & Schmidt, 2011).

This study sought to develop a model that could be used across postsecondary agricultural education to enhance CST through integration of technology. We need to gain a deep understanding of the lived experience of instructors as they try to integrate technology while ensuring students receive the full benefits of CST. As we consider the foundation for effective use of CST, the conceptual framework of this study was based on the findings of the literature review. As we move from theoretical framework to conceptual framework, we can start to understand how the application of technology still needs to align with the foundational concepts of CST, which is grounded in the framework of constructivism. Figure 1 shows a visual concept explaining the elements of constructivism that align with the essentials of CST based on the review of literature, theoretical concept, and practical concept.

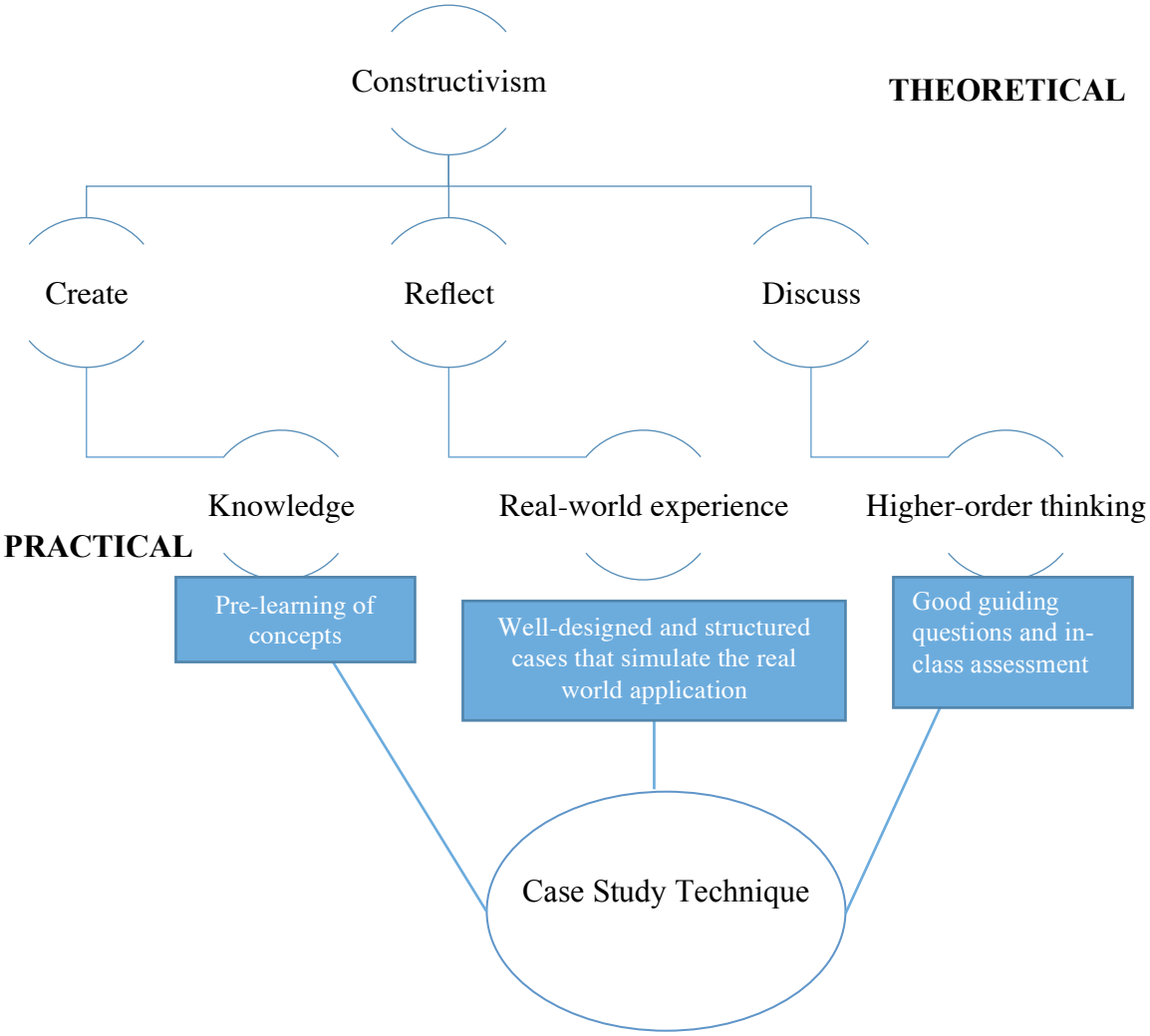

Figure 1. Conceptual Framework for Effective Integration of Technology into the Case Study Technique Based Upon the Literature Review.

CHAPTER III

METHODS

This chapter provides a detailed explanation of the methods and procedures used in this study. This chapter included the purpose and objectives, methods overview, sampling, data collection strategies/procedures, and data analysis. Trustworthiness was included to ensure the credibility and objectivity of the study. Documentation of institutional review board concluded the chapter.

This study utilized qualitative research methods to gain a deeper understanding of the use of CST across postsecondary agricultural education. The phenomenon under investigation was the CST. This chapter discusses how the purpose of the study was achieved. First, an overview of the method for this study is described in the "Method Overview." The second section covers "Sampling" and describing the rationale for selecting the study participants. The third section, "Data Collection" provides the methods of collecting data. The fourth section provides an overview of steps for "Data Analysis,, and the final section, "Trustworthiness," discusses strategies to ensure the trustworthiness of the study. Institutional Review Board approval (IRB # 0128D; See Appendix D) was obtained to conduct this study.

Purpose and Objectives

The purpose of this phenomenological study was to investigate the individual experiences of instructors in regards to the case study instruction technique (CST) in

both traditional and technology-integrated classes within postsecondary agricultural education. The intension was to document the use of case studies as a teaching technique across postsecondary agricultural education, the effectiveness of case studies, and how the technology-integrated CST could improve interaction and engagement in the classroom. The goal of this research was to develop a model for using CST that could be used across academic disciplines of agricultural education, communication, and leadership. The objectives of this research were to:

a) Describe instructors' experiences with the current method of using the case study as a teaching technique,
b) Describe instructors' experiences using technology to enhance CST, and,
c) Identify technology skills needed by instructor in order to effectively enhance CST with technology use.

Methods Overview

This phenomenological study employed a qualitative method design, which allowed the researchers to comprehend the complexity of processes and phenomena through qualitative data. This type of research aims to find different interpretations of reality to understand how individuals within a context of a social system construct their own reality (Merriam & Tisdell, 2015). This approach was especially appropriate given the investigation of instructors' individual experiences with CST in both traditional and technology-integrated classes. This design allowed the researcher to be able to examine human experiences through the description provided by the participants of the study.

This study was situated in naturalistic inquiry. Lincoln and Guba (2013) explained that in the naturalist paradigm, realities are multiple, constructed, and holistic. To understand a phenomenon in full-scale, a researcher needed to collect information or data in a setting where the phenomenon naturally would occur. The best instrument for gathering data then was a human, as "only the human instrument is capable of grasping and evaluating the meaning of (interaction between instruments and respondents)" (p. 39). In a naturalistic inquiry, the method and techniques of data collection for qualitative research are again best conducted by people, as they are able to interview, observe, and analyze reality that is essential for this research (Merriam & Tisdell, 2015). The data was collected through individual in-depth interviews of instructors who regularly used the case study as an instructional method.

The study aimed to determine the effectiveness of the case study approach and to understand the ability of the instructor to develop a model for integrating technologies into CST. The interviewer asked the participants to describe their use of case studies to ensure the definition of case studies was consistent with the study. Interviews were conducted in a semi-structured manner where participants were allowed to elaborate and explain their perspectives beyond the guided questions.

In order to understand how technology could be integrated into CSTs of instruction, it was first necessary to understand how case studies were currently being implemented and utilized within the classroom. It was also important to be aware of the technical skills possessed by instructor. In addition, this study attempted to understand

technology skills of the instructor in order to develop a model in which technology could be integrated to enhance the case studies technique.

The constant comparative method (Lincoln & Guba, 2013) was used for data analysis, in which the researcher compared interview responses and reflection notes throughout the entire study. In qualitative research, trustworthiness is imperative to "conduct the investigation in an ethical manner" (Merriam & Tisdell, 2015). The researcher of this study considered trustworthiness a high priority; therefore, throughout data collection and analysis, multiple techniques, including researchers' position, purposive sampling, member checks, triangulation, and peer debriefing, were employed.

Researcher's Position

The main researcher is an instructional designer. She is passionate about improving instructional methods. After a first-hand experience with the use of case studies as a teaching technique at Harvard University, which is well known for being the pioneer in the use of case studies as teaching technique (Kimball, 2006), she became interested in the technique and determined to develop a model in which the technique can be applied to agricultural education.

Sampling

A purposive sampling technique, expert sampling, was used for this study (Merriam & Tisdell, 2015). Participants were identified based on their association (as an instructor) with courses that utilized case studies. The researcher reviewed syllabi that were available on publicly accessible agricultural education departments' websites to

identify potential participants. The criteria for choosing institutions were based on Birkenholz and Simonsen (2011)'s research. Ten of the most distinguished programs in agricultural education were selected, including "University of Florida, Texas A&M University, Ohio State University, University of Missouri, Iowa State University, Oklahoma State University, North Carolina State University, Pennsylvania State University, Texas Tech University, and University of Arizona" (Birkenholz & Simonsen, 2011, p. 16). Individuals who were identified were contacted individually via email. If an individual chose to participate, a consent form would be sent to them individually. In addition, a recruitment email was sent via the listserv of the Association for Agricultural Education, requesting that instructor or instructors who utilized the case study approach and were willing to be interviewed make themselves known so that they could be contacted. The combining of these approaches allowed the maximum number of instructor to contribute to the study. Individuals were recruited for participation until data saturation was reached.

From the review of syllabi, sixteen individuals from seven universities throughout the Unites States were selected from various disciplines of agriculture such as agricultural education, agricultural leadership, and agricultural communication. From the recruiting email sent to the Association for Agricultural Education, an additional five individuals were identified. A total of 14 individuals responded with a confirmation that they were willing to participate in the study. All participation was voluntary, and all

participants received informed consent, in line with ethical standards. No vulnerable populations were included.

Data Collection Strategy/Procedures

After receiving an email confirmation from individuals of their willingness to participate, the researcher scheduled a date and time for an interview with each individual. An email reminder was sent to each participant a day before the scheduled date. The IRB approval email can be found in Appendix A.

The interviewer began each session with a brief description of the research and explained the research purpose and objectives. The interviewer then asked the participants to describe their use of the case studies to ensure the definition of case studies was consistent with the study. Interviews were conducted in a semi-structured manner in which participants were allowed to elaborate and explain their perspectives beyond the guided questions; the interview script is available in Appendix B. A total of 14 interviews were conducted. Nine were on the phone and five were in person. Interviews took place from April 2017 to May 2017. Interview lengths ranged from 30 to 65 minutes. Guided questions were used at the beginning of the interview; however, as the interview proceeded, participants took initiative and provided information beyond the guided question. After each interview, a transcript of the interview was sent to the participant. All participants confirmed their transcript prior to data analysis.

Data Analysis

The data analysis strategy employed for this study was the phenomenological approach, which allowed the researcher to "seek to discover some of the underlying structure or essence of that experience through the intensive study of individual cases" (Thorne, 2000, p. 69). The overall steps in the analysis process were a) transcribing the interview, b) member checking, c) unitizing the data, d) labeling each idea/comment, e) coding and documenting phrases for emerged themes, f) regrouping/reorganizing, g) defining keywords, and h) peer debriefing.

The first step in data analysis was to ensure the trustworthiness of the data collection; a member check method was used to ensure internal validity and credibility. According to Merriam and Tisdell (2015), member checks allow the researcher to solicit feedback and receive validation from the participants regarding the transcripts, emerging themes, or findings. After each interview, the researcher transcribed the interview in a word document and sent the document to the participants via email to allow them to verify their responses. They were asked to add, edit, or delete any content as needed. It was crucial for this study that the interview's responses accurately represented the true perspectives of the participants regarding case studies as a teaching method.

Coding is often used within qualitative research to safeguard the identity of participants (Merriam & Tisdell, 2015). For this study, each participant was coded using a unique identifier with three parts. The first part consisted of the letter P and a number assigned for a participant. The second part consisted of the letter E (agricultural

education), C (agricultural communication), or L (agricultural leadership), identifying participants' associated discipline. The third part consisted of the letter T (tenured) or N (non-tenured), identifying the tenure status of participants.

After receiving a confirmation from each participant that the transcripts accurately represented their views, the transcripts were taken apart for the data to be unitized (Merriam & Tisdell, 2015). The researcher disaggregated transcripts into smallest pieces that standalone as independent ideas or thoughts. These standalone thoughts were considered units. Each unit was labeled to be easily identified. For example: a comment on line 12 of participant P01ET was coded "P01ET.L12." The next step of the data analysis was to employ the constant comparative method, which used the emergent category designation approach (Merriam & Tisdell, 2015). This approach includes open coding and axial coding technique. The first unit was set aside as the first entry and first category. Other units were added to the first category or set aside as new categories. This step continued until all units were assigned a category. The next step was to document keywords for emerged themes.

The first round generated fifteen categorical themes, and a unique key phrase was used to represent each theme. Colors were used to categorize themes into three major areas as follows:

a) Instructors' experiences with the current method of using the case study as a teaching technique (green),
b) Instructors' perspectives on limitations of the CST (orange), and

c) Instructors' attitudes toward technology that could be integrated to enhance the CST and their competency in using the technology (blue).

The first round of key phrases for emerged themes through open coding can be found in Appendix B. After the first coding revealed themes, a second round of phrases using axial coding merged into similar themes. The eight identified themes included Use of Case Studies for Teaching, Intended Learning Outcomes and Skills, Issues in Terms of Students, Issues in Terms of Instructor, Technology for Instruction, Future for Technology-Integrated Case Study technique, Technology Skills/Efficacy, and Issues/Concerns with Technology Integration.

Each theme was given a definition. This step was documented in a peer-debriefing document, which the researcher created to ensure the keywords represented the data units appropriately. The peer-debriefing document can be found in Appendix C. After having the peer-debriefing document reviewed, any feedback provided was taken into consideration when finalizing the key phrases for the themes. Four themes were compiled into three areas corresponding to the first three objectives of this study. The compilation is shown in Figure 2. Each colored box represents the objective on the study. The corresponding white boxes reveal emerged themes that addressed the objectives.

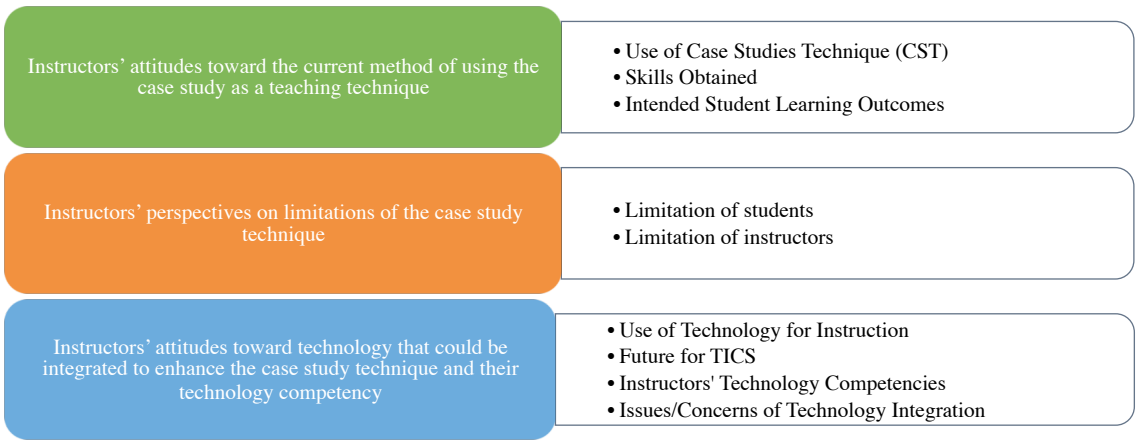

Figure 2. Compilation of Emerged Themes for Instructors' Attitudes and Perspectives Related to the Case Study Technique, based on Responses Collected from Participants' from the Broad Discipline of Agricultural Education, including Leadership, Communication, and Education.

For each area, the objective was addressed with the emerged themes. Each emerged theme then resulted in subthemes to further specify the themes. To find missing links that could be addressed with the help of technology integration, a combination of themes and subthemes were used to respond to the objective. Evidence from the results was used to develop a model of technology integrated CST, which is addressed in the implication section.

Institutional Review Board

Approval of all research studies that involve human subjects is required by Texas A&M University policy and federal regulations before investigators can begin their research. To protect the rights and welfare of human subjects involved in biomedical and behavioral research, the Texas A&M Office of University Research Services and the

Institutional Review Board conduct a review of all human subject research. This study was reviewed and the researcher was granted permission to proceed. The protocol number assigned to this study was 2014-0128 (see Appendix D).

CHAPTER IV

FINDINGS

This chapter reports findings related to the purpose of the study. Characteristics of study participants are provided. Findings were categorized into three objectives, which aligned with the objectives of this study. Quotes from actual interviews are provided to validate the interpretation of findings. Lastly, this chapter ends with a summary of findings.

Participants

The 14 participants in this study were instructors at six of the ten most distinguished programs in agricultural education (Birkenholz & Simonsen, 2011, p. 16). These instructors taught both undergraduate- and graduate-level courses with six each in agricultural education and agricultural leadership and two in agricultural communication. The genders of participants were eight male and six female; participant ages ranged from 30 to 60 years old. The instructor ranks were two lecturers, four assistant professors, six associate professors, and two full professors. One participant did not confirm the transcript, therefore the data for P13ET was not included in the study.

According to participants, courses listed in Table 1 integrated the use of CST. This table shows CST as being used in a variety of courses across agricultural education, leadership, and communication.

Table 1

Courses Reported by Participants as Using the Case Study Technique in Postsecondary Agricultural Education

Agricultural Education	Agri-Science Curriculum Development and Implementation; Agri- Science Instructional Methods; Design and Delivery of Teacher Professional Development; Professional Observation of Agricultural Science Teachers; Diffusion of Innovation; Early Field Experiences; Orientation to Agricultural Education; Youth Development through FFA; Global Agricultural education; Method of Teaching Agriculture; Students Teaching Seminar; Advanced Methods in Agricultural education; and Guidance and Counseling for Rural Youth
Agricultural Leadership	Introduction to Leadership; Personal Leadership Education; Applied Ethics in Leadership; Interpersonal Leadership; Global Uncertainties; Critical and Creative Thinking; Leadership; Study Aboard Experience; Addressing Challenges of Our World; Advancing Leadership in Agriculture; Institution Serving Agriculture in Developing Nations; Project Management; and Foundation of Leadership Practice.
Agricultural Communication	Communicating Agriculture to the Public; Theories and Practice of Agriculture in Public Relations; and Advanced Public Relations Methods

Findings from these interviews were categorized under the following objectives:

a) Instructors' experiences with the current method of using the case study as a teaching technique,
b) Instructors' perspectives on limitations of CST, and
c) Instructors' attitudes toward technology that could be integrated into their teaching to enhance CST and competency with using the technology.

Objective I: Instructors' Experiences With The Current Method Of Using The Case Study As A Teaching Technique

The first objective of the research focused on documenting experiences of instructors with CST. Participants were asked to explain:

a) How had they been using case studies?
b) What did they think about implementing case studies in terms of teaching and students' learning?, and
c) What skills did they believe students would obtain from the case studies?

An analysis of the interview data revealed how and why participants utilized CST. In addition, findings also suggested skills students obtained from the use of CST.

Use of the Case Study Technique

There were four themes regarding the use of CST. The first theme related to the timing of the integration of CST by participants. There were two different approaches: some participants chose to make use of CST following traditional content, while others designed the content around CST. Participants who chose the method of integrating CST

after traditional content did so because they perceived that the tool had to be appropriate for learning outcomes. One participant said, “I designed the content first, and then the method would come later. You write the tune to the music and the lyrics come later. I choose what method is appropriate after designing the content” (P05ET.L27-29). Another participant stated that, “I use [case studies] because I think they are relevant to the topic we are covering or if a case study accommodates a unit” (P09LN.L2-3). The content of the class often lent itself to the use of case studies because instructors were able to select the cases that corresponded best to the content. One participant stated, “in ethics class, the subject lends itself to case studies” (P03LT.L4). However, there was an another approach, which was to design and organize courses around case studies. These participants based their lecture design on relevant cases because they believed this approach would prepare students for the workforce. One participant indicated, “For the course I'm teaching right now, it was a pre-planned decision. The courses are organized around case studies” (P06LN.L21-22). Another participant designed the course by “picking the textbook because they have cases in there” (P12ET.L32-33).

The second theme was the development of case studies. There were four approaches to case study development in the participant group. The first approach was expressed by participants as a reaction to not being able to find suitable cases for their content; these participants found themselves preparing or writing the case studies. One participant indicated, “sometimes, I have something in mind; if I cannot find a case, I would write my own” (P12ET.L19). Another participant stated, “most of the time, I

prepare the cases myself" (P09LN.L36). The reason behind developing the cases themselves was to ensure relevant learning outcomes were met, as one participant stated, "Harvard Business School cases are more informational. The ones I developed focus on the outcomes of the class" (P06LN.L28-29). The second approach to development was through the utilization of textbooks. Several instructors indicated that they intentionally chose textbooks that came with case studies, or they searched for a textbook with case studies. One participant mentioned, "in a Technology Change class, I am using Roger's book, and the content is based on case studies and real-life situations" (P12ET.L6-7). A participant shared that the textbooks included guided questions that were used "for the case study assignments" (P01ET.L30). The reason many instructors used cases from textbooks was because "it was really easy for the instructor" (P12ET.L23) as they could teach the content with cases that were chosen specifically for that particular content. Another approach participants mentioned was to develop cases from news items and current events. Instructors believed that developing case studies through this approach would guarantee case studies "that are very real and very current" (P05ET.L43). The final approach was to have students write their own cases based on their field experiences, interviews, and research. One participant explained, "each student writes the case, brings [it] to class, and presents. The class would discuss what they would do with it, without revealing what the case is about. [The] instructor would facilitate the discussion. Then, the writer reveals the outcomes" (P08LT.L37-39). Another participant described, "For the guidance class, I have students write their own case studies. Students

would give background information on a student with issues and address prevention and an intervention method to get that particular student on a good path" (P12ET.L16-18).

Another theme that emerged regarding the use of CST was different ways participants delivered case studies. Four methods were shared. The first method was to deliver cases through lectures as CST can "help deliver the content" (P04LN.L21). Instead of a traditional lecture that only allowed for concrete concepts and theories to be delivered, CST was used to validate the lecture with real world examples (P11ET.L4). Instructors indicated that CST allowed for story telling that was much more exciting than traditional lectures (P04LN.L41). One participant explained, "case studies are stories, and humans enjoy hearing stories" (P07CT.L10). The second method that participants shared was using case studies to "lead good discussions among the groups" (P01ET.L4-5). One participant indicated, for her class, each student reviewed two case studies and came up with guided questions for the class discussion (P08LT.L21). In addition to discussion, participants also utilized case studies as assignments. According to participants P10CN and P06LN, using case studies for writing assignments allowed students to reflect on their own understanding and address guided questions that often asked them to "dig deep" and express their own ideas from case studies (P10CN.L16; P06LN.L6). Similarly, another participant stated, "since I integrated case studies, students are writing responses to the cases" (P07CT.L57-59). The fourth method was using case studies to teach high impact experiences such as practical fieldworks, research, and interviews with experts, etc. Students would write their own case studies

using their practice experiences in fieldworks, research, and professional development. One participant indicated, “I use case studies in an informal way such as to report findings like in qualitative research” (P04LN.L5). Another participant used CST as a fieldwork experience by having students “interview a person who conducted development work within 5 years” (P08LT.L9) and write a case study about the person. Another participant used case studies as a professional development tool by having “live-streaming sessions with companies to talk about case studies” (P14LN.L21-22).

As the study examined the frequency of CST use among different disciplines, agricultural communication and agricultural leadership appeared to use case studies more often than agricultural education. One participant stated, “We use it in all leadership classes. We use it in a non-traditional sense, 80% of the time” (P04LN.L1). In these two disciplines, participants indicated the reason for frequent use was because in leadership, the courses required “application of knowledge” (P06LN.L2-3) instead of only memorizing facts. Another participant explained, “I use case studies for eight sessions because in development, it is important to understand first hand experiences of what is going on out there” (P08LT.L5-6). Alternatively, CST was used less often and to meet learning objectives in agricultural education. One participant stated, “We use case studies once for the entire semester. A combination of four different cases was used to achieve learning objectives for a class session” (P02EN.L1-2).

Intended Learning Outcomes

In addition to how often participants used CST, they were also asked to articulate their thoughts about student learning. Participants indicated they design, develop, and deliver CST based on the intended learning outcomes, including classroom interaction and ability to rationalize theories to students.

Regarding classroom interaction, participants indicated CST would force students to interact with instructors and among themselves. Student participation would therefore increase, as they were required to discuss case studies with each other or in small groups. One participant indicated, "[students] have to interact with me. I put them in groups of two or three, and gave them guided questions for class discussion" (P03LT.L44-45). Another participant stated, "I have to be much more engaged in the conversation in helping shape students' understanding of each case" (P07CT.L22-23), which allowed "students to get involved and participate in the lesson more completely" (P02EN.L6-7). CST also builds trust between instructors and students, empowering students to express their opinions openly. One participant stated, "students establish a relationship with me when they begin to trust" (P04LN.L36). Another participant shared, "It's important for the instructor to give control to students" (P07CT.L16) to create a safe space by giving up control of the classroom and urging students to participate more. Participants believed that as instructors, they should "be much more engaged in the conversation in helping shape students' understanding of each case" (P07CT.L22-23). One participant explained, "I would have multiple cases to be sure that students can

relate to one another. Students' choice is very important. I let them choose cases that they are interested in. The student-centered method is effective" (P12ET.L48-50).

In addition to classroom interaction, participants indicated CST would help students rationalize theories by connecting to practice. One participant stated, "Case study gives me opportunities to provide real world context that students can work through" (P06LN.L14-1), "which is valuable for understanding the outputs" (P06LN.L17-18). Students were also able to rationalize how theories apply to different situations. "As much as you can in the classroom, give students the feel of what to do when things happen and allow them to apply concepts" (P10CN.L19-20). By relating concepts to real world application, students would be able to put content to context, which increases their interest in the subjects.

Skills

As participants identified intended learning outcomes, they were also asked to identify skills that they believed students obtained from CST. Participants identified multiple skills, including higher-order thinking, real world application, and communication. According to participants, "higher order thinking skills are employed when using case studies" (P04LN.L17). These skills included "critical thinking, being able to evaluate, synthesize information, dissect info[rmation] and being able to see what happened in individual context" (P01ET.L12-13). Participants indicated students gained an ability to "think of different vantage points" (P09LN.L26) by analyzing and solving problems through case studies. In addition to higher-order thinking skills, experience

with real world application through case studies allowed students to think deeply about their decision. One participant explained, “For me the opportunity to think about something that might have been abstract to them and think how it would play out in the real world allowed them to demonstrate critical thinking” (P09LN.L19). Students were able to “respond and react in different situations” (P02EN.L19) appropriately and apply what they learned when facing real world situations. Within the real-world situation, they started to “see the interconnectedness of the content” (P07CT.L32). As the theme of classroom interaction emerged in the intended learning outcomes, we also learned CST helped students with “communication and collaboration” (P03LT.L46). They developed the ability to listen to different perspectives and respond appropriately. In summary, participants believed students developed their communication skills over time with CST. One participant indicated, “students needed to talk to each other. They have to think, write well, and speak well” (P08LT.L59-61). Participants from leadership and communication disciplines developed cases that were meant to improve and practice communication skills, which is “important to address agricultural communication issues [the discipline] faces today” (P07CT.L11-12).

Engagement

As participants discussed student learning, the category of engagement emerged, and participants highly praised CST for its ability to "increase students' interest by providing context to the content" (P11ET.L5-6). Overall, participants observed changes in engagement and motivation when CST was introduced. Students seemed to enjoy the

stories and events from the case studies and demonstrated appreciation of this technique of instruction. One participant explained this phenomenon as, "experiencing something you are familiar with would increase your involvement" (P02EN.L14-15) because [students] are more engaged anytime they can find an application in real life" (P04LN.L26).

Objective II: Instructors' Perspectives On Limitations Of The CST

The second objective of this study examined the limitations of CST. Participants were asked the following questions:

a) When did they implement the case studies? What obstacles or issues arose when they used case studies for teaching?
b) With these obstacles and issues, did they consider different tools or methods besides case studies? If yes, what are they?

Analysis of the interview data revealed obstacles that prevented or obstructed participants from using CST efficiently and effectively. Two categories emerged indicating limitations on both the instructors' side and the students' side.

Limitations of the CST for Students

Regarding limitations of CST for students, several themes emerged. First, participants from all three agricultural disciplines (leadership, education, and communication) agreed that students' prior experience with CST was a limiter of CST's effectiveness. One participant stated, "Students react to cases differently based on their background" (P08LT.L49). Another participant concurred that for some students, "it's

really difficult because they expected to come to the class being told what to do and what the answer was" (P05ET.L18-19) because they were "not used to being taught this way with case study" (P08LT.L45). Some students had difficulties expressing opinions. When CST requires students to express how they feel after reading a case, some students found difficulty interpreting what they read (P08LT.L47). CST needed students to express their ideas and share with others. Students who did not like to speak up would not receive the full benefit of CST.

The second theme emerged primarily from participants from within agricultural education. Participants indicated that excessive use of CST could be another limitation. A participant indicated, "Students can get tired of case study if it becomes a routine" (P12ET.L24-25). Indeed, case studies should not be used alone, but they should be used in conjunction with another method of teaching as a participant mentioned that "we have to use multiple tools" (P04LN.L22).

The last theme identified that was related to limitations of CST for students related to the formats and structures of the case studies being used. First, the case studies needed to be current. Participants indicated that if the content was outdated, students would fail to find content relevant (P05ET.L52). This factor was very important to ensure the effectiveness of CST, as a participant mentioned, "if students don't see why they need to know something or if they don't have an interest in it, they won’t remember [content]" (P03LT.L10-11). The second limitation mentioned by participants was the length of the case studies. One participant indicated, "Some students said case study

takes too long and some said case study is not long enough" (P07CT.L73). The length of the case studies also greatly affected the class participation as "some students [who] may not get to participate in the discussion" due to time constraints or large class sizes (P02EN.L21-23). Lastly, a limitation of CST for students was expressed as the relevancy to their discipline(s). Participants suggested that if case studies were not related to [students'] discipline, "it made connecting the theory-concept difficult for them. Having a case study that is appropriate to the audience is very important" (P12ET.L45-47).

Limitations of the CST for Instructors

The majority of participants agreed that the biggest obstacle in using CST was finding high-quality cases. Some existing cases were too old or not relevant anymore. One participant stated, "I think case studies can get old quickly. The content can become outdated. [Cases] have to be revised and adapted" (P05ET.L33-34). Specifically, case studies that are tied to current events, "like political ones or agricultural technology ones, these might be outdated" (P05ET.L49-50). If they were unable to find cases that work best with their content, instructors resorted to crafting their own case studies. This method, however, required a significant amount of "time and skills to develop good case studies" (P01ET.L18). Participants indicated that there were additional development struggles because "[instructors] have to put enough detail [in case studies they developed] for it to be believable" (P12ET.L37-38). Not only did case studies take time to develop, but participants also indicated that "it takes to time writing guided questions" (P03LT.L32).

The second limitation of CST was the need for skilled facilitators. Participants mentioned that CST intimidated many new instructors because this technique of instruction "encouraged deep thought" (P07CT.L20-21) and intense discussion; therefore, instructors needed to be well prepared to facilitate the classroom. Some instructors might find keeping up with the pace difficult. Moreover, one participant observed that "Newer instructor may struggle more with using case studies at first" (P03LT.L16-17). With CST, instructors needed to provide leadership and be able to engage students in considering "different points of view" (P08LT.L28). A participant explained, "As an instructor, I need to be able to take the inputs and opinion from students and make sure students stay on topics" (P07CT.L18). However, some participants struggled to keep up with the pace of change. They had to learn well enough to "keep up with students" (P07CT.L80-81).

Lastly, participants indicated some issues were due to letting go of complete control of the classroom. To deliver CST effectively, instructors needed to let students take charge of the classroom, especially for discussion. As one participant explained, "From my end, I have to force myself not to tell students what I think. In the case of study method, I have to hold back and wait for students to ask me what I think" (P05ET.L14-15). CST is a student-centered method that allows students to become active learners. Instructors then must facilitate the class differently than they would with another method. "Using the case study method, I need to know a whole lot more than I need to share. I may not always know the answer" (P07CT.L24-25). Participants also

indicated that they would have to be prepared for unpredictable responses from students. They have to be open-minded and listen to students more with CST. One participant asked himself, "As a facilitator, how do I encourage people [who] have different viewpoints to share their perspectives?" (P07CT.L55-56).

In addressing the limitations of CST, participants were also asked if they had considered different tools when facing limitations mentioned above. They responded that they "did not consider another tool" (P01ET.L19) because they did not believe "other tools can accomplish the same learning outcomes" (P09LN.L39). They also believed that as instructors, they needed to do more with teaching than using traditional lectures. One participant stated, "not enough [was] done with what instructors do about teaching" (P05ET.L74). Even though CST was "an effective tool more than an efficient tool" (P03LT.L33), [participants] had not used [other method] like [CST] (LN.L13).

Objective III: Instructors' Attitudes Toward Technology

The last objective of this research was to understand instructors' attitudes toward a type of technology that could be integrated into teaching plans to enhance CST and instructors' competency in using those technologies. To determine the degree of technology integration in courses, we needed to identify technologies that were being used and how well instructors were using them. In addition, we needed to consider any concerns that instructors across postsecondary agricultural education had with current and future technology integration into teaching. Regarding attitudes toward technologies, participants were asked:

a) What types of technology do you use for class instruction?,
b) How would you describe your ability to use technology for teaching and your technology skills?,
c) What technologies are you interested in using and what particular technologies do you believe would support/aid in the implementation of case studies? And,
d) What are your concerns about integrating technologies into teaching?

Findings resulting from this line of questioning during the interviews resulted in four themes: a) the use of instructional technology (IST), b) the future for technology-integrated CST, c) instructors' technology competencies, and d) concerns regarding technology integration.

The Use of Instructional Technology (IST)

Participants were asked what types of technology they used for class instruction. The types of technology indicated by participants were categorized into three groups based on their instructional objectives, which included delivering learning materials, communicating beyond the classroom, and assessing learning.

The first instructional objective of IST mentioned by participants was to deliver learning materials. Electronic presentation software such as PowerPoint seemed to be the most frequently mentioned software (P01ET.L27; P08LT.L65-66; P11ET.L16-17). However, other web-based presentation programs such as Prezi and GoogleSlides were mentioned also, as these added more interactive features that would increase student

engagement (P11ET.L16-17; P12ET.L54). Among mentioned technologies for delivering content, learning management systems (LMS) and the use of video were mentioned by the participants. LMSs that participants are currently using included eCampus/Blackboard, Moodle, and Canvas. The LMS was expressed as housing the learning materials such as syllabi, presentation, articles, and also additional web resources (P03LT.L55; P10CN.L56). One participant stated, "I use eCampus a lot. My classes are online, so I interact with students online and grade their assignment online" (P06LN.L32-33). For those [who] taught face-to-face courses, they would "put PPT on eCampus after class and also post rubrics for writing assignments on eCampus" (P08LT.L65-66).

The second type of IST was for communication beyond the classroom. To connect with students outside of the classroom, participants used social media and blogs. These technologies allowed students to share content online with each other, establishing a learning community outside of the classroom. One participant explained, "I use Facebook (closed group); I tried to get students to see the world content. Students share interesting content to the group"(P12ET.L63). Another participant also concurred that a social media site like Facebook allowed students to "post video presentation on the Facebook group and have others comment on their posts as well" (P12ET.L58-59). Additionally, using social media sites as discussion boards allowed students to use the online space to "get feedback from each other" (P08LT.L67-68). One participant also mentioned LinkedIn, a professional social media site that focuses on professional

activities for working professionals. Participants believed that incorporating a professional social media site could help students connect with each other on a professional level (P09LN.L63-64). Blogs were a second tool participants mentioned as a technology they used for instructional purposes. Blog sites, such as Wordpress, was mentioned as an alternative to a LMS (P04LN.L30) as it allowed instructors to post learning materials while giving students a space to share their thoughts online. In addition to social media and blogs, other communication technologies such as videoconference and online messaging were used to bring students together regardless of geographical locations. Among the specific programs participants mentioned were Adobe, Collaborate, Skype, and Yahoo Messenger (P01ET; P02EN; P11ET). These technologies allow participants to bring in experts and guest speakers to the class with ease (P01ET.L28).

The third type of IST was for assessing student learning. First, participants mentioned electronic voting systems that allowed participants to collect immediate feedback and assess students' formative learning during class (P07CT.L70). Systems such as iClickers and web-based software such as Socrative and Kahoot were indicated as applications that created an interactive learning experience allowing instructors to "ask a series of questions on prior class reading" (P02EN.L30) and allowed students to provide feedback that instructors could grade (P12ET.L70-71).

Technology Integration for the CST

Regarding technology integration into the CST, participants were asked what technologies they were interested in using and which technologies they believed would support the implementation of case studies. Examination of participant responses revealed technologies that could be categorized into three major themes based on intention to integrate with CST. These themes included improving content accessibility, enhancing existing practice, and increasing interaction.

Participants, who wanted to use technologies to improve content accessibility for case study, indicated that they would like to share case studies among themselves because a good case study was hard to find (P01ET; P05ET; P06LN). The participants believed using Cloud or online data storage to share case studies with other instructors was a viable option. If someone has developed a high-quality case and is willing to share, the case could be beneficial to other instructors who are looking for cases (P01ET; P05ET; P06LN). In addition to creating a Cloud space for sharing cases with other instructors, creating additional access through online channels such as YouTube for video cases was an interest of participants. One participant mentioned, "I would like to provide links through YouTube channel" (P06LN.L41).

The second type of technology expressed as having the potential to enhance existing CST practices, included video and virtual reality experiences. Traditionally, CST was done through readings, as students would read case studies then discuss findings. However, when participants were asked if there were technologies they would

like to integrate with CST, they emphasized a need for alternative ways to present case studies. The majority of participants suggested video cases as an alternative or simply to enhance CST. One participant explained, "I started out with not using videos, but just links to content but students would have a lot of questions. Now I develop video solutions, which help students better" (P06LN.L43). Another participant used video cases for “discussion after we talk about theories or concepts” (P09LN.L9) to enhance the use of CST. A third participant explained, "Videos are used to show how things work. [For] example, showing clips of people negotiating to teach how to negotiate" (P03LT.L50-51). These responses all show strong support for the development of video-supported case studies. In addition to videos, participants who already implemented video cases expressed that they would like to try creating a virtual reality for case study to bring experiences to life. Virtual reality has become a technology that afforded educators and students the “opportunity for us to go to places we could not” (P04LN.L59). One participant had already "developed online simulations that are like case studies (P05ET.L63)" to be used for CST. For study aboard purposes, virtual reality would also be of use and allow instructors to "bring back the experience to students and what it would be like interacting with people from another country" (P04LN.L45-48). Another participant reported a desire to explore immersive technology that goes beyond virtual reality, by allowing the audience to immerse themselves into the digital world (P11ET.L21-22). These technologies would bring case studies to life and allow students to gain knowledge through more than moving images or text.

The last category of technologies mentioned by participants related to increasing interaction in both the classroom and the online environment when using CST. These technologies included software and hardware that aided in classroom management, connected students outside of the classroom and online, and assessed students' learning and understanding of case studies. Electronic classroom management tools such as TopHat can turn students' electronic devices into learning tools. In larger classrooms, participants mentioned that TopHat allowed them to "keep up with what's happening" (P07CT.L84). In addition to a classroom management software, participants also indicated they would like to "find an innovative way to incorporate social media" (P09LN.L63-64). Social media can serve as a way to connect with students both outside of the classroom and online; for example, students could read cases outside of classroom and begin discussions on social media before coming to class. Participants also indicated they would like students to share any resources related to the cases on social media for other class members. Lastly, participants indicated they were interested in using an electronic voting system to facilitate discussion about cases. For a larger classroom, "incorporat[ing] technology like an electronic voting system" (P09LN.L57) such as iClicker, Polleverywhere, Plicker (P07CT.L66), etc., allowed instructors to "assess concepts relating to the case studies – getting the class consensus" (P02EN.L39-40).

Technology Competence of Responding Instructors

To gauge the technology competence of the responding instructors, participants were asked to describe their technology skills. Analysis of participant responses

indicated differences in self-identified technology skills between those in agricultural education and agricultural leadership. Participants who described themselves as being early adopters (P05ET; P02EN; P12ET) indicated that they would attend technology training and had experimented with different technologies because "it is easier now to be an early adopter compared to the past when technology was more expensive" (P02EN.L34-36).

Participants who considered themselves to be late adopters or who had a low use of technology indicated that they would consider themselves "somewhere in the middle" (P09LN.L59-61) and that "it helps me to see what technology they use and in what way" (P09LN.L59-61). Another reported he would like to "see how people use it first" (P03LT.L58-59). One indicated that he would "hop on board if something is interesting" (P07CT.L78-79) and "usually would try it out" (P10CN.L62).

Technology Concerns

In addition to technology competency, participants were asked to identify concerns or issues they may have experienced when implementing instructional technologies. While four participants indicated they had no concerns or issues regarding implementing technologies, the remaining participants shared concerns that they would carefully consider when implementing technology for instruction. According to the analysis of responses, three major themes emerged including a) technology could be a distraction, b) technology could be time-consuming, and c), the availability of support for the technology.

Three participants believed “technology could be a distraction” (P07CT; P09LN; P10CN). Students do not always use their devices for learning purposes, which can detract from classroom engagement. Another shared that electronic devices such as "laptop[s] can hinder learning" (P07CT.L90). One participant indicated that he tried using online resources such as YouTube videos, but non-relevant content could appear unexpectedly and distract students (P07CT.L91). Implementing technology in the classroom did not always work, especially when assuming that "students are technology savvy" (P09LN.L67). One participant stated, "some students may not know the technology" (P09LN.L69). Even when students knew how to use the technology, they would often use the technology in a rushed manner, thinking, "technology will speed up their learning" (P10CN.L66).

In addition to the distraction technology might create, participants also mentioned that there were other issues that obstructed them from using technology efficiently. One of the reasons expressed related to technology being appropriate for particular learning objectives. Sometimes instructors found difficulties in implementing technologies that "do not satisfy the [discipline] objectives" (P04LN.L24). Participants agreed that they did not want to "use technology for technology sake" (P08LT.L76-78) but desired to “have a reason for using technology” (P08LT.L76-78).

The most emphasized concern mentioned by participants was support for the technology. When technical issues wasted their time, it created obstacles in implementing classroom technology. One participant stated, “I don't want to waste class

time. The classroom hardware needs to also support the technology" (P04LN.L62). Another participant who used videos intensively was concerned that students would not "have access to the videos" (P09LN.L32-33). She also believed that "it's always important to have a backup plan, as technology might not always come through" (P09LN.L65). Another participant had similar experiences as he mentioned, "if I can't install software on computers, that could be a problem" (P02EN.L44); for many universities, installing software requires administrator-level access. Others were worried about "the time to do personal development in technology" (P03LT.L62). Another participant concurred with the heavy time demand that training in new technologies require: "the more we use technology, the more adaptive we are. We never finish with improving our ability to use technology" (P04LN.L50-51).

Summary of Findings

Findings provided a better understanding of instructors' experiences with the current method of using the case study as a teaching technique, using technology to enhance CST, and technology skills needed by instructors in order to effectively enhance CST with technology use. A total of eight findings were found based on the responses of participants. These findings will be expanded upon in Chapter V to share a better understanding of the implications each finding suggests and to analyze the findings in order to generate a model for a Technology-Integrated Case Study Technique.

Finding 1: Two different approaches existed in the ways participants designed the integration of CST in teaching. The first idea related to designing the use of CST

after content creation due to concerns to match learning outcomes. The second idea related to designing the content around the CST. The participants who supported this second approach believed that designing the use of CST this way would help them prepare students for the current workforce.

Finding 2: Four approaches were revealed as to how participants developed their case studies. The first approach was to prepare or write the cases themselves if a high-quality case was not available. The second approach was to utilize textbooks which already contain case studies. The third approach was to develop cases from news and current events to address a concern of using outdated cases. The fourth approach was to have students write their own cases based on their field experiences, interviews, and research.

Finding 3: There were four unique ways that participants delivered case studies. The first method was delivery through lectures as CST assisted in delivering the content. The second method that participants expressed related to using case studies to lead discussions. The third method involved participants utilizing case studies for assignments. The fourth method related to using case studies to teach high impact experiences such as field work.

Finding 4: The design, development, and delivery of CST were based on intended learning outcomes that participants wanted to achieve, including increasing classroom interaction and rationalizing theories. Participants identified multiple skills that they believed were obtained by students as a result of using CST. These skills

included higher order thinking skills, real world application skills, and communication skills. In terms of a behavior change, participants indicated an increase in student engagement as a result of using CST.

Finding 5: Regarding limitations of CST for students, regardless of discipline, participants agreed that student backgrounds and experiences were obstacles for implementing CST effectively. Further, an excessive use of CST and the variability of formats and structures of the case studies was expressed as a possible limitation. Participants emphasized that case studies needed to be current, an appropriate length, and relevant to the students' discipline. In terms of limitations for the instructor, the majority of participants agreed that the most relevant obstacle in using CST was finding high-quality cases. Other limitations included the need for skilled facilitators who were comfortable with allowing students taking more control in the classroom.

Finding 6: Technologies were expressed by participants as serving three purposes: delivering learning materials, communicating beyond the classroom, and assessing learning.

Finding 7: The technologies participants desired to integrate with CST were those that would improve content accessibility, enhance existing practices, and increase interaction.

Finding 8: In relation to technology skills, participants reported themselves as being early adopters or late adopters.

CHAPTER V

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

This chapter provides a discussion of each of the eight findings, conclusions based on the findings, and recommendations for future research and practice. The discussion aims to address the objectives including a) describe instructors' experiences with the current method of using the case study as a teaching technique, b) describe instructors' experiences using technology to enhance CST, and c) identify technologies and skills needed by instructors in order to effectively enhance CST with technology use. Within the discussion, a model for the technology-integrated CST (CST) is developed that could be used across the board context of agricultural education, including areas of education, communication, and leadership. The conclusions' section of this chapter provides a summary of the study as well as an explanation of the significance of the results. The chapter ends with recommendations for future research and future application of the Technology-Integrated CST model.

Discussion

Finding 1: Designing Teaching to Utilize the Case Study Technique

In CST, the first step is to design and plan for the integration of case studies into teaching instruction. Ahn et al. (2014) explained that situational factors such as learning topics, the nature of course delivery, learning goals, and others aspects influence the design of the course. In addition, according to the ADDIE model, "selecting the most

appropriate environment, writing instructional objectives, selecting the overall approach and program look and feel, and designing the course content" are essential components in the instruction design phase (Dooley, 2005, p. 7). Therefore, these factors should be focused on the design and developmental phase as they can ensure a successful and purposeful course. As the findings of this research found two ideas dictating when to integrate CST, the researcher concluded that in order to create a feasible design and implementation model for CST, we need to first determine how to integrate CST. If case studies are not appropriately implemented, students will not understand the course concepts (Yadav et al., 2010).

Regarding the idea of planning CST integration after designing the course content, the findings indicated that the instructional method, such as CST, should be considered after content has been designed (P05ET.L27-29). To support the importance of course content, one participant stated that he used [case studies] because they were relevant to the topics he was covering (P09LN.L2-3). These findings imply that relevancy to course content should be a criterion for choosing CST as an instructional method. Anh et al. (2014) explained that content sets priorities and determines necessary learning outcomes. The design phase of a course should therefore determine what students need to know, how students are able to achieve the learning outcomes, and what is relevant. As Giacalone (2016) explains, CST "is especially useful to assess the application of concepts" (p. 2), and relevancy to course concepts can significantly motivate students, making learning active and pushing students to integrate concepts

(Yadav et al., 2010). The case studies that will be used in courses should target the appropriate level of learners, match the content, and reflect instructional goals and objectives (Kim et al., 2006).

The second idea of implementing CST was to design the content around CST. One participant indicated that the courses are “organized around case studies” (P06LN.L21-22), meaning the instructional method (CST) was selected prior to designing the content. These findings imply the conceptual content could be built around case studies, which is different from the prior approach. The participants who supported this approach believed designing the use of CST in this way emphasizes the importance of preparing students for the workforce by focusing on real world examples. The review of literature confirmed the finding that case studies used in courses should be authentic to allow learners to "experience complex and unpredictable decision-making process" (Kim et al., 2006, p. 870). Providing progressive disclosure of content according to timelines or stages can increase the realism of CST.

Both ideas have merit, as they focused on creating an active learning experience through relevancy and realism. Therefore, to choose one method over the other, one must consider which method would be best to accomplish the goal of a course. The development of case-based courses must begin with a careful consideration of learning outcomes (Giancalone, 2016). This implies that how CST can be used should be determined as early as the goals and objectives of the course are being developed. Figure

3 visualizes the first phase of the model for implementing CST in instruction, which includes establishing goals, objectives, and instructional method.

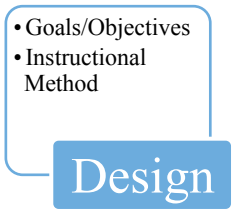

Figure 3. First Phase of a Case Study Technique Model, based on the Review of Literature and Responses Collected from Participants' from the Broad Discipline of Agricultural Education, including Leadership, Communication, and Education.

Finding 2: Development of Case Studies to be Used in CST

The most important aspect of efficient CST implementation is the selection of case studies. The literature review suggested cases used in CST need to be well formatted and structured, relevant, realistic, engaging, challenging, and instructional (Kim et al., 2006). Poorly constructed cases affect students' abilities to analyze and make use of the information (Baeten et al., 2013). The analysis of the study findings suggested that there were four approaches to case study development among participants.

The first approach was to prepare or write the cases themselves if a high-quality case could not be found. As one of the participants stated, "sometimes, I have something

in mind; if I cannot find a case, I would write my own" (P12ET.L19). This statement showed that participants, being the content experts, believed they would be able to develop case studies that served their teaching and learning objectives. One participant also stated that the case studies he developed "focus on the outcomes of the class" (P06LN.L28-29). In many fields, including education, case studies were written by classroom participants or observers who could inform the readers of the realities of classroom (Florio-Ruane, 1990). Through intense observations, these participants were able to transcribe their experiences in the classroom to case studies. Writing case studies themselves allowed the instructors to provide detailed information and give credibility to situations and problems that result in real outcomes. In addition, if the writer provided factual information, case studies could provide concrete solutions to a realistic organizational problem (Sudzina, 1997).

The second approach to developing case studies was through the utilization of textbooks, which already contained cases. The main reason many instructors used the cases in the book was because "it was really easy for the instructor" (P12ET.L23). In 1999, Graves explained his method to address a large knowledge gap in professional writing among his students through using case studies found in books. He used book as an optional text and required students who had no professional writing experience to read the book. He stated, "Cases provide a variety of contexts and examples for professional writing that enlighten students as to the range of documents, rhetorical situations, and audiences that may be addressed in workplace writing" (Graves, 1999, p.

92). A participant in this study also concurred, “the content is based on case studies and real life situations” (P12ET.L6-7).

The third approach was to develop cases from news and current events to address concerns with using old cases. Participants believed developing cases through this approach would guarantee content that was “very real and very current” (P05ET.L43). Because case studies should be authentic and allow learners to "experience complex and unpredictable decision-making process" (Kim et al., 2006, p. 870), case studies from news and current events that presented all sides of the information would allow students to distinguish the essential elements in a situation to make informed actions (Pearce, 2002).

The final approach was to have students write their own cases based on their field experiences, interviews, and research (P12ET.L16-18). Pavan (1996) described her experience in having students write teaching cases, analyze the cases using the theoretical framework, and develop an action plan. She found that power shifted to the students, meaning her students took charge of their learning. This method trained her students to expand their perspectives in a personal and theoretical way, and, most importantly, her students learned the importance of theory-practice connection. In this study, some participants also had their students write case studies based on their experiences. Overall, this approach has helped students develop research, synthesis, critical thinking, and communication.

These findings helped the researcher identify best practices for future development of case studies for CST. As participants were instructors from departments within the broad area of agricultural education, including leadership, education, and communication, the four identified approaches provided guidance for the development of a CST guide describing how case studies could be developed for these fields of study. The findings contributed to the second phase of the development of the CST model, as Figure 4 explains how ideas that are essential to the development of case studies fit into the CST model. When considering choices for or developing cases, one should consider that:

a) Writing cases allows instructors to share their expertise and experiences with students,
b) Using cases from textbooks provides context with real world examples,
c) Using news and current events provides students with real and current experiences with information from various sources, and
d) Having students write cases provides a first-hand experience and shifts the control of learning to students.

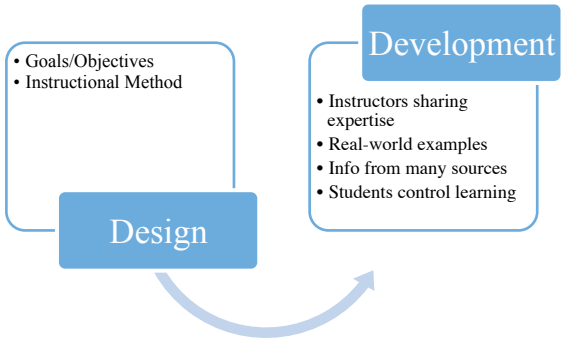

Figure 4. Second Phase of the Case Study Technique Model, based on the Review of Literature and Responses Collected from Participants' from the Broad Discipline of Agricultural Education, including Leadership, Communication, and Education.

Finding 3: Utilizing CST within Instruction

CST is a method of instruction that promotes a learner-centered approach to transferring knowledge and skills using real world examples (Peuse, 1989). Therefore, the utilization of case studies that include reading assignments, writing assignments, and class discussion aims to help students acquire knowledge that is deeper than theories and concepts (Yadav et al., 2010). Not only does CST foster theory-to-practice connection, it also encourages content retention when students are exposed to experiences that are relevant to their field of study. Studies found that CST emphasizes "social interactions between students and the development of learner autonomy and learning situations that resemble those relevant to the profession" (Giacalone, 2016). Therefore, utilizing CST provides a significant impact on students' learning by providing active experiences. This

study found various approaches in which participants utilized CST that included delivering content, leading discussion, assessing students' understanding through assignments, and providing high impact experiences. These approaches help identify best practices in utilizing CST to ensure an active learning experiences.

According to the findings, the first approach to utilizing CST was to "deliver the content" (P04LN.L21) and "validate the lecture using real world examples" (P11ET.L4). Participants agreed that CST has potential to deliver concepts and theories in the courses. According to Giacalone (2016), CST is useful because it combines traditional lectures with real-life scenarios, giving students the opportunity to experience "real world context that they can work through" (P06LN.L14-15). Studies (Giacalone, 2016; Gravett et al., 2017; Yadav et al., 2010) have also confirmed that when using CST, students tend to be "more engaged" [P01ET.L20] and more interested [P11ET.L5-6] in their learning. This finding implies that CST works best when used to support and validate concepts. This implication also confirmed the review of literature that suggested effectively teaching a concrete concept could be difficult to accomplish with CST alone (Kimball, 2006).

The second approach from the findings was the utilization of CST to lead group discussion (P01ET.L4-5; P05ET.L58; P07CT.L15). CST allows students to see actual situations and theories being utilized, fostering excellent discussion among student groups (P01ET). Stuhler (1994) found discussion of case studies created opportunities to expose students to new perspectives and diverse ideas. Through constructive and

informed arguments, instructors and students can come together to identify problems and bring their own experiences to case study discussion (Fawcett, 2017). Meaningful discussions would lead to problem solving, which is "a practical requirement in professional life" (Stuthler, 1994, p. 40). However, in order to ensure meaningful discussions, instructors need to facilitate the discussion (P08LT.L37-39). The instructor should take account of the diverse ideas expressed by students and facilitate discussion with thought-provoking questions (Fawcett, 2017). This implies that to utilize CST for discussion effectively, instructors need good reasoning and questioning skills, as the lack of real connection could lead to students' inability to grasp the learning concepts and result in an ineffective class discussion (Herreid, 2013).

The third method of utilizing CST was through class assignments, as participants assigned writing assignments that connected to the case studies (P06LN.L6). Instructors also observed that students handled case study assignments differently than other assignments (P10CN.L49). They also believed when assigning case study assignments, students would "do a little better on the unit tests" (P09LN.L42). These assignments were beneficial for students as they were able to apply what they learned in a real-world situation (P08LT). These findings imply CST can be used for writing assignments that offer an enhanced way to improve the ability of students to learn. According to Giacalone (2016), CST offers "a better way for the teacher to see whether students are able to apply their knowledge of the subject matter" (Giacalone, 2016, p. 2) as instructors could check knowledge and understanding of concepts, while promoting

creativity in problem solving. CST also allows assignments to be more relevant. Using CST, students reflected on their own understanding and addressed guided questions that often asked students to dig deep and express their own ideas from cases through writing, resulting in better long-term retention of the subject matter (Giacalone, 2016). By asking students to write their own cases, CST allowed students to draw upon scenarios they had encountered in their professional lives. He also found that the student's ability to solve problems depends not only on an awareness of the theories and practices of the field but also on creativity and innovative thinking.

The fourth method of utilizing CST was to deliver High Impact Experiences (HIE) by incorporating case studies into activities such as fieldwork, research, and professional development. According to Murphrey, Odom, and Sledd (2016), HIEs were defined as "activities that purposefully and systematically encourage students to create new knowledge…explore opinion/views/perspectives beyond their own…" (p. 162). Participants believed that with CST, "students would learn and highlight experiences that were impactful" (P08LT.L11) as they were able to "make decisions and experience consequences" (P05ET.L64-65). Especially in the field of agricultural development, it is "important to understand first hand experiences of what is going on out there" [P08LT.L5-6]. These findings imply that CST, which provides a simulated experience (Peuse, 1989), can be used to deliver HIE, which fosters learning through actively solving problems, working collaboratively with peers, immersing in meaningful discussion, and applying knowledge to solve real-world issues.

As Finding 5 identified four approaches in which CST can be used to ensure active learning experiences, the third phase of the model incorporated the delivery aspect of CST.

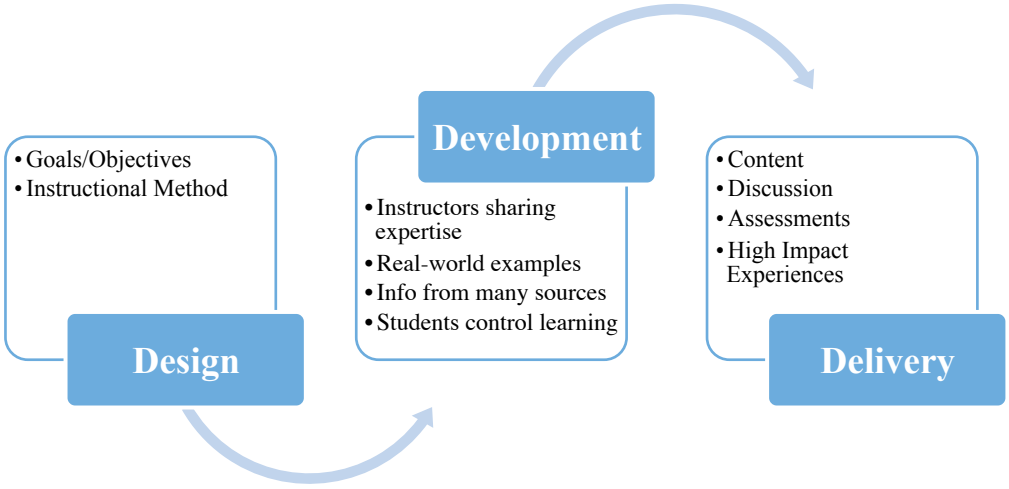

Figure 5. Third Phase of a Case Study Technique Model, based on the Review of Literature and Responses Collected from Participants' from the Broad Discipline of Agricultural Education, including Leadership, Communication, and Education.

Finding 4: Intended Outcomes and Skills

CST is an instructional method that focuses on student-centered learning, which promotes personal expression, provides practical application, and solidifies new concepts with prior knowledge (Hains & Smith, 2012). In order to achieve these objectives, course design, development, and delivery must be carefully planned with

intended learning outcomes in mind. As this study examined instructors' experiences with CST, the findings suggested that outcomes participants would like to achieve with CST were classroom interaction and the ability to rationalize theories.

In terms of classroom interaction, participants agreed that when using CST they "had to be much more engaged in the conversation and help shape students' understanding of each case" (P07CT.L22-23), while "students needed to get involved and participate in the lesson more completely" (P02EN.L6-7). To increase interaction, participants suggested that building relationships and trust was important in urging students to interact with them (P04LN.L36). They believed that giving "control of learning to students" (P07CT.L16) created a safe space and urged students to participate more. These findings were confirmed by literature in which most authors agree that the CST approach should be student-centered with much interaction between participants to build knowledge (Fawcett, 2017). Gravett et al. (2017) also found CST "involves each learner in the class and allows them to interact" (p. 377) by including new ideas and perspectives to be discussed. CST was found to result in engaged learning where active participation, interest, and meaningful dialogue between instructors and students existed. Such findings imply using CST can result in significant interaction, which is essential in ensuring an engaging learning environment. However, instructors need to relinquish control of the classroom and allow students to take control of their learning (Andersen & Schiano, 2014). The role of the instructor should be facilitating a safe learning environment, encouraging peer interaction, and providing needed advice (Hains &

Smith, 2012). From this analysis, the design, development, and delivery of CST should enable and increase interaction between instructors and students and among students.

Another outcome participants desired to achieve from using CST was students' ability to rationalize theories. As CST was developed to fill the theory-practice gap (Gravett et al., 2017), participants hoped this method would give them "opportunities to provide real world context that students can work through" (P06LN.L14-15) and enable them to rationalize how theories apply to different situations. By relating concepts to real world situations, students could match content to context and identify issues, which could lead to innovative solutions (Ota, 2006). This finding implies using CST can help students rationalize theories. When students can see what they are learning in action, they are better able to remember and recall information by referring to past work with the cases. Therefore, the use of case studies can result in improved retention, recall, and use of learning outside the classroom (Ota, 2006). This analysis indicates the importance of CST's role in improving learning. Furthermore, the intended learning outcomes evidently led to students achieving higher order thinking skills, real world application, and communication skills. These skills were confirmed through literature (Davis & Wilcock, 2003; Fawcett, 2017; Gravett et al., 2017; Kindle & Schmidt, 2011; Marsh & Stock, 2006; Noblitt, et al., 2010; VanSickle & Hoge, 1991; Yadav et al., 2010) as skills students would obtain from the use of CST.

As participants were able to use case studies to rationalize theories via provided real-world context, students were able to "respond and react in different situation(s)"

(P02EN.L19) appropriately and apply what they learned when facing real-world situations. Within the real-world instance, students began to "see the interconnectedness of the content" (P07CT.L32). In addition, by facilitating discussion and providing assignments that required students to critically think, evaluate, and synthesize and dissect information (P01ET), students were able to develop "higher order thinking skills" (P04LN.L17). These findings imply case studies used in CST must include real-world context and connection to theories and concepts covered in class. In addition, CST must contain activities that allow students to a) think deeply about their decisions/actions, b) understand the consequences, and c) exercise critical thinking, analyzing, evaluating, and authentic problem-solving as they work through cases (Mitchem et al., 2008).

Lastly, effective classroom interaction helped students develop the ability to listen to different perspectives and respond appropriately. Participants believed that with CST, students developed their communication skills through interaction, as when they "talk to each other, they would have to think, write well, and speak well" (P08LT.L59-61). Participants believed CST was an effective approach and "important to address agricultural communication issues [the discipline] faces today" (P07CT.L11-12). These findings imply that when utilizing CST, activities need to encourage student-to-student and instructor-to-student interaction, which will help students develop communication skills. In addition to oral communication, CST also provides opportunities to learn professional writing for a range of document types, rhetorical situations, and audiences.

Case studies must be made interesting and challenging by creating opportunities for students to respond to communication situations (Graves, 1999).

Figure 6 reveals the fourth phase of CST before technology integration. To review, the design, development and delivery phases should be based on intended learning outcomes. In addition, the intended outcomes should inform the design phase of the CST. Each learning outcome leads to skills which students would obtain from the use of CST. Findings reported later in the document complete the model of technology-integrated CST.

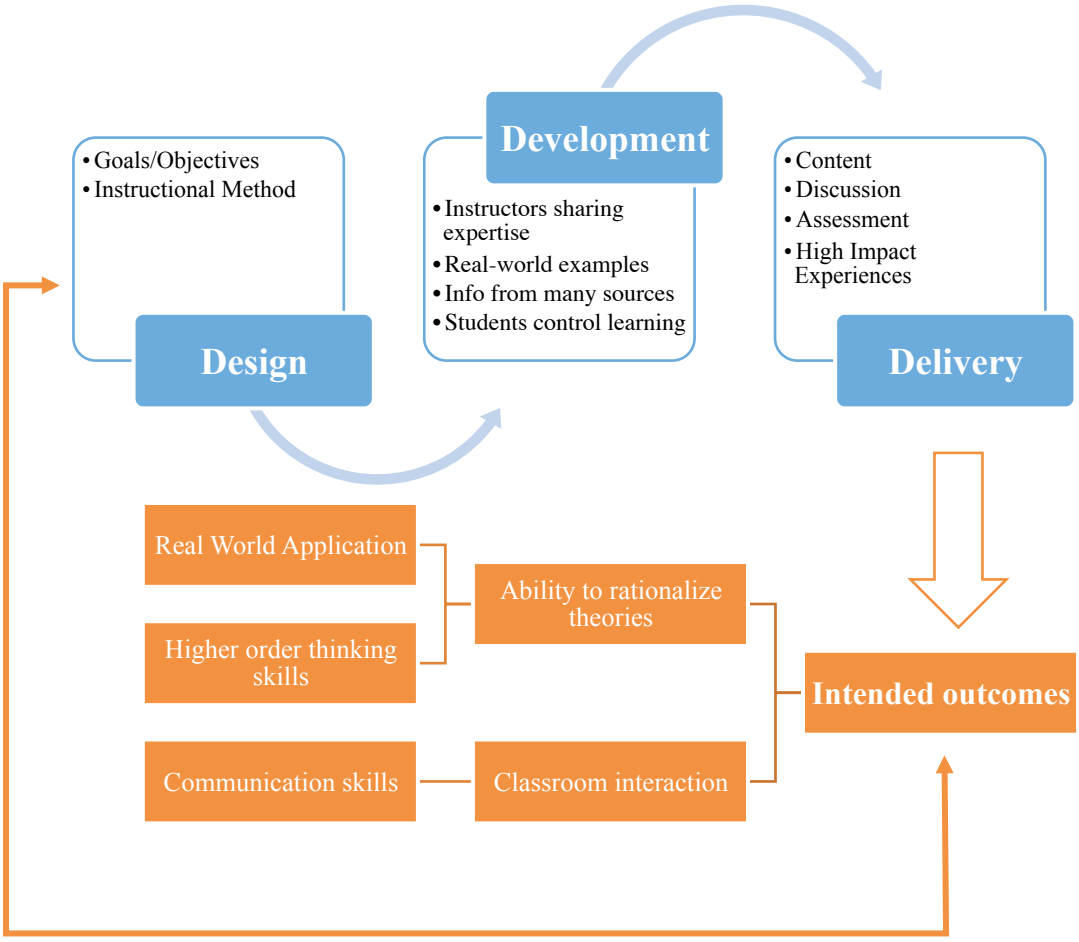

Figure 6. Fourth Phase of a Case Study Technique Model, based on the Review of Literature and Responses Collected from Participants' from the Broad Discipline of Agricultural Education, including Leadership, Communication, and Education.

Finding 5: Limitations of CST

The review of the literature found limitations of CST included the lack of foundational concept delivery (Kimball, 2006), the need for a skilled facilitator (Ozdilek, 2014), and the influence of the format and structure of CST (Kim et al., 2006). Similarly, participants in this study identified key issues that included lack of prior experience with CST, difficulty of finding quality case studies, and the need for skilled facilitators. This study also found additional limitations identified by instructors across the broad area of agricultural education who used CST and believed these additional limitations obstructed them from successfully implementing CST.

Regarding the lack of prior experience, participants expressed concern that when they implemented CST, students would “react to cases differently based on their backgrounds” (P08LT.L49) as some students were "not used to being taught” with CST (P08LT.L45). Because CST requires activities that promote reflection, collaboration, and cognitive demand (Mitchem et al., 2008), students who lack the ability to express their ideas, interpret a case study’s outcome, or communicate with others may have difficulty learning through CST. Such findings imply students’ lack of prior knowledge with CST plays a significant role in learning. Because learners construct knowledge from what they learned previously (Cook, 2006), without a prior experience with CST, students may not be able to accomplish the course objectives due to an inability to perform tasks required by CST. Addressing prior experiences with various instructional techniques therefore becomes an important step in implementing CST.

In addition to prior experience with CST, participants believed (P05ET; P08LT) students had difficulty analyzing case studies when given poor quality case studies. Kim et al. (2006) found that well-structured cases impacted learners' ability to generate knowledge. An additional finding from that study suggested that the biggest obstacle in using CST was finding high-quality cases that would help participants achieve teaching/learning objectives. Participants in this study identified key attributes of ensuring high-quality cases that included being current, having appropriate length, and maintaining relevancy to students' disciplines (P03LT; P05ET; P12ET). Kim et al. (2006) also identified core attributes of high-quality case studies that aligned with this study's findings; these included relevant, engaging, and instructional as descriptors. These findings imply that when selecting or preparing cases, the factors to consider include:

a) cases need to be new and contain updated information allowing students to elicit and assess the information to determine appropriate actions,
b) cases must be at an appropriate length while still containing "rich and sufficient content" (Andersen & Schiano, 2014; Kim et al., 2006, p, 870),
c) cases must be relevant to students' discipline by requiring activities that "address the goals and objectives of both learners and teachers" (Kim et al., 2006, p. 870) and set in realistic and relevant practice settings that simulates situations in their field of study (Kim et al., 2006), and

d) cases must not be used excessively in order to avoid students becoming disengaged.

The final issue found by this study was the need to train instructors in facilitating CST. Participants from this study explained that when using CST, they needed to make sure they could facilitate inputs from students and “make sure students stay on topic" (P07CT.L18). However, some participants struggled to keep up with the pace of change and "keep up with students" (P07CT.L80-81). Kim et al.’s (2006) research suggested: “the power of cases lies in a skilled discussion facilitator who unpacks the content” (p. 867). Being both a teacher and a discussion leader requires not only skill, but extensive preparation for each case to enable the instructor to have the class function as a learning group, with students personally involved in the discussion (Pavan, 1996). Such a finding implies the need for instructor training to become an effective facilitator.

Even though Finding 5 identified several limitations of CST, it also implies attributes to improve CST. These attributes allowed the researcher to update

the model for CST regarding the development of cases and instruction, displayed in Figure 7. Regarding instructional development, in addition to sharing expertise and allowing students to control their learning, facilitating discussion is an important attribute of effective CST. Regarding case development, in addition to using real-world examples and information from varied sources, cases should consist of new and updated information, be an appropriate and of purposeful length (Andersen & Schiano, 2014), and be relevant to students’ disciplines.

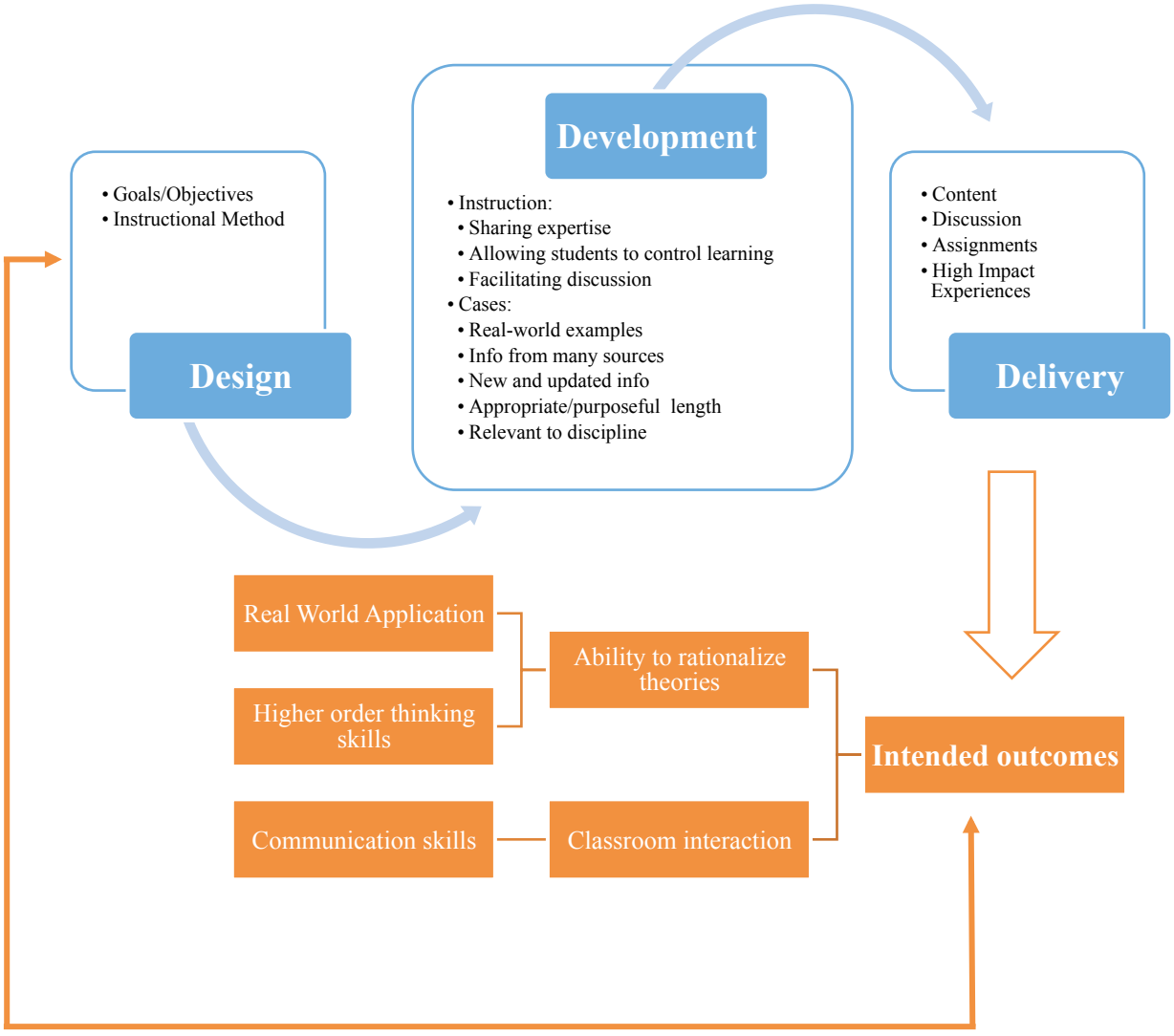

Figure 7. Updated Fourth Phase of a Case Study Technique Model, based on the Review of Literature and Responses Collected from Participants' from the Broad Discipline of Agricultural Education, including Leadership, Communication, and Education.

Finding 6: Current Use of Instructional Technology

Referring back to Finding 5, the researcher found several key issues that prevented the implementation of CST including the students' lack of prior experience with CST, the difficulty of finding quality case studies, and the need for skilled facilitators. Finding 6 revealed technologies that could be used to address these issues. The use of technology became an interest in this study as research has proven that the use of technology has made significant impacts on how people learn (Altun, 2015). Lane (2007) found that digital technologies could be successfully incorporated into traditional teaching techniques to support the learning of the digital-age generation. Further, the development phase of the ADDIE model explained that the use of media could influence the construction of a supportive learning environment (Dooley, 2005). Therefore, this study attempted to examine the current use of instructional technology among instructors in the broad field of agricultural education, including education, leadership, and communication, to determine if these technologies can be used to enhance CST. Three types of technology mentioned by participants were categorized by their instructional purpose, including delivering learning materials, communicating beyond the classroom, and assessing in-class learning.

The first instructional objective purpose was the delivery of learning content. Various electronic presentation software programs mentioned by participants such as PowerPoint, Prezi, and GoogleSlides (P01ET; P08LT; P11ET; P12ET) were used to present learning materials or lectures. Some of these software programs had interactive

features that kept students engaged in the content (P11ET; P12ET). In addition to presentation software, participants also mentioned the various learning management systems (LMS) such as Blackboard, Moodle, and Canvas that were used to house learning materials, including presentations created with the software mentioned previously (P03LT.L55; P10CN.L56). The implication for CST reveals that the LMS plays a vital role in delivering content in today's classrooms. Learning content delivery requires a platform that allows learners to access the content regardless of their location. A LMS allows instructors to facilitate learning in an online environment by providing digital materials such as video lectures, audio, presentations, assignments, tests, discussion questions, and others (Meishar-Tal et al., 2012) which students can access asynchronously at their own pace, in their own time. Therefore, the LMS can be used to provide students with resources describing theories and concepts they need to know before working on case study activities; this would address the issue of students' lack of prior knowledge of CST. Studies on the use of LMS have shown positive effects on the quality of both teaching and learning (Pereira & Wahi, 2017). Additional resources such as examples of similar cases, supporting documents, and other media resources can also be housed in the LMS to familiarize students with the content prior to receiving CST.

Besides delivering content, this study also found the use of technology to communicate with students beyond the classroom as an instructional purpose category. Participants (P04LN; P08LT; P09LN; P12ET) indicated that they used social media and blogs to connect with students outside of the classroom. These technologies also allowed

students to share content online with each other, establishing a learning community outside the classroom. Participants wanted students to share interesting content with the group and have others comment on the postings. Additionally, participants reported the use of social media and blog sites as discussion boards allowing students obtain feedback from each other. To connect with students outside of the classroom, participants used social media and blogs. These findings imply social media and blogs provide students with access to instructors and experts, and flexibility and convenience of asynchronous participation (Mitchem et al., 2008). The benefits of using these technologies include increasing participation rates, enhancing levels of interpersonal interactions between instructors and students, enabling peer mentoring, decreasing anxiety, and increasing motivation (Kivunja, 2015). Therefore, for CST, these technologies can be used as a medium to communicate with students (Kivunja, 2015), bring in experts from case studies, and allow students to discuss the case studies outside of the classroom.

The final learning purpose category identified was the use of technology to assess in-class learning. Participants mentioned that they utilized electronic voting systems, such as PollEverywhere, iClickers, or TurningPoint, to collect immediate feedback and assess students' formative learning during class. The implication for CST suggests these technologies can be used to gain in-class immediate feedback. Additionally, Altun (2015) suggests that learners need to be motivated through "interactive activities and technologies" (p. 23). In addition, the use of digital devices

such smart phones, tablets, and digital voting systems have been used for facilitating anonymity and non-anonymity tests, often in situations where feedback is essential for learning (Mathiasen, 2015). When using CST, feedback is essential for instructors to facilitate an effective learning environment. Digital devices fill this need as they allow learners to reflect on their learning and provide immediate feedback on their progress from instructors and peers. Additionally, this type of assessment allows learners to self-check their own knowledge, aid in the decision-making process and create meaningful discussion through teamwork.

Finding 6 uncovered three major purpose categories that instructors in the field of agricultural education, leadership, and communication focused on when utilizing technologies for instruction. The implications from Finding 6 helped the researcher address one of the limitations of CST found in previous findings, which was the lack of prior experience with CST. In addition, three major types of technologies that could be used to enhance different aspects of instruction emerged, which included content, discussion, and assessment. Figure 8 reveals the first phase of the Technology-Integrated CST model that displays the utilization of technologies for each of the instructional areas.

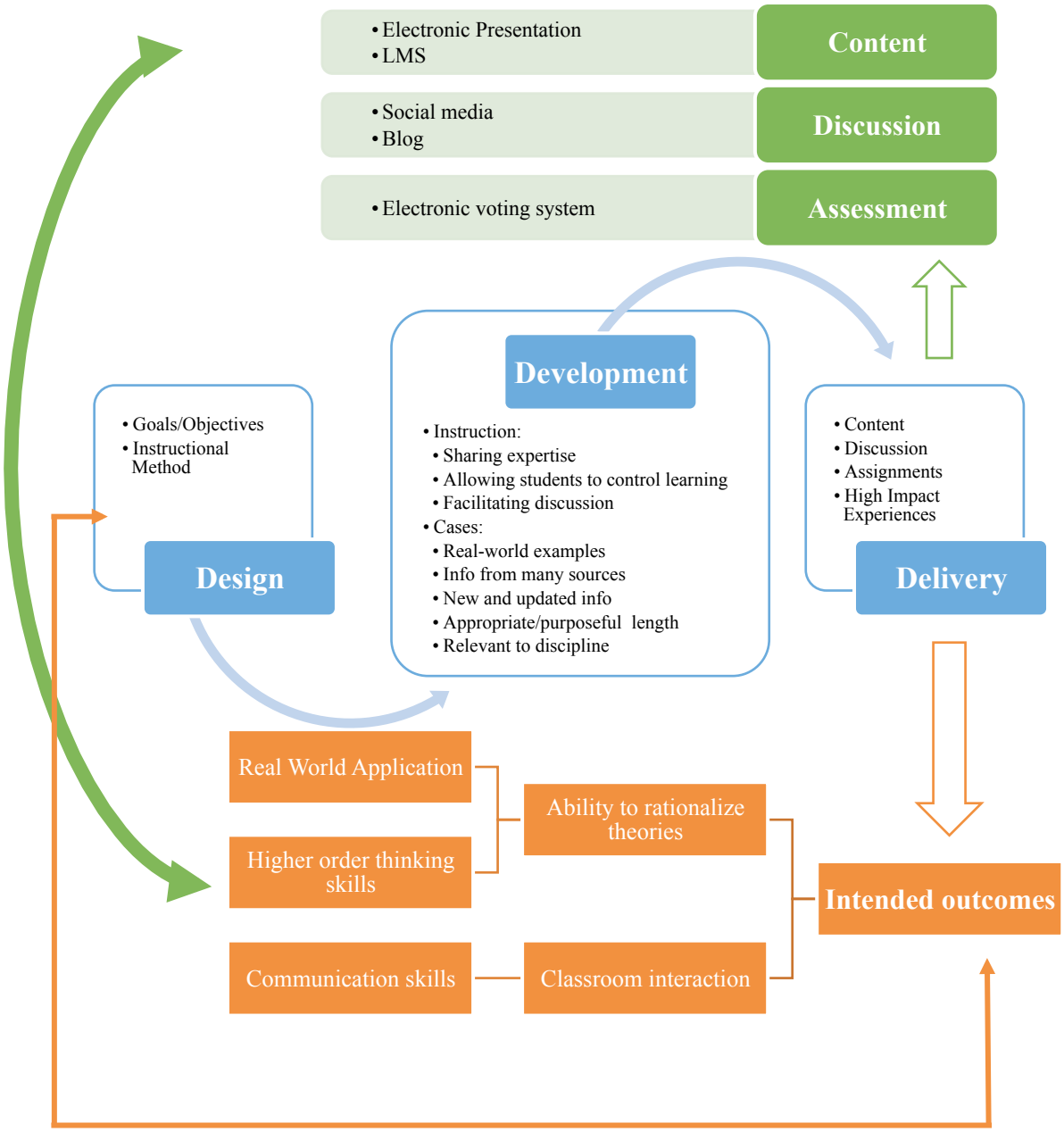

Figure 8. First Phase of the Technology-Integrated Case Study Technique Model, based on the Review of Literature and Responses Collected from Participants' from the Broad Discipline of Agricultural Education, including Leadership, Communication, and Education.

Finding 7: Integration of Technology into the CST

Finding 6 found that the use of the learning management systems (LMS) could address students' lack of prior knowledge of the CST. Finding 7, additionally, found additional technologies that address the issues of locating quality cases. As participants were asked to identify technologies they were interested in integrating with CST, three major themes emerged. Participants wanted to use technologies to a) improve access to content, b) enhance existing practices in CST, and c) increase interaction.

Regarding better access to content, participants indicated that they wanted to use cloud-based/online data storage or an online video channel to share electronic case studies among their peers. Due to the issues of locating quality case studies, participants believed it would be useful if they had access to high-quality case studies developed or selected by peers in their discipline. This finding implies that cloud-based storage sharing has a potential to address the issue of locating quality cases. In a study by Lee et al. (2009), the findings further suggest the positive perception students have about the CST in online environments was the result of "a well-designed and managed case study the technique of instruction" (p. 185). Having high-quality resources could also improve the use of CST as examples of best practices can be shared through online channels.

In addition to increasing accessibility, findings also showed participants wanted to enhance existing CST practices, especially case study delivery. Traditionally, CST was done through reading physical documents or online documents. However, this study suggested that instructors wanted to explore alternative ways to present case studies.

Participants indicated that using video cases instead of reading cases allowed students to experience real world situations virtually. In addition to videos, participants were also interested in using virtual reality (VR) to bring case studies to life. VR has become a technology that has afforded educators and students the opportunity to go to places they could not otherwise afford (P04LN). These findings imply that instructors believe technology can enhance CST in a way that improves case study delivery. Mitchem et al. (2009) investigated perceptions of how students learn and the effects of implementing multimedia case-based instruction (CBI) with technology supports. Findings from their study suggest that when using CST, activities should simulate real-world applications. Video cases have an exceptional ability to model behaviors and demonstrate practices (Howlett et al., 2009, Mitchem et al., 2009), which students can build knowledge upon. On the other hand, VR put students in the middle of the action and allows students to gain real-world experiences beyond images and text.

The last theme was the use of technologies to increase interaction. These technologies included software and hardware that aided in classroom management, connected students outside of the classroom and online, and assessed students' learning and understanding of case studies. Technologies mentioned by participants included TopHat, Facebook, Wordpress, Instagram, blogs, and electronic voting systems. These can turn students' electronic devices into learning management tools that allow instructors to keep track of attendance, assess students' knowledge, and facilitate discussion in a large classroom. Altun (2015) believed that traditional methods of

instruction such as class lectures do not motivate or allow students to enjoy learning, but technology-based instruction has the ability to aid learners in learning as it can bring "undivided motivation that will lead to achievement" (p. 23). Learners in the 21st century need to be motivated through interactive activities and technologies such as smart phones, video games, and music players. These technologies allow students to "expand topic searches, further discussion opportunities with both professors and peers and create interactive atmosphere" (Gilbert et al., 2016). Participants also indicated they would like students to share any resources related to the cases on social media for other class members. Social media sites such as Facebook can serve to connect with students both outside of the classroom and online; for example, students could read cases outside the classroom and begin discussions on social media before coming to class. Through the discussion of case studies, students would be actively engaged in in-depth discussions with others, especially in an online environment (Chen et al., 2008). Lastly, participants indicated they were interested in using an electronic voting system to facilitate discussion about cases. When using CST, feedback is essential for instructors to facilitate an effective learning environment. Digital devices allow learners to reflect on their learning and provide immediate feedback on their thinking. Such feedback helps inform the instructors of students' understanding, which is important for planning activities in CST. Additionally, this type of assessment allows learners to self-check their own knowledge, aid in the decision-making process, and create meaningful

discussion through teamwork when they need to respond to case study-related questions as a group.

The advantages of these technologies imply that they have the potential to improve students' real world application, higher-order thinking, and communication skills. Videos and VR allow students to visually experience case studies through scenarios that simulate real world conditions (Mitchem et al., 2009). Studies have shown that video case modeling is helpful, and can be used to enhance learning through modeling behaviors and demonstrating practices (Kurz & Batarelo, 2010). As students are increasingly immersed in the experience, they are better prepared to apply their knowledge. Meanwhile, the use of social media, blogs, classroom management tools, and electronic voting systems provide students the opportunity to think critically thorough discussion, synthesize information provided by peers, reflect on self-check knowledge (VanSickle & Hoge, 1991), and practice both oral and written communication as they present their position and justify their answers (Noblitt et al., 2010).

Finding 7 found several uses of technology that can be implemented to support and enhance CST as well as address the limitation of locating quality case studies. The analysis of findings revealed applications for technology in CST. These applications include:

a) sharing high quality case studies and best practices through online file sharing storage or video streaming channels,

b) developing video cases and VR that simulate real world situations,
c) providing resources through an online learning management system to increase accessibility, access to pre-learning of concepts, and familiarize students with CST,
d) utilizing social media and blogs to expand communication beyond the classroom, and
e) allowing students to use digital devices for class management and in-class assessment to get immediate feedback and to be informed of students' learning.

These applications can be seamlessly incorporated into the technology-integrated CST model, as the first phase of the model has already set a foundation for the implementation of technology. Figure 9 reveals a completed model, which includes the application of technologies to enhance content delivery, discussion, and assessment. In addition, as the researcher's findings and literature review concurred, these technologies have the potential to enable CST to prepare students for real world application, higher-order thinking, and improved communication skills.

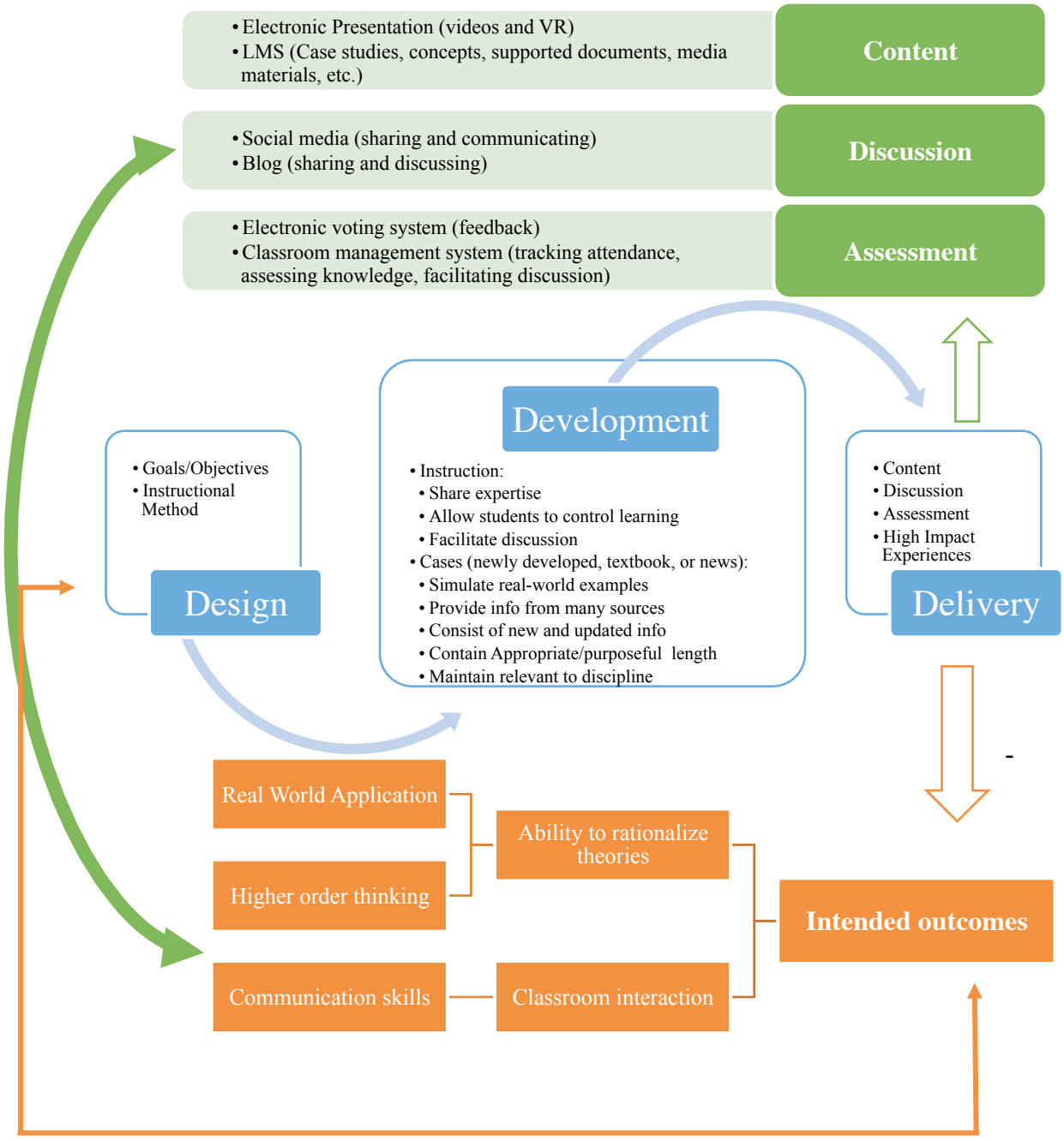

Figure 9. Second Phase of the Technology-Integrated Case Study Technique Model, based on the Review of Literature and Responses Collected from Participants' from the Broad Discipline of Agricultural Education, including Leadership, Communication, and Education.

Finding 8: Technology Concerns and Skills Needed for CST

Finding 8 provides an understanding of instructors' technology competencies and concerns about technology integration. In the ADDIE model, the implementation phase called for the "preparation for technical difficulties and alternative plan" (Dooley, 2005, p. 8). Examination of the findings revealed implications regarding skills needed by instructors to effectively use the Technology-Integrated CST. These implications could address attitudes of instructors toward technologies and the concerns of integrating technologies. Participants were asked to describe their technology skills and the concerns they had with current and future technology integration into teaching. Participants expressed willingness to learn new technologies even if they believed themselves to be late adopters. Though, when participants were asked about the concerns over implementing technologies, three major concerns emerged including a) fear of creating a distraction, b) time, and c), the availability of technical support.

As the participants ranked themselves on a continuum between early adopters to late adopters, they identified themselves as being familiar with technologies but not at an expert level in the technologies they identified. However, participants explained that they were willing to try new technologies. This finding implies that instructors had a positive attitude toward technology and the willingness to learn the technology. There is a socio-psychological factor that explained such attitudes that contributed to participants' acceptance of integrating technology into CST. This factor is rooted in a model called the technology acceptance model (TAM), which provides a theoretical

framework for the factor. According to Davis, Bagozzi, and Warshaw (1989), TAM provides "a basis for tracing the impact of external factors on internal beliefs, attitudes, and intentions" (p. 985). The external variable for the desire to adopt technology that TAM proposed is perceived usefulness (Davis et al., 1989). Perceived usefulness is based on beliefs that new technologies have an ability to produce positive results. Participants accepted and embraced the integration of technology, as they would "hop on board if [technology] is interesting" (P07CT). These findings signify that the integration of technology into CST would not be problematic due to the willingness of participants to adopt the technology.

Regarding concerns about technology integration, participants were concerned that technology could become a distraction and hinder learning (P07CT) if using technology did not satisfy the learning objectives (P04LN). In addition, they reported that technologies required time to learn and that sufficient technology support must be available (P02EN). These findings imply needs for training and administrative support for the technical and financial aspects of technology. For past decades, studies on college teaching improvement had always shown that instructors have expressed a high level of interest in learning more about technologies (Wardlow & Johnson, 1999; Wingenbach & Ladner, 2002). Rogers's (2003) diffusion of innovation theory suggests that an innovation perceived to be complex often has a lower rate of adoption. Studies have shown that technology training is a way to improve the adoption of technology if the training consists of pedagogical as well as technological components (Pereira & Wahi,

2017). Not only do instructors need to be trained on the operation of technologies, they would also like to understand the pedagogical approaches to integrate the technologies into their teaching without creating a distraction. In addition to training, creating a peer support group for those using CST can encourage instructors to share best practices. A study by Sjoer and Meirink (2015) found the interaction between teachers creates a learning community where they can encourage each other on various aspects (Sjoer & Meirink, 2015), such as best practices in CST. Through a peer support group, instructors will have an opportunity to learn from each other and observe varied uses of technology. Participants who identified themselves as late adopters indicated that they would like to see others use the technology and understand how [the technology] works before adopting (P03LT; P09LN; P10CN). By completing training and participating in a peer support group, instructors would have a better understanding of how technologies can be integrated to enhance CST as well as feel more comfortable with the technology itself.

In addition to addressing the concerns that technology can create a distraction and the time required to learn a technology, the Technology-Integrated model requires adequate financial and technical support. A study by Wingenbach and Ladner (2002) indicated instructors would be discouraged from exploring the use of educational technologies if there is a lack of administrative and technology support. An application of this model requires an institution to provide information technology (IT) support necessary to operate these technologies sufficiently. In addition, because technologies

can be costly, the application of this model also requires financial assistance from the institution to purchase necessary equipment.

Finding 8 revealed the last part of the Technology-Integrated CST model, which articulated a list of important factors to consider when implementing technology in any instructional method. The factors offer insight into training needs for instructors who are interested in integrating technology with the CST and completed the last part of the Technology-Integrated CST model. Figure 10 reveals the support/services needed from the administration of a department, college, or university for technology use including:

a) provide training on the technologies being used as well as pedagogical approaches for integrating the technologies with an instructional method such as CST,
b) establish a peer support group for those using CST and are interested in using technologies,
c) offer financial assistance for purchasing software licenses and hardware that will be used for CST, and
d) deliver quality IT support and services for instructors to ensure smooth operation of Technology-Integrated CST.

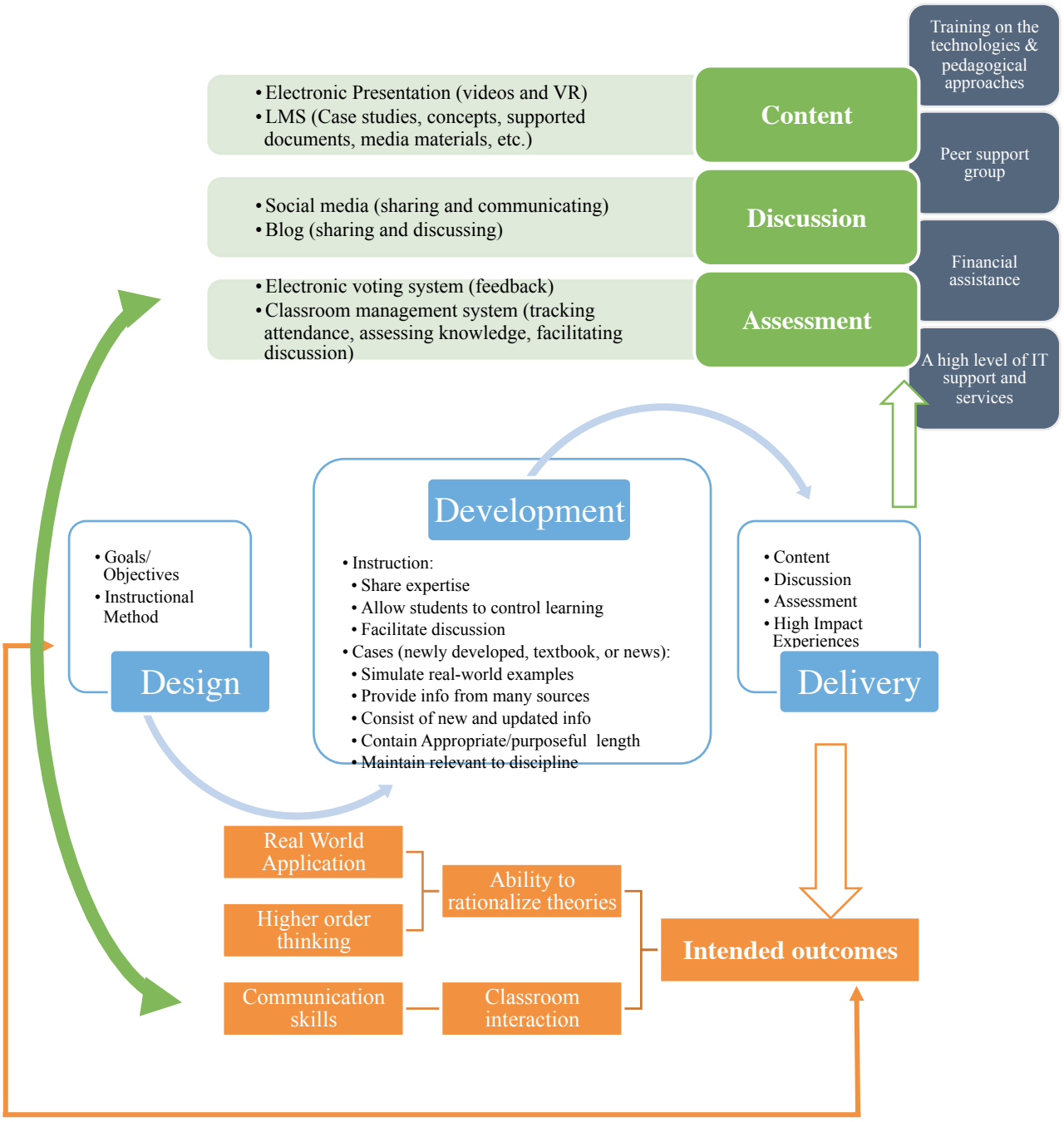

Figure 10. Completed Technology-Integrated Case Study Technique Model, based on the Review of Literature and Responses Collected from Participants' from the Broad Discipline of Agricultural Education, including Leadership, Communication, and Education.

Conclusions

This research evaluated the current use of case studies as a teaching technique (CST) across the broad discipline of agricultural education, including leadership, communication, and education. Through a qualitative study, this research explored the current use of case studies, technology use with CST, and skills instructors needed to effectively enhance CST through the use of technology. The goal of this research was to develop a model for integrating technologies into the CST (CST).

A review of literature found that while case studies have been used in multiple disciplines, the technique has not been studied thoroughly in the context of agricultural education. The benefits of CST concerning student learning included making a theory-practice connection (Marsh & Stock, 2006), providing a simulated experience that encourages higher-order thinking (Deboer, 2002), and increasing communication and team building skills (Noblitt et al., 2010). However, there were several limitations associated with the technique. One limitation was that learners must rely on retrospective reports to generate knowledge (Ozdilek, 2014). Also, CST can be difficult to use when teaching concrete concepts (Kimball, 2006). Lastly, instructors must have good reasoning and questioning skills (Herreid & Schiller, 2013). The literature review provided the conceptual framework for this study, which aligns with the theoretical framework of constructivism.

Fourteen participants from six universities of the ten most distinguished programs in agricultural education (Birkenholz & Simonsen, 2011, p. 16) across the United States were interviewed. Through a qualitative analysis of the interview data, findings from this study provided a better understanding of instructors' experiences with the current method of using the case study as a teaching technique, instructors' perspectives on limitations of CST, and instructors' attitudes toward technology that could be integrated into their teaching to enhance CST and competency with using the technology. A total of eight findings emerged, resulting in the following topics: designing case study teaching, development of case studies, utilizing CST, intended outcomes and skills, limitations of CST, current use of instructional technology, integration of technologies into CST, and technology concerns and skills needed for CST use.

The discussion provided an in-depth explanation of the implications for each finding. One implication related to how the use of CST needed to be determined at the onset of course development - as early as the goals and objectives being established. Another implication related to accessing/developing case studies and approaches in which CST can be used to ensure active learning experiences. Further, the design, development and delivery phases of CST should be based on the intended learning outcomes. Findings also revealed attributes to improve CST as well as limitations of CST. It was revealed that suggested technologies could be used with CST to prepare students for real world application, higher-order thinking, and communication skills.

Lastly, factors to consider when implementing technology in CST were documented. These findings attributed to the formation of the model for the Technology-Integrated CST.

In conclusion, this research resulted in a model that can be used as a guideline for the design, development, and delivery of CST. For those who are interested in using case studies for teaching or those who are already using CST, this research confirmed the benefits of using CST and added factors to be considered to ensure the effectiveness of the technique. Furthermore, this research also provided a guideline on the improvement of CST by addressing its limitations with the use of instructional technology. While technology has the potential to enhance instructional techniques, there are limitations to using technology. Instructors often require training in technical and pedagogical aspects to utilize CST effectively.

This study facilitates a better understanding of the effective integration of technology for researchers and instructors. Analysis of findings revealed ways to improve an instructional method that has proven to be an effective tool to prepare students for real-world application, higher-order thinking, and communication skills. Gaining insight from instructors in the broad discipline of agricultural education allowed a better understanding of the current use of CST, the use of technology with CST, and the impact of CST through instructors' perspectives.

Recommendations

Recommendations for Future Research

While this research explored the experiences of instructors who use CST, it did not examine the impact of the Technology-Integrated CST model on students' learning. Future research is informed by the last phase of the ADDIE model which is the evaluation phase (Dooley, 2005). In the evaluation phase, the research should focus on examining the effectiveness of the Technology-Integrated CST model in preparing students for real world application, higher-order thinking, and communication skills. To determine effectiveness, the research should utilize students' self-evaluations, students' achievement of learning outcomes, and employers' satisfaction/evaluation as measures of students' success. The data collected should be able to provide a better understanding of role of technology in enhancing CST.

Recommendations for Practice

Instructional designers and instructors can benefit from the findings. The use of Technology-integrated CST should be considered when designing a course that focuses on real world application, higher order thinking, and communication. As the use of technology impacts students' motivation and participation, practitioners should consider use of CST and seek support from administration. The model requires technical and financial support in order to operate and maintain technological capability. In addition, CST itself (without the integration of technology) requires proper design and well-managed instructional activities, as well as skilled facilitators. With the integration of

technology, instructors will need to understand the technical and pedagogical approaches of the model. Therefore, administration will need to provide training related to improving facilitating skills as well as technological competencies.

Findings revealed that participants often relied on case studies for teaching in order to connect content with real world examples. It is recommended that practitioners consider using CST in conjunction with other instructional methods or switching between different methods. This approach will not only keep students engaged, but also allow instructors to practice diverse instructional methods to best compliment CST.

The use of technology to compliment the CST has the potential to benefit learners through the enhancement of lifelong learning skills. Agricultural education instructors should consider applying the model to their instruction as a means of assisting agriculture students to be prepared for the workforce.

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APPENDIX A

EMAIL INVITATION

Phuong Huynh, M.Ed.
Texas A&M University
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pandh01@email.tamu.edu

<date>

Dear faculty/instructor

My name is Phuong Huynh, a PHD student from the Department of Agricultural Leadership Education and Communications in the College of Agriculture and Life Sciences at Texas A&M University. I am conducting a study focused on understanding the use of case studies as a teaching technique under the supervision of Dr. Theresa Murphrey. The purpose of this study is to evaluate the current use of case study as an instruction technique across disciplines to understand the current use and determine the effectiveness of the technique. In addition, this study attempts to understand technology skills of the instructor in order to develop a model in which technology can be integrated to enhance the case studies technique. Interviews will be used to collect data for the study.

We value your time and hope you will consider participating in this study. Participation in this study is **completely voluntary**. Responses will be coded to ensure confidentiality. Your name will be required so that we can identify and verify the course you are associated with.

If you elect to participate in this study, you will be asked to complete either an in-person or a phone interview. Each interview will take approximately 1 hour to complete.

Thank you in advance for your consideration and assistance. Please let me know if you have any questions or concerns. I look forward to hearing from you.

Sincerely,

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979-422-1390

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IRB APPROVAL DATE:
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IRB EXPIRATION DATE: 10/01/2017

APPENDIX B

INTERVIEW SCRIPT

An Examination of Technology Use and eLearning
(Phase 2: Case Studies & Technology)

Interview Protocol: *The protocol includes open-ended questions and a number of areas to keep in mind. The purpose of these guiding questions is to enable individuals to be as informative as possible in their responses. The questions are neutral and encourage additional information, but do not suggest specific answers. Encouraging questions such as 'Why?, "Why not?", "How is that?" or "In what ways?" will be used to support conversation. Follow-up questions will be employed to obtain further information and should touch on whatever the participant has already shared, thus these are only suggestions.*

Guide

Introduction:
Hello, my name is Phuong Huynh at Texas A&M University. This study is being conducted to understand the use of case studies as a teaching method and identify the technology skills of instructors. We are conducting interviews with individuals who have been using case studies in their courses. Thank you for taking the time to visit with us today. You were selected because you were identified as an instructor who has used case studies in your teaching. This interview will take approximately 30 minutes to one hour. As a reminder, all information shared will remain confidential. Your name will not be associated with any comments you make. Information shared will be reported in aggregate and your name will not be associated with the study.

Guiding Questions: (It is possible that not all questions will be needed – only relevant questions will be asked based on the individual's experiences)

- How often have you use case studies as a teaching tool? (Every class session, every other class, twice a month, once a month, or less than 5 case studies per semester)
- What are the reasons for the frequency in which you are using case studies?
- Why do you use case studies?
- What are your thoughts about implementing case studies in terms of teaching & learning?
- What skills do you believe students will obtain from the case studies?
- Why did you design the course using case studies?
- Did you consider different tools or methods besides case studies?
- Are there any obstacles you feel preventing the utilization of case studies? If yes, what are the obstacles?
- Does student learning and performance differ when you implement case studies? If yes, how?
- Do you use technology for teaching? If yes, what types of technology? How would you describe your ability to use technology for teaching?
- Do you incorporate or integrate technology when implementing case studies? If yes, why and how?
- How would you describe your technology skills?
- What technologies are you interested in using and what particular technologies do you believe would support/aid in your implementation of case studies?
- Finally, what are your concerns about integrating technologies in your teaching?

Conclusion:
Thank you for sharing your thoughts, ideas, and experiences with us. Our goal is to document best practices for implementing successful courses. We appreciate your participation. Again, your name will not be associated with the comments you have provided.

IRB NUMBER: IRB2014-0128D
IRB APPROVAL DATE: 10/11/2016
IRB EXPIRATION DATE: 10/01/2017

APPENDIX C

PEER DEBRIEF MOMORANDUM

PEER DEBRIEF MEMORANDUM

TO: Dr. Theresa Murphrey
FROM: Phuong Huynh
SUBJECT: Key Phrases
DATE: 6/15/2017

Dear Dr. Murphrey,

The following memo contains information regarding the data analysis of the study, particularly the coding process. The purpose of this research is to evaluate the current use of case study as an instructional technique across disciplines to understand the current use and determine the effectiveness of the technique. In addition, this study attempts to understand technology skills of the instructor in order to develop a model in which technology can be integrated to enhance the case studies technique. Lastly, this research serves the requirement for my dissertation.

The First Round of Coding Process

To date, data were collected from interviews with seven participants. After receiving a confirmation from each participant that the transcripts accurately represent their views on objectives related to the study, the transcripts were taken apart for data to be unitized. I have completed my first round of open coding on the pieces of units from the transcripts. The first wound has generated fifteen categorical themes. A unique key phrase was used to represent each theme. Colors were used to categorize themes into three major findings that address the objectives of the study, which are:

(a) Instructors' experiences with the current method of using the case study as a teaching technique (Green),
(b) Instructors' perspectives on limitations of the CST (Orange), and
(c) Instructors' attitudes toward a group of technology that could be integrated to enhance the CST and their competency in using the technology (Blue).

The first round of key phrases for emerged themes through open coding appear below:

Students' Issues with Case Studies	Learning Outcomes of Using Case Studies	Use of Technology Communication
Skills Obtained from Case Studies	Delivery of Case Studies in Courses	Technology Issues/Concerns
Impacts of case studies technique on instructor teaching	Designing the implementation of case studies technique	Making Case Studies Technique More Engaging with Technology
Development of Cases Used in the Class	Instructors' Issues with Case Study	Use of technology of assessing student learning
Frequency of the Use of Case Studies	Use of Technology for Delivering Case Studies	Technology Skills/Competencies of Instructors

Second Round of Coding Process

After the first coding found emerged themes, second round of phrases using axial coding helped merged similar themes. The eight themes below have been finalized and given definitions.

Use of Case Studies	Limitations for Student	Future for Technology-Integrated Case Studies Technique
Intended Learning Outcomes, Engagement, and Skills	Limitations for Instructors	Technology skills/efficacy of the instructors
Limitations of Case Studies Technique	Technology for Instruction	Issues/Concerns of Technology Integration

These are defined as follows:

Use of Case Studies

- Different approaches to utilizing case studies as a technique of instruction. The instructor may use case studies for different intentions such as to deliver concepts, to assess student learning, or to enable collaboration between students. I merged "Frequency of the Use of Case Studies," "Development of Cases," "Designing the implementation of case studies technique," and "Delivering of Case Studies in Courses", from the first round coding as the underline concept of these themes is about the use of case studies.

Limitations for Instructors

- Obstacles or issues that arise for instructors when design, develop, or deliver of case study technique for instruction.

Limitations for Students

- Obstacles or issues that arise for students when an instructor uses case studies.

Intended Learning Outcomes and Skills

- Learning outcomes and skills an instructor intended for students to achieve when using case studies for instruction purposes.

Use of Technology for Instruction

- How an instructor integrates technologies into the teaching instruction. I merged "Use of technology for delivering case studies", "Making case studies technique more engaging with technology, and "Use of technology of assessing student learning" together as these themes have the same underlining purpose.

Future for Technology-Integrated Case Studies Technique

- Instructors' perspectives and ideas on what could be used and what would they like to use to enhance the case studies technique of instruction. These perspectives based on the notion that they have an unlimited budget and resources.

Instructors' Technology Skills and Competencies

- Instructors' skills related to technology. This is a self-assessment of one's ability to use technology.

Issues/Concerns of Technology Integration

- Concerns that may arise when integrating technology into any aspects of teaching and learning.

APPENDIX D

IRB APPROVAL

DIVISION OF RESEARCH

TEXAS A&M UNIVERSITY

DATE: February 19, 2016

MEMORANDUM

TO: Theresa PESL Murphrey
ALRSRCH - Agrilife Research - Ag Leadership, Education & Communication

FROM: Dr. James Fluckey
Chair, TAMU IRB

SUBJECT: Amendment Approval

Study Number:	IRB2014-0128D
Title:	An Examination of Technology Use and eLearning
Date of Determination:	
Approval Date:	04/16/2014
Continuing Review Due:	11/01/2016
Expiration Date:	12/01/2016
Documents Reviewed and Approved:	Only IRB-stamped approved versions of study materials (e.g., consent forms, recruitment materials, and questionnaires) can be distributed to human participants. Please log into iRIS to download the stamped, approved version of all study materials. If you are unable to locate the stamped version in iRIS, please contact the iRIS Support Team at 979.845.4969 or the IRB liaison assigned to your area.

Submission Components			
Study Document			
Title	Version Number	Version Date	Outcome
2014_0128D_Phase2_Recruitment_script	Version 1.0	02/17/2016	Approved
2014_0128D_Phase2_Info_Sheet	Version 1.0	02/17/2016	Approved
2014_0128D_Phase_2_Interview_Protocol	Version 1.0	02/17/2016	Approved

Document of Consent: Waiver approved under 45 CFR 46.117 (c) 1 or 2/ 21 CFR 56.109 (c)1
Waiver of Consent:

Comments:
- Research is to be conducted according to the study application approved by the IRB prior to implementation.

750 Agronomy Road, Suite 2701
1186 TAMU
College Station, TX 77843-1186
Tel. 979.458.1467 Fax. 979.862.3176
http://rcb.tamu.edu

TEXAS A&M UNIVERSITY

APPROVAL
MODIFICATION OF PROTOCOL
Using Expedited Procedures

April 13, 2017

Type of Review:	Submission Response for IRB Amendment
Title:	An Examination of Technology Use and eLearning
Investigator:	Theresa PESL Murphrey
IRB ID:	IRB2014-0128D
Reference Number:	052582
Funding:	
Documents Approved:	2014_0128D_Phase2_Info_Sheet 2014-0128D_Phase_2_IRB_amend_recruitment_email_listserve2
Special Determinations:	
Risk Level of Study:	Not Greater than Minimal Risk under 45 CFR 46 / 21 CFR 56
Review Category:	Category 7: Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies

Dear Theresa PESL Murphrey:

On 04/13/2017 the IRB approved the modification(s) described below:

The amendment to add a recruitment email to be sent to the American Association for Agricultural Education listserve has been approved.

If you have any questions, please contact the IRB Administrative Office at 1-979-458-4067, toll free at 1-855-795-8636.

Sincerely,
IRB Administration

APPROVAL
CONTINUING REVIEW OF RESEARCH
Using Expedited Procedures

August 14, 2017

Type of Review:	IRB Continuing Review Form
Title:	An Examination of Technology Use and eLearning
Investigator:	Theresa PESL Murphrey
IRB ID:	IRB2014-0128D
Reference Number:	062031
Funding:	N/A
Documents Approved:	IRB Continuing Review Form (Version 4.0) Phase 4 student Consent Renewal (Version 1.0) Phase 4 Parent Consent Renewal (Version 1.0) 2014_0128d_phase_3_information_sheet_v2 - (Version 2.0) 2014_0128d_phase_4_recruitment - (Version 1.0) 2014_0128d_phase_3_recruitment_script - (Version 1.0) 2014_0128d_phase_4_interview_protocol - (Version 1.0) 2014_0128d_phase_3_focusgroupprotocol - (Version 1.0)
Special Determinations:	Minor Risk Assessment: 45 CFR 46.404 - Not greater than minimal risk Parental Permission – One Parent Signature
Risk Level of Study:	Expedited

Dear Theresa PESL Murphrey:

The IRB approved the continuing review of this research on 08/14/2017.

It is recommended that you submit your next continuing review by 07/13/2018 to avoid a lapse in approval. Your study approval will end on 08/13/2018.

Your study must maintain an **approved status** as long as you are interacting or intervening with living individuals or their identifiable private information or identifiable specimens.

Obtaining identifiable private information or identifiable specimens includes, but is not limited to:

1. using, studying, or analyzing for research purposes identifiable private information or identifiable specimens that have been provided to investigators from any source; and