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Mixed Methods Action Research: How Integrating Student Response Technology and Case Studies in a Largely Populated University Course Influences Student Engagement, Feedback, and Learning

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MIXED METHODS ACTION RESEARCH: HOW INTEGRATING STUDENT
RESPONSE TECHNOLOGY AND CASE STUDIES IN A LARGELY
POPULATED UNIVERSITY COURSE INFLUENCES STUDENT
ENGAGEMENT, FEEDBACK, AND LEARNING

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DEDICATION

This dissertation work is dedicated to my better half Connie Phal, and our kids Jessica

Lancewicz, Andrew Phal, and Ben Matteson. Without all your support this work would

not have been possible. Thank you for your understanding and patience. To my father

Richard Matteson, we did it. To my mother Marj Matteson, go brag. To my sisters Ann

Matteson and Kris Conger, yes, you have to call me Doctor now. I also dedicate this to

two of my favorite people and friends Dr. Heather McCauley and Dr. Yuya Kiuchi.

Thank you for believing in me and being my cheering section.

ABSTRACT

The purpose of this study was to determine if implementing student response technology (SRT) and case studies into a largely populated university undergraduate course would influence student engagement. When student engagement is influenced the potential for positive learning outcomes occurs leading to a higher likelihood of student success (Swap & Walter, 2015). Four research questions guided this study: How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence: (1) student motivation; (2) cognitive, emotional, and behavioral engagement; (3) feedback; and (4) What are the effects of SRT and case studies on student learning with applications of leadership, strategic planning, partnership, and the importance of human capital?

Participants ($n = 56$) were students enrolled in a course at Michigan State University. The data for this study were collected from a pre-and-post quantitative survey and learning assessment, participant interviews, and a written reflective artifact. An SRT digital tool called Acadly was utilized to influence discussion during a four-week innovation. Participants were surveyed, interviewed ($n = 8$), and required to provide awritten reflection regarding their perceptions of Acadly and its influence on their motivation, engagement, feedback, and learning.

Results from paired-samples t-tests showed no significant difference statistically from presurvey to postsurvey on engagement. Wilcoxon Signed-Rank tests were performed on constructs of the learning assessment, and again, no statistical significance

was found. However, participant interviews and artifacts identified perceptions of

influence on motivation, engagement, and feedback.

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CHAPTER 1

INTRODUCTION

National Context

Major universities across the United States struggle with large enrollment courses, causing students to become disengaged, uncollaborative, and less interactive. This can be especially true when class sizes exceed 50 students and become more of a passive, lecture-based format (Burrowes, 2003). With the increase in class sizes growing, a climate of disengagement is being created between the professor and students (Kezar & Kinzie, 2006). However, universities and teachers are taking a proactive approach when it comes to student engagement and learning outcomes (Rissanen, 2018). With today's technical climate and the vast number of applications available, it is becoming easier for universities to have an influence on student engagement. In over-populated classrooms, implementing student response technology can assist universities in capturing more of the student's voice thus leading to increased engagement (Ault & Horn, 2018).

University completion rates are one of the main reasons prompting universities to comprehend various factors affecting student success (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008). Thus, student engagement becomes an influence on success and scholarship at the university level (Kahu, 2013). In addition, student success is being linked to student engagement more and more. One issue is the failure to utilize technologies in an effective manner (Hernwall, Fors, Bergdahl, & Knutsson, 2018). A number of studies, for example Martinez-Torres et al. (2007), Poirier and Feldman

(2007), and Sitthiworachart and Joy (2008), contend that technology can influence student engagement (Hernwall et al., 2018). Student response technology (SRT) has shown to influence engagement, student contribution, and overall experience in the classroom (Hedén et al., 2016). However, the utilization of too much technology in the classroom can also lead to disengagement due to an over whelming focus on the technology itself (Heflin, Shewmaker, & Nguyen, 2017). This indicates the existence of a fine line between engagement and disengagement when it comes to technology, such as student response technology.

In response, researchers are becoming more and more interested in how technology addresses varying issues such as student engagement and achievement (Voelkel & Bennett, 2013). Students who are more engaged become more productive learners, and in turn, outcomes and opportunities are improved (Zepke, 2014). Student engagement, both nationally and internationally, is becoming a nucleus of higher educational learning (Macfarlane & Tomlinson, 2017). Furthermore, Macfarlane and Tomlinson (2017) stated the focus should be to concentrate on creating educational strategies to proactively enhance student engagement. So, SRT may be one strategy to improve student engagement in large enrollment courses.

Local Context

This study will take place on the campus of Michigan State University (MSU). Established in 1855, MSU spans over 5300 acres in East Lansing, MI. The university offers over 200 degrees spread across the bachelor, masters, and doctoral levels (Michigan State University, 2019) in over 100 academic buildings throughout campus. Seventy-six percent of the classes at MSU have up to 49 students with 24% having 50 or

more in attendance (How does Michigan, 2021). Total student body is approximately 50,000, doubling the population of the city in which it is located when school is in session (Michigan State University, 2019). Females make up 51.9% and males make up 48.1% of MSU's student body (Michigan State University, 2019).

Overall, there are 4,900 students enrolled in 14 degree programs offered in the College of Social Science. Demographically, students in the College of Social Science trend along the same lines as the university population in terms of gender. Students in this study will be working toward a minor in Human Behavior and Social Services and enrolled in the Management of Human Services capstone course. Many of the students enrolled in the course have majors concentrated in psychology, human development and family studies, and child development. Because of this, demographically, enrollment in the course tends to lean heavily toward females at 98% with 2% being male (MSU RO, 2019).

Regionally, universities such as MSU, have instilled engagement models to strengthen bonds and improve learning ("Engaging students", 2016). The philosophy at MSU is that an increase in student engagement correlates to a more robust learning environment and an increase in graduation rates ("Engaging students", 2016). The focus is directed at providing students with multiple opportunities outside of the classroom, not unlike that mentioned by Macfarlane and Tomlinson (2017), in order to create a bond with the university. More recently MSU created the Hub, which focuses on the creation of new initiatives surrounding collaboration and enhanced ways to provide instruction for students to be more active and engaged ("Hub for innovation", n.d.). The gap occurs when the focus is on social, activities outside of school, student governance, and inter-

mural/inter-collegiate athletics (Di Battista, Pivetti, & Berti, 2014) as opposed to student engagement within the classroom. Thus, leaving the issue of classroom engagement up to individual instructors.

Statement of Problem

Large, matriculated courses at major universities are a burden when it comes to highly engaged learning environments; thus, these courses force more of a lecture-based pedagogy to be the normal course of action, stifling student engagement and motivation in the process (Trees & Jackson, 2007). Classroom design issues, such as the physical gap between the teacher and student, how desks are arranged, the amount of students in the class, along with the detached setting, lend themselves to the suppression of student engagement and motivation (Trees & Jackson, 2007). Because of this, universities are trending toward an increase in the implementation of emerging technologies (Mansouri & Piki, 2016). The issue occurs when instructors implement newer technology without taking into account how the technology applies to enhancing a student's learning experience, engagement, and motivation (Mansouri & Piki, 2016). Students are uncertain about their abilities regarding technology, causing a discrepancy in the learning expectations centered on the technology (Howard, Ma, & Yang, 2016). The discrepancy in turn leads to a disengaged, unmotivated class of students (Howard et al., 2016). Teachers can create a more productive and engaged learning environment by allowing students to generate their own awareness and reality through active participation (Moallem, 2001). SRT coupled with authentic pedagogies, such as case studies, are strategies that may improve student engagement and motivation in large enrollment courses. By gaining a better understanding of these issues surrounding technology

teachers can prepare and create more engaged, motivating, and collaborative learning environments.

Purpose Statement

The purpose of this action research will be to determine if utilizing a combination of SRT and case studies in a largely populated undergraduate course at Michigan State University will have an influence on student learning and engagement.

Research Questions

The research questions to address this purpose statement are:

1. How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence student motivation?
2. How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence cognitive, emotional, and behavioral engagement?
3. How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence feedback?
4. What are the effects of SRT and case studies on student learning with applications of leadership, strategic planning, partnership, and the importance of human capital?

Researcher Subjectivities & Positionality

I am a heterosexual middle-aged white male who is fully aware of the privilege that affords me. I have been teaching face-to-face and online classes for the Human Development and Families Studies department at Michigan State University for the past four years. I believe educational technology and the learning of today go hand in hand. Technology can foster the sharing of information and transform individuals' view of the

world (García Álvarez-Coque, Mas-Verdú, & Roig-Tierno, 2017). I am of the belief educational technology allows students to customize their learning environment and resources as supported by instructors and peers (Hegarty, 2015). I am biased toward educational technology because I feel it is the answer we seek in engaging and motivating students to be better scholars.

I am a constructivist and believe people in general create their own reality and knowledge and values are generated through the shared views of myself and others (Mertens, 2007). In addition, I believe from an ethical standpoint there needs to be balance between researcher and participant in order to create understanding (Mertens, 2007). I believe open dialogue, observations, and interviews with participates is a vital aspect of my research (Onwuegbuzie & Frels, 2013).

I believe teachers have a responsibility to research, discover, and create an engaged learning environment in which students can discover how to become personally motivated to own their education. I have come to this conclusion based on my past experiences as a student and an instructor. Being both a student and a teacher has provided me with the insight teachers and students need to collaborate and work together to enhance the learning environment for both parties to benefit. Working on the campus of MSU positions me in two categories: insider, and insider in collaboration with other insiders (Mertens, 2007). My main positionality would be insider as I am studying my own class. I am considered an insider from the standpoint of being directly involved in the study as the instructor however, the participants themselves may not view me as an insider because I am in a position of power. I believe if I can be a reflective practitioner, it will be a benefit to myself and my research. I will be able to learn from my study and

then in following semesters incorporate what I have discovered to improve my teaching and design, thus supporting the engagement and motivation levels within my classroom. Regarding my positionality as an insider in collaboration, this occurs at the institutional level since my research is being done on the campus of MSU where I am employed. Other insiders in the case of insider in collaboration are other faculty members who may be doing their own research. As an insider in collaboration with other insiders I am surrounded by colleagues with years of experience, with whom I can converse and gain insight.

I am in control of my surroundings once I step into my classroom, but I need to be aware that it is sometimes fine to just observe and see where the study takes itself. With participants it may be a bit difficult. Although I feel that I am an insider, students may perceive me as an outsider and as a person of power (Caldwell, 2007). I will negotiate my positionality with students by allowing for open collaboration and discussion pertaining to my research. Opening the door for them to collaborate, plus showing I care about them and their feelings will allow me to be seen a trusted collaborator. In addition, I need to make sure I am aware of all students within the class and not just the study. I will need to concern myself with their feelings and perceptions as well.

Stakeholders are another concern. In my setting I am considered an outsider and I can see colleagues not taking my research seriously since it is a dissertation. I will negotiate my positionality by asking for input and professional advice thus creating a sense of contribution. By doing so it opens them up to acceptance of the findings and brings me closer to being considered an insider in collaboration with others and on the same playing field as them.

I am very self-aware of unintended bias and make it known to others when incidences occur. If I am continuously aware, I will be able to limit any affect bias may play a part in concerning my research. I am of the viewpoint that all people have something to offer and I can learn from anyone. Knowing this, and maintaining this worldview, will create a positive effect on my research. I must remain cautious and need to self-reflect to make sure negative influences are kept to a minimum.

Definition of Terms

Anxiety: A number of physical and psychological reactions students are subjected to when contemplating their concern over their learning outcomes (Hull et al., 2019).

Behavioral engagement: How a student actively participates and forms the beginnings of the cycle of engagement and success in school (Elffers, 2013).

Case study: Highly elaborate, situated accounts that adequately allow for multi-layered levels of explanation and understanding allowing students to apply their knowledge (Kunselman & Johnson, 2004; Levin, 1995).

Cognitive engagement: The intellectual state in which a substantial level of work is applied to obtain the knowledge needed to understand the topic presented (Greene & Miller, 1996; Meece, Blumenfeld, & Hoyle, 1988).

Collaborative learning environment: The pedagogical use of student groups working together synchronously and asynchronously to expand each other's scholarship (Bruffee, 1984; Słowikowski, Pilat, Smater, & Zieliński, 2018).

Constructivism: Learning is the process of processing, planning, internalizing, and the utilization of social constructs to discover knowledge through the awareness of personal beliefs and understanding (Vygotsky, 1978).

Emotional engagement: The excitement/feelings one has about their learning and the

institution they attend (Lam, Xu, & Loi, 2018).

Engagement: is defined as understood in active learning where self-motivation,

reflection and time, and student voice is centered on academic activities (Axelson

& Flick, 2011; Delialioğlu, 2012; Ryle & Cumming, 2007).

Enjoyment: A favorable, driving feeling experienced by students when a task can be

controlled and is perceived as valuable (Linnenbrink, 2007).

Feedback: The dialogue between teacher and student in order to construct knowledge

(Boud & Molloy, 2013)

Interest: The constant and long-lasting fondness held by an individual/student toward a

subject, topic, or circumstance (Walkington, 2013).

Motivation: An individual's vigor, disposition, interest, push to learn, work efficiently,

and reach potential combined with engagement (A. Martin & Lazendic, 2018).

Personality: Persistent form of responses and conduct spanning comparable situations

that include characteristics such as introversion, extraversion, meticulousness, and

anxiousness (Hunsinger, Poirier, & Feldman, 2008).

Student response technology: Allows for students to respond electronically through

their own device, such as a cellphone or laptop, to questions posed by the teacher

during a lecture/class session (Caldwell, 2007).

CHAPTER 2

LITERATURE REVIEW

The purpose of this action research will be to determine if utilizing a combination of student response technology (SRT) and case pedagogy in a largely populated undergraduate course at MSU will have a positive influence on student engagement. The review of literature is developed in support of the following research questions: (1) How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence student motivation? (2) How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence cognitive, emotional, and behavioral engagement? (3) How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence feedback? (4) What are the effects of SRT and case studies on student learning with applications of leadership, strategic planning, partnership, and the importance of human capital? The methodological approach in reviewing literature consisted of a multi-prong technique. The variants pertaining to each research question were input into each of the following databases: *Education Full Text, ERIC (on ProQuest), Education Source, ERIC (on EBSCO) and ERIC (on FirstSearch).* To further expand the search MSU Library's general search covering articles, books, media, databases, journals, and guides was utilized. Multiple searches were performed using myriad combinations of the following keywords: engagement, student engagement, collaborative learning environments, integration issues, constructivism, constructivist,

higher education, self-motivation, intrinsic motivation, extrinsic-motivation, self-determination theory, student voice, student reflection, and SRT. In addition to keyword searches, additional resources were garnered from the use of Google Scholar along with scanning bibliographies of all references. Lastly, the occasional reference was gleaned from a daily email article subscription to Academia in which preferences were set to educational technology articles.

In support of the purpose statement and research questions above, the literature review is a culmination of four defined sections. The first section will be a discussion on linking constructivist theory to student engagement through learning and the discovery of knowledge. The second section reviews the benefits of SRT and its impact on student engagement along with the instructor's role in the implementation of the technology. The next section establishes the definition of engagement and the influence the applied model of leaner engagement has on the definition of engagement. The fourth section of the literature review will define the collaborative learning environment along with case study pedagogy. In addition, the necessary components and pedagogical issues involved in providing an adequate environment will be discussed.

Constructivist Learning Theory

Although there are various theories that may be applied, adherents of engagement have made links to motivation, student voice, and reflection through the internal desire to learn; consequently leading engagement down the path of constructivism (Boekaerts, de Koning, & Vedder, 2006; Milner, Templin, & Czerniak, 2017; Thompson, 2015). Vygotsky (1978) defined constructivism in the following way: Learning is the process of processing, planning, internalizing, and the utilization of social constructs to discover

knowledge through an awareness of personal beliefs and understanding. In addition, constructivism can be defined as an exploration of teacher-student perceptions and experiences allowing for the student to become an involved party in the exploration of the discovery of new knowledge and experiences via practical activity, cooperation, and community activity (Alt & Alt, 2017; Karpouza, Karpouza, Emvalotis, & Emvalotis, 2019; Kwan & Wong, 2014). Constructivism is also known as discovery learning in which students take an exploratory approach via engagement, motivation, self-determination, duty, solving problems, being creative, and customized learning experiences; students need to take their learning experience into their own hands to create new knowledge (Clark, 2018). Therefore, constructivists gain an understanding of previous knowledge and then utilize student strengths allowing them to own their learning thus becoming more engaged (Scruggs, 2009).

Constructivism urges students to continually appraise how their learning is improving through the process of constant questioning and active learning strategies (Brandon & All, 2010). Through the constructivist approach, students work to identify a condition that is recognizable. In doing so, students discover knowledge of their understanding (Schuh & Kuo, 2015). Through this process of new discovery, personal beliefs and understanding can come under conflict and students' assumptions become challenged (Kroll, 2004). For example, it is unlikely for a student to construct natural theory when new cases are introduced which is why it is important to introduce cases to the social environment so learners can interact with one another (Bächtold, 2013). Through introduction, concepts can be acquired in base form and then connected to cases that will allow them to grow into newly discovered knowledge (Bächtold, 2013).

A constructivist approach becomes important because participants in the study will be asked to reflect and gauge their experiences. The use of this approach allows for self-discovery and an awareness of their personal perceptions related to engagement. Since constructivism uses a somewhat loosely organized pedagogy students will have the much-needed room to flourish and explore their own perceptions without teacher interference. It is important to this study for students to take ownership of their own perceptions and viewpoints (Tan & Tan, 2017).

Student Response Technology

SRT allows for students to respond electronically through their own device to questions posed by the teacher during a lecture/class session. Response technology lets students answer and react to posed questions through a personal hand-held device (Caldwell, 2007), such as a cell phone and tablet computers. Initially, student response technology involved the use of *clickers* with buttons pertaining to the answers of a multiple choice question (Nagy-Shadman & Desrochers, 2008). With the development of smartphone technology, SRT now allows students to participate via a phone app (Wood, 2020). As almost all students now carry smartphones (Jain & Farley, 2012), most have access to SRT applications.

Advocates of technology in the classroom have expressed the benefits of using SRT (Varier et al., 2017). According to Varier et al. (2017) implementing SRT leads to an increase in communication between students and teachers. Furthermore, Varier et al. (2017) state students moved toward an increase in student-teacher communication, cooperation, and immersive learning. In addition, students believe SRT supports intercommunication along with useful collaboration (Retalis et al., 2018). Therefore,

cooperation between student and teacher becomes an usual characteristic of SRT instruction and learning (Santori & Smith, 2018). Utilizing SRT in the classroom allows teachers to provide an open, collaborative, and highly communicative learning environment.

SRT, with proper teacher support, can influence student engagement. Classroom environment, student learning, and engagement were positively affected using classroom response system technology enhancing the student learning experience (Wu, Wu, & Li, 2019). With the incorporation of SRT students reported improved engagement, collaboration, class participation, and were more inclined to assist in self-evaluation (Shea, 2016). This along with redesigned instructional models exploited by teachers lead to increased engagement and excitement among students (Retalis et al., 2018; Santori & Smith, 2018; Varier et al., 2017). When taking the time to properly prepare and incorporate SRT into their lesson plans, teachers can have a profound impact on student engagement.

Teachers play an important role in the implementation of technology into the learning environment. Teachers must have an understanding that choices need to be made pertaining to the determined learning objective, matching program capabilities, and changing environments (Robbins & Butler, 2009). Just because a teacher adds a technological component does not mean students will be engaged; technology should not drive the learning, learning should drive the technology (O'Byrne & Pytash, 2015; Sobocan, Turk, & Pecovnik Balon, 2017). Teacher skills need to include well established objectives, development of defined groups, student oversight and support, the ability to foresee difficulties, aggregating information and acknowledging students, and being able

to reflect and analyze the end results (Kaendler, Wiedmann, Rummel, & Spada, 2015). Poor implementation and unclear instruction can lead to students becoming disengaged within a classroom.

Previous studies in SRT have been conducted using the quantitative method utilizing surveys (Nagy-Shadman & Desrochers, 2008). A majority SRT studies are of mixed methods design using surveys for the quantitative portion, combined with focus groups and interviews for the qualitative aspect (Caldwell, 2007; Retalis et al., 2018; Wood, 2020; Wu et al., 2019). Lastly, qualitative methods using observation, interviews, and focus groups have been conducted (Santori & Smith, 2018; Varier et al., 2017).

Student Engagement

In a recent study by the National Institute for Learning Outcomes Assessment (NILOA), 76% of the responding universities stated they used student engagement surveys to evaluate student educational outcomes (Zilvinskis, Masseria, & Pike, 2017). Since its inception in 2000 the National Survey of Student Engagement (NSSE) has had over 1600 four-year colleges and universities from across the United States and Canada participate in its annual survey (NSSE, 2018 p. 2). The survey saw 511 institutions participate in their 2018 survey (NSSE, 2018 p. 2). The NSSE survey has become one of the most reputable instruments regarding student engagement with over 7000 articles and presentations citing the study along with a number of universities reporting positive growth and improvement in student engagement (Zilvinskis et al., 2017). In the case of the NSSE, student engagement is measured across five themes: Academic challenge, academic learning, student-faculty interaction, enriching educational experiences, and supportive campus environment (NSSE, 2018).

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Understanding the factors influencing engagement becomes important if the goal is student success. Being sympathetic to engagement assists educators in developing tactics to reduce negative learning outcomes (Christenson, Reschly, & Wylie, 2012). It becomes evident, however, that we need to allow students their voice in telling us what they have to say about their own engagement. For example, student perceptions of how much work they are doing, their reasons for attending college, and academic activities are all factors students consider when defining their level of engagement (Kember, 2004). Taking a holistic approach is good, but we need to investigate what student engagement looks like at the individual class level. By having an understanding at the individual class level, we can work toward consistency across college campuses and reinforce student engagement, purpose, and reasoning for attending college (Xerri, Radford, & Shacklock, 2018).

Engagement Defined

Many components influence student engagement. The more insight gained pertaining to the influences and facets associated with student engagement the better one is able to solidify their understanding of each component as it pertains to defining engagement (Kahu, 2013). Due to the overlap of the elements of engagement it can be conceptually chaotic, consequently a need for clearness of what components are and are not needed is necessary when defining the term (Fredricks, Blumenfeld, & Paris, 2004). In addition, engagement remains a perplexing idea encompassing multiple concepts and relies on a vast range of intertwined elements (Bouvier, Lavoué, & Sehaba, 2014). Therefore, to study influential elements of student engagement the elements need to be clear to reduce confusion.

It is often said that engagement is an important ingredient, if not the main ingredient, of student learning. Engagement is defined as the duration, dedication, involvement, attitude, and effort students spend in learning activities (Kuh, 2001; Macfarlane & Tomlinson, 2017). Kuh (2001) specifically defines engagement as the degree in which students are challenged academically, the length of time they spend doing an assignment, and their involvement in additional intentional academic exercises. In addition, student engagement is defined through collaborative, interactive, challenging learning along with time spent on the learning and influenced by student self-motivation combined with common interests and goals (Delialioğlu, 2012; Ryle & Cumming, 2007). When adding the technology factor, engagement is a characteristic of a participants encounter with technology marked by question, look and feel, response, newness, interactive nature, ability to manage, understanding, drive, curiosity, and influence (O'Brien & Toms, 2008). Student engagement, although being an important ingredient in learning, is a very complex multifaceted term. For the purposes of this study, engagement as defined by Delialioglu (2012) and Ryle and Cumming (2007) will be used.

When discussing engagement in a learning setting or the confines of a classroom, it is thought of as a construct of three components: behavioral, emotional, and cognitive engagement (Fredricks, Blumenfeld, & Paris, 2016). Student engagement is characterized by a student's link to their learning, which is influenced by the immediate physical and social setting (Kahu, 2014). Since engagement is usually the most important factor in determining successful learning outcomes it is important to have an understanding of each type (Maguire, Egan, Hyland, & Maguire, 2016). There are three types of engagement: (a) behavioral, (b) emotional, and (c) cognitive. Each is discussed below.

Behavioral engagement. Behavioral engagement refers to how a student actively participates and forms the beginnings of the cycle of engagement and success in school (Elffers, 2013). Components of behavioral engagement include attendance, participation, and disciplinary issues such as detention and suspensions (Engels et al., 2016). Besides academics, behavioral engagement considers social and extracurricular activities students are involved in (Yin, 2018).

Over the course of many years', researchers have studied the concept of behavioral engagement and its effects on learning outcomes. Research suggests the more rewarding the course is the more willing to be engaged the student will be (Rodríguez et al., 2019). Thus, student motivation becomes an influencing variable on behavioral engagement (Xu & Corno, 1998).

In connection with the participation and social aspect of behavioral engagement the use of SRT in a classroom tends to increase activity and enjoyment levels, as well as attention and engagement (Balta & Tzafilkou, 2018). It is the immediate feedback and ability for students to see the instant comparison to their peers that heightens their level of behavioral engagement in this context. Feedback in the case of SRT becomes part of the experience and an event that provides the student an understanding of the material through active participation (Egelandsdal, Egelandsdal, Krumsvik, & Krumsvik, 2017). In addition, SRT leads to more interactive teacher/student relationships in turn influencing behavioral engagement in a positive manner (Engels et al., 2016). Therefore, we can see the implementation of SRT by combining increased activity, immediate feedback, and positive social relationships can have an influence on student behavioral engagement.

Previous studies in behavioral engagement are a majority quantitative utilizing varying types of self-reporting questionnaires (Balta, Balta, Tzafilkou, & Tzafilkou, 2019; Elffers, 2013; Engels et al., 2016; Rodríguez et al., 2019; Yin, 2018). Mixed methods using a self-report survey combined with a focus group (Egelandsdal et al., 2017) have also been done.

Emotional engagement. Emotional engagement is the excitement/feelings one has about their learning and the institution they attend (Lam et al., 2018). For students to be successful in their educational endeavors, it becomes important for them to become invested, engaged, and have a sense of belonging (Ulmanen, Soini, Pietarinen, & Pyhältö, 2016). Emotional engagement is an individual's impression of him/herself and how he/she sense, think, and believe in their educational experiences (Bruce, Omne-Pontã N, & Gustavsson, 2010). Because of this impression of self, social relationships become important in emotional engagement and will decrease in students when they are not accepted by their peers (Danneel et al., 2019). Emotional engagement is more in line with shared values and maintaining long-term interactions in the development of norms (Brinck, 2014).

Research is somewhat inconclusive on the influence of emotional engagement on student learning with multiple variables playing a part (Luo, Xie, & Lian, 2019). For example, for technology to influence emotional engagement several elements need to be present such as visual cosmetics and highly increased stimulation like those found in video games (Ninaus et al., 2019).

Previous studies in emotional engagement are a majority quantitative utilizing varying types of self-reporting questionnaires or surveys (Bruce et al., 2010; Danneel et

al., 2019; Lam et al., 2018; Luo et al., 2019; Ulmanen et al., 2016). During the research process for this literature review qualitative or mixed method studies were not uncovered. This, however, is not to say they do not exist.

Cognitive engagement. Cognitive engagement is the intellectual state in which a substantial level of work is applied to obtain the knowledge needed to understand the topic presented (Greene & Miller, 1996; Meece et al., 1988). Cognitive engagement is related to how students think about what they learn (Fuller et al., 2018). In addition, cognitive engagement is an investigation of student scholarship relative to didactic processes as well as personal attributes (Corno & Mandinach, 2009).

Research finds communication tools, such as SRT, are closely linked to student cognitive engagement but are being underutilized (Kayode, 2018). Using multifaceted interaction, advanced questioning, and effective discussion, teachers can scaffold a student's understanding influencing his/her cognitive engagement (Smart & Marshall, 2017). For example, SRT can be a tool for teachers to utilize to provide a collaborative learning environment. Utilizing sound implementation strategies paired with increased and improved dialog increases cognitive engagement in students (Joo, Andrés, & Shearer, 2014). For example, being strategic in how SRT is implemented will assist in increasing large class dialog resulting in a positive change in cognitive engagement.

Rotgans and Schmidt (2011) stated, when students know their voice will be heard it fosters a motivating effect, encouraging engagement. Since effort is a component of cognitive engagement and SRT possibly increases student effort in larger classrooms, cognitive engagement becomes an important component of this study. Cognitive

engagement can be measured through student effort, time spent on tasks, and is a common measure of motivation (Corno & Mandinach, 2009).

Student engagement becomes more important when it comes to classes with large enrollment. It is difficult to imagine how engagement can be achieved with lecture-based pedagogy and a lack of interaction in larger populated classrooms (Swap & Walter, 2015). Where learning in large classrooms includes interactive activities, SRT, and an opportunity for deeper learning students reported increased engagement and involvement in the content (Rissanen, 2018).

Being able to build rapport is also important for increasing student engagement. Large classrooms become a barrier in the building of student-teacher relationships. SRT fosters engagement, communication and increase interpersonal relationships (Shaw, Kominko, & Terrion, 2015). Being able to move students from a state of passivity to a more involved state using student response technology allows them to be seen and heard in highly populated classes, thus increasing engagement (Hourigan, 2013).

Previous studies in emotional engagement are a majority quantitative utilizing varying types of self-reporting questionnaires or surveys (Fuller et al., 2018; Kayode, 2018; Rotgans & Schmidt, 2011). Swap and Walter (2015) used a case study quantitative method to evaluate student engagement in a large course. Mixed-method approaches using online surveys, questionnaires, focus groups, and open-ended questions have been conducted (Rissanen, 2018; Shaw et al., 2015). Lastly, the qualitative method employing small group discussion and in-depth interviews have been carried out (Joo et al., 2014).

Models of Engagement

Many academics agree there is value in student engagement. The issue, however, lies in the lack of understanding the constructs of engagement (Kahu, 2013). Many researchers have crafted models of student engagement, some based on specific issues (Kahn, 2014; Thomas, 2012; Trowler, 2010), others based off of a definition of engagement (Bryson & Hardy, 2010; Trowler & Trowler, 2010; Zepke, 2015), and even more on how to measure engagement (Payne, 2019) with each seeking to gain a clearer, more robust understanding of engagement.

One such model is known as measurement modeling in which 28 benchmarks are used to analyze the linkage between the three types of engagement (Wu & Wu, 2020). This model substantiated a connection between emotional engagement and behavioral engagement but failed to directly connect emotional engagement to cognitive engagement (Wu & Wu, 2020). Another model directed toward engagement is known as the force-field model. This model is predicated on the forces influencing student engagement with each having either a positive or negative influence (Payne, 2019). In this model, a major influence on student engagement is students' ability to be flexible based on how much creativity tasks or assignments require (Kahn, 2014).

The applied model of learner engagement takes the influence of technology into account. This model considers factors from the individual, the task, and the environment and looks at how each factor interacts and leads to prolonged levels of engagement (Scornavacca, Huff, & Marshall, 2009). Teachers now need to overcome a multitude of distractions to compete for a student's attention and have wrestled with how to do so (Howard, 2015). Technology can work in one of two ways in the classroom: It can have a

negative effect or it can have a supportive role on influencing student learning (Amry, 2014; Scornavacca et al., 2009). For example, utilizing a technology that is difficult to use or not enjoyable for students can have negative effects (Aubusson, Burke, Schuck, Kearney, & Frischknecht, 2014). However, utilizing technology that is enjoyable, easy to use, and helps peak student interest can have a supporting role in learning (Florenthal, 2019).

Applied Model of Learner Engagement

For this study, the applied model of learner engagement is the most appropriate to reference. The applied model of learner engagement is formed from the interplay of individual influencing factors across three degrees of engagement: micro-level engagement, macro-level engagement, and flow (Carroll, Lindsey, Chaparro, & Winslow, 2019). Micro-level engagement is a students' involvement in a moment, activity, or learning event (Sinatra, Heddy, & Lombardi, 2015). Macro-level engagement occurs over a longer timeframe related to a task taking place prior to or after a scholastic activity, for example reviewing information (Carroll et al., 2019). The following factors provide the best connection between the applied model of learner engagement and student response technology thus providing the best opportunity to measure impact on student engagement. The factors are motivation, interest, personality, and anxiety all, of which, occur at the macro level and enjoyment and feedback, which occur at the micro level. Since flow is a measure of the physiological constructs such as cardiovascular and chemical balance of the individual, it will not be considered for this study. Three of these factors are important to this study; motivation, interest, and feedback are further discussed below.

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Motivation. Motivation is defined as an individual's vigor, disposition, interest, push to learn, work efficiently, and reach potential combined with the engagement (Martin & Lazendic, 2018). Motivation in this case is being able to relate an activity to personal goals allowing for increased autonomy and individual interest. Motivation is very personal for individuals with each having his/her own subtle differences in definition.

With planning and various tools available to them, teachers can influence a students' motivation. For example, the implementation of challenging tools and high skill tasks led to an increased attention rate and positive effect on motivation and engagement (Annetta, Minogue, Holmes, & Cheng, 2009; Sun & Hsieh, 2018). Being able to easily access technology in the classroom motivates students to become more engaged (Florenthal, 2019). Through an interactive and competitive technological platform, teachers have an influence over the learning environment and can have an influence on student motivation (Öqvist et al., 2016; Sun & Hsieh, 2018). Although teachers and technology have a vast amount of influence, the student still needs to be vested in his/her learning.

Motivation and engagement are often used interchangeably and with the subject area being taught (Martin, Mansour, & Malmberg, 2019). These variations in motivation and engagement levels have an effect on outcomes and how instructors and students respond (Martin et al., 2019). In addition, student perception toward technology, the use of technology, and the professors' implementation of technology plays a role in the attitude toward motivation and engagement (Han & Finkelstein, 2013). The technology teachers implement has to entice students and compel them to become interested and

motivated to learn (Harris, Al-Bataineh, & Al-Bataineh, 2016). Although students may not always be engaged in their learning, teachers can take steps to avoid additional disengagement.

      Interest. Interest is the constant and long-lasting fondness held by an individual/student toward a subject, topic, or circumstance (Walkington, 2013). It is an affection or sense that forms a student's focus on specific subjects (Romine et al., 2014). In addition, a student's competence in and value in a topic are connected to how interest is defined (Smit, Robin, De Toffol, & Atanasova, 2021). Interest as it relates to this study is defined as the intellectual state of experiencing a response to and concentrated attention to topics or content (Linvill, 2014).

      Student interest is an important construct as various studies have linked interest to successful learning outcomes (Hidi, Renninger, & Krapp, 2004; McDaniel, Waddill, Finstad, & Bourg, 2000; Romine et al., 2014; Schiefele, Krapp, & Winteler, 1992). Students who show more interest in a topic and are more attentive become more engaged (Hidi et al., 2004). Interest in a subject leads to enhanced data processing, understanding, and improved problem-solving (Nieswandt, 2007; Schiefele, 1991). A strong interest constitutes a personal desire to engage and re-engage with the content and leads to the discovery of knowledge and has value to the student (Ainley & Ainley, 2011). Interest-based relationships enable general knowledge to become experiences that lead to more sound learning outcomes (Walkington, 2013). Thus, interest supports learning.

      Implementing technology that students have an interest in helps them to thrive and become more engaged in their learning (Rahimi & Kim, 2019). In order for students to become interested in technology, such as SRT, there has to be a connection to ease of

use and the usefulness of the technology (Rana & Dwivedi, 2016). In general, students have an optimistic bias toward the usefulness and the ease of use associated with interactive technologies (Raes & Depaepe, 2020).

Holding student interest in large classrooms is problematic at best, utilizing SRT takes a student out of passive mode and into a more active interested mode (Velasco & Çavdar, 2013). Through proper use and implementation SRT can greatly enhance student interest (Tsai et al., 2019). Moreover, usefulness of implemented technology is a primary factor in changing student demeanor and interest toward learning (Healey et al., 2021). Lastly, perceived usefulness in relation to the student's expectation of effort influences individual interest (Durak, 2019). If the technology is not easy to use or useful students will not be interested and will not want to use it.

Feedback. Feedback is a process utilized to educate learners (Kulhavy & Stock, 1989). The structure for genuine feedback consist of authenticity, intellectual query, meaningful query, critical appraisal, and implementation of feedback (Dawson, Carless, & Lee, 2021). Traditionally, feedback is a conveyance of information from teacher to student (Ajjawi & Boud, 2017). More recently, feedback is considered a dialogue between teacher and student in order to construct knowledge (Boud & Molloy, 2013; Yang & Carless, 2013). Feedback is also the space between initial and realized learner achievement (Ramaprasad, 1983). Feedback is a tool employed to assist and motivate students in their learning (Besser & Newby, 2019). Students believe straightforward, prompt feedback or feedback received within two weeks on written assignments to be optimum (Perera, Lee, Win, Perera, & Wijesuriya, 2008)

Feedback is one of the most essential and significant factors affecting student learning outcomes (Hattie & Timperley, 2007). Unfortunately, the feedback received is not always adequate and satisfactory to the student (Ferguson, 2011). As courses increase in enrollment personal feedback diminishes due to time constraints experienced by the instructor (Pardo, Jovanovic, Dawson, Gašević, & Mirriahi, 2019). Benefits of prompt feedback include increase trust, ambition, motivation, and self-worth (Clynes & Raftery, 2008).

Due to the ease of use, both students and teachers feel feedback supplied through SRT is a viable component (Alexander, Crescini, Juskewitch, Lachman, & Pawlina, 2009). The real-time feedback provided by SRT allows teachers to ascertain what topics students are struggling with allowing for further instruction (Hooker, Denker, Summers, & Parker, 2016). Feedback provided by SRT has a favorable impact on student control and value (Buil, Catalán, & Martínez, 2016). Implementing SRT by allowing students time to answer and discuss and then providing appropriate feedback can help students to clarify and deepen their comprehension (Cooper, Downing, & Brownell, 2018).

Collaborative Learning Environment

Interactive, team conducive atmospheres get people more involved and engaged in the activity being performed (Heinrich, 2013; Zhu & Wang, 2020). Pursuant to cognitive load theory, the development of widespread knowledge along with social interaction are important components of collaborative learning (Cai & Gu, 2019). Concentrating on collective working memory and transactive activities are essential to collaboration (Kirschner, Sweller, Kirschner, & Zambrano R, 2018). Lastly, group

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learning at the university level has increased in level of importance over the last few years (Laurent & Sonia, 2019).

Collaboration

Shifting from lecture-based pedagogy to a more cooperative, synergistic, collaborative learning environment, such as case-based pedagogy, can have a positive influence on learning outcomes and engagement (Martin & Beese, 2020). Proponents of collaborative learning environments describe them as learning in which participants contribute exceptional concepts and experiences resulting in better outcomes than what would occur by operating on their own (Hathorn & Ingram, 2002). For example, an environment in which groups of students are purposely engaged in the discovery of learning and knowledge through the support of their teacher and learning materials (Popescu & Popescu, 2014) pulls students out of the everyday lecture-based atmosphere they are accustomed to.

There are six essential components of a collaborative learning environment consisting of process/practice, student effort, defined goals, tiered lessons, evaluations/support, and making sure students stay on course (Alvarez, Alarcon, & Nussbaum, 2011; Jeong & Hmelo-Silver, 2016; Trees & Jackson, 2007). Adhering to established design components can move a normally lectured-based setting toward an environment that is more collaborative.

Utilizing the essential design components becomes beneficial in practice. A collaborative learning environment foments learner accountability, autonomy, and fosters a personal, supportive environment (Ezeanyanike, 2013). In addition, tiered lessons and relevant interactions of support boost a collaborative learning environments student

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engagement (Saqr, Fors, & Tedre, 2018). For example, designing the lesson to address different levels of knowledge allowing students at varying degrees of knowledge to have voice. Lastly, shared goals have a significant multifaceted beneficial impact on learning in relationship to collaborative learning environments (Saqr et al., 2018). Combining student autonomy with purposeful, relevant lessons provides an environment with a favorable effect toward student engagement.

Collaborative learning environments must be more than interaction and discussion amongst students; there must be purpose. When it comes to the design of a collaborative learning environment, there must be an activity associated with and incorporated with the material provided (Ritter & Lemke, 2000), otherwise, it is just an activity without consideration for learning. The level of engagement and strength of the collaboration amongst students are dependent on the difficulty of the task involved (Kienle & Kienle, 2009). Through the utilization of collaborative design components, student engagement benefits from the deep learning gained from a co-operative, participatory learning environment (Ruokonen, 2013). However, collaborative learning environments are not without pedagogical issues.

Policy. Hinderances and restrictions caused by a rigid structure can have implications on learning outcomes regarding the integration of technology (Hamilton, Rosenberg, & Akcaoglu, 2016; Surry, Ensminger, & Haab, 2005). When teachers adopt more student-centered focused strategies, students use more effective learning strategies (Van Horne & Murniati, 2016). Overcoming prior experiences of both teachers and students is an implementation issue resulting in a power struggle between teacher and students with teachers believing they are losing control (Helleve, 2013). Teachers and

universities need to shift the paradigm in instituting policies, infrastructure, and attitudes that are more conducive toward student engagement.

Implementation. Collaborative environments are important when considering the implementation of innovations, such as SRT. Simply adding SRT to a lecture-based course will not increase collaboration, motivate students, or allow students voice. The environment needs to be discussion/dialog-based and allow for students to engage. Through conversations encouraged via case study pedagogy, students are motivated to discover answers and ascertain the how best to execute solutions (Kantar, 2013). The issue occurs when teachers feel they need to be in control of the environment and the learning as opposed to implementing technology that will allow the student increased voice.

Case Study Pedagogy

Utilizing case studies, or case study pedagogy, can be beneficial in getting students more involved in their learning. A case study is a multifaceted narrative of an issue that can be approached from a vast array of perspectives (Sudzina, 1997) thus allowing for increased discussion within a classroom setting. To further define case studies in terms of teaching, cases are highly elaborate, situated accounts that adequately allow for multi-layered levels of explanation and understanding (Levin, 1995). From a pedagogical standpoint, the case study allows students to apply knowledge through discussion, conceptualization, evaluation, and analyzation in an engaging manner (Kunselman & Johnson, 2004).

Engaging students in courses of little interest to them is problematic. Case studies can offer an useful format for engaging students in ways that connect with their previous

experiences and interests and allow for an increase in contribution in large classes (Hodges, 2005). Case studies allow students to draw on prior knowledge to optimize their learning and in turn shows gaps where in-depth, interactive discussion can occur (Aluko, Rana, & Burgin, 2018). In addition, utilizing a case study grants students the freedom to recognize how their experiences, feelings, and backgrounds can be of importance in discussions (Gravett, Beer, Odendaal-Kroon, & Merseth, 2017). Students tend to place worth on active involvement and become engaged at the onset of a case study discussion (Doran, Healy, McCutcheon, & O'Callaghan, 2011). Simply put, the case study gives rise to engaged learning (Gravett et al., 2017).

Previous studies indicate one issue with technology is ease of use for the student and complete buy-in at the university level (Cennamo, 1993; Skiba, 2016). What needs to occur is a maximization of student effort while reducing student challenges in overcoming the use of technology (Cennamo, 1993). It is possible for this to be achieved through the utilization of easy-to-use SRT (Christopherson, 2011) in combination with case study pedagogy to create a more collaborative learning environment. The use of SRT in combination with case study pedagogy promotes class dialogue, is exceedingly welcomed by students, and provides for more pleasant learning environment (Giacalone, 2016). In addition, utilizing a case study pedagogy with SRT gets the classroom away from and beyond the overuse of opinion polling and static assessment (Thompson, 2019).

Chapter Summary

Unfortunately, for teachers in largely populated courses of more than 50 students, there are times when students are not engaged due to the lecture-based environment. This is where utilizing the constructivist learning theories concepts of a discovery learning

(Clark, 2018) incorporated with SRT and case pedagogy lets students explore and discover their learning (Caldwell, 2007). By understanding the factors that influence engagement we gain consistency in learning across university campuses (Christopherson, 2011). Utilizing collaborative learning and becoming partners with students we allow them to be reflective and have a voice in their learning, thus shifting away from lecture-based pedagogy (Martin & Beese, 2020). In addition, by adding case studies students are able to make connections with their interests and experiences through real situations (Hodges, 2005).

To maintain engagement in classrooms, it becomes important to challenge students to provide them meaning and purpose pertaining to their studies (Balta & Tzafilkou, 2018). Furthermore, teachers who utilize the tools, the techniques, and the concepts available to them have the capability of maintaining a high level of influence over student motivation and engagement (Robbins & Butler, 2009). Additionally, providing an atmosphere in which students have the freedom to utilize their voice in their learning lends itself to a more engaged environment (Heinrich, 2013). Thus, implementing SRT and case pedagogy may take the learning environment to a place of increased engagement.

CHAPTER 3

METHOD

The purpose of this action research was to determine if utilizing a combination of student response technology and case pedagogy in a largely populated undergraduate course at Michigan State University would have an influence on student learning and engagement.

The research questions to address this purpose statement are:

1. How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence student motivation?
2. How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence cognitive, emotional, and behavioral engagement?
3. How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence feedback?
4. What are the effects of SRT and case studies on student learning with applications of leadership, strategic planning, partnership, and the importance of human capital?

Research Design

A multitude of studies have prioritized the issue of increasing student engagement in education (Collaço, 2017; Gerholz, Backhaus, & Rameder, 2018; Witkowski &

Cornell, 2017; Saito & Smith, 2017). Educators are aware of the significance of student engagement and of the realization there are uninvolved, unmotivated, disengaged students (Appleton, Christenson, & Furlong, 2008). Understanding how technology influences student engagement lends itself well to action research.

Action research is an orderly investigation carried out by professionals, such as teachers, with a keen interest in the improvement of classroom excellence and performance (Mertler, 2017). The importance of this research lends itself to pinpointing a problem, which in turn leads to the betterment of instructional procedure. These two aspects lead directly into action research. Action research is appropriate in the case of this research as it permits the collection of data in a comfortable, natural setting providing for a more focused and collaborative study. More so, it will enable me to investigate the problem, fact find, and take action by formulating a strategy that adheres with my current teaching environment (Yasmeen, 2008). Traditional research, on the other hand, is usually practiced by researchers not normally deeply seated in the habitat they are researching (Mertler, 2017).

Action research aims to achieve a benefit of all and is often a collaborative, group effort to effectuate change (Cain, 2008). Action research takes commitment, enthusiasm, and mettle because it is about change and the recognition that change needs to happen (Rowell, Polush, Riel, & Bruewer, 2015). The research is framed as a cyclical examination of a problem, analysis, plan, intervention, and finally a diagnosis of results in which the researcher has an active, participatory role (Cassell & Johnson, 2006).

Action research provides the opportunity to gain a greater understanding of students in terms of engagement. Action research, being collaborative in nature, is

beneficial to this research because the process creates the ability to identify issues, conduct the inquiry, build collaborative strength, and interpret and propagate results to create direct action (Blair & Minkler, 2009). Action research creates a culture of learning for the students (Cain, 2008). Another advantage to using action research for this study is it allows for the possibility of solving a classroom issue, leading to increased student engagement, motivation, and achievement (Mitchell, Reilly, & Logue, 2009).

Convergent mixed method design was the concurrent collection of qualitative and quantitative data continuously throughout the study cycle with the purpose of disseminating a complete investigation of the issue (Alwashmi, Hawboldt, Davis, & Fetters, 2019) thus aligning with the practical approach of this research. In addition, integrating qualitative and quantitative types of data informed, refined, and validated the study's findings (Fetters, Curry, & Creswell, 2013).

Qualitative and quantitative data were collected so each could inform and refine the other and allow for a total comprehension of the results. A parallel track approach was taken during analysis in which each set of data was analyzed independently of each other and then combined once results were ascertained from each (Hatta et al., 2018). A plan conducive to merging both sets of data was developed to ensure a thorough, in-depth understanding of the results (Fetters et al., 2013). The combination of the two methods provides confirmation, significance, and rigor concerning the study's results.

<center>**Setting and Participants**</center>

Setting

Most classrooms at Michigan State University are what would be considered the stereotypical classroom makeup with chairs structured in rows and able to handle up to

<center>35</center>

50 students. Under normal conditions, the classroom for this study would be a lecture hall style due to a total seating capacity of 300 for the room. The room would have had tiered rows of fixed seating with pull up/drop down small desktops. Located at the front right of the room would be a lectern and an information technology cart consisting of an overhead projector, computer system, audio system with a microphone input, and control panel for an overhead projection system with drop down screen. On the front wall would sit multiple sliding blackboards and whiteboards.

Due to COVID-19 protocols, the setting was forced to a hybrid-flex format in which students had the option to be face-to-face with the instructor in a lecture hall as described above or participate asynchronously using a Zoom pro account if they chose. Zoom pro account meeting rooms accommodated 300 participants. Zoom allowed for online voice and internet meetings in which two or more people could meet and communicate virtually. Meetings occurred via the Zoom application and were initiated and shared out by anyone involved in the meeting. Participants were able to join Zoom meetings one of two ways, either by phone or with a webcam.

The typical class session, when introducing a topic, was mainly lecture based with the integration of Microsoft PowerPoint for visuals. During days when case studies were presented, the class session was discussion based with two-way conversation between students and instructor. Seating was bolted to the floor making it difficult for students to move around the room for small group discussion. The overall content of the course was focused on critical skills needed to effectively manage a human service organization. Topics included elements of strategic planning, leadership, marketing, grant writing, technology, and fundraising.

Throughout my initial course development, I strived to influence student engagement by trying to pull discussion from them. In prior courses I have evolved from lectures to discussion lectures into case studies. Although each move has influenced student engagement to a certain extent, I acknowledged there are still many students who do not engage, and their voices are not being heard.

Participants

Students selected for this study were working toward a minor concentration in Human Behavior and Social Services and enrolled in the Management of Human Services capstone course. Many of the students enrolled in the course have majors concentrated in psychology, human development and family studies, and child development. Because of this, demographically, enrollment in the course was heavily female at 98% with 2% being male (MSU RO, 2019).

Students were selected via purposive sampling. Purposive, or purposeful sampling is an approach used in qualitative research to identify and choose data-rich instances for the greatest efficiency of minimal resources (Palinkas et al., 2013). All students participating in the study were enrolled in Human Development and Family Studies 447 Management of Human Services. A total of 100 students began the study. A total of 56 students finished the study by completing all of the data collection. Due to the complexity of the hybrid-flex environment and to have better control over the study, only students who were participating in the course setting participated in the study as part of the course requirement. The requirement was stated as such in the course syllabus. To gather a representative sample, student selection for the interview portion of the study was as follows: Two of the highest performers based on grades, two of the lowest performers

based on grades, two students who utilize SRT the most, and two students who utilize SRT the least were selected.

The primary source of information was the students, but students and site are equally critical in this study. The students were in a position in which they were able to compare their experiences to other courses they have taken or are currently enrolled in. The site was critical because the study was about engagement of students enrolled in overpopulated classes at a large university.

Innovation

The innovation of this action research was to determine if utilizing student response technology in an undergraduate collaborative learning environment at Michigan State University (MSU) has an influence on student engagement. For this study, I used the Acadly (https://www.acadly.com) application for the SRT. Acadly is an online collaborative tool that allows students to have increased participation, communication, and engagement. Acadly allows for automatic attendance, recording the attendance status for all students logged in in less than a couple of minutes, thus helping students to maintain a sense of self-awareness concerning their attendance record. Acadly provided for real-time polling with options including timers, not allowing late responses, anonymity, and the ability to pull reports to provide credit. In addition, the technology offered the ability to initiate and incentivize text-based discussion anytime pertaining to any topic being presented with the bonus of being able to share content such as video and Microsoft Power Point files. Utilizing an interactive approach, students collaborated, engaged, analyzed, applied, and connected in the completion of multiple case study discussions with the incorporation of Acadly student response technology.

Students were then guided through a 4-week series of topics and case studies pertaining to management of non-profit organizations in which in-depth discussion took place both orally and using Acadly response technology. To access Acadly, students were provided a course specific access code. Students created an account and accessed Acadly through either their personal computers or via a cell phone application. To participate via Acadly in course discussions, students needed to be logged into their Acadly accounts. Students were able to type out their responses to questions posed and submit them in real time when needed during live class sessions. The same concept occurred when case studies were utilized. For visual assistance, questions were posted on Acadly and projected on a screen in the front of the class and on Zoom. Utilizing Acadly along with the case study method allowed students who may not have the opportunity to be heard due to the large classroom population to have a voice and have an impact on the discussion taking place.

Justification for the innovation. The utilization of Acadly combined with case studies was chosen for the freedom it allowed for open discussion and thought within a classroom format. In return, SRT supported and fostered the dissemination of information, collective writing, and real time communication (Chu & Kennedy, 2011). Furthermore, case studies allowed students to relate new topics to realistic circumstances and in combination with Acadly opened the classroom up to stimulating student conversation (Greenawalt, 1994).

To properly measure engagement, the model of learner engagement constructs must connect with both the innovation component and engagement components. Students who consistently show interest and effort in their learning outcomes are more conscious

of their own achievements leading to enhanced engagement (Maguire et al., 2016; Steinmayr, Weidinger, & Wigfield, 2018). Utilizing quiz style questions and discussion questions in which students respond through SRT maintains student interest thus impacting engagement (Cain, Black, & Rohr, 2009; Dhaliwal, Allen, Kang, Bates, & Hodge, 2015). Furthermore, case study discussions with SRT leads to more active learning environments increasing interest and effort having influence on student engagement (Doucet, Vrins, & Harvey, 2009).

Individual factors. I enhanced motivation using polls, quizzes, case studies, and discussion to influence interest, effort, and achievement. I influenced interest by using discussion and case studies to impact approach, knowledge, and achievement. I influenced student personality using polls, quizzes, and artifacts to enhance attitude, commitment, interest, effort, approach, confidence, and achievement. I supported self-efficacy utilizing polls, quizzes, and case studies to influence attitude and achievement.

Task factors. I challenged students using case studies, quizzes, and assigning an artifact influencing time on task, participation, understanding, and connection. I provided enjoyment by using discussion and case studies to enhance participation and focus. Meaningfulness was gained by utilizing discussion, case studies, and assigned artifact to impact participation, immersion, and interest. Appropriate feedback was provided regarding discussion, case studies, and written artifacts influencing immersion, focus, and commitment. Table 3.1 shows the relationship between the model of learner engagement constructs, innovation components, engagement components.

Table 3.1 *Model constructs, innovation, and engagement components*

Model of learner engagement component	Innovation component	Engagement components			Reference
		Cognitive	Behavioral	Emotion	
Individual Factors					
Motivation	Polls and quizzes Case Study Discussion	Achievement	Effort	Interest	Maguire 2016, Steinmayr 2018, Cain 2009, Dhaliwal 2015, Doucet 2009
Interest	Discussion Case Study	Knowledge Achievement	Approach	Interest	Heaslip 2013, Barr 2017
Self-Efficacy	Polls and quizzes, Case Study	Achievement		Attitude	Maguire 2016
Task Factors					
Challenge	Case Study, Artifact, Quizzes	Understanding, Connection	Time on task, participation		Witkowski 2015
Enjoyment	Discussion, Case Study	Focus	Participation		Heaslip 2013
Meaningfulness	Discussion Case Study, Artifact	Immersion	Participation	Interest	Barr 2017
Feedback	Artifact, Case study, Discussion	Focus, Immersion	Time on task Accomplishment	Commit	Hughes 2020

Weekly Topics

Overview. The implementation of the study included four weeks of lecture and

case studies on four individual topics. Each week of the study consisted of two class

periods, each lasting an hour and twenty minutes in length. Figure 1 shows a general flow

of the weekly session.

Start
- Introduction of topic - lecture based
  - Key terms
    - Acadly quiz
  - Critical skills and competencies
- Pertinent questions
- Class discussion
  - Dialogue - Acadly

- Introduction of topical Case Study
  - Read study
  - Collect thoughts
- Thought provoking question
- Class discussion
  - Dialogue - Acadly

End
- Instructor Explanation
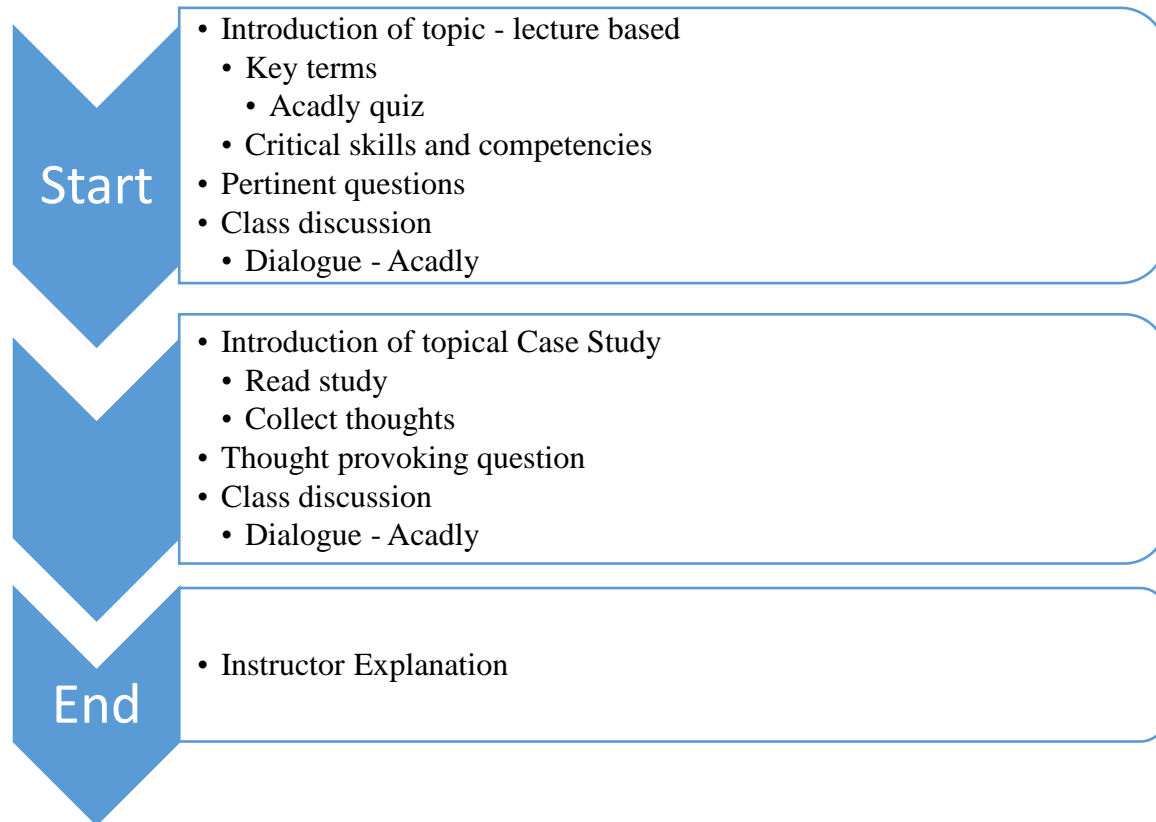
Figure 3.1 *Flowchart of SRT session (Note:* This figure demonstrates the flow of the
innovation between instructor and student for a two-session week.)

The typical two session week consisted of a session of new topic introduction via

a lecture/discussion style format. Key terms were defined. Critical skills and

competencies were introduced, and important do's and don'ts were discussed. Pertinent

questions were posed to students to create and generate topical dialogue. New topics were

added to the student's base knowledge to get them to think about how their past experiences applied.

The second session of the week consisted of case study discussion. Students were presented a case study relevant to the topic discussed in the first session of the week. They were given five to ten minutes to log into their Acadly accounts, read the study, and collect their thoughts. I led off the discussion by posing a thought-provoking question such as "based on our previous discussion do you think the decision made was justified?" Students answered either orally or using Acadly's discussion/chat application. My teaching assistant and I monitored the Acadly platform and added to the oral discussion by relaying student input. In addition, students drew on their experiences and applied them to the case study. Lastly, I provided ad final explanation and concluded the case study discussion session.

The purpose of utilizing Acadly for the case study is to allow students choice, voice, and the ability to take their time and reflect on the assigned tasks. Student voice and choice is encouraged through Acadly via word clouds, student feedback, remote participation, and discussion boards. Student's ability to take time and reflect is supported through note sharing, lecture summaries, and being able to access content any time of day or night through the app.

Week One

Lecture: Thriving as an executive director. Students were introduced to the topic of leadership within nonprofit organizations and the difference compared to managers. The first task to take place was the good, the bad, and the ugly. Students were asked to think about past and present instructors and respond with the

reasons/characteristics that made them good teachers. Next, students were asked to think about teachers they have had or currently have and respond with what reasons/characteristics they feel made them bad teachers. Lastly, students were asked the ugly question of what is the worst thing you have ever heard or have seen a teacher say or do? Students had the choice of responding orally or via Acadly for each of these questions allowing for voice and choice. After this exercise, lecture continued with students learning about the critical skills of effective leadership and how the characteristics they brought up during the discussion apply. During the lecture session Acadly was used to create a word cloud of leadership characteristics. Students were only allowed to answer by using Acadly.

  Case study. "Congruity or Walking Your Talk" by C. Kenneth Meyer and Robert Wood (Kiser, 2015). The case study was based on an executive director's sole decision pertaining to purchasing goods per his personal beliefs on women's reproductive rights and abortion. Questions asked of the students were:

- How do you personally assess the adequacy of the decision-making process that was used by the executive director to stop all procurement of goods and services associated with foundations that supported women's reproductive rights?

- Elaborate on the strengths and deficiencies associated with his judgement.

- To what extent does his directive violate the constitutional rights and employment rights of those who work in his organization? If yes, in what ways? If no, why not?

The questions above were asked aloud in class, posted on Acadly, and projected on the screen in front of the class and via Zoom. Students had a choice in how they responded, either orally or via Acadly. Discussion continued through the completion of all questions. After all questions had been discussed I debriefed the class and provided further explanation on how the discussion aligned with the current topic.

Week Two

Lecture: Strategic planning. Lecture introduced the seven phases of strategic planning as laid out by the textbook to give students an understanding of what strategic planning looks like. Components included articulating mission, vision, and values along with the ability to assess your situation. In addition, critical skills such as understanding environment, partnership strategies, defining impact, potential funding, and the ability to identify questions needed to be addressed were discussed. During the lecture session Acadly was used to present quiz questions. Students were only able to answer the quiz questions by using Acadly.

To apply the information students were asked the following: How do we grow an organization to serve three new counties with two years? How does an organization provide services in a third language to meet the needs of a changing demographic in our region? And how do we diversify our income by securing support from foundations and individual donors? During this discussion questions were read out loud, projected on the screen in the front of the class, and posted on Acadly and Zoom. Students had a choice of responding orally or via the Acadly app.

Case study. "When the Disease Hits Home." By Carole Sipfle and C. Kenneth Meyer (Kiser, 2015). This case study is about making a managerial decision based on a

lifelong employee dedicated to his organization and position having dementia. The organization does not have a strategic plan in place to deal with such matters. Students were asked the following upon reviewing the case:

- Identify any major administrative or policy issues you see and what could be done to alleviate them?

- Was the employee treated fairly and in a legal and ethical manner?

- What would you have done differently if dealing with a similar situation?

The questions above were asked out loud in class, posted on Acadly, and projected on the screen in front of the class and via Zoom. Students had a choice in how they would like to respond, either orally or via Acadly. Discussion continued through the completion of all questions. After all questions had been discussed I debriefed the class and provided further explanation on how the discussion aligns with the current topic.

Week Three

Lecture: **Nonprofit partnerships: Collaboration and alliances**. Students were introduced to this topic by gaining an understanding of critical skills and competencies and how they apply to the fifteen forms of collaboration available to nonprofit organizations. Students were asked what the key challenges or critical issues are facing organizations. Acadly word cloud and quiz options was used during the critical skills, competencies, and application portion of the lecture. Students had to use Acadly to answer. Students were then asked:

- What do they believe to be the potential reaction of funders to a partnership?

- Can they think of any red flags that would prevent them from partnering with an organization?

The questions above were asked out loud in class, posted on Acadly, and projected on the screen in front of the class and via Zoom. Students had a choice in how they would like to respond, either orally or via Acadly. Discussion continued through the completion of all questions. After all questions were discussed, I debriefed the class and provided further explanation on how the discussion aligns with the current topic.

Case study. "What Should it Be? CEO or Executive Director" by Angela Moody, C. Kenneth Meyer, and Garry Frank (Kiser, 2015). Students were required to think back to the previous lectures on leadership and strategic planning by diving into succession plans and how leaders feel about titles. Students were asked:

- If they were selected as the head of a nonprofit organization, what title would they prefer and why?

- Do you believe the board presidents rationale pertaining to titles is appropriate?

- What major implications do you see, if any, with changes to official titles?

The questions above were asked out loud in class, posted on Acadly, and projected on the screen in front of the class and via Zoom. Students had a choice in how they would like to respond, either orally or via Acadly. Discussion continued through the completion of all questions. After all questions had been discussed I debriefed the class and provided further explanation on how the discussion aligns with the current topic.

Week Four.

  Lecture: **Attracting and hiring staff**. Students were introduced to how important human capital is to nonprofit organizations. They discovered the must-have strategy, how to implement an effective hiring process, how to attract great people, and how to screen candidates for quality through the interview process. Students were asked how they can be thoughtful and thorough in the hiring process. How can bias be minimized and how can the allow candidates multiple opportunities to demonstrate their abilities and qualities. The questions stated were asked out loud in class, posted on Acadly, and projected on the screen in front of the class and via Zoom. Students had a choice in how they would like to respond, either orally or via Acadly. Discussion continued through the completion of all questions. After all questions were discussed, I debriefed the class and provided further explanation on how the discussion aligns with the current topic.

  Case study. "Representative Bureaucracy: Does That Apply to Us?" by Benjamin S. Bingle and C. Kenneth Meyer (Kiser, 2015). The case study pertained to a predominately white male organization facing the changing dynamic of their client demographic in which the organization's employees really do not represent. Students were asked:

- How can you recognize the changing demographic sooner?

- What strategies/techniques can the use to attract a more representative workforce?

- What responsibility do nonprofit leaders have, if any, to hiring a diverse workforce?

The questions above were asked out loud in class, posted on Acadly, and projected on the screen in front of the class and via Zoom. Students had a choice in how they would like to respond, either orally or via Acadly. Discussion continued through the completion of all questions. After all questions were discussed, I debriefed the class and provided further explanation on how the discussion aligns with the current topic.

Data Collection

Multiple data collection methods were utilized to investigate the intended research questions. The methods utilized were interviews, formative assessments, and quantitative surveys. Measures were taken to protect participant identity and confidentiality. Table 3.2 shows the data collection method in relationship to each research question.

Table 3.2 *Research Question and Data Sources*

Research question	Data collection methods
RQ1: How and to what extent does incorporating SRT and case studies in a largely populated course at MSU influence student motivation?	• Interviews • Artifacts • Formative assessment
RQ2: How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence cognitive, emotional, and behavioral engagement?	• SCEQ
RQ3: How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence feedback?	• Interviews • Artifacts • Formative assessment
RQ4: What are the effects of SRT on student learning with applications of leadership, strategic planning, partnership, and the importance of human capital learning?	• Learning assessment

Interviews. IRB approval was obtained from the University of South Carolina to conduct interviews with participants (See Appendix A). Interviews consisted of open-ended questions. Interviews were scheduled at an appropriate time agreed upon. The interviews were approximately thirty minutes in length and were recorded. Although every effort was made to interview selected participants face-to-face COVID-19 restrictions prevented this. In the case of COVID-19 restrictions interviews were conducted face-to-face via Zoom. The benefit of the open-ended interview format allowed for students to take the time to reflect, while minimizing the interviewer-interviewee ranking (Wolgemuth et al., 2015). Taking a constructivist approach to the interview, the interview can be centered on the student and becomes more collaborative in nature (Wolgemuth et al., 2015). Having a recorded open-ended interview format eliminated possible transcription errors and allowed for the capture of accurate student responses. Recording responses also eliminated the contamination of the data by the interviewer through improper contribution (Hoffmann, 2007). When collection of qualitative interview data was complete, it was reviewed, and students were contacted for additional clarification when needed.

Aside from select demographic questions, interview questions were aligned with the research questions (See Appendix B). Sample questions included: (1) Tell me of a time when you felt motivated in a course? and (2) Can you give me an example of when you felt motivated in our course?

Individual interviews were conducted at the conclusion of the four-week study. Interviews were video recorded via Zoom and were between 15 to 25 minutes long

depending on the participants' responses. The Zoom mp4 video file was uploaded to Camtasia so closed captioning could be added. While wearing headphones, segments of each video were looped to accurately capture participant voices and transcribed manually into Camtasia's closed captioning format. Once transcription was completed, the file was saved as a text document and imported into Delve tool for analysis.

      Artifacts. It is important to get an accurate accounting of participant perception in relation to Acadly's effect on their motivation, interest, enjoyment, personality, anxiety, and feedback. An artifact in the form of a written reflection assignment does just that. By having participants put thoughts to word through a written assignment may provide richer data through their feedback as opposed to oral responses (Bahn & Weatherill, 2012). Utilizing a written reflective assignment also allows participants to explore the process and their experiences within the classroom and the impact it has on their learning (Edwards & I'Anson, 2020). Lastly, reflection leads the participant to recollection, self-assessment, and refocusing of their experience leading to valid feedback (Jones et al., 2019). For this study, participants completed a three- to five-page written reflection assignment. The assignment was designed to align with the research questions (See Appendix C). The reflection artifact provided additional supporting data written and verified by the participant.

      At the end of the study, participants were required to submit a written reflection paper. Each artifact was submitted to Michigan State University's Desire2learn (D2L) learning platform and saved via the online format. Each artifact submitted in a Microsoft Word file format was imported into Delve tool for analysis. The written artifacts were used to enhance the qualitative data.

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Informal discussion and field notes. Formative evaluation was conducted via informal discussion and occurred on a weekly basis throughout the study during weekly in-class sessions. The students benefitted from these formative assessments by being able to discuss their positive or negative feelings toward the study and its components. The informal discussions allowed for a deeper understanding of research being done.

As stated above, the evaluation was conducted via informal discussion during weekly class sessions. Students were asked questions such as, how do you feel about using Acadly? Do you think using Acadly is helping you or hindering you? Clarification of answers was asked for when needed. Field notes were taken at the time of the informal discussion.

My purpose for gathering the formative evaluation data was to assure participants were not being demotivated using SRT in class. Field notes were utilized to capture my thoughts and the results of the informal two-question survey. I wrote a brief description of how I felt the use of SRT was going and if participants seemed to be engaged with the tool. In addition, I kept track of the percentage of participants who stated they were engaged and were receiving feedback. I monitored the percentages to make sure there were no major declines. I added observer comments to explain the behavior of the participants each week. Weekly field notes were transcribed into a single Microsoft Word document. The original entries were retained for reference if questions arise.

Student Course Engagement Questionnaire (SCEQ). The SCEQ (see Appendix D) was a quantitative research-based questionnaire incorporating 23 behaviors and attitudes indicative of engagement (Mitchell, William, Nora, & Annette,2005). Nine items within the questionnaire pertained to cognitive engagement, five items pertained to

emotional engagement, and nine items addressed behavioral engagement. The alignment

of each SCEQ item to type of engagement is shown in Table 3.3.

Table 3.3 *SCEQ Item to Type of Engagement Alignment*

Type of Engagement	Item	
Cognitive	1. Making sure to study on a regular basis 2. Putting forth the effort 3. Doing all the homework 4. Staying up on the readings 5. Looking over class notes between classes to make sure I understand the material 6. Being organized 7. Taking good notes in class 8. Listening carefully in class 9. Coming to class every day	
Emotional		1. Finding ways to make the course material relevant to my life 2. Applying course material to my life 3. Finding ways to make the course interesting to me 4. Thinking about the course between class meetings

Type of Engagement	Item
	5. Really desiring to learn the material
Behavioral	1. Raising my hand in class
	2. Asking questions when I don't understand the instructor
	3. Having fun in class
	4. Participating actively in small-group discussion
	5. Going to the professor's office hours to review assignments or tests or to ask questions
	6. Helping fellow students

All students registered in the course were asked complete a pre- and post- SCEQ. Each survey consisted of the main question: "To what extent do the following behaviors, thoughts, and feelings describe you?". The following scale was available for each item: 1 = *not at all characteristic of me*, 2 = *not really characteristic of me*, 3 = *moderately characteristic of me*, 4 = *characteristic of me*, 5 = *very characteristic of me*. No reliability information has been established for this instrument. Internal reliability was conducted utilizing Cronbach's Alpha and reported later in Chapter 4.

Learning assessment. The learning assessment (see Appendix E) was self-designed to assess students' content knowledge regarding managerial skills pertaining to

leadership, strategic planning, partnerships, and the importance of human capital. The learning assessment was administered once before students received instruction on the topics and then after instruction for a pretest-posttest result. The assessment included eight multiple-choice items with between three to five answer selections. Two example items were: (1) What is not true regarding what current research shows about nonprofit organization executive directors? and (2) What is the goal of strategic planning? To check validity, two content experts from MSU reviewed the assessment, provided feedback, and verified each assessment question. Each item of the assessment aligned with the instructional portion of the innovation. Table 3.4 shows the alignment of assessment items with the managerial skills.

Table 3.4   *Alignment of Assessment Items with Managerial Skills*

Managerial Skill	Assessment Item
Leadership	1,3,4,5
Strategic Planning	2,8,9,16,17,18
Partnership	11,13,20
Importance of Human Capital	10,12,14,15,19,21

Data Analysis

Mixed method analysis pulls from the strengths of both qualitative and quantitative processes (Fetters et al., 2013). Each process within mixed method analysis contributes and complements each component of the method (Doherty, Carcary, Ramsey, & Ibbotson, 2015). In this mixed method study, data were examined in two segments. Qualitative results are presented in the first segment with quantitative results following in

the second segment. To ensure reliability and validity, qualitative and quantitative data were triangulated (Creswell, 2014). A full description of the data analysis process for each type of data is provided later in Chapter 4. Table 3.5 summarizes the alignment between the research questions, data sources, and methods of analysis.

Table 3.5 *Research Questions, Data Sources and Methods of Analysis*

Research Questions	Data Sources	Methods of Analysis
RQ1: How and to what extent does incorporating SRT and case studies in a largely populated course at MSU influence student motivation?	Artifact Participant Interviews Informal Discussion	Inductive thematic analysis Inductive thematic analysis
RQ2: How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence cognitive, emotional, and behavioral engagement?	SCEQ Questionnaire	Paired-sample *t*-tests Wilcoxon-Signed ranks tests
RQ3: How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence feedback?	Artifact Participant Interviews Informal Discussion	Inductive thematic analysis Inductive thematic analysis
RQ4: What are the effects of SRT and case studies on student learning with applications of leadership, strategic planning, partnership, and the importance of human capital learning?	Learning assessment	Paired-sample *t*-tests Wilcoxon-Signed ranks tests

Qualitative Data

      Interviews. Qualitative analysis is the process of narrowing data by compacting it into visible, measurable codes or themes (Marvasti, 2019). In addition, the focus is on mining themes from the available data (Cho & Lee, 2014). This is also considered inductive analysis in which the researcher is attempting to reduce the amount of information at hand (Mertler, 2017). The analysis of qualitative content consist of three distinct phases: planning/prepping, organization, and the dissemination of findings (Elo et al., 2014).

      The process of analysis began with the interview process in which data were gathered via written or face-to-face sessions. Participants were asked open ended questions. Answers were recorded and then transcribed to a Microsoft Word document. To further categorize the data, the transcription was coded via the use of Delve Tools to organize and discover themes and specific patterns. A researcher developed coding scheme was created for the clustering of data (Mertler, 2017). The coding scheme was based on grounded coding in which categories and themes develop during the coding process (Hernandez, 2009). Once the transcribed word document was completely coded, the Delve Tools program was used to create an organized table of the data. Each piece of data was placed into the table with the selected data put into a column labeled comment scope. The code utilized was listed in the next column labeled comment text. Columns labeled author and date will complete the table. Delve Tools groups data by coded text. For example, all data coded *benefit* is grouped together making it easier for the researcher to see themes develop. A final coding step was performed combing similar codes together to propagate each of the final themes.

Artifacts. At the end of the four-week study, students were required to write a reflection paper discussing their experiences and interactions with Acadly. Being able to measure an individual's motivation, interest and enjoyment, personality, and anxiety, along with thoughts and reflection they have spent on a task is a daunting task. In the case of this study, having participants express their views in written form allows for richer data that may not be obtained through the typical interactive interview (Bahn & Weatherill, 2012). Utilizing a reflective written assignment permits participants to gain additional self-awareness and further recognize their personal experience (Ilcewicz, Poirier, & Pailden, 2018). In addition, artifacts such as this reflective written assignment enable participants to check, examine, and edit their documents thus instantly validating the data (Harricharan & Bhopal, 2014). Participants were provided with open-ended prompts in order to align with the research questions.

Each artifact was coded via the use Delve Tools to organize and discover themes and specific patterns. The coding scheme utilized will be the same process as stated under qualitative data above. Once again, the Delve Tools program was used to create an organized table. The table format will be an exact duplicate of the table described above. Lastly, a final coding step was performed to combine similar codes to finalize themes.

Quantitative Data

The research base SCEQ utilizing a scale from one to five produced the pre- and post- data pertaining to questions one thru four of this study. The range of possible scores are from 20 to 100. The questionnaire addresses the following constructs: achievement, interest, effort, confidence, understanding, concentration, commitment, and attitude. I utilized a paired sample *t*-test to analyze the statistical effectiveness regarding observed

differences to the stated variables above. An alpha level of 0.05 was used as the threshold for statistical significance. Cronbach's alpha was calculated to assure internal consistency.

A nine-question researcher developed learning assessment produced the data pertaining to question five of this study. The range of possible scores are from zero to nine. I utilized a paired sample t-test to analyze the statistical effectiveness regarding observed differences in student learning pertaining to leadership, strategic planning, partnerships, and human capital. An alpha level of 0.05 was used as the threshold for statistical significance. Cronbach's alpha was calculated to assure internal consistency.

Rigor and Trustworthiness

I took a serious approach to the integrity of the rigor and trustworthiness of the research to establish credibility. Credibility can be connected to trustworthiness when readers see the researcher's descriptive narrative as if it were their own experience (Chiovitti & Piran, 2003). In addition to the quantitative procedures for validity and reliability mentioned in the Data Collection section, four additional procedures were adopted to strengthen rigor and trustworthiness. The four additional procedures are peer debriefing, audit trail, member checking, and triangulation.

Peer Debriefing

The intent of peer review is to avoid prejudice and assist in the development of the study (Morse, 2015). This is achieved through equitable, clear, encouraging, and caring review designed to educate (Le Sueur et al., 2020). Utilizing this method allowed me to gain additional insight for my research from others with more experience. My dissertation chair has been the main constituent for peer debriefing providing guidance

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throughout the writing and study process. I invited colleagues of mine at Michigan State University to provide review and critiques of my research prior to defense. However, I fully realize that even though I will receive the professional opinion of others, the end results of the study are my responsibility (Morse, 2015).

Audit Trail

An audit trail is an additional approach for obtaining trust in qualitative research; it is a detailed account from beginning to end of the method/process taken to conduct the study and includes all decisions and details for the overall process (Barusch, Gringeri, & George, 2011). I utilized a digital database to preserve an audit trail. All instruments and collected data were stored in the database and accessible for auditing. My researcher's journal for decisions about combining codes was kept in a lock file cabinet in my office at Michigan State University and was made available for auditing.

Member Checking

The circumstances in this case are directed toward interaction with the students of the study to gain insight into their point of view (Johnson, Douglas, Bigby, & Iacono, 2011). Member checking allows for a higher level of credibility and allows for an increase in understanding of the problem (Johnson et al., 2011). After finalizing data analysis, findings will be presented orally or emailed to each participant of the study. This will allow participants to ruminate, verify, and provide additional clarification if needed. By actively engaging participants potential researcher bias may be reduced (Birt, Scott, Cavers, Campbell, & Walter, 2016).

Triangulation

Triangulation is the collection of data using various methods such as interviews, audit trails, and artifacts in an attempt to suppress vulnerabilities or prejudice (Tuckett, 2005). This study used methodological triangulation by combining various data sources in the consideration and development of themes. Doing so gives viability to research findings through data collection method descriptions, descriptions of data integration, and comparison of study results (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014). I accomplished triangulation by combining the data collection methods of interviews, observation, formative assessments, and quantitative pre-/post-test surveys.

<div align="center">

Procedures

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This study took place over four stages. The procedure adhered to the following timeframe. Stage 1 – Overview. Stage 2 – Participant selection. Stage 3 –Data collection. Stage 4 – Data analysis. Each stage is described in further detail below along with table 3.6 showing the details and timeline of each stage.

Table 3.6 *Procedures and Timeline*

Stage	Action	Time Frame
Stage 1: Overview	1. Synopsis of study 2. Technology overview 3. Learning assessment pre	1 week
Stage 2: Participant Selection	1. Discern participants 2. Email consent forms to all students in course 3. Receive and review consent form 4. Schedule interview times	2 weeks

Stage	Action	Time Frame
Stage 3: Data Collection	1. Conduct pre-quantitative survey 2. Weekly topic introduction and discussion 3. Weekly case study analysis, application, and discussion 4. Formative assessment field note collection 5. Interview participants 6. Conduct post-quantitative survey 7. Learning assessment post 8. Artifact – Reflection paper	4 weeks
Stage 4: Data Analysis	1. Interview transcription analysis 2. Qualitative open coding 3. Constant comparative method 4. External auditor 5. Formative assessment analysis 6. Repeated measures t-test 7. Member checking 8. Share analysis	15 weeks

This study took place during the regular scheduled class time of my Management of Human Services course. I provided a brief synopsis of the study and instructed the class on the use of the technology.

All 200 students enrolled in my Management of Human Services course were required per the course syllabus to participate in the study. In addition, I had a clause in the class syllabus stating by taking the class they were opting into the study and were providing consent to be interviewed. However, participation was strictly on a volunteer basis and students could opt out at any given time. Once consent was received, students received additional information regarding the study and any technology issues were addressed.

Stage 3: Data Collection

A quantitative presurvey utilizing a five-point Likert scale and the learning assessment were given to participants at the beginning of the study. Following the completion of the quantitative presurvey and the learning assessment, I met with participants during the scheduled course time twice a week for four weeks on Tuesdays and Thursdays. Tuesdays were set aside for new topic lecture and discussion. On Thursdays, participants were presented with a case study in which they applied their new knowledge, analyze, and discuss both orally and via SRT. At the conclusion of the four weeks of topic and case study discussion, eight students were selected to be interviewed. Interviews were conducted via video conferencing face-to-face. Interviews lasted approximately 30 to 45 minutes. Interviews were recorded, and I took notes. Formative assessments were conducted weekly in which informal questions were asked and field notes taken to collect real time descriptive data. A post quantitative survey utilizing a five-point Likert scale was given to participants in the final week of the study. Student participants received this survey via an email link. Lastly, student artifacts in the form of a reflection paper assignment were collected.

Stage 4: Data Analysis

I began data analysis by transcribing and coding student participant interviews on an ongoing basis once the interview sessions begin. I utilized an inductive qualitative method to code and analyze data collected from the interviews and formative assessments. In addition, inductive qualitative method was utilized to code and analyze student artifacts. This information was presented to an external auditor for review and to verify the accuracy of discovered themes. The quantitative pre- and post-test data were

analyzed via a repeated measures *t*-test to determine statistical significance. At the conclusion of qualitative and quantitative analysis information was presented to participants for verification of accuracy. Lastly, member checking arrangements will be made to share my findings with appropriate stakeholders.

Plan for Sharing & Communicating Findings

The principal reason of action research is to appreciate and strengthen one's craft. There are many reasons and benefits that come with the sharing of the results of our research. Involvement with participants and stakeholders is just as important after the study and helps to promote trust and increases knowledge and understanding (Kerasidou, 2015). Additionally, the chance of participants endorsing research in crucial ways, such as the principled and transparent quality of research can be seen as a viable return when it comes to sharing findings (Jao et al., 2015). Therefore, making a sharing and communication findings plan an important component.

First and foremost, the discoveries will be shared with my doctoral thesis committee to maintain the integrity afforded the degree. Second, qualitative results were share with the students who participated in the study via email. Participants were asked to review the data and provide comments if they felt the information presented was not accurate. In addition, my intentions are to share results through an oral presentation using visual aids to summarize and explain the outcomes. The presentation will take place on a time and date that is deemed convenient for most participants and be held on the campus of Michigan State University.

Next, discoveries will be shared with the Dean of the College of Social Science at Michigan State University (MSU), the Department Chair of Human Development and

Family Studies (HDFS) at MSU, and HDFS faculty members via presentation format. I will present the findings through informal job talks and area group faculty meetings. Sharing discoveries with colleagues at MSU will allow for additional query, comment, and scrutiny to further strengthen my ability to conduct research. Lastly, discoveries will be submitted for publication to *Tech Trends*, an AECT publication, and for presentation at the annual AECT conference.

It is the researcher's ethical responsibility to protect participant identity. Pseudonyms will be used in place of the participant's actual names. In addition, although I do not foresee any reason for having identifying information for the quantitative data, if needed a participant will be protected by utilizing a coding system for any observation and participant survey response.

CHAPTER 4

ANALYSIS AND FINDINGS

The purpose of this action research was to determine the influence student response technology has on student engagement. Data were collected from self-report surveys of learner engagement, tests of learning knowledge, face-to-face interviews, and written reflection papers in order to answer the following questions:

1. How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence student motivation?

2. How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence cognitive, emotional, and behavioral engagement?

3. How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence feedback?

4. What are the effects of SRT and case studies on student learning with applications of leadership, strategic planning, partnership, and the importance of human capital?

Analysis will begin with the two quantitative instruments followed by the two qualitative instruments.

This chapter represents a synopsis and analysis of the data collected during a mixed-methods action research study. Participants were administered a learning assessment and engagement survey prior to and after completion of the innovation. They

also submitted written reflection papers pertaining to the innovation. In addition, informal weekly surveys were conducted, and eight participants were selected to take part in an interview. This chapter includes both my quantitative and qualitative findings. The quantitative data is a breakdown of the Student Course Engagement Questionnaire (SCEQ) (Handelsman et. al, 2005) and the teacher designed learning assessment results. The qualitative findings include participant interviews and artifact reviews. These findings were analyzed to assist in answering the research questions. From the data collected I provided my interpretations and themes.

Quantitative Analysis and Findings

Quantitative data collected in the study consists of (a) participants' responses on the SCEQ and (b) participants' scores on the teacher-created learning assessment. All analyses of the data were conducted using JASP (version 0.16.0.0; 2022), an open-source statistical analysis software program supported by the University of Amsterdam. For all statistical tests, an alpha level of .05 was used to determine significance (Mertler, 2017).

Student Course Engagement Questionnaire

In order to measure student engagement a modified version of the SCEQ (Appendix D) was conducted. The questionnaire for student engagement consisted of nine items categorized into two subscales: cognitive engagement and behavioral engagement (Handelsman, et al., 2005). Each participant responded to items as to their cognitive and behavioral engagement toward the innovation. Each of the Likert-type items were scaled as: (1) Not at all characteristic of me, (2) Not really characteristic of me, (3) Moderately characteristic of me, (4) Characteristic of me, and (5) Very characteristic of me. As stated previously, no published reliability information has been

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established for this instrument, so internal consistency analysis was conducted on the postquestionnaire values. Cronbach's alpha showed the questionnaire to reach acceptable reliability, $\alpha = 0.84$. In addition, I conducted reliability analysis on each subscale post-questionnaire values. Cronbach's alpha showed the cognitive engagement subscale results to be less consistent and should be taken tentatively, $\alpha = 0.69$. Cronbach's alpha showed the behavioral subscale results to reach acceptable reliability, $\alpha = 0.85$.

Descriptive statistics. After completion of the SCEQ, descriptive statistics were run on the pre- and postquestionnaire data using JASP to determine the mean and standard deviation of the overall questionnaire and each subscale as follows: Overall prequestionnaire ($M = 3.49$, $Mdn = 3.44$, $SD = .56$), overall postquestionnaire ($M = 3.41$, $Mdn = 3.40$, $SD = .57$), cognitive prequestionnaire ($M = 4.10$, $Mdn = 4.00$, $SD = .54$), cognitive post-questionnaire ($M = 3.98$, $Mdn = 4.00$, $SD = .61$), behavioral engagement pre-questionnaire ($M = 3.19$, $Mdn = 3.00$, $SD = .72$), behavioral engagement post-questionnaire ($M = 3.12$, $Mdn = 3.17$, $SD = .74$). Overall and for each subscale the mean and median showed little change between the pre- and postquestionnaire. The overall and each of the subscales show a slight decline in both the mean and median, signifying a slight decrease in responses. Overall participants felt items were characteristic of them. Cognitively participants felt items were characteristic of them. Behaviorally participants felt items were moderately characteristic of them. The descriptive statistics for this measure are displayed in Table 4.1.

Table 4.1 *Descriptive Statistics for SCEQ Questionnaire (n=59)*

	Prequestionnaire			Postquestionnaire		
	M	*Mdn*	*SD*	*M*	*Mdn*	*SD*
Overall	3.49	3.44	0.56	3.41	3.40	0.57
Cognitive	4.10	4.00	0.54	3.98	4.00	0.61
Behavioral	3.19	3.00	0.72	3.12	3.17	0.74

Inferential statistics. My intention was to run paired-samples *t*-tests to compare pre- and postquestionnaire data regarding the two subscales. After running a Shapiro-Wilk test to confirm normality, I determined the cognitive data set to be a normal distribution (p > 0.05) and the behavioral data set to be non-normal data (p < 0.05). However, the skewness and kurtosis were confirmed to be between -1.0 and +1.0, so data were determined to be normally distributed. Hence, a paired-samples *t*-test was run on the cognitive data to determine any significant differences between the prequestionnaire and postquestionnaire data. The output indicated the post-questionnaire responses (*M* = 3.98, *Mdn* = 3.40, *SD* = .61) were not significantly different than pre-questionnaire responses (*M* = 4.10, *Mdn* = 3.44, *SD* = .54), *t* (58) = 1.57, *p* = .12. In addition, a paired-samples *t*-test compared prequestionnaire and postquestionnaire scores for the behavioral engagement subscale. The output indicated that postquestionnaire scores (*M* = 3.12, *Mdn* = 3.17, *SD* = .74) were not significantly different from prequestionnaire scores (*M* = 3.19, *Mdn* = 3.00, *SD* = .72), *t* (58) = 0.99, *p* = .33. In addition, a paired-samples *t*-test compared prequestionnaire and postquestionnaire scores for the cognitive engagement subscale. The output indicated that postquestionnaire scores (*M* = 3.98, *Mdn* = 4.00, *SD* =

.61) were not significantly different from prequestionnaire scores ($M = 4.10$, $Mdn = 4.00$, $SD = .54$), $t (58) = 1.62$, $p = .11$.

Learning Assessment

To measure student knowledge, a learning assessment (Appendix E) was conducted. The assessment consisted of 21 items categorized into four subscales: leadership, strategic planning, partnerships, and the importance of human capital. When reviewing the assessment data, I determined items six and seven were not aligned directly to any of the subscales and were removed from the analysis leaving 19 items. The learning assessment measured student managerial skill. Each participant responded to items as to their knowledge of leadership, strategic planning, partnership, and the importance of human capital. Each of the items were multiple choice questions with four answer options in which the participant selected one choice. I conducted reliability analysis on the posttest values utilizing a Kuder-Richardson 20 (KR-20) test. The KR-20 test showed the overall assessment to reach acceptable reliability, KR-20 = 0.75. In addition, I conducted reliability analysis on each subscale posttest values. KR-20 showed the leadership skill subscale results to be less consistent and should be taken tentatively, KR-20 = 0.23. KR-20 showed the strategic planning skill subscale to be less consistent and should be taken tentatively, KR-20 = 0.31. KR-20 showed the partnership skill subscale to be less consistent and should be taken tentatively, KR-20 = 0.14. Lastly, KR-20 showed the importance of human capital skill subscale to be reliable, KR-20 = 0.72.

Descriptive statistics. After completion of the learning assessment descriptive statistics were run on the pre-and-post data using JASP to determine the mean and standard deviation of the overall questionnaire and each subscale as follows: Overall

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prelearning assessment (*M* = 12.56, *Mdn* = 13.00, *SD* = 2.50), overall postlearning

assessment (*M* = 13.14, *Mdn* = 14.00, *SD* = 3.25), leadership skill prelearning assessment

(*M* = 2.62, *Mdn* = 3.00, *SD* = .99), leadership skill postlearning assessment (*M* = 2.72,

Mdn = 3.00, *SD* = .93), strategic planning skill prelearning assessment (*M* = 3.50, *Mdn* =

4.00, *SD* = 1.13), strategic planning skill postlearning assessment (*M* = 3.76, *Mdn* = 4.00,

SD = 1.24), Partnership skill prelearning assessment (*M* = 1.58, *Mdn* = 2.00, *SD* = 0.64),

Partnership skill postlearning assessment (*M* = 1.62, *Mdn* = 2.00, *SD* = .64), Importance

of human capital skill prelearning assessment (*M* = 4.86, *Mdn* = 5.00, *SD* = 1.25),

Importance of human capital skill postlearning assessment (*M* = 5.04, *Mdn* = 5.00,

SD = 1.37). The descriptive statistics for this measure are displayed in Table 4.2.

Table 4.2 *Descriptive statistics for learning assessment (n=50)*

	Preassessment			Postassessment		
	M	*Mdn*	*SD*	*M*	*Mdn*	*SD*
Overall	12.56	13.00	2.50	13.14	14.00	3.25
Leadership	2.62	3.00	.99	2.72	3.00	1.13
Strategic plan	3.50	4.00	1.13	3.76	4.00	1.24
Partnership	1.58	2.00	.64	1.62	2.00	.64
Human Capital	4.86	5.00	1.25	5.04	5.00	1.37

Inferential statistics. My intention was to run paired-samples *t*-tests to compare

pre- and postlearning assessment data regarding the four subscales. However, after

running a Shapiro-Wilk to confirm normality, I determined the strategic skill subscale

data set to have a normal distribution of the pre-post pair differences ($p > 0.05$) while the overall combined assessment, the leadership skill, partnership skill, and human capital skill subscales data sets to be non-normal data ($p < 0.05$). The skewness and kurtosis were confirmed to be between -1.0 and +1.0 for the leadership and partnership subscales, so data were determined to be normally distributed. Hence, paired-samples *t*-tests were run on the leadership, partnership, and strategic skill subscales to determine any significant differences between the prelearning assessment and postlearning assessment data, and Wilcoxon-Signed ranks tests for the overall data and human capital subscale. Also, because five tests were run, I corrected the alpha level for significance using the Bonferroni adjustment to $\alpha = .01$ ($\alpha = .05/5 = .01$).

A Wilcoxon Signed-ranks test compared prelearning overall assessment and postlearning overall assessments. The output indicated that postlearning assessment scores ($M = 13.14$, $Mdn = 14.00$, $SD = 3.25$) were not significantly different from prelearning assessment scores ($M = 12.56$, $Mdn = 13.00$, $SD = 2.50$), $W = 0.936$, $p = .133$. A paired-samples *t*-test compared prelearning assessment and postlearning assessments for the leadership skill subscale. The output indicated that postlearning leadership skill assessment scores ($M = 2.72$, $Mdn = 3.00$, $SD = 1.13$) were not significantly different from prequestionnaire scores ($M = 2.62$, $Mdn = 3.00$, $SD = .99$), $t(49) = -0.66$, $p = .51$. A paired-samples *t*-test indicated the postlearning strategic skill assessment scores ($M = 3.76$, $Mdn = 4.00$, $SD = 1.24$) were not significantly different than prelearning strategic skill assessment scores ($M = 3.50$, $Mdn = 4.00$, $SD = 1.13$), $t(49) = -1.097$, $p = .278$. A paired-samples *t*-test compared prelearning assessment and postlearning assessments for the partnership skill subscale. The output indicated that postlearning partnership skill

scores (*M* = 1.62, *Mdn* = 2.00, SD = .64) were not significantly different from prequestionnaire scores (*M* = 1.58, *Mdn* = 2.00, *SD* = .64), *t*(49) = -0.31, *p* = .76. A Wilcoxon Signed-ranks test compared prelearning assessment and postlearning assessments for the human capital skill subscale. The output indicated that postlearning scores (*M* = 5.04, *Mdn* = 5.00, *SD* = 1.37) were not significantly different from prelearning scores (*M* = 4.86, *Mdn* = 5.00, *SD* = 1.25), *W* = 0.91, *p* = .230.

Qualitative Analysis, Findings, and Interpretations

Below, I (a) describe the qualitative data with codes applied, (b) explain the procedure of qualitative analysis utilized to determine categories and themes for the data, and (c) present comprehensive findings for the data.

Description of Data

Qualitative data were collected from two sources. These included participant artifacts in the form of a required written assignment and semi-structured individual interviews. A total of 58 artifacts were randomly selected for review and a total of 8 interview sessions were collected. Interviews were recorded via Zoom, digitally transcribed and imported, along with participant artifacts, into Delve Tool for analysis. Data were coded and cultivated into categories and emergent themes via inductive analysis (Saldana, 2021; Creswell, 2017; Mertler, 2017). Table 4.3 displays the data sources and numbers of codes applied to each.

Table 4.3 *Summary of Qualitative Data Sources*

Types of Qualitative Data Sources	Number	Total Codes Applied
Artifacts	58	155

Types of Qualitative Data Sources	Number	Total Codes Applied
Participant Interviews	8	46

Qualitative Data Analysis

After participant interviews were transcribed utilizing TechSmith's Camtasia video editing software, I imported them and participant artifacts into Delve Tool's online coding program to analyze the qualitative data. Codes were not generated prior to the import of the data. Each document was analyzed sentence by sentence. For the first cycle of data, the open coding technique was used. To move into the next cycle of coding code mapping was utilized to group and organize the data. The second cycle of coding used the open coding technique. For the final cycle pattern coding was used.

The first cycle of coding began with reading participant's transcripts and artifacts sentence by sentence applying the open coding method to organize the data (see Figure 4.1) (Saldaña, 2021). Open coding was used because it allows for a combination of different compatible coding techniques to be applied to the data collected (Saldaña, 2021). The grammatical method of simultaneous coding and the elemental method of descriptive coding were used to draw out data.
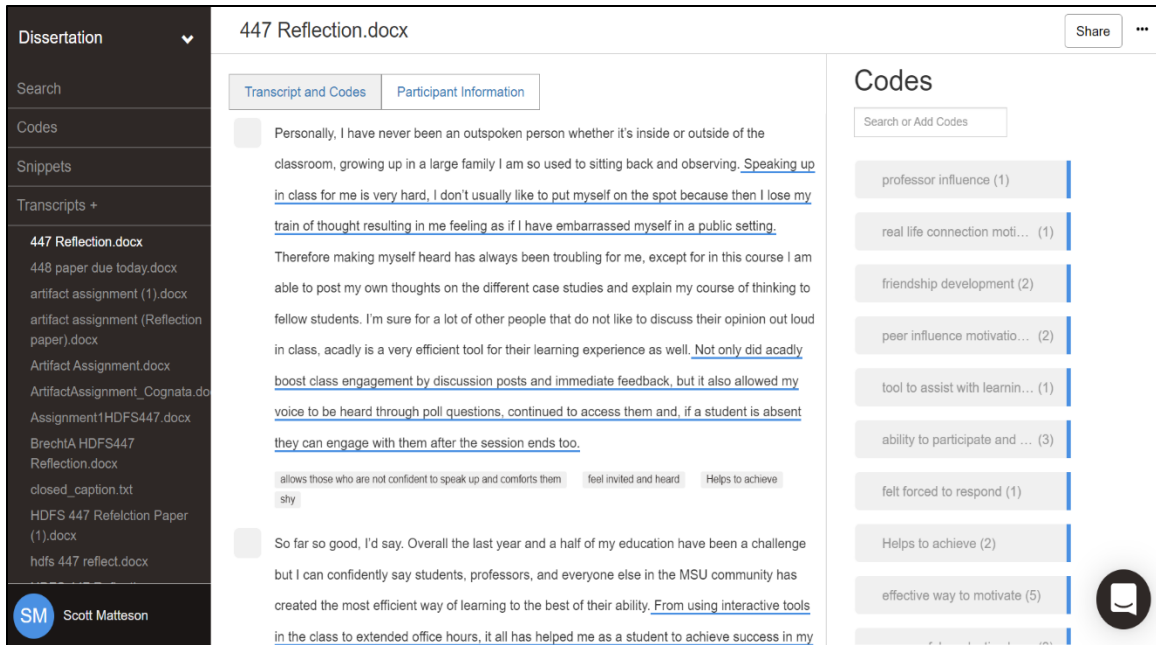
Figure 4.1 *Qualitative Delve Transcripts in the First Round of Coding*

Simultaneous coding allowed for lines of data to be categorized into multiple codes (Saldaña, 2021). For example, the sentence "Speaking up in class for me is very hard, I don't usually like to put myself on the spot because I lose my train of thought resulting in me feeling as if I have embarrassed myself in a public setting." was placed into two different codes, *shy and allows those who are not confident to speak up* and *comforts them*. Eventually these two codes were absorbed into and became a part of the alleviates anxiety code.

Participant words were summarized to develop topics as codes using descriptive coding (Saldaña, 2021). An example of this type of coding is the *self-awareness* code. This code appeared as a place to note one participant's thought on sharing in class and the discomfort it caused them. This code was revised to *needed to take more advantage of* and in later rounds, grouped with the *collaboration* code. These codes provided a model of how codes merged and were used for both the interview and written artifact data.

Before the second coding cycle, I began to reassess data based on revelations and understandings gained from the initial coding process. I began to look for connections using a tabletop method to organize my first cycle codes. Tabletop organization is the examination of how data can be arranged by printing out and placing the data on a flat surface or table (Saldaña, 2021). The codes were printed out, separated, and placed on the table. Figure 4.2 shows how codes were initially arranged.
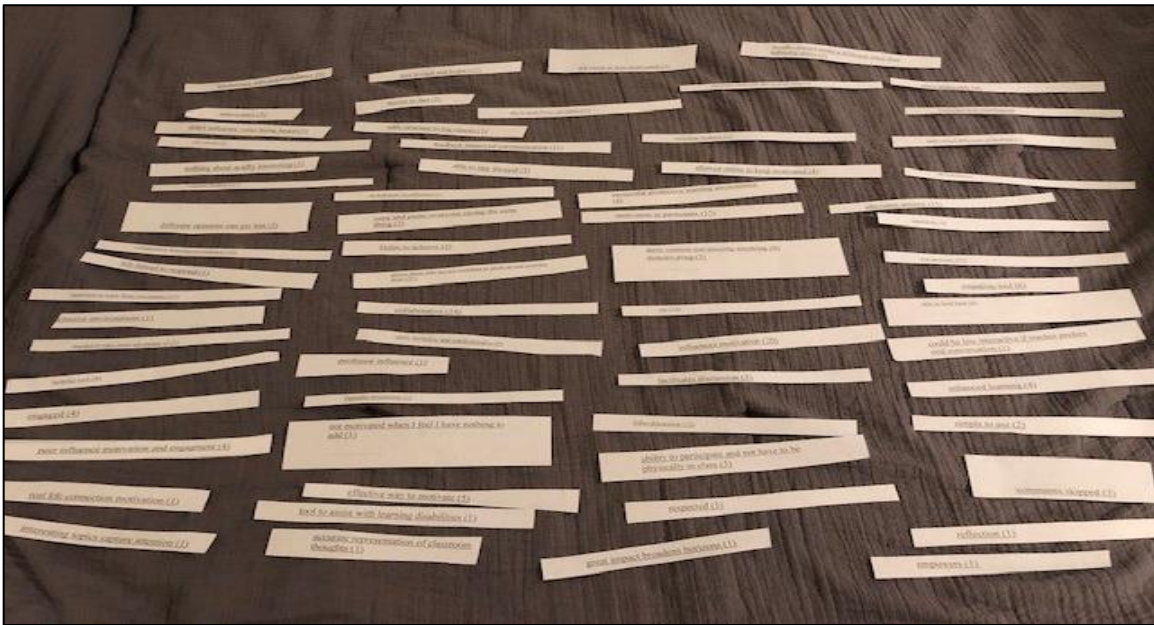
Figure 4.2 *Initial Code Tabletop Arrangement*

Utilizing this process allowed me to visualize and reflect upon the initial development of the codes. Next, I began to do some initial code mapping (Saldaña, 2021), thus allowing me to gain a better understanding of the data. The open coding technique presented itself as the best process for grouping codes. A second cycle of coding was conducted by combining and organizing initial codes into groups generating new codes. The new codes would become newly created categories, further organizing the data. Figure 4.3 shows how codes for the technology platform were combined based on similarities and reflections from artifacts and interviews. Figure 4.4 shows how all the

initial codes are organized into groups. An example of how opening coding was used to combine initial codes would be the use of *technology platform* in place of the first stage codes of *tool to assist with learning disabilities, able to stay focused, needed to take more advantage of, engaging tool, engaged, peer influenced motivation and engagement, simple to use,* and *helpful tool.*
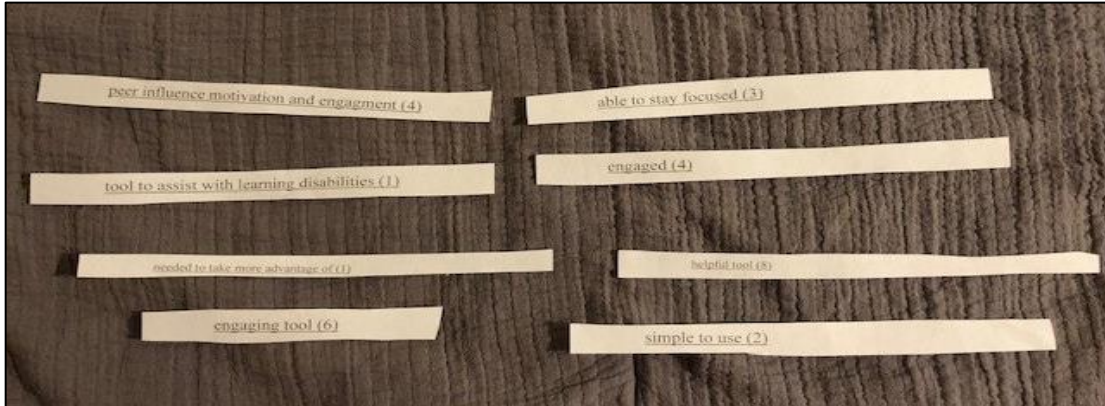
Figure 4.3 *Grouping of Second Cycle Pertaining to Technology Platform*
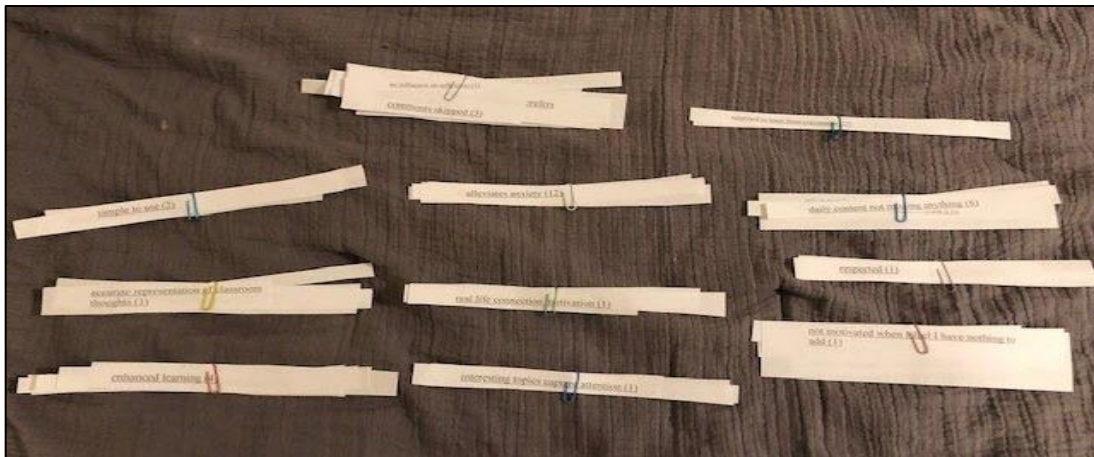
Figure 4.4 *Organization of Initial Codes*

After reviewing the codes and groupings further, it became necessary to relabel categories to better reflect participants words and meanings. For example, the group labeled *technology platform* did not properly define the grouping. Codes in this group reflected participant's thoughts on the advantages of the technology pertaining to learning

disabilities and engagement. How did SRT assist participants with learning disabilities? Did the tool help with engagement? By seeing student responses, were others influenced? After reviewing the data, I relabeled the group *advantages to using SRT.* Likewise, the group initially labeled *tech complaints* was relabeled as *disadvantages to using SRT*.

In addition, I began culling unnecessary data not relevant to the research questions. For example, the codes *professor influence, professors don't allow time to hear students, interest in nonprofits,* and *self-awareness* all indicated participant perceptions toward participating in discussion in a classroom setting in general but did not address the use of SRT as a whole. Simply put, these codes addressed participant thoughts on other professors and classes they have had regarding collaboration and discussion, not the use of SRT. As a result, I eliminated these codes from the data.

This point of the coding process involved incorporating categories into groupings to form themes of data. The categories of *advantages to using SRT* and the *disadvantages to using SRT* were combined to form the theme of *SRT – Tool/application utilized by participants to share their voice when corresponding during class discussions.* Comparison of the data found the types of participant responses lend themselves to the pros and cons of using SRT within the learning environment. Furthermore, I consolidated the categories of *participation*, *learning environment*, *discussion*, and *feedback* into the theme *Learning Environment -Actively participating in open discussions and providing feedback to create an exciting, interactive, comfortable collaborative environment.* Participant thoughts from each of these categories were in reference to how SRT influenced the learning environment. Lastly, the categories of *personal feelings, motivation, personality,* and *reflection* were combined to form the theme *Participant*

Perceptions – Influence over feelings of empowerment, personal value, motivation, and

feedback as experienced through the incorporation of SRT within the classroom. Each of

these categories referred to how SRT had and influence on participants personally. A

summary of qualitative codes is show in Table 4.4.

Table 4.4 *Summary of Qualitative Codes*

Theme	Category
Participant Perceptions – Influence over feelings of empowerment, personal value, motivation, and feedback as experienced through the incorporation of SRT within the classroom	Personal Feelings Motivation Personality Reflection No difference
Learning Environment -Actively participating in open discussions and providing feedback to create an exciting, interactive, comfortable collaborative environment.	Participation Learning Environment Discussion Feedback
SRT – Tool/application utilized by participants to share their voice when corresponding during class discussions.	Advantages to using SRT Disadvantages to using SRT

Themes and Interpretations

Three themes materialized during the data analysis. Participant interview and artifact

responses indicated that SRT influences student engagement in a largely populated

university course by (a) participant perceptions - influence over feelings of

empowerment, personal value, motivation, and feedback as experienced through the

incorporation of SRT within the classroom, (b) influencing the learning environment **-**

actively participating in open discussions and providing feedback to create an exciting,

interactive, comfortable collaborative environment, and (c) SRT - tool/application

utilized by participants to share their voice when corresponding during class discussions.

Each theme is discussed in further detail below. Pseudonyms for participants are used for

confidentiality. Quotations are verbatim responses from participant recorded interviews and written artifacts.

Theme 1: Participant Perceptions – Influence over feelings of empowerment, personal value, motivation, and feedback as experienced through the incorporation of SRT within the classroom.

Participant perceptions in this study was defined as the influence over the feelings of empowerment, personal value, motivation, and feedback as experienced through the incorporation of SRT within the classroom. Incorporating individual personalities is important in influencing student engagement through curiosity, drive, and understanding (O'Brien & Tom, 2008). Students face immense pressure in performing at a high level. In today's world, there is a need to maintain a sense of self. SRT provides students with the ability to maintain who they are and protect their personalities if needed (Martin & Lazendic, 2018). Participant responses indicated their experiences ranged from having no influence due to having a strong personality to having feelings of empowerment, being valued, and respected.

According to existing research students who are sociable, welcoming, and open to new experiences are more inclined to have positive experiences leading to favorable perceptions (Keller & Karau, 2013). The consensus is students need to be invested in their experience and excited about the learning they are participating in (Lam et al., 2018; Ulmanen et al., 2016). In addition, studies have shown reflection, instant comparisons to others, and increases in activity and enjoyment levels influenced student perceptions. Throughout the qualitative data, participants displayed common characteristics in the ability to invest themselves in the learning and the experience.

The findings for this theme were developed from five categories (a) personal feelings, (b) motivation, (c) personality, (d) reflection, and (e) no difference. The findings in this theme did show some indifference to participant perceptions. Nonetheless, the positive responses far outweighed the indifference.

Personal feelings. Personal feelings were defined as the sense of being empowered, valued, and respected by being heard and acknowledged by others. Participants consistently acknowledged that when personal feelings were honored and respected their perceptions of the experience were more positive. Previous studies show when students are moved from a state of passivity to becoming involved, knowing their voices will be heard fosters an opportunity for deeper learning (Rissanen, 2018; Rotgans & Schmidt, 2011).

Participant responses expressed a need to feel valued, respected, and empowered. For example, in a reflection, one student wrote, "Utilizing Acadly was a key component in helping everyone's voice be heard" (Participant #1). This sentiment was reflected throughout various written artifacts that confirm personal feelings play an integral role in personal value, as another participant stated:

Acadly had and continues to have an impact on how I feel my voice is being heard. I mentioned briefly earlier that I tend to be soft spoken in classrooms in favor of boasting out my opinions. With Acadly I have an opportunity to post whatever I feel like might be the best answer to me without the anxiety of raising my hand and directly stating it verbally. It also allows for my voice to be bolstered when I see others echoing my points or aligning with it in general.

Participants recognized the importance of their thoughts and insights being shared, allowing for an increase in learning success. For example, another student wrote in their artifact, "Acadly has made a great impact in my life because it broadens my horizon" (Participant #2). This led them to the realization they have something of value to provide to others as this participant stated:

> Aside from my voice simply being heard, have the open opportunity to provide my own insights, commentary, or answers promote the overall inclusive feeling that my thoughts and opinions are valued. (Participant #3)

Data from written artifacts referred to the mention of personal feelings eight times. Personal feelings contributed to a positive influence using SRT.

Motivation. Motivation was defined as the personal experience of wanting to come to class, participate, provide personal input, and receive peer support. Connecting topics to real life experiences and the interest in engaging led participants to being more motivated to participate in their learning experience providing a positive perception. Studies have shown student perception toward technology, the ease of use, and the interactive component of the technological platform all play a role in student attitude toward motivation (Hans & Finkelstein, 2013; Öqvist et al., 2016; Sun & Hsieh, 2018).

Being able to see other responses created a sense of relation and the desire of participants to provide their insight. For example, one student wrote, "However, I feel that Acadly has motivated me to share more opinions without the pressure of having to be put on the spot, so to speak, and I appreciate this aspect of this resource a lot" (Participant #4). The expression of influence on motivation was relayed by many participants and supported the impact SRT has as written by this participant:

I believe Acadly has had a positive influence on my motivation in the class. As a

person, I have been described as outgoing, but Acadly has created a platform that

I can utilize when I do not feel like speaking in class that day. Also, I have

noticed that others may feel uncomfortable speaking in class, so seeing

everyone's answers or ideas displayed motivates me. It shows me that we are all

trying to learn, not just those of us who are speaking in class. (Participant #8)

In addition, participants became aware of the influence of others on their own motivation.

For example, a student commented on their motivations, "At times, Acadly gave me

motivation because I was able to see different perspectives through the discussion posts"

(Participant #5. The connection between others and real life became a powerful motivator

as one participant stated during their interview session:

Acadly motivates more of the classmates to participate as well, like through the

use of, like the discussion and questions on Acadly. Like it kind of brings it more

into like personal experiences and you can really relate to what's going on

(Participant #20).

Data from written artifacts and interviews referred to the mention of motivation twenty-

six times. SRT led to a positive influence on participant motivation.

Personality. Personality was defined as the alleviation of anxiety and stress along

with the promotion of confidence, comfort, and expression. Allowing students multiple

platforms to share their voice breaks down barriers influenced by anxiety, stress, and

introversion. Studies show adhering to stereotypical pedagogy discourages student

engagement (Baroutsis et al., 2015). The expansion of student voice empowers learners

giving them a greater say, fostering confidence through listening, hearing, and meaningful dialogue (Beach et al, 2014; Baroutsis et al., 2016).

Throughout the written artifact data, participants communicated the additional benefit of mental relief such as, "By using Acadly, I hoped to eliminate some of this anxiety and be more comfortable openly discussing my thoughts" (Participant #6). This opinion was repeated throughout the artifact data that confirmed Acadly reduced pressure, anxiety, and helped participants achieve, as one participant wrote in their reflection submission:

> I am a very shy person so speaking up during class is not very like me but with the online option of being able to share my thoughts without having to raise my hand is a much more appealing way to interact in HDFS 447 without the pressure of speaking in front of the entire class (Participant #21).

Participants acknowledged their tendency to not participate in classes due to being either anxious, shy, or a fear of judgement. For example, one student wrote, "Some students, like myself, may prefer not to speak up in front of a class full of people due to fear, anxiety, or any other reason" (Participant #7). They also acknowledged the platform gave them an opportunity to express themselves without fear of retribution as written by this participant:

> Acadly in my honest opinion saved the entire class because if gave a semi-anonymous platform for collective collaboration that took all the anxiety for introverts away and allowed them to be able to still participate and express themselves without having to vocalize their points for fear of being judged openly. (Participant #12)

The combination of written artifact and interview data uncovered the mention of personality 90 times. Personality contributed to positive influence over participant personality.

   Reflection. Reflection was defined as the process of receiving validation from others and being able to look back on missed content. Participants tended to worry about their responses in terms of others thinking the same way as they do. Participants mentioned throughout the written artifact responses their appreciation to look back on daily content. In a reflection paper, one student commented, "For example, if someone couldn't make it to class, Acadly was there for them to stay caught up and still feel engaged" (Participant #8). In addition, participants expressed appreciation for having an online option to alleviate concerns due to the current pandemic crisis as this participant stated:

> By using Acadly, I still feel like I am participating and engaging in the material
>
> taught in class. Especially because there has been so much fear surrounding being
>
> in person with the pandemic not being fully over, I like that Acadly keeps
>
> everyone engaged without having to risk everything. (Participant #22)

Participants confessed sometimes classes were missed, but with Acadly discussions always being opened, it allowed them to review to stay up to date. For example, one participant wrote, "The discussion post is always open, which means they're always there to go back to and read" (Participant #9). Participants, in general, valued the ability to reflect on content if they were unable to attend class as this participant stated:

> As well, Acadly helps connect students who otherwise would not be present for
>
> class and would not be able to contribute/engage in a given lecture. I feel this is

the largest benefit by Acadly, as there are days where I might not be able to attend

lectures in person yet still want to understand the material covered. (Participant

#2)

Data from written artifacts and interviews mentioned reflection eighteen times.

Reflection contributed positively to participant personality.

No Differences. No difference in the case of this study was a participant's

perception there was no influence on their motivation, reflection, or no notice in the

amount of feedback received by using the SRT platform. Students who frequented class

and were normally outspoken often perceived no difference in their perceived learning.

Some participants will refuse to buy into any new technology introduced and therefore

their effort is minimal (Cennamo, 1993). In addition, the simple addition of technology to

the learning environment does not mean students will become engaged (O'Byrne &

Pystash, 2015; Sobocan et al., 2017).

Some participants voiced concern within the qualitative data. They saw no

significant difference in learning overall concerning motivation or amount of feedback

received. For example, a student wrote in an assignment, "For me, Acadly doesn't make a

difference to my education other than a reduction in stress" (Participant #10). Concern for

demotivation was shared, especially when opinions seemed to repeat themselves as this

participant 12 stated, "I feel that when many people answer similarly, I am not as

motivated to participate, as I feel that I have nothing to add to the discussion."

Students did acknowledge the benefit of stress reduction, but when present in the

classroom, they thought following both an in-class discussion while following the online

written format did not have an impact on them. For example, one student wrote in a

reflection, "Because I attended mostly in person and not on Zoom, I feel that Acadly did not have a big impact on my performance" (Participant #11). Many in-class participants indicated there was no difference in the amount of feedback received, especially if they were present and vocal in class, such as mentioned by this student in their written reflection:

> I have not noticed a personal difference in the amount of feedback I received in
>
> class through the use of Acadly because I tend to speak 95% of the time.
>
> (Participant #11)

Between the interview and written artifact qualitative data, no differences were mentioned seventeen times and it was established there was no influence on some participants' perceptions.

Theme 2: Learning Environment -Actively participating in open discussions and providing feedback to create an exciting, interactive, comfortable collaborative environment.

Learning environment in this study was defined as actively participating in open discussions and providing feedback to create an exciting, interactive, comfortable collaborative environment. When participants contribute outstanding, experienced-based concepts, it results in better outcomes (Hathorn & Ingram, 2002). Purposely pulling students out of everyday lecture-based environments leads to more engaged learning discovery (Popescu & Popescu, 2014). Participant experiences indicated they were motivated to participate, share one's thoughts, and the feeling of being in an open, inclusive learning environment.

According to research, positive influence on learning outcomes and engagement occurs when there is a shift from lecture-based pedagogy to more collaborative environments (Martin & Beese, 2020). By implementing SRT the environment is naturally moved to a more collaborative environment. Learner accountability, autonomy, and a personal, supportive environment becomes the norm for the learning environment (Saqr, Fors, & Tedre, 2018). In addition to SRT, activities such as case-studies need to be implemented to strengthen student collaboration (Kienle & Kienle, 2009). With all the components in place, students benefit from a deeper cooperative, participatory learning environment (Ruokonen, 2013).

The findings for this theme were developed from four categories (a) participation, (b) learning environment, (c) discussion, and (d) feedback. Throughout this study there was favorable correlation between the learning environment and positive participant experiences. The findings in this theme showed an overall positive influence of SRT on the overall learning environment.

Participation. Participation was defined as the ability to contribute to classroom discussions while feeling invited and heard and able to speak freely and openly in a judgement free environment. Open conversations, encouraged through the learning environment, allow students to discover and best mitigate how to express their viewpoint (Kantar, 2013). Studies show participatory environments with the purpose of creating relevant interactions foster accountable, supportive environments (Ezeanyanke, 2013; Saqr et al., 2018).

Participants consistently expressed the positive influence SRT had on their participation. For example, one student wrote, "Acadly does motivate me to be more

involved in class, even if just by responding to the question prompts throughout the lecture" (Participant #12). Moreover, participants expressed how invited and heard they were within the environment. As one participant stated:

> I personally feel like Acadly has had an influence in my voice being heard. If provides another platform to voice my opinion without speaking in person. It also allows for me to be acknowledged by other students who see what I have to say. By providing another outlet I have multiple ways for me to contribute to a conversation/lecture (Participant #13).

Being able to speak openly and freely in a large class was an added bonus for participants. For example, one student wrote, "I feel that Acadly has truly enhanced my learning thus far through increased class participation, feeling heard in such a large classroom setting, and increasing my motivation" (Participant #14). Participants had no concerns in feeling heard within the learning environment and felt the impact of the experience as stated by this participant:

> Acadly had and continues to have an impact on how I feel my voice is being heard. I mentioned briefly earlier that I tend to be soft spoken in classrooms in favor of boasting out my opinions. With Acadly I have an opportunity to post whatever I feel like might be the best answer to me without the anxiety of raising my hand and directly stating if verbally. It also allows for my voice to be bolstered when I see others echoing my points or aligning with it in general. (Participant #15)

Data from qualitative interview and written data referenced participation 78 times. Participation had a considerable influence pertaining to participant participation when it came to SRT.

Learning environment. The learning environment category was defined as a collaborative, interesting, enjoyable, open, and inclusive environment leading to productive enhanced learning. Students find the learning environment to be more pleasant when dialogue is promoted using SRT (Giacolone, 2016). A previous study shows when activities are linked to in class materials the learning environment becomes enhanced (Ritter & Lemke, 2000). Additional studies have shown an increase in group learning which concentrates on the collective memory of students which is essential to collaboration (Kirschner et al., 2018; Laurent & Sonia, 2019).

Participants explained how Acadly influenced the environment while piquing their interests. One student wrote in a class reflection, "Having the opportunity to learn in a collaborative environment that Acadly helps foster not only improves my personal learning experience, but also my interest and motivation in class" (Participant #15). In addition, participants expressed how they enjoyed coming to class and found it interesting as this participant stated:

> I like actually coming to class and like, I'll say it with as many people don't come, it's like you get to talk to everyone you get to meet a lot of different people, so it's like exciting to learn the material and have the smaller environment, like, interact with you. (Participant #30)

Participants articulated they felt Acadly allowed the bigger setting to shrink enabling more people to be heard within the environment. One student wrote, "I do think that

90

Acadly made for a more collaborative environment because we are in such a big setting, we can always hear what everyone has to say and Acadly made responses easier" (Participant #16). Participants felt the addition of Acadly to the classroom provided them with the ability to see what others were thinking adding to the collaborative nature of the learning environment as this participant stated:

> I get to see what everyone is thinking, and I enjoy seeing their opinions. When I am in class, I feel as though I get to participate, even if I don't say anything and this has helped to create a collaborative learning environment for me. (Participant #41)

Data from written artifacts and interviews referenced the learning environment category 72 times. The category learning environment had a positive influence in regard to the learning environment theme.

Discussion. Discussion was the bringing together of cohesive thoughts and ideas through open and honest conversation. Students have expressed on many occasions they feel they are being talked at instead of having viable conversations (Kezar & Kinzie, 2006). Studies have shown breaking down the large classroom barrier by increasing communication and fostering engagement causes students to become more involved (Shaw et al., 2015; Hourigan, 2013).

Participants communicated they felt the discussions were unified and integrated although there was a split format of in class and online attendees. As one student wrote, "Acadly has allowed the discussion to be had cohesively, although our classroom is split between in-person on campus and virtually via zoom" (Participant #17). Participants

added by not grading participation, it added to the authenticity of the discussions as expressed by this participant in their written reflection:

I think almost not having it be part of the participation grade and not saying if is is part of the participation grade is maybe helpful because I feel that's when you are getting the most genuine responses like I have other classes where we are all saying the same forced thing that we know the professor wants us to say and I don't think that occurs in our class very much (Participant #18).

Participants acknowledged Acadly was a driver of discussion and was the seed needed to advance discussions further. For example, one student commented, "It drives conversations, which is always nice for a person such as me that normally remains unspoken in a class setting" (Participant #19). Not only did participants reiterate their previous statements regarding motivation but added Acadly was a steppingstone, as stated by this participant:

The best asset about Acadly and how it affects motivation is that it is not the end all be all like in other classes. If I had to describe it in short, it's like a steppingstone for all other ideas. We touch base on what has been posted and that gives us our fuel to evolve discussions. (Participant #37)

Discussion was mentioned in the qualitative data 19 times and had a positive influence in relation to the learning environment.

Feedback. Feedback was defined as the real time interaction between others in which ideas and thoughts are analyzed providing immediate assessment. Studies show optimum feedback needs to be received promptly and be straightforward (Perera et al., 2008). In addition, feedback is essential and significant to a student's learning outcome

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(Hattie & Timperley, 2007). Furthermore, prompt feedback is beneficial to increasing student trust, ambition, motivation, and self-worth (Clynes & Raftery, 2008).

Participants expressed in their written reflections there was an overwhelming amount of feedback received in real time. For example, one participant reflected, "The environment created by the use of Acadly has made it easier to gain feedback, because there is so much communication happening" (Participant #22). Likewise, participants expressed how the feedback being received increased their self-esteem as communicated by this participant:

> By being given prompts to talk about and each of us putting our own thoughts in, then having the professor talk about the results and bouncing off them and further giving information helps so much. Knowing your idea is right and that you are on the right track instantly is something that I love about this course. When I put in my answer and then as everyone else is putting in theirs and all our thoughts are similar that feedback is exactly what I need to motivate me and let me know that I am on the right track, which is exactly what I need (Participant #23).

Participants recognized feedback became a shared responsibility as expressed by this participants statement "I feel participating in a more collaborative learning environment allowed for more immediate feedback because it helps me to develop my own opinions. There were students adding and providing feedback to other students because everyone could see other students' responses" (Participant #24).

In addition, the shared feedback didn't necessarily have to be verbal feedback. It could be posted in Acadly and still have an impact as stated by this participant written response:

I felt that I noticed a difference in the amount of feedback I received in class with

the use of Acadly. Having multiple ways that people could engage in discussion, I

felt increased the amount of students that were willing to share their thoughts and

opinions on the topics. Specifically, when it came to the case studies, I felt more

people were willing to present ideas via the Acadly chat. With more students

sharing their ideas, and opinions I felt that this allowed for the instructor to

provide feedback, raise additional questions and comment on other students'

responses (Participant #25).

Feedback was mentioned in the interview and written qualitative data 76 times and had a

positive influence in relation to the learning environment.

Theme 3: SRT – Tool/application utilized by participants to share their voice when

corresponding during class discussions.

SRT was defined as the tool/application utilized by participants to share their

voice when corresponding during class discussions. Accessing Acadly via a cellphone or

laptop, participants were able answer and react to questions posed to them. SRT initially

involved a clicking device in which participants clicked a button responding to a

particular answer (Nagy-Shadman & Desrocher, 2008). With the advancement of

technology and smartphones, students now have access to applications allowing them to

compose answers to discussion questions (Wood, 2020; Jain & Farley, 2012).

According to research implementing SRT in classrooms leads to a rise in

communication, cooperation, and immersive learning between student and teacher along

with an enhancement of the overall educational experience (Varier et al., 2017; Retalis et

al., 2018; Santori & Smith, 2018, Wu et al., 2019). In addition, incorporating SRT

resulted in improved engagement, collaboration, participation, and excitement among students (Robbins & Butler, 2009). However, SRT is not without its flaws, studies show poor implementation, lack of teacher skills, and a lack of established objectives, student oversight, and support can lead to students becoming disengaged (Robbins & Butler, 2009; Kaendler et al., 2015).

The findings for this theme were developed from two categories (a) technology platform and (b) technology complaints. The findings in this theme did show some indifference to SRT. However, the positive responses outweighed the indifference.

Technology platform. The technology platform for this study was defined as helpfulness, ease of use, and how engaging the SRT being used is. Recent studies show today's smart phone technology provides students with the ability to download an easily understood application allowing for ease of use (Wood, 2020; Jain & Farley, 2012). Another study showed that technology that is easy to use and enjoyable can have a positive effect on student learning (Florenthal, 2019).

In the written reflections participants expressed their thoughts on how Acadly was a helpful tool. For example, one participant wrote: "Acadly was helpful in my learning experience because I am autistic and can't handle sensory overstimulation" (Participant #26). In addition, they acknowledged how engaging the tool is as this participant stated: "I like how engaging the application can be and how it has a strong user-experience" (Participant #27).

Participants recognized the simplicity of the tool in their written reflections. For instance, this student wrote: "On Acadly, it is quite easy to scroll through and see the ideas of everyone in the class as responses are short and manageable and not 300-word

discussion posts. It is simple to use" (Participant #27). Furthermore, participants

expressed their thoughts on the influential nature of Acadly as this student wrote:

"Acadly was a great tool to influence participation and attendance in class" (Participant

#28). Technology platform was mentioned in the interview and written qualitative data

29 times and had a positive influence in relation to the student response technology

theme.

        Technology complaints. Technology complaints for this study were defined as

SRT creating a hinderance, annoyance, or simply not having any influence within the

learning environment. A previous study indicated that poor implementation and unclear

instruction leads to student frustration (Kaendler et al., 2015). Additionally, one study has

shown that using technology that is difficult and not enjoyable can have a negative effect

on students (Aubusson et al., 2014).

        Participants expressed concern voices were getting lost due to the technology

moving to fast. For instance, this participant wrote: "The part where it falters to help get

voices out there is the quantity and speed that opinions seem to fly by" (Participant #29).

Furthermore, there was concern a difference of opinion may go unnoticed and popular

responses would garner more credit as reflected upon by this participant:

        However, the sheer number of responses can also be a disadvantage to using

        Acadly to foster in class discussions. It is easy for the same 2-3 answers to flood

        in, and while someone could have a different opinion, it may go unnoticed by the

        class and the instructor. Specifically, HDFS-447 often the most popular response

        in Acadly gets announced and contributed to the discussion, while other responses

that may be more unique or insightful are buried in the chaos of responses coming

in right after a question is asked. (Participant #30)

Participants acknowledged Acadly was demotivating as this participant stated in their

written reflection: "However, due to the lack of attention on Acadly, my motivation and

interest in responding to discussions declined" (Participant #31). Moreover, participants

expressed an annoyance at the use of the technology in the classroom and the distractions

it causes. For example, this participant wrote:

Being that there are many opportunities during class within HDFS-447 to respond

to Acadly using the app, this also contributes to more students in class being on

their phone. Phone use during class can be incredibly distracting and the problem

is exacerbated using an app for in class discussion. It becomes that much easier to

double tap the home button or drag up and switch to a social media platform and

become engulfed in that. Students in HDFS-447 are distracted by their phones at

times in class from observations. (Participant #32)

Technology complaints were mentioned in the interview and written qualitative data 23

times, and it was established there was a negative influence regarding participants and the

SRT.

Chapter Summary

For this study, both quantitative and qualitative data were collected and analyzed

with the purpose of answering the research questions directing this study. Quantitative

data included participants' presurvey-postsurvey responses to the SCEQ (n=59) and the

Learning Assessment ($n = 50$). Descriptive statistics indicated no significant differences

from presurvey to postsurvey results on the SCEQ. Inferential statistics indicated there

was no significant differences between the pre-post surveys. Likewise, descriptive statistics indicated there was no significant difference for all subscales as well. Descriptive statistics indicated no significant difference from pre-learning assessment to post-learning assessment. In addition, inferential statistics indicated no significant difference between pre- and postlearning assessments as well. Descriptive statistics for the learning assessment subscales showed no significant difference between pre- and post-assessment.

Qualitative data included participant interviews ($n = 8$) and written artifacts ($n = 58$) in the form of written reflections. Inductive analysis led to the affirmation that *integrating student response technology in a largely populated university course influences student engagement.* This affirmation was supported by three themes: 1) student response technology, 2) learning environment, and 3) participant perception. The data indicated that SRT influences students through multiple facets that have an overall influence on engagement.

CHAPTER 5

DISCUSSION, IMPLICATIONS, AND LIMITATIONS

This chapter situates the findings of this study with the literature on student response technology and its influence on student engagement. The purpose of this action research was to evaluate if implementing student response technology in a largely populated university course influences student engagement. Three primary themes materialized from the analysis of the data. Data from both quantitative (i.e., SECQ and learning assessment) and qualitative methods (i.e., written reflections and participant interviews) were collected and analyzed. This chapter will present (a) a discussion, (b) implications, and (c) limitations.

Discussion

It is important to situate these results within the larger context of the literature, particularly studies associated with SRT and the influence on student engagement. To answer the research questions, the data were combined and viewed with the understanding that a student's internal desire to learn leads them down a path of engagement (Boekaerts, et al., 2006; Milner, et al., 2017). The literature on SRT implementation and student engagement also contributed to understanding environments that are beneficial to positive learning outcomes. This discussion is organized by the study's four research questions.

Research Question 1: How and to what extent does incorporating SRT and case studies in a largely populated undergraduate course at MSU influence student motivation?

The fundamental goal for this question was to uncover if there was a relationship between SRT and student motivation. Motivation is defined as an individual's vigor, disposition, interest, push to learn, work efficiently, and reach potential (Martin & Lazendic, 2018). In research, motivation and engagement are often used interchangeably (Martin et al. 2019). To corroborate that prospect, I reviewed literature related to the implementation of SRT such as Wu, Wu, and Li (2019). The Wu et al. study examined the impact of SRT on student learning experiences. Students utilized their own devices to access SRT in a classroom setting three hours per week. The findings of this study found the role of SRT in discussion and feedback scenarios in relation to student motivation to be strong. Motivation in Wu; et al. was based on the teacher's analysis if they felt students were concentrating during specific classroom activities of their own volition for a certain period. Teacher observations were supported by student reflections and comments. In addition, Annetta; et al. (2009) along with Sun and Hseih (2018) findings showed implementing challenging tools and tasks led to a positive effect on motivation. In my study, to answer question one, the findings led to two key components needed to influence motivation by implementing SRT. Those two components are (1) the learning environment and (2) SRT. Each of these is discussed in detail below.

Learning environment. The learning environment in my study was defined by six characteristics: process/practice, student effort, defined goals, tiered lessons, evaluations/support, and making sure students stay on course (Alvarez et al. 2011; Jeong

& Hmelo-Silver, 2016; Trees & Jackson, 2007). Furthermore, characteristics of collaborative learning environments have been identified as having an atmosphere of lively, complex, investigative learning (Heinrich, 2013; Zhu & Wang, 2020). In order to nurture collaborative learning behavior work in small groups is required (Zhu & Wang, 2020). Zhu and Wang's study found by finding a space where students can collaborate and share their voice instructors are able to avoid students feeling ignored and losing interest concluding collaborative learning environments have a positive impact on learning engagement. Popescu and Popescu (2014) found having environments that purposely engage in the discovery of learning results in better outcomes.

These findings align with previous research related to learning environments (Ezeanyanike, 2013; Hathorn & Ingram, 2002; Martin & Beese, 2020; Roukonen, 2013; Saqr et al., 2018). Learning environments that are cooperative, synergistic environments have a positive influence on motivation (Martin & Beese, 2020). In collaborative environments, participant contributions are exceptional and result in better outcomes (Hathorn & Ingram, 2002). Collaborative learning environments factor into the fostering of a personal, supportive environment (Ezeanyanike, 2013), having relevant interactions (Saqr, Fors, & Tedre, 2018) and creating deeper learning Ruokonen (2013).

The findings of my study indicated participants characterized the learning environment as being enjoyable, interesting, collaborative, and open and inclusive which does not align with the defined learning environment as stated above. This could be the result of students being overcome by the structured rigorous learning environment they were accustomed to.

Participants in my study indicated they found class to be enjoyable and interesting. This corroborates previous research in which a collaborative learning environment should foster a personal, supportive environment (Ezeanyanike, 2013). One participant supported this experience when they stated, "I enjoy coming to class as I feel more comfortable sharing my ideas" (Participant #24). Furthermore, qualitative data revealed participants found the learning environment to be interesting, exciting, interactive, and comfortable. These characteristics align with motivation by relating to participants' disposition and push to learn.

Participants in my study indicated the environment was very collaborative by allowing multiple platforms for participation. This corroborates previous research findings in which relevant interactions and participant contributions are characteristics of collaborative environments. For example, Participant #26 stated, "Acadly allowed for a more collaborative learning environment in that it makes it possible for all individuals to participate in class discussion." Additionally, qualitative data revealed participants reported the environment to be interactive, influential, informative, and positive. Collaborative learning environments are important to supporting students and helping them work more efficiently therefore having an influence on student motivation.

Participants in my study indicated a preference for an open, inclusive, and communicative learning environment. An environment such as this allowed students of varying levels of knowledge to share their voice. This is like the findings of Saqr et al. (2018) in which sharing student voices had a significant beneficial impact on learning. Furthermore, Rotgans and Smiths (2011) study found when students know their voices will be heard, it fosters a motivating effect. For example, Participant #28 expressed,

"Aside from my voice simply being heard, having the open opportunity to provide my own insights, commentary, or answers promotes the overall inclusive feeling that my thoughts and opinions are valued." Additional qualitative data revealed participants reported, with the use of Acadly, less anxiety and the ability to share their thoughts freely. In doing so students were given power and autonomy thus having an influence on their motivation as defined above.

SRT. It has been found technology has a small impact on learning when it comes to correct answers, but the positive effect wears off later in the semester (Velasco & Cavdar, 2013). This could be the result of students' affinity for a topic and that the novelty of technology wears off. Although Velasco and Cavdar's study suggested a stronger engagement with the instructor when the use of technology was implemented, in this case clickers, student perception regarding an increase in motivation was relatively low. Velasco and Cavdar's findings align with previous research related to SRT. Additional studies showed SRT improved engagement, collaboration, class participation (Shea, 2016); Increased engagement and excitement (Retalis, et al., 2018; Santori & Smith, 2018; Varier et al., 2017); showed an increase in activity, enjoyment levels, attention, and engagement (Balta & Tzafilkou, 2018); and found students to have a change of demeanor and interest (Healy et al., 2021).

The findings of my study indicated participants preferred to characterize their thoughts on SRT into three areas on the implementation of SRT in the learning environment and its influence on student motivation that are comparable to existing research. As evidenced by the qualitative data, these characteristics include the ability to stay focused, how engaging a tool SRT is and its influence on discussion, and how

helpful the tool was. While not all of these characteristics align with current research on SRT they are comparable with previous results.

Participants in this study revealed they were able to stay more focused because of the use of SRT. This corroborates previous research that students were more attentive (Balta & Tzafilkou, 2018). One participant described their experience with SRT and the positive influence it had on their focus when they wrote, "The certain aspects of motivation that Acadly offered me was not only the freedom of speech, but it also allowed me to stay focused on the topic at hand because of how the app was set up on the internet" (Participant #4). In addition, qualitative data revealed participants reported they were attentive to the information being learned and able to stay focused during class. Participants confirming their focus and attentiveness shows them having an interest in their learning influencing their motivation.

Participants in this study revealed how engaging the SRT tool was in terms of ease of use and its influence on discussions. This corroborates previous research (Florenthal, 2019) showing technology that is easy to use and enjoyable has positive effects on student learning. For example, when writing about SRT, Participant #7 stated, "I like how engaging the application can be and how it has a strong user-experience." Additional qualitative data revealed participants agreed discussions were more engaging and being able to see peer responses was valuable to influencing their motivation and learning. An aspect of motivation is a push to learn, which participants expressed as shown in the data above.

Participants in my study revealed a preference for the helpfulness of SRT in terms of creating a collaborative learning environment. This aligns with previous research in

which students reported increased collaboration and improved engagement (Shea, 2016).

For example, Participant #23 said, "I really feel like Acadly has come to be an easy tool

for creating a collaborative learning environment." Further qualitative data revealed

participants expressed the technology was easy to operate and scroll through as an

effective tool, allowing them to view the perspectives of others providing a link between

discussion and topic.

Research Question 2: How and to what extent does incorporating SRT in a largely

populated undergraduate course at MSU influence cognitive, emotional, and

behavioral engagement?

The central goal for question two was to understand if through the implementation

of SRT, would there be an influence on student engagement. Previous studies have stated

defining engagement can be chaotic due to so many overlapping elements (Kahu, 2013).

Because of so many intertwined elements and multiple concepts, defining engagement

becomes complex and perplexing (Bouvier et al., 2014). Engagement in my study is

defined as related to active learning where self-motivation, reflection and time, and

student voice are centered on academic activities (Axelson & Flick, 2011; Delialioğlu,

2012; Ryle & Cumming, 2007). To corroborate the definition of engagement, I reviewed

literature related to influential elements of student engagement such as Kuh (2001) and

Macfarlane and Thominson (2017). Kuh (2001) found an influence on student

engagement if students were challenged, spent additional time on assignments, and were

involved in additional academic activities. Macfarlane and Thominson (2017) found an

influence on student engagement needed students to be dedicated, involved, and have a

positive attitude toward the learning activity. In addition, O'Brien and Toms (2008)

found when adding technology in order to influence student engagement student curiosity, the look and feel of the technology and an understanding of how to use the technology became important factors. In my study, to answer question two, quantitative findings were broken down into two types of engagement: (1) Behavioral engagement and (2) Cognitive engagement. Each of these is discussed in detail below.

Behavioral engagement. Behavioral engagement in my study was defined in terms of how a student actively participates and forms the beginnings of the cycle of engagement and success in school (Elffers, 2013). Elffers found school experiences have an influence on behavioral engagement but differ depending on student background. For example, living situation and perceived support from academic staff played a factor in the behavioral engagement of students (Elffers, 2013). However, Engels et al. (2016) found that components of attendance and participation were important to a student's behavioral engagement. In addition, when behavioral engagement was assessed annually by Engels et al. (2016), student scores came out at high values with behavioral engagement showing a significant mean-level change. Rodriquez et al.'s (2019) findings on the other hand, found the amount of time spent on a subject or homework had little influence on a student's behavioral engagement. Rodriquez et al. also found that prior achievement influenced intrinsic motivation leading to a positive influence on a student's behavioral engagement.

For my study, the SCEQ overall and for each subscale the mean and median showed little change between the pre- and postquestionnaires. The overall and each of the subscales show a slight decline in both the mean and median, signifying a slight decrease in responses. Behavioral engagement prequestionnaire ($M = 3.19$, $Mdn = 3.00$, $SD = .72$),

behavioral engagement postquestionnaire ($M = 3.12$, $Mdn = 3.17$, $SD = .74$). Regarding behavioral engagement, participants expressed the items posed were moderately characteristic of them. However, the results of my study did not show a significant change in participants behavioral engagement. Therefore, a direct correlation between the implementation of SRT and the influence it has on behavioral engagement could not be made. This could be to the short time frame of the study and there not being enough time to recognize a change in behavior.

Cognitive engagement. Cognitive engagement in my study was defined as the intellectual state in which a substantial level of work is applied to obtain the knowledge needed to understand the topic presented (Green & Miller, 1996; Meece et al., 1988). Using SRT as a tool to enhance effective discussions and asking advanced questions can influence cognitive engagement (Smart & Marshall, 2017). Smart and Marshall found when teachers asked progressively complex questions, it caused students to have to explain thus influencing their cognitive level. Kayode (2018) found, although underutilized, communication tools such as SRT influence cognitive engagement if used effectively. However, Fuller et al. (2018) also discovered students reported pretending to be engaged when observations reported them as being engaged in 42 out of 46 activities. This becomes a concern when utilizing self-reports for quantitative data. I did not find this to be the case with my quantitative data.

For my study with the SCEQ overall and for each subscale, the mean and median showed little change between the pre- and postquestionnaires. The overall and each of the subscales show a slight decline in both the mean and median, signifying a slight decrease in responses on the cognitive prequestionnaire ($M = 4.10$, $Mdn = 4.00$, $SD = .54$) to the

cognitive postquestionnaire ($M = 3.98$, $Mdn = 4.00$, $SD = .61$). Cognitively, participants

expressed items were characteristic of them. However, the results of my study did not

show a significant change in participant's cognitive engagement. Therefore, a direct

correlation between the implementation of SRT and the influence it has on cognitive

engagement could not be made. Being participants were in their junior or senior year they

may be conditioned and set in their ways on how they engage in their course work.

Therefore, a change in cognitive engagement may not occur.

Research Question 3: How and to what extent does incorporating SRT and case

studies in a largely populated undergraduate course at MSU influence feedback?

The fundamental goal for question three was to uncover if there was a relationship

between SRT, case studies, and feedback. Feedback was defined as the dialogue between

teacher and student in order to construct knowledge (Boud & Molloy, 2013). Previous

studies have stated feedback needs to consist of authentic, meaningful appraisal in order

to assist and motivate students in their learning (Dawson, et al., 2021; Besser & Newby,

2019). Feedback has been considered one of the most essential and significant factors in

student learning; however, it has usually been inadequate and unsatisfactory (Hattie &

Timperley, 2007; Ferguson, 2011). Literature relating to the characteristics leading to

diminished feedback (Pardo et al., 2019), real-time aspects of SRT in relation to feedback

(Hooker et al., 2016), and the significance of straightforward, prompt feedback (Perra et

al., 2008) is appropriate to consider here.

Dawson et al. (2021) found students had a positive response to the value and

usefulness of authentic feedback that included elements of realism and evaluative

judgement. Besser and Newby (2013) determined students find feedback to be important

when instructors provide corrections, are detailed, and include rationales. Ferguson (2011) found students prefer timely, positive, constructive, written feedback that recognizes their accomplishments.

The findings of my study indicated participants preferred to characterize their thoughts on feedback into two characteristics: (1) immediate and (2) shared openly. As evidenced by the qualitative data, these characteristics align with current research on feedback and are comparable with previous results. Each of these characteristics is discussed in detail below.

Immediate. Immediate feedback for my study was defined as constructive, positive, useful feedback received in real-time via SRT. Hattie and Timperley (2007) found immediate feedback through easy-to-use SRT platforms, according to students, was found to be a viable component of learning. Likewise, Alexander et al. (2009) findings were aligned with Hattie and Timperley when they found both teachers and students felt immediate feedback provided through SRT was a viable component. Furthermore, Hooker et al. (2016) found immediate feedback provided by SRT allowed for the discovery of struggles in need of additional instruction. In addition, research found SRT allowed students to clarify and deepen comprehension when receiving immediate, appropriate feedback (Cooper et al., 2018). Lastly, Buil et al. (2016) found immediate feedback provided through SRT to have a favorable impact on students.

Participants in this study expressed how utilizing SRT in the classroom allowed the professor to give immediate feedback when time was dedicated to reading and interpreting online responses. This corroborates both Hattie and Timperley (2007) and Alexander et al. (2009) findings. For example, when writing about SRT, Participant #34

stated, "This allowed for immediate feedback because it allows students and professors to questions things right on site as it was happening." Additional qualitative data revealed participants agreed feedback through SRT was immediate, constant, open, and influential in their learning. These data confirm SRT increased feedback.

Shared openly. Feedback shared openly in my study was defined as constructive, critical appraisal shared across a public format. Previous research has found feedback was considered a dialogue between teacher and student (Boud & Molloy, 2013; Yang & Carless, 2013). In a separate study, Ajjawi and Boud (2017) verified feedback to be the conveyance of information from teacher to student. In contrast, Pardo et al. (2019) found that feedback in courses with large enrollments diminished. Findings from Ferguson's (2011) study determined feedback is not always acceptable or sufficient for students.

Participants in my study indicated the openly shared use of SRT provided them with the ability to gain additional insight from both teacher and fellow students. This was done by having responses projected in the classroom and shared online via zoom. Participants were able to see all the comments in an open format. This corroborated Boud and Molloy's (2013) and Yang and Carless' (2013) studies. For example, Participant #42 expressed, "I do receive more feedback from other students which is also important because having your ideas and thoughts analyzed by people different from you is key to success." Additional qualitative data revealed participants agreed SRT allowed for structured discussions in which they could offer feedback and time to process information in order to gain a better understanding after hearing from peers. These data support findings that implementing SRT has a positive influence on feedback.

Research Question #4: What are the effects of SRT and case studies on student learning with applications of leadership, strategic planning, partnership, and the importance of human capital?

The central goal for question four was to understand if the implementation of SRT would have an influence on student learning. Vygotsky (1979) defined learning as the process of planning, internalizing, and the use of social constructs to discover knowledge. Clark's (2018) study reported that learning was an exploratory approach that included the constructs of engagement, motivation, self-determination, and being creative. For my study, Vygotsky's (1979) definition of learning was adopted.

With the addition of SRT, Santori and Smith (2018) found that cooperation between student and teacher became a characteristic of learning. Furthermore, Balta's (2017) findings determined SRT significantly affected student learning and Heden and Ahlstrom (2016) determined SRT was one avenue to improve learning. Moreover, Ainley and Ainley (2011) found a strong student interest leads to re-engagement of content leading to the discovery of knowledge. Walkington (2013) confirmed interest enabled general knowledge to become experiences leading to increased learning. Bächtold (2013) found the introduction of cases along with SRT allows students to connect to the social environment increasing discovery leading to new learning. Shuh and Kuo (2015) agreed with Bachtold (2013) when they found students are able to find new knowledge when they can identify a condition that is recognizable. In addition, Brandon and Alt (2010) found students can appraise how they are learning by constantly questioning and utilizing active learning strategies.

To measure student knowledge, a learning assessment (Appendix E) was conducted. The assessment consisted of 19 items categorized into four subscales: leadership, strategic planning, partnerships, and the importance of human capital. The learning assessment measured student managerial skill. Each participant responded to items as to their knowledge of leadership, strategic planning, partnership, and the importance of human capital. The output indicated that postlearning assessment scores ($Mdn = 14.00$, $SD = 3.25$) were not significantly different from prelearning assessment scores ($Mdn = 13.00$, $SD = 2.50$). Subscale postlearning strategic skill assessment scores ($M = 3.76$, $SD = 1.24$) were not significantly different than prelearning strategic skill assessment scores ($M = 3.50$, $SD = 1.13$). Subscale postlearning leadership skill assessment scores ($Mdn = 3.00$, $SD = .93$) were not significantly different from prequestionnaire scores ($Mdn = 3.00$, $SD = .99$). Subscale postlearning partnership skill assessment scores ($Mdn = 2.00$, $SD = .64$) were not significantly different from prequestionnaire scores ($Mdn = 2.00$, $SD = .64$). Subscale postlearning human capital assessment scores ($Mdn = 5.00$, $SD = 1.37$) were not significantly different from prelearning human capital assessment scores ($Mdn = 5.00$, $SD = 1.25$). While no research has specifically addressed these learning contents, previous research has reported that SRT generated positive perceptions on student learning but sometimes at the expense of engagement.

Implications

This research has implications for me, practitioners, and scholarly practitioners and researchers. Three types of implications are considered: (1) personal implications, (2)

implications for implementing SRT into largely populated classrooms, and (3)

implications for future research.

Personal Implications

As a result of this study, I have learned multiple personal lessons that will assist in

my continued growth as a researcher and educator that will help guide my future

scholarly endeavors. These lessons include (a) transformed conceptions of teaching and

student learning, (b) implementation of SRT, and (c) becoming a scholarly practitioner.

Transformed conceptions of teaching and student learning. When it comes to

largely populated classrooms, what stands out to me the most is the lack of experiences

for students to become involved. Within constructivist philosophy practical activity,

cooperation, and community activity are all important constructs in the discovery of new

knowledge (Alt & Alt, 2017; Karpouza et al., 2019; Kwan & Wong, 2014).

Constructivism supports student's internal desire to learn, allows students to have a voice,

and allows them the freedom to discover knowledge (Boekaerts et al., 2006; Milner et al.,

2017; Thompson, 2015). Although the constructivist theory has been around for many

decades, researchers are still exploring this area. I agree with Vygotsky's (1978)

definition of constructivism in that it is a learning process of processing, planning,

internalizing, and the utilization of social constructs to discover knowledge. I have come

to the realization that today's technology, if implemented properly, can have a profound

impact on student learning and success.

Through this study, I have grown as an educator. Through the research and

implementation of this innovation, I have learned how I can utilize technology to have a

positive impact on student learning. As an educator I needed to change my approach

within the learning environment by passing control of the environment to my students thus allowing students to take the discovery of knowledge into their own hands (Clark, 2018). In addition, I discovered I needed to take time to understand the existing knowledge of my students and allow them to own their learning and build on it (Scruggs, 2009). During this study I discovered my teaching now included (a) connections to real life and (b) written artifacts.

Connections to real life. One understanding I gained from my study was the importance of including connections to real life experiences. Students tend to place value in real life connections and become actively involved and engaged in their learning (Doran et al., 2011). Prior to this study, I felt lecture-based instruction in largely populated courses was failing students and was detrimental to successful learning outcomes. I felt as though students were learning to remember for an exam instead of retaining knowledge to carry them through their careers. As I planned for this study, I had to think about how I could create elements that would build on a student's discovery of new knowledge. I realized, from my experience, students needed to be involved in the creation and development of their learning environment. I met this need by implementing SRT and changing the delivery from lecture-based pedagogy to that of open communication, discussion, and connections to real life experiences. I needed to provide a cooperative, synergistic, collaborative environment to have a positive influence on student learning and outcomes (Martin & Beese, 2010).

Written artifacts. Written artifacts offer students a way to reflect upon, process, and engage themselves in the understanding of the new discoveries of knowledge they have made. In the past, I thought the purpose of a teacher was to impart their knowledge

and wisdom within the classroom. My planning did not include student reflection and consisted mainly of myself asking the questions and students telling me what I wanted to hear as the correct answer. Through constructivism, instead of concentrating on what was perceived to be the correct answer, I was able to move toward more cooperative, participatory learning (Ruokonen, 2013) and let students, through their writing, express to me their discoveries. Through this study, I was able to gain a better understanding of how my students experience their learning. I was able to adapt my style and environment to gain a more favorable, purposeful experience. Overall, adopting written artifacts has changed my approach to teaching and student learning.

      Implementing SRT. During this study, student engagement was influenced through the implementation of SRT into the learning environment. SRT moves students toward an increase in student-teacher communication, cooperation, and immersive learning (Varier et al., 2017). A key element to the development of learning environment was allowing students to have a voice. Initially, in this study, some students were apprehensive about utilizing the available technology in getting their voice heard. They may have had difficulty in using and navigating the new technology. Throughout the study, students showed increased comfortability in utilizing SRT to voice their thoughts, opinions, and experiences. By the end of the study, they were having side conversations that led to the development of new relationships. Shy, introverted students commented on how important SRT was for them in that it allowed them to have a voice, many for the first time in their college career. For me, the most important factor was learning how to facilitate the discussions, so I was not detracting from the interaction or losing voices of students who primarily posted within SRT. As a teacher I sometimes found it difficult to

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keep up with the conversations occurring within the SRT platform and had to make sure to take some time to back track on occasion during discussions. Observing quiet students speaking openly, becoming involved, and collaborating with others was an important aspect of SRT learning for me.

Another factor in implementing SRT into the learning environment was the impact it had on the transformation of the classroom into a collaborative environment. As students advanced through the study, I noticed the role SRT was having on their interactions and learning. They challenged each other with open, honest dialogue and were surprised to learn from each other. They approached difficult conversations with respect and took responsibility for not only their learning, but their peers as well. Because of the role SRT played in the learning environment, students wanted to know more about who was in the room and what they had to say. Through their conduct I realized I needed to adopt SRT into my classrooms and allow the students to be co-facilitators. I received the benefits of the effects implementing SRT has on student learning and the learning environment.

Becoming a scholarly practitioner. Assessing literature corresponding to SRT implementation, engagement, and collaborative learning environments allowed me to discover knowledge of research conducted in the past and the findings that have been uncovered. This made it possible for me to utilize the prior knowledge of others to inform my own data. I considered it to be of value to ground my SRT learning experience within the fields existing literature. The review of literature led me to the use of the existing SCEQ. The SCEQ was revised and adapted for the purpose of my study. Defining constructivism and its approach to open and communicative environments brought me to

the idea of implementing SRT into my classroom environment. SRT frameworks (e.g., Caldwell, 2007; Nagy-Shadman & Desrochers, 2008; Wood, 2020; Jain & Farley, 2012) guided my design innovation. In addition, I incorporated frameworks of collaborative learning environments (e.g., Heinrich, 2013; Kirschner et al., 2018; Cai & Gu, 2019; Zhu & Wang, 2020) into my innovation as well.

To summarize, implementing SRT into my classroom environment has had an influence on the way I think about largely populated classrooms and my approach to teaching in such an environment. I have learned to create and implement my own innovations based on educational philosophies. By reading about what others in the field have done, I have developed my skills as an educator, designer, and implementer. My plan is to continue to utilize SRT in my learning experiences, continue to reflect on my experiences, and continue to improve upon my design process. By continuing to investigate current and future research, I will be able to utilize a continuous improvement process to advance my research and teaching skills. In addition, I will be able to assist other professors to build more collaborative environments when teaching largely populated courses.

Implications for Implementing SRT into Largely Populated Classrooms

SRT should be implemented into largely populated university classrooms if the curriculum warrants it. The curriculum should drive the technology, the technology should not drive the curriculum. Through conversations, students are encouraged and motivated to discover answers, solutions, and knowledge (Kantar, 2013). When considering implementing SRT into a classroom environment, there must be an understanding of the need for discussion and dialog thus allowing for students to engage.

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Taking a lecture-based class and adding SRT will not increase collaboration. Teachers need to change the way they are facilitating and need to give up some control of the environment and learning, giving students more voice.

Teachers and administrators need to shift their thinking in instituting policies and project an attitude that is more inclusive of students. Hinderances and restrictions caused by university policy have implications on the implementation of technology (Hamilton et al., 2016; Surry et al., 2005). For example, depending on university policy, if the technology is not free, teachers may have to pay out of their own pocket to license the technology for use. Furthermore, depending on informational technology policies prior approval may be required and possibly denied prior to implementing any new technologies in the classroom. Prior experiences of both teachers and students cause implementation issues because teachers believe they are losing control (Helleve, 2013). A teacher must change her pedagogical philosophy, which she may have adhered to for many years. To add to the power struggle, a lack of technical knowledge on the part of the teacher and the technology not being easy to use or useful to students will result in a lack of use by the student (Raes & Depaepe, 2020).

Implications for Future Research

The findings of this research study present practitioners with implications for future research. This study primarily consisted of participants pursuing degrees in social science majors. As a result, the data collected suggest implementing SRT in more discussion-based courses, such as psychology, social work, or criminal justice, may yield similar results and the transition may be fluid. In addition, teachers who are interested in

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creating more collaborative learning environments by implementing SRT may be interested in future research.

If I were to replicate this research, I would make modifications and alterations. I would change the learning assessment (Appendix E). The assessment was researcher developed and I do not feel it addressed the needs of the study. After evaluating the learning assessment questions, I have reason to believe they did not accurately capture the content discussed and covered in classroom discussions. To remedy this issue, I would expand on the number of questions for each topic and make sure to verify each was covered within the context of the discussions or select a course text that includes a test bank.

Another implication for subsequent cycles of this action research is to extend the length of the study. This study was conducted over a four-week period during a fifteen-week semester. By lengthening the study, I could ascertain if implementing SRT was cyclical in nature. For example, are students engaged at the onset of the study because SRT is a new tool and then become disengaged over the course of the semester once the newness of SRT wears off. With new technology the impact wanes over the course of time, known as the novelty effect (Luiz et al., 2022). Future cycles of SRT could monitor its influence on student engagement over the course of a full semester as opposed to a four-week span. For example, Hancock et al. (2018); Hourigan (2013; and Shekhar and Borrego (2016) studies were conducted over the course of an entire semester.

A change in the design of the study pertaining to the course topic would be of interest to me. This study collected data from students enrolled in a Management of Human Services course. This course is an outlier for HDFS majors as they are usually

focused on the family dynamic and not the management aspects of an organization. I am interested in developing an additional cycle of this research to determine if the course topic in conjunction with SRT has an influence on the outcome.

Limitations

As with any research, this study is not free of limitations. The action research approach lends itself to limitation. Action research is research conducted by a teacher with an interest in a specific issue within their sphere of influence (Mertler, 2017). Through this study I was able to identify a problem within my classroom and sphere of influence in which I would be able to effect change. Additionally, researcher bias is a limitation. Although every effort was taken to minimize researcher bias, it is possible participants may have responded in ways they thought were appropriate, thus skewing the results based on my role as both teacher and researcher. Findings of this study are limited to my specific course. The findings of my study are not meant to be generalized across a broad spectrum of educational environments or student populations but may be done through the reasonable evaluation and credible reasoning of future researchers (Warnick, 2004). Any relevancy to other circumstances would be at the discretion and interpretation of the reader.

The sample is a limitation because it is not reflective of the entire university. Participants were students specifically enrolled in the management of human services course and majoring in the College of Social Science offerings. As a result, participants in my study were representative of students primarily majoring in psychology, social work, criminology, and human development and family studies. Therefore, it is not possible to state the study's findings are translatable to other courses in other colleges

across campus. Data collection is a limitation of this study. The test to measure learning

knowledge was teacher-created and needs to be re-examined and tested to assure validity

and reliability. The learning assessment (Appendix E) returned a low Cronbach's alpha,

meaning my scale is less reliable and less consistent. Therefore, I would want to find a

more reliable instrument or improve the reliability of the current scale. Although a best

effort was used to triangulate data, research questions utilizing quantitative data sources

(i.e., Research questions 2, 4) were evaluated using only a single source. Lastly, as

mentioned above, the duration of the study was a limitation. The study was limited to a

four-week period. Extending the duration of the study across a full fifteen-week semester

may return different results as newness of the innovation wanes (e.g., Hourigan, 2013;

Shekar & Borrego, 2016).

REFERENCES

Ainley, M., & Ainley, J. (2011). Student engagement with science in early adolescence: The contribution of enjoyment to students' continuing interest in learning about science. *Contemporary educational psychology, 36*(1), 4-12. doi:10.1016/j.cedpsych.2010.08.001

Ajjawi, R., & Boud, D. (2017). Researching feedback dialogue: An interactional analysis approach. *Assessment & Evaluation in Higher Education, 42*(2), 252-265.

Alexander, C. J., Crescini, W. M., Juskewitch, J. E., Lachman, N., & Pawlina, W. (2009). Assessing the integration of audience response system technology in teaching of anatomical sciences. *Anatomical Sciences Education, 2*(4), 160-166. doi:10.1002/ase.99

Alt, D., & Alt, D. (2017). Constructivist learning and openness to diversity and challenge in higher education environments. *Learning Environments Research, 20*(1), 99-119. doi:10.1007/s10984-016-9223-8

Aluko, A., Rana, J., & Burgin, S. (2018). Teaching & learning tips 9: Case-based teaching with patients. *International journal of dermatology, 57*(7), 858-861. doi:10.1111/ijd.13781

Alvarez, C., Alarcon, R., & Nussbaum, M. (2011). Implementing collaborative learning activities in the classroom supported by one-to-one mobile computing: A design-based process. *The Journal of Systems & Software, 84*(11), 1961-1976. doi:10.1016/j.jss.2011.07.011

Alwashmi, M. F., Hawboldt, J., Davis, E., & Fetters, M. D. (2019). The iterative

    convergent design for mobile health usability testing: Mixed methods approach.

    JMIR mHealth and uHealth, 7(4), e11656. doi:10.2196/11656

Amry, A. B. (2014). The impact of WhatsApp mobile social learning on the achievement

    and attitudes of female students compared with face to face learning in the

    classroom.

Annetta, L. A., Minogue, J., Holmes, S. Y., & Cheng, M.-T. (2009). Investigating the

    impact of video games on high school students' engagement and learning about

    genetics. *Computers & Education, 53*(1), 74-85.

    doi:10.1016/j.compedu.2008.12.020

Appleton, J. J., Christenson, S. L., & Furlong, M. J. (2008). Student engagement with

    school: Critical conceptual and methodological issues of the construct.

    Psychology in the schools, 45(5), 369-386. doi:10.1002/pits.20303

Aubusson, P., Burke, P., Schuck, S., Kearney, M., & Frischknecht, B. (2014). Teachers

    choosing rich tasks: The moderating impact of technology on student learning,

    enjoyment, and preparation. *Educational Researcher, 43*(5), 219-229.

    doi:10.3102/0013189X14537115

Ault, M. J., & Horn, C. K. (2018). Increasing active engagement: Guidelines for using

    student response systems. *Journal of special education technology, 33*(3), 207-

    216. doi:10.1177/0162643418775745

Axelson, R. D., & Flick, A. (2011). Defining student engagement. *Change, 43*(1), 38-43.

    Retrieved from http://www.jstor.org.proxy2.cl.msu.edu/stable/23568219

Bächtold, M. (2013). What do students "construct" according to constructivism in science

    education? *Research in science education (Australasian Science Education*

    Research Association), 43(6), 2477-2496. doi:10.1007/s11165-013-9369-7

Bahn, S., & Weatherill, P. (2012). Eliciting data from participants using visual mapping

    as a collection technique. *Qualitative Social Work, 11*(4), 431-444.

    doi:10.1177/1473325010396602

Balta, N., Balta, N., Tzafilkou, K., & Tzafilkou, K. (2019). Using Socrative software for

    instant formative feedback in physics courses. *Education and Information*

    Technologies, 24(1), 307-323. doi:10.1007/s10639-018-9773-8

Balta, N., & Tzafilkou, K. (2018). Using Socrative software for instant formative

    feedback in physics courses. *Education and Information Technologies, 24*(1),

    307-323. doi:10.1007/s10639-018-9773-8

Baradaran Rahimi, F., Baradaran Rahimi, F., Kim, B., & Kim, B. (2019). The role of

    interest-driven participatory game design: Considering design literacy within a

    technology classroom. *International Journal of Technology and Design*

    Education, 29(2), 387-404. doi:10.1007/s10798-018-9451-6

Barusch, A., Gringeri, C., & George, M. (2011). Rigor in qualitative social work

    research: A review of strategies used in published articles. *Social work research,*

    35(1), 11-19. doi:10.1093/swr/35.1.11

Besser, E. D., & Newby, T. J. (2019). Exploring the role of feedback and its impact

    within a digital badge system from student perspectives. *TechTrends, 63*(4), 485-

    495. doi:10.1007/s11528-019-00386-2

Birt, L., Scott, S., Cavers, D., Campbell, C., & Walter, F. (2016). Member checking: A

tool to enhance trustworthiness or merely a nod to validation? *Qualitative Health

Research, 26*(13), 1802-1811. doi:10.1177/1049732316654870

Blair, T., & Minkler, M. (2009). Participatory action research with older adults: Key

principles in practice. *The Gerontologist, 49*(5), 651-662.

doi:10.1093/geront/gnp049

Boekaerts, M., de Koning, E., & Vedder, P. (2006). Goal-directed behavior and

contextual factors in the classroom: An innovative approach to the study of

multiple goals. *Educational Psychologist, 41*(1), 33-51.

doi:10.1207/s15326985ep4101_5

Boud, D., & Molloy, E. (2013). *Feedback in higher and professional education:

Understanding it and doing it well*: Routledge.

Bouvier, P., Lavoué, E., & Sehaba, K. (2014). Defining engagement and characterizing

engaged-behaviors in digital gaming. *Simulation & Gaming, 45*(4-5), 491-507.

doi:10.1177/1046878114553571

Brady Greenawalt, M. (1994). Student-written case studies: The benefits to the internal

audit curriculum. *Managerial Auditing Journal, 9*(2), 3-7.

doi:10.1108/02686909410053520

Brandon, A. F., & All, A. C. (2010). Constructivism theory analysis and application to

curricula. *Nursing education perspectives, 31*(2), 89-92. Retrieved from

http://msulibraries.summon.serialsolutions.com/2.0.0/

Brinck, I. (2014). Developing an understanding of social norms and games: Emotional

engagement, nonverbal agreement, and conversation. *Theory & Psychology,*

24(6), 737-754. doi:10.1177/0959354314555792

Bruce, M., Omne-Pontã N, M., & Gustavsson, P. J. (2010). Active and emotional student

engagement: A nationwide, prospective, longitudinal study of Swedish nursing

students. *International Journal of Nursing Education Scholarship, 7*(1), Article

14-Article 14. doi:10.2202/1548-923X.1886

Bruffee, K. A. (1984). Collaborative learning and the 'conversation of mankind'. *College*

English, 46(7), 635. Retrieved from

http://msulibraries.summon.serialssolutions.com/2.0.0/

Bryson, C., & Hardy, C. (2010). Reaching a common understanding of the meaning of

student engagement.

Buil, I., Catalán, S., & Martínez, E. (2016). Do clickers enhance learning? A control-

value theory approach. *Computers and education, 103*, 170-182.

doi:10.1016/j.compedu.2016.10.009

Burrowes, P. A. (2003). A student-centered approach to teaching general biology that

really works: Lord's constructivist model put to a test. *The American Biology*

Teacher, 65(7), 491-502.

Cai, H., & Gu, X. (2019). Supporting collaborative learning using a diagram-based

visible thinking tool based on cognitive load theory. *British Journal of*

Educational Technology, 50(5), 2329-2345. doi:10.1111/bjet.12818

Cain, J., Black, E. P., & Rohr, J. (2009). An audience response system strategy to

    improve student motivation, attention, and feedback. *American Journal of*

    Pharmaceutical Education, 73(2), 21-21. doi:10.5688/aj730221

Cain, T. (2008). The characteristics of action research in music education. *British Journal*

    of Music Education, 25(3), 283-313. doi:10.1017/S0265051708008115

Caldwell, J. E. (2007). Clickers in the large classroom: Current research and best-practice

    tips. *CBE—Life Sciences Education, 6*(1), 9-20.

Carroll, M., Lindsey, S., Chaparro, M., & Winslow, B. (2019). An applied model of

    learner engagement and strategies for increasing learner engagement in the

    modern educational environment. *Interactive Learning Environments*, 1-15.

    doi:10.1080/10494820.2019.1636083

Carter, N., Bryant-Lukosius, D., DiCenso, A., Blythe, J., & Neville, A. J. (2014). The use

    of triangulation in qualitative research. *Oncology nursing forum, 41*(5), 545-547.

    doi:10.1188/14.onf.545-547

Cassell, C., & Johnson, P. (2006). Action research: Explaining the diversity. *Human*

    Relations, 59(6), 783-814. doi:10.1177/0018726706067080

Cennamo, K. S. (1993). Learning from video: Factors influencing learners'

    preconceptions and invested mental effort. *Educational Technology Research and*

    Development, 41(3), 33-45. doi:10.1007/BF02297356

Cheri Ann Hernandez, R. N. P. D. C. D. E. (2009). Theoretical coding in grounded theory

    methodology. *Grounded Theory Review: An International Journal, 8*(3).

    Retrieved from http://msulibraries.summon.serialssolutions.com/2.0.0/

Chiovitti, R. F., & Piran, N. (2003). Rigour and grounded theory research. *Journal of Advanced Nursing, 44*(4), 427-435. doi:10.1046/j.0309-2402.2003.02822.x

Cho, J. Y., & Lee, E.-H. (2014). Reducing confusion about grounded theory and qualitative content analysis: Similarities and differences. *The Qualitative Report, 19*(32), 1. Retrieved from http://msulibraries.summon.serialssolutions.com/2.0.0/

Christopherson, K. M. (2011). Hardware or wetware: What are the possible interactions of pedagogy and technology in the classroom? In (Vol. 38, pp. 288-292). Los Angeles, CA: SAGE Publications.

Clark, K. R. (2018). Learning theories: Constructivism. *Radiologic technology - Journal Article, 90*(2), 180. Retrieved from http://msulibraries.summon.serialssolutions.com/2.0.0/

Clynes, M. P., & Raftery, S. E. C. (2008). Feedback: An essential element of student learning in clinical practice. *Nurse education in practice, 8*(6), 405-411. doi:10.1016/j.nepr.2008.02.003

Collaço, C. M. (2017). Increasing student engagement in higher education. *Journal of Higher Education Theory and Practice, 17*(4), 40. Retrieved from http://msulibraries.summon.serialssolutions.com/2.0.0/

Cooper, K. M., Downing, V. R., & Brownell, S. E. (2018). The influence of active learning practices on student anxiety in large-enrollment college science classrooms. *International Journal of STEM Education, 5*(1), 1-18. doi:10.1186/s40594-018-0123-6

Corno, L., & Mandinach, E. B. (2009). The role of cognitive engagement in classroom

 learning and motivation. *Educational Psychologist, 18*(2), 88-108.

 doi:10.1080/00461528309529266

Danneel, S., Colpin, H., Goossens, L., Engels, M., Leeuwen, K. V., Wim Van Den, N., &

 Verschueren, K. (2019). Emotional school engagement and global self-esteem in

 adolescents: Genetic susceptibility to peer acceptance and rejection. *Merrill-

 Palmer Quarterly, 65*(2), 158-182. doi:10.13110/merrpalmquar1982.65.2.0158

Dawson, P., Carless, D., & Lee, P. P. W. (2021). Authentic feedback: Supporting learners

 to engage in disciplinary feedback practices. *Assessment and evaluation in higher

 education, 46*(2), 286-296. doi:10.1080/02602938.2020.1769022

Delialioğlu, Ö. (2012). Student engagement in blended learning environments with

 lecture-based and problem-based instructional approaches. *Journal of Educational

 Technology & Society, 15*(3), 310-322. Retrieved from

 http://msulibraries.summon.serialssolutions.com/2.0.0/

Dhaliwal, H. K., Allen, M., Kang, J., Bates, C., & Hodge, T. (2015). The effect of using

 an audience response system on learning, motivation and information retention in

 the orthodontic teaching of undergraduate dental students: A cross-over trial.

 Journal of orthodontics, 42(2), 123-135. doi:10.1179/1465313314Y.0000000129

Di Battista, S., Pivetti, M., & Berti, C. (2014). Engagement in the university context:

 Exploring the role of a sense of justice and social identification. *Social

 psychology of education, 17*(3), 471-490. doi:10.1007/s11218-014-9255-9

Doherty, E., Carcary, M., Ramsey, E., & Ibbotson, P. (2015). The importance of 'e' in

 mixed methods research - Development of an SME framework to leverage value

from IT. *European Conference on Research Methodology for Business and Management Studies*, 177. Retrieved from

http://msulibraries.summon.serialssolutions.com/2.0.0/

Doran, J., Healy, M., McCutcheon, M., & O'Callaghan, S. (2011). Adapting case-based teaching to large class settings: An action research approach. *Accounting education (London, England), 20*(3), 245-263. doi:10.1080/09638180.2011.583742

Doucet, M., Vrins, A., & Harvey, D. (2009). Effect of using an audience response system on learning environment, motivation and long-term retention, during case-discussions in a large group of undergraduate veterinary clinical pharmacology students. *Medical teacher, 31*(12), e570-e579. doi:10.3109/01421590903193539

Edwards, R., & I'Anson, J. (2020). Using artifacts and qualitative methodology to explore pharmacy students' learning practices. *American Journal of Pharmaceutical Education, 84*(1), 7082-7059. doi:10.5688/ajpe7082

Egelandsdal, K., Egelandsdal, K., Krumsvik, R. J., & Krumsvik, R. J. (2017). Clickers and formative feedback at university lectures. *Education and Information Technologies, 22*(1), 55-74. doi:10.1007/s10639-015-9437-x

Elffers, L. (2013). Staying on track: Behavioral engagement of at-risk and non-at-risk students in post-secondary vocational education. *European journal of psychology of education, 28*(2), 545-562. doi:10.1007/s10212-012-0128-3

Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K., & Kyngäs, H. (2014). Qualitative content analysis: A focus on trustworthiness. *SAGE Open, 4*(1), 215824401452263. doi:10.1177/2158244014522633

Engels, M. C., Colpin, H., Van Leeuwen, K., Bijttebier, P., Van Den Noortgate, W.,
Claes, S., . . . Verschueren, K. (2016). Behavioral engagement, peer status, and
teacher–student relationships in adolescence: A longitudinal study on reciprocal
influences. *Journal of youth and adolescence, 45*(6), 1192-1207.
doi:10.1007/s10964-016-0414-5

Ezeanyanike, P. A. (2013). Assessing benefits of collaborative learning environment for
quality higher education in Nigeria. *Journal of educational and social research*.
doi:10.5901/jesr.2013.v3n6p85

Ferguson, P. (2011). Student perceptions of quality feedback in teacher education.
Assessment & Evaluation in Higher Education, 36(1), 51-62.

Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed
methods designs-Principles and practices. *Health services research, 48*(6pt2),
2134-2156. doi:10.1111/1475-6773.12117

Florenthal, B. (2019). Students' motivation to participate via mobile technology in the
classroom: A uses and gratifications approach. *Journal of Marketing Education,
41*(3), 234-253. doi:10.1177/0273475318784105

Fredricks, Blumenfeld, & Paris. (2016). School engagement: Potential of the concept,
state of the evidence. *Review of Educational Research, 74*(1), 59-109.
doi:10.3102/00346543074001059

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential
of the concept, state of the evidence. *Review of Educational Research, 74*(1), 59-
109. doi:10.3102/00346543074001059

Fuller, K. A., Karunaratne, N. S., Naidu, S., Exintaris, B., Short, J. L., Wolcott, M. D., . . . White, P. J. (2018). Development of a self-report instrument for measuring in-class student engagement reveals that pretending to engage is a significant unrecognized problem. *PloS one, 13*(10), e0205828-e0205828. doi:10.1371/journal.pone.0205828

García Álvarez-Coque, J. M., Mas-Verdú, F., & Roig-Tierno, N. (2017). Technological innovation versus non-technological innovation: different conditions in different regional contexts? *Quality & Quantity, 51*(5), 1955-1967. doi:10.1007/s11135-016-0394-2

Gerholz, Backhaus, M., & Rameder. (2018). Editorial: Civic engagement in higher education institutions in europe. *Zeitschrift für Hochschulentwicklung*(Jg.13/Nr.2), 9-19. doi:10.3217/zfhe-13-02/01

Giacalone, D. (2016). Enhancing student learning with case-based teaching and audience response systems in an interdisciplinary food science course. *Higher Learning Research Communications, 6*(3), 26. doi:10.18870/hlrc.v6i3.304

Gravett, S., Beer, J. d., Odendaal-Kroon, R., & Merseth, K. K. (2017). The affordances of case-based teaching for the professional learning of student-teachers. *Journal of curriculum studies, 49*(3), 369-390. doi:10.1080/00220272.2016.1149224

Greene, B. A., & Miller, R. B. (1996). Influences on achievement: Goals, perceived ability, and cognitive engagement. *Contemporary educational psychology, 21*(2), 181-192.

Hamilton, E. R., Rosenberg, J. M., & Akcaoglu, M. (2016). The substitution augmentation modification redefinition (SAMR) model: A critical review and

suggestions for its use. *TechTrends, 60*(5), 433-441. doi:10.1007/s11528-016-0091-y

Han, J. H., & Finkelstein, A. (2013). Understanding the effects of professors' pedagogical development with clicker assessment and feedback technologies and the impact on students' engagement and learning in higher education. *Computers & Education, 65*, 64-76. doi:10.1016/j.compedu.2013.02.002

Harricharan, M., & Bhopal, K. (2014). Using blogs in qualitative educational research: An exploration of method. *International Journal of Research & Method in Education, 37*(3), 324-343. doi:10.1080/1743727X.2014.885009

Harris, J. L., Al-Bataineh, M. T., & Al-Bataineh, A. (2016). One to one technology and its effect on student academic achievement and motivation. *Contemporary Educational Technology, 7*(4), 368. Retrieved from http://msulibraries.summon.serialssolutions.com/2.0.0/

Hathorn, L. G., & Ingram, A. L. (2002). Online collaboration: Making it work. *Educational Technology, 42*(1), 33-40. Retrieved from http://msulibraries.summon.serialssolutions.com/2.0.0/

Hatta, T., Narita, K., Yanagihara, K., Ishiguro, H., Murayama, T., & Yokode, M. (2018). Crossover mixed analysis in a convergent mixed methods design used to investigate clinical dialogues about cancer treatment in the Japanese context. *Journal of Mixed Methods Research, 14*(1), 84-109. doi:10.1177/1558689818792793

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81-112.

Healey, P. R., Dunn, S. M., Witherow, J. L., Dunn, H. P., Kang, C. J., Marks, S., &
White, A. J. (2021). Perceived usefulness and ease of use of fundoscopy by
medical students: A randomised crossover trial of six technologies (eFOCUS 1).
BMC medical education, 21(1), 1-41. doi:10.1186/s12909-020-02469-8

Hedén, L., Ahlstrom, L., Institutionen för medicin, a. f. s. o. f., Sahlgrenska, a.,
Göteborgs, u., Gothenburg, U., . . . Sahlgrenska, A. (2016). Individual response
technology to promote active learning within the caring sciences: An
experimental research study. *Nurse education today, 36*, 202-206.
doi:10.1016/j.nedt.2015.10.010

Heflin, H., Shewmaker, J., & Nguyen, J. (2017). Impact of mobile technology on student
attitudes, engagement, and learning. *Computers and education, 107*, 91-99.
doi:10.1016/j.compedu.2017.01.006

Hegarty, B. (2015). Attributes of open pedagogy: A model for using open educational
resources. *Educational Technology, 55*(4), 3-13. Retrieved from
http://msulibraries.summon.serialssolutions.com/2.0.0/link/

Heinrich, E. (2013). Recommendations to university managers for facilitating
engagement of academics with teaching. *Journal of Higher Education Policy and
Management, 35*(5), 458-470. doi:10.1080/1360080X.2013.812180

Helleve, I. (2013). The networked classroom – Socially unconnected. *Education Inquiry,
4*(2), 395-412. doi:10.3402/edui.v4i2.22080

Hernwall, P., Fors, U., Bergdahl, N., & Knutsson, O. (2018). The use of learning
technologies and student engagement in learning activities. *Nordic Journal of
Digital Literacy, 13*(2), 113-130. doi:10.18261/issn.1891-943x-2018-02-04

Hidi, S., Renninger, K., & Krapp, A. (2004). Interest, a motivational variable that combines affective and cognitive functioning.

Hodges, L. C. (2005). From problem-based learning to interrupted lecture: Using case-based teaching in different class formats. *Biochemistry and molecular biology education, 33*(2), 101-104. doi:10.1002/bmb.2005.494033022446

Hoffmann, E. A. (2007). Open-ended interviews, power, and emotional labor. *Journal of Contemporary Ethnography, 36*(3), 318-346. doi:10.1177/0891241606293134

Hooker, J. F., Denker, K. J., Summers, M. E., & Parker, M. (2016). The development and validation of the student response system benefit scale. *Journal of Computer Assisted Learning, 32*(2), 120-127. doi:10.1111/jcal.12121

Hourigan, K. L. (2013). Increasing student engagement in large classes: The ARC model of application, response, and collaboration. *Teaching sociology, 41*(4), 353-359. doi:10.1177/0092055X13491580

Howard, J. (2015). *Discussion in the college classroom: Getting your students engaged and participating in person and online*: John Wiley & Sons.

Howard, S., Ma, J., & Yang, J. (2016). Student rules: Exploring patterns of students' computer-efficacy and engagement with digital technologies in learning. *Computers and education, 101*, 29-42. doi:10.1016/j.compedu.2016.05.008

Hull, K., Lawford, H., Hood, S., Oliveira, V., Murray, M., Trempe, M., . . . Jensen, M. (2019). Student anxiety and evaluation. *Collected essays on learning and teaching, 12*, 23-35. doi:10.22329/celt.v12i0.5409

Hunsinger, M., Poirier, C. R., & Feldman, R. S. (2008). The roles of personality and class

    size in student attitudes toward individual response technology. *Computers in*

    Human Behavior, 24(6), 2792-2798. doi:10.1016/j.chb.2008.04.003

Ilcewicz, H. N., Poirier, T. I., & Pailden, J. (2018). Use of mixed-methods approach to

    assess the impact of a pre-professional health humanities honors course on

    developing interpersonal skills. *Currents in pharmacy teaching and learning,*

    10(11), 1456-1465. doi:10.1016/j.cptl.2018.08.010

Jain, A., & Farley, A. (2012). Mobile phone-based audience response system and student

    engagement in large-group teaching mobile phone-based audience response

    system and student engagement in large-group teaching. *Economic Papers, 31*(4),

    428-439. doi:10.1111/1759-3441.12002

Jao, I., Kombe, F., Mwalukore, S., Bull, S., Parker, M., Kamuya, D., . . . Marsh, V.

    (2015). Research stakeholders' views on benefits and challenges for public health

    research data sharing in Kenya: The importance of trust and social relations. *PloS*

    one, 10(9), e0135545. doi:10.1371/journal.pone.0135545

Jeong, H., & Hmelo-Silver, C. E. (2016). Seven affordances of computer-supported

    collaborative learning: How to support collaborative learning? How can

    technologies help? *Educational Psychologist, 51*(2), 247-265.

    doi:10.1080/00461520.2016.1158654

Johnson, H., Douglas, J., Bigby, C., & Iacono, T. (2011). The challenges and benefits of

    using participant observation to understand the social interaction of adults with

    intellectual disabilities. *Augmentative and Alternative Communication, 27*(4),

    267-278. doi:10.3109/07434618.2011.587831

Jones, J., Bion, J., Brown, C., Willars, J., Brookes, O., Tarrant, C., . . . the, P. c. (2019). Reflection in practice: How can patient experience feedback trigger staff reflection in hospital acute care settings? *Health expectations : an international journal of public participation in health care and health policy, 23*(2), 396-404. doi:10.1111/hex.13010

Joo, K. P., Andrés, C., & Shearer, R. (2014). Promoting distance learners' cognitive engagement and learning outcomes: Design-based research in the Costa Rican national university of distance education. *International review of research in open and distance learning, 15*(6), 188-210. doi:10.19173/irrodl.v15i6.1908

Kaendler, C., Wiedmann, M., Rummel, N., & Spada, H. (2015). Teacher competencies for the implementation of collaborative learning in the classroom: A framework and research review. *Educational Psychology Review, 27*(3), 505-536. doi:10.1007/s10648-014-9288-9

Kahn, P. E. (2014). Theorising student engagement in higher education. *British Educational Research Journal, 40*(6), 1005-1018.

Kahu, E. (2013). Framing student engagement in higher education. *Studies in higher education (Dorchester-on-Thames), 38*(5), 758-773. doi:10.1080/03075079.2011.598505

Kahu, E. (2014). Increasing the emotional engagement of first year mature-aged distance students: Interest and belonging. *The international journal of the first year in higher education, 5*(2), 45-55. doi:10.5204/intjfyhe.v5i2.231

Kai-Wai Chu, S., & Kennedy, D. M. (2011). Using online collaborative tools for groups to co-construct knowledge. *Online Information Review, 35*(4), 581-597. doi:10.1108/14684521111161945

Kantar, L. D. (2013). Demystifying instructional innovation: The case of teaching with case studies. *The journal of scholarship of teaching and learning, 13*(2), 101. Retrieved from http://msulibraries.summon.serialssolutions.com/2.0.0/

Karpouza, E., Karpouza, E., Emvalotis, A., & Emvalotis, A. (2019). Exploring the teacher-student relationship in graduate education: A constructivist grounded theory. *Teaching in Higher Education, 24*(2), 121-140. doi:10.1080/13562517.2018.1468319

Kayode, B. K. (2018). Effect of communication management on distance learners' cognitive engagement in Malaysian institutions of higher learning. *International Review of Research in Open and Distributed Learning, 19*(4). doi:10.19173/irrodl.v19i4.3672

Kember, D. (2004). Interpreting student workload and the factors which shape students' perceptions of their workload. *Studies in higher education (Dorchester-on-Thames), 29*(2), 165-184. doi:10.1080/0307507042000190778

Kerasidou, A. (2015). Sharing the knowledge: Sharing aggregate genomic findings with research participants in developing countries. *Developing world bioethics, 15*(3), 267-274. doi:10.1111/dewb.12071

Kezar, A. J., & Kinzie, J. (2006). Examining the ways institutions create student engagement: The role of mission. *Journal of College Student Development, 47*(2), 149-172. doi:10.1353/csd.2006.0018

Kienle, A., & Kienle, A. (2009). Intertwining synchronous and asynchronous

communication to support collaborative learning—system design and evaluation.

Education and Information Technologies, 14(1), 55-79. doi:10.1007/s10639-008-

9065-9

Kirschner, P. A., Sweller, J., Kirschner, F., & Zambrano R, J. (2018). From cognitive

load theory to collaborative cognitive load theory. *International Journal of

Computer-Supported Collaborative Learning, 13*(2), 213-233.

doi:10.1007/s11412-018-9277-y

Kiser, P. M. (2015). *The human services internship: Getting the most from your

experience*: Cengage Learning.

Kroll, L. R. (2004). Constructing constructivism: How student-teachers construct ideas of

development, knowledge, learning, and teaching. *Teachers and teaching, theory

and practice, 10*(2), 199-221. doi:10.1080/1354060042000188035

Kuh, G. D. (2001). Assessing what really matters to student learning. *33*(3), 10. Retrieved

from http://msulibraries.summon.serialssolutions.com/2.0.0/

Kuh, G. D., Cruce, T. M., Shoup, R., Kinzie, J., & Gonyea, R. M. (2008). Unmasking the

Effects of Student Engagement on First-Year College Grades and Persistence. *The

Journal of Higher Education, 79*(5), 540-563.

doi:10.1080/00221546.2008.11772116

Kulhavy, R. W., & Stock, W. A. (1989). Feedback in written instruction: The place of

response certitude. *Educational Psychology Review, 1*(4), 279-308.

doi:10.1007/BF01320096

Kunselman, J. C., & Johnson, K. A. (2004). Using the case method to facilitate learning. *College teaching, 52*(3), 87-92.

Kwan, Y. W., & Wong, A. F. L. (2014). The constructivist classroom learning environment and its associations with critical thinking ability of secondary school students in liberal studies. *Learning Environments Research, 17*(2), 191-207. doi:10.1007/s10984-014-9158-x

Lam, L. W., Xu, A. J., & Loi, R. (2018). Is emotional engagement possible in emotionally demanding jobs? The role of lLeader-member exchange (LMX). *Journal of personnel psychology, 17*(1), 42-52. doi:10.1027/1866-5888/a000194

Laurent, C., & Sonia, L. (2019). From groupwork to collaborative learning: Analysis of undergraduate business students' experiences. *Revue française de pédagogie, 202*(1), 77-88. doi:10.4000/rfp.7514

Le Sueur, H., Dagliati, A., Buchan, I., Whetton, A. D., Martin, G. P., Dornan, T., & Geifman, N. (2020). Pride and prejudice - What can we learn from peer review? *Medical teacher, 42*(9), 1012-1018. doi:10.1080/0142159X.2020.1774527

Levin, B. B. (1995). Using the case method in teacher education: The role of discussion and experience in teachers' thinking about cases. *Teaching and Teacher Education, 11*(1), 63-79. doi:10.1016/0742-051X(94)00013-V

Linnenbrink, E. A. (2007). The role of affect in student learning: A multi-dimensional approach to considering the interaction of affect, motivation, and engagement. In *Emotion in education* (pp. 107-124): Elsevier.

Linvill, D. (2014). Student interest and engagement in the classroom: Relationships with

    student personality and developmental variables. *Southern Communication*

    Journal, 79(3), 201-214. doi:10.1080/1041794X.2014.884156

Luiz, R., Filipe, D. P., Armando, M. T., Paula, T. P., Marcela, P., Leandro Silva Galvão,

    C., . . . Seiji, I. (2022). Gamification suffers from the novelty effect but benefits

    from the familiarization effect: Findings from a longitudinal study. *International*

    Journal of Educational Technology in Higher Education, 19(1), 1-25.

    doi:10.1186/s41239-021-00314-6

Luo, Y., Xie, M., & Lian, Z. (2019). Emotional engagement and student satisfaction: A

    study of chinese college students based on a nationally representative sample. *The*

    Asia-Pacific Education Researcher, 28(4), 283-292. doi:10.1007/s40299-019-

    00437-5

Macfarlane, B., & Tomlinson, M. (2017). Critiques of student engagement. *Higher*

    Education Policy, 30(1), 5-21. doi:10.1057/s41307-016-0027-3

Maguire, R., Egan, A., Hyland, P., & Maguire, P. (2016). Engaging students emotionally:

    The role of emotional intelligence in predicting cognitive and affective

    engagement in higher education. *Higher education research and development,*

    36(2), 343-357. doi:10.1080/07294360.2016.1185396

Mansouri, S. A., & Piki, A. (2016). An exploration into the impact of blogs on students'

    learning: Case studies in postgraduate business education. *Innovations in*

    Education and Teaching International, 53(3), 260-273.

    doi:10.1080/14703297.2014.997777

Martin, & Beese, J. (2020). Moving beyond the lecture: Inspiring social justice

    engagement through counter-story using case study pedagogy. *The Educational*

    forum (West Lafayette, Ind.), 84(3), 210-225.

    doi:10.1080/00131725.2020.1730531

Martin, A., & Lazendic, G. (2018). Computer-adaptive testing: Implications for students'

    achievement, motivation, engagement, and subjective test experience. *Journal of*

    Educational Psychology, 110(1), 27-45. doi:10.1037/edu0000205

Martin, A. J., Mansour, M., & Malmberg, L.-E. (2019). What factors influence students'

    real-time motivation and engagement? An experience sampling study of high

    school students using mobile technology. *Educational Psychology*, 1-23.

    doi:10.1080/01443410.2018.1545997

Marvasti, A. (2019). Qualitative content analysis: A novice's perspective. *Forum,*

    qualitative social research U6 - Journal Article, 20(3). Retrieved from

    http://msulibraries.summon.serialssolutions.com/2.0.0/

McDaniel, M. A., Waddill, P. J., Finstad, K., & Bourg, T. (2000). The effects of text-

    based interest on attention and recall. *Journal of Educational Psychology, 92*(3),

    492.

Meece, J. L., Blumenfeld, P. C., & Hoyle, R. H. (1988). Students' goal orientations and

    cognitive engagement in classroom activities. *Journal of Educational Psychology,*

    80(4), 514.

Mertens, D. (2007). Research and evaluation in education and psychology: Integrating

    diversity with quantitative, qualitative, and mixed methods. *Journal of*

Technology Studies, 33(2), 134. Retrieved from

http://msulibraries.summon.serialssolutions.com/2.0.0/

Milner, A. R., Templin, M. A., & Czerniak, C. M. (2017). Elementary science students'

motivation and learning strategy use: Constructivist classroom contextual factors

in a life science laboratory and a traditional classroom. *Journal of science teacher

education, 22*(2), 151-170. doi:10.1007/s10972-010-9200-5

Mitchell, M. H., William, L. B., Nora, S., & Annette, T. (2005). A measure of college

student course engagement. *The Journal of Educational Research, 98*(3), 184-

191.

Mitchell, S. N., Reilly, R. C., & Logue, M. E. (2009). Benefits of collaborative action

research for the beginning teacher. *Teaching and Teacher Education, 25*(2), 344-

349. doi:10.1016/j.tate.2008.06.008

Moallem, M. (2001). Applying constructivist and objectivist learning theories in the

design of a web-based course: Implications for practice. *Journal of Educational

Technology & Society, 4*(3), 113-125.

Morse, J. M. (2015). Critical Analysis of Strategies for Determining Rigor in Qualitative

Inquiry. *Qualitative Health Research, 25*(9), 1212-1222.

doi:10.1177/1049732315588501

Nagy-Shadman, E., & Desrochers, C. (2008). Student response technology: Empirically

grounded or just a gimmick? *International Journal of Science Education, 30*(15),

2023-2066. doi:10.1080/09500690701627253

Nieswandt, M. (2007). Student affect and conceptual understanding in learning

chemistry. *Journal of Research in Science Teaching: The Official Journal of the*

National Association for Research in Science Teaching, 44(7), 908-937.

Ninaus, M., Greipl, S., Kiili, K., Lindstedt, A., Huber, S., Klein, E., . . . Moeller, K.

(2019). Increased emotional engagement in game-based learning – A machine

learning approach on facial emotion detection data. *Computers and education,*

142, 103641. doi:10.1016/j.compedu.2019.103641

O'Brien, H. L., & Toms, E. G. (2008). What is user engagement? A conceptual

framework for defining user engagement with technology. *Journal of the*

American Society for Information Science and Technology, 59(6), 938-955.

doi:10.1002/asi.20801

O'Byrne, W. I., & Pytash, K. E. (2015). Hybrid and blended learning: Modifying

pedagogy across path, pace, time, and place. *Journal of Adolescent & Adult*

Literacy, 59(2), 137-140. doi:10.1002/jaal.463

Onwuegbuzie, A. J., & Frels, R. K. (2013). Introduction: Toward a new research

philosophy for addressing social justice issues: Critical dialectical pluralism 1.0.

International Journal of Multiple Research Approaches, 7(1), 9-26.

doi:10.5172/mra.2013.7.1.9

Öqvist, A., Malmström, M., Institutionen för ekonomi, t. o. s., Innovation och, D.,

Institutionen för konst, k. o. l., Pedagogik språk och, Ä., & Luleå tekniska, u.

(2016). Teachers' leadership: A maker or a breaker of students' educational

motivation. *School Leadership & Management, 36*(4), 365-380.

doi:10.1080/13632434.2016.1247039

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2013). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and policy in mental health and mental health services research, 42*(5), 533-544. doi:10.1007/s10488-013-0528-y

Pardo, A., Jovanovic, J., Dawson, S., Gašević, D., & Mirriahi, N. (2019). Using learning analytics to scale the provision of personalised feedback. *British Journal of Educational Technology, 50*(1), 128-138. doi:10.1111/bjet.12592

Paula Witkowski, P., & Thomas Cornell, P. (2017). An investigation into student engagement in higher education classrooms. *Insight (Parkville, Mo.), 10*, 56-67.

Payne, L. (2019). Student engagement: Three models for its investigation. *Journal of Further and Higher Education, 43*(5), 641-657. doi:10.1080/0309877X.2017.1391186

Perera, J., Lee, N., Win, K., Perera, J., & Wijesuriya, L. (2008). Formative feedback to students: The mismatch between faculty perceptions and student expectations. *Medical teacher, 30*(4), 395-399. doi:10.1080/01421590801949966

Popescu, E., & Popescu, E. (2014). Providing collaborative learning support with social media in an integrated environment. *World Wide Web, 17*(2), 199-212. doi:10.1007/s11280-012-0172-6

Raes, A., & Depaepe, F. (2020). A longitudinal study to understand students' acceptance of technological reform. When experiences exceed expectations. *Education and Information Technologies, 25*(1), 533-552. doi:10.1007/s10639-019-09975-3

Ramaprasad, A. (1983). On the definition of feedback. *Behavioral science, 28*(1), 4-13.

Rana, N. P., & Dwivedi, Y. K. (2016). Using clickers in a large business class: Examining use behavior and satisfaction. *Journal of Marketing Education, 38*(1), 47-64. doi:10.1177/0273475315590660

Retalis, S., Paraskeva, F., Alexiou, A., Litou, Z., Sbrini, T., & Limperaki, Y. (2018). Leveraging the 1:1 iPad approach for enhanced learning in the classroom. *Educational Media International, 55*(3), 213-230. doi:10.1080/09523987.2018.1512463

Rissanen, A. (2018). Student engagement in large classroom: The effect on grades, attendance and student experiences in an undergraduate biology course. *Canadian journal of science, mathematics and technology education, 18*(2), 136-153. doi:10.1007/s42330-018-0015-2

Ritter, M. E., & Lemke, K. A. (2000). Addressing the 'seven principles for good practice in undergraduate education' with Internet-enhanced education. *Journal of Geography in Higher Education, 24*(1), 100-108. doi:10.1080/03098260085171

Robbins, R. W., & Butler, B. S. (2009). Selecting a virtual world platform for learning. *Journal of Information Systems Education, 20*(2), 199.

Rodríguez, S., Núñez, J. C., Valle, A., Freire, C., Ferradás, M. d. M., & Rodríguez-Llorente, C. (2019). Relationship between students' prior academic achievement and homework behavioral engagement: The mediating/moderating role of learning motivation. *Frontiers in psychology, 10*, 1047-1047. doi:10.3389/fpsyg.2019.01047

Romine, W., Romine, W., Sadler, T. D., Sadler, T. D., Presley, M., Presley, M., . . . Klosterman, M. L. (2014). Student interest in technology and science (SITS)

survey: Development, validation, and use of a new instrument. *International journal of science and mathematics education, 12*(2), 261-283. doi:10.1007/s10763-013-9410-3

Rotgans, J. I., & Schmidt, H. G. (2011). Cognitive engagement in the problem-based learning classroom. *Advances in Health Sciences Education, 16*(4), 465-479.

Rowell, L. L., Polush, E. Y., Riel, M., & Bruewer, A. (2015). Action researchers' perspectives about the distinguishing characteristics of action research: A delphi and learning circles mixed-methods study. *Educational action research, 23*(2), 243-270. doi:10.1080/09650792.2014.990987

Ruokonen, I. (2013). Bridges of joy – A case study of the collaborative design learning process of the university teacher students. *The European Journal of Social & Behavioural Sciences, 7*(4), 1187-1192. doi:10.15405/ejsbs.98

Ryle, A., & Cumming, K. (2007). Reflections on engagement in online learning communities. *International Journal of Pedagogies and Learning, 3*(3), 35-46. doi:10.5172/ijpl.3.3.35

Saito, A., & Smith, M. E. (2017). Measurement and analysis of student (dis)engagement in higher education: A preliminary study. *IAFOR journal of education, 5*(2). doi:10.22492/ije.5.2.01

Santori, D., & Smith, C. A. (2018). Teaching and learning with iPads to support dialogic construction of multiliteracies. *Middle School Journal, 49*(1), 24-31. doi:10.1080/00940771.2018.1398944

Saqr, M., Fors, U., & Tedre, M. (2018). How the study of online collaborative learning
can guide teachers and predict students' performance in a medical course. *BMC
medical education, 18*(1), 24-14. doi:10.1186/s12909-018-1126-1

Schiefele, U. (1991). Interest, learning, and motivation. *Educational Psychologist, 26*(3-
4), 299-323.

Schiefele, U., Krapp, A., & Winteler, A. (1992). Interest as a predictor of academic
achievement: A meta-analysis of research.

Schuh, K. L., & Kuo, Y.-L. (2015). Seeking construct validity grounded in constructivist
epistemology: Development of the survey of contemporary learning
environments. *International Journal of Research & Method in Education, 38*(4),
388-412. doi:10.1080/1743727X.2014.940307

Scornavacca, E., Huff, S., & Marshall, S. (2009). Mobile phones in the classroom: If you
can't beat them, join them. *Communications of the ACM, 52*(4), 142-146.

Scruggs, B. (2009). Constructivist practices to increase student engagement in the
orchestra classroom. *Music Educators Journal, 95*(4), 53-59.
doi:10.1177/0027432109335468

Shaw, J., Kominko, S., & Terrion, J. L. (2015). Using lecturetools to enhance student–
instructor relations and student engagement in the large class. *Research in
learning technology, 23*(1), 27197-27114. doi:10.3402/rlt.v23.27197

Shea, K. M. (2016). Beyond clickers, next generation classroom response systems for
organic chemistry. *Journal of Chemical Education, 93*(5), 971-974.
doi:10.1021/acs.jchemed.5b00799

Sinatra, G. M., Heddy, B. C., & Lombardi, D. (2015). The challenges of defining and measuring student engagement in science. In: Taylor & Francis.

Skiba, D. J. (2016). On the horizon: Trends, challenges, and educational technologies in higher education. *Nursing education perspectives, 37*(3), 183-185. doi:10.1097/01.NEP.0000000000000019

Słowikowski, M., Pilat, Z., Smater, M., & Zieliński, J. (2018). Collaborative learning environment in vocational education. *AIP Conference Proceedings, 2029*(1). doi:10.1063/1.5066532

Smart, J. B., & Marshall, J. C. (2017). Interactions between classroom discourse, teacher questioning, and student cognitive engagement in middle school science. *Journal of science teacher education, 24*(2), 249-267. doi:10.1007/s10972-012-9297-9

Smit, R., Robin, N., De Toffol, C., & Atanasova, S. (2021). Industry-school projects as an aim to foster secondary school students' interest in technology and engineering careers. *International Journal of Technology and Design Education, 31*(1), 61-79. doi:10.1007/s10798-019-09538-0

Sobocan, M., Turk, N., & Pecovnik Balon, B. (2017). Paper problem-based learning (p-PBL) versus technology-enhanced decision-based pbl (d-PBL) in the classroom: Is there an educational difference when using virtual patients? *Medical Science Educator, 27*(1), 119-122. doi:10.1007/s40670-016-0352-6

Steinmayr, R., Weidinger, A. F., & Wigfield, A. (2018). Does students' grit predict their school achievement above and beyond their personality, motivation, and engagement? *Contemporary educational psychology, 53*, 106-122. doi:10.1016/j.cedpsych.2018.02.004

Sudzina, M. R. (1997). Case study as a constructivist pedagogy for teaching educational

　　psychology. *Educational Psychology Review, 9*(2), 199-260.

Sun, J. C.-Y., & Hsieh, P.-H. (2018). Application of a gamified interactive response

　　system to enhance the intrinsic and extrinsic motivation, student engagement, and

　　attention of english learners. *Journal of Educational Technology & Society, 21*(3),

　　104-116.

Surry, D. W., Ensminger, D. C., & Haab, M. (2005). A model for integrating

　　instructional technology into higher education. *British Journal of Educational

　　Technology, 36*(2), 327-329. doi:10.1111/j.1467-8535.2005.00461.x

Swap, R. J., & Walter, J. A. (2015). An approach to engaging students in a large-

　　enrollment, introductory STEM college course. *The journal of scholarship of

　　teaching and learning, 15*(5), 1. doi:10.14434/josotl.v16i5.18910

Tan, C., & Tan, C. (2017). Constructivism and pedagogical reform in China: Issues and

　　challenges. *Globalisation, Societies and Education, 15*(2), 238-247.

　　doi:10.1080/14767724.2015.1105737

Thomas, L. (2012). Building student engagement and belonging at a time of change:

　　Final report from the what works? Student retention and success programme.

　　*Higher Education Academy. Available from: www. heacademy. ac.

　　uk/system/files/what_works_summary_ report_1. pdf [Accessed 17 July 2017].*

Thompson, C. (2015). Constructivism in the art classroom: Praxis and policy. *Arts

　　Education Policy Review, 116*(3), 118-127. doi:10.1080/10632913.2015.1015759

Thompson, L. (2019). Using audience response systems to amplify student learning in political science: a case study of electoral systems teaching. *European political science, 18*(2), 351-362. doi:10.1057/s41304-018-0188-1

Trees, A. R., & Jackson, M. H. (2007). The learning environment in clicker classrooms: Student processes of learning and involvement in large university-level courses using student response systems. *Learning, Media and Technology, 32*(1), 21-40. doi:10.1080/17439880601141179

Trowler, P., & Trowler, V. (2010). Student engagement evidence summary.

Trowler, V. (2010). Student engagement literature review. *The higher education academy, 11*(1), 1-15.

Tsai, H.-H., Chang, C.-T., Hou, X.-Y., Yong, Y.-M., Chiou, K.-C., & Yu, P.-T. (2019). Interactive student response system with iBeacon and web-socket for flipped classroom learning. *Journal of Computing in Higher Education, 31*(2), 340-361. doi:10.1007/s12528-019-09226-x

Tuckett, A. G. (2005). Part II. Rigour in qualitative research: complexities and solutions. *Nurse researcher, 13*(1), 29-42. doi:10.7748/nr2005.07.13.1.29.c5998

Ulmanen, S., Soini, T., Pietarinen, J., & Pyhältö, K. (2016). Students' experiences of the development of emotional engagement. *International Journal of Educational Research, 79*, 86-96. doi:10.1016/j.ijer.2016.06.003

Van Horne, S., & Murniati, C. T. (2016). Faculty adoption of active learning classrooms. *Journal of Computing in Higher Education, 28*(1), 72-93. doi:10.1007/s12528-016-9107-z

Varier, D., Dumke, E., Abrams, L., Conklin, S., Barnes, J., & Hoover, N. (2017).

    Potential of one-to-one technologies in the classroom: Teachers and students

    weigh in. *Educational Technology Research & Development, 65*(4), 967-992.

    doi:10.1007/s11423-017-9509-2

Velasco, M., & Çavdar, G. (2013). Teaching large classes with clickers: Results from a

    teaching experiment in comparative politics. *PS, political science & politics,*

    46(4), 823-829. doi:10.1017/S1049096513001121

Voelkel, S., & Bennett, D. (2013). New uses for a familiar technology: Introducing

    mobile phone polling in large classes. *Innovations in Education and Teaching*

    International, 51(1), 46-58. doi:10.1080/14703297.2013.770267

Walkington, C. A. (2013). Using adaptive learning technologies to personalize instruction

    to student interests: The impact of relevant contexts on performance and learning

    outcomes. *Journal of Educational Psychology, 105*(4), 932-945.

    doi:10.1037/a0031882

Warnick, B. R. (2004). Educational Research and the Interests of the State: The Divisive

    Case of Generalizability. *Philosophy of Education Yearbook*, 271-279. Retrieved

    from

    http://ezproxy.msu.edu/login?url=https://search.ebscohost.com/login.aspx?direct=

    true&AuthType=ip,uid,cookie&db=eue&AN=16651333&site=eds-live

Wolgemuth, J. R., Erdil-Moody, Z., Opsal, T., Cross, J. E., Kaanta, T., Dickmann, E. M.,

    & Colomer, S. (2015). Participants' experiences of the qualitative interview:

    Considering the importance of research paradigms. *Qualitative Research, 15*(3),

    351-372. doi:10.1177/1468794114524222

Wood, A. (2020). Utilizing technology-enhanced learning in geography: Testing student

    response systems in large lectures. *Journal of Geography in Higher Education,*

    44(1), 160-170. doi:10.1080/03098265.2019.1697653

Wu, P., & Wu, H. (2020). Constructing a model of engagement in scientific inquiry:

    Investigating relationships between inquiry-related curiosity, dimensions of

    engagement, and inquiry abilities. *Instructional Science, 48*(1), 79-113.

    doi:10.1007/s11251-020-09503-8

Wu, Y., Wu, T., & Li, Y. (2019). Impact of using classroom response systems on

    students' entrepreneurship learning experience. *Computers in Human Behavior,*

    92, 634-645. doi:10.1016/j.chb.2017.08.013

Xerri, M. J., Radford, K., & Shacklock, K. (2018). Student engagement in academic

    activities: A social support perspective. *Higher Education, 75*(4), 589-605.

    doi:10.1007/s10734-017-0162-9

Xu, J., & Corno, L. (1998). Case studies of families doing third-grade homework.

    Teachers College Record.

Yang, M., & Carless, D. (2013). The feedback triangle and the enhancement of dialogic

    feedback processes. *Teaching in Higher Education, 18*(3), 285-297.

Yasmeen, G. (2008). Action research: An approach for the teachers in higher education.

    TOJET the Turkish online journal of educational technology U6 - Journal Article,

    7(4).

Yildiz Durak, H. (2019). Examining the acceptance and use of online social networks by

    preservice teachers within the context of unified theory of acceptance and use of

    technology model. *Journal of Computing in Higher Education: Research &*

Integration of Instructional Technology, 31(1), 173. doi:10.1007/s12528-018-9200-6

Yin, H. (2018). What motivates Chinese undergraduates to engage in learning? Insights from a psychological approach to student engagement research. *Higher Education, 76*(5), 827-847. doi:10.1007/s10734-018-0239-0

Zepke, N. (2014). Student engagement research in higher education: Questioning an academic orthodoxy. *Teaching in Higher Education, 19*(6), 697-708. doi:10.1080/13562517.2014.901956

Zepke, N. (2015). Student engagement research: Thinking beyond the mainstream. *Higher Education Research & Development, 34*(6), 1311-1323.

Zhu, Q., & Wang, M. (2020). Team-based mobile learning supported by an intelligent system: Case study of STEM students. *Interactive Learning Environments, 28*(5), 543-559. doi:10.1080/10494820.2019.1696838

Zilvinskis, J., Masseria, A. A., & Pike, G. R. (2017). Student engagement and student learning: Examining the convergent and discriminant validity of the revised national survey of student engagement. *Research in Higher Education, 58*(8), 880-903. doi:10.1007/s11162-017-9450-6

APPENDIX A

INSTITUTIONAL REVIEW BOARD DECLARATION

UNIVERSITY OF
SOUTH CAROLINA

OFFICE OF RESEARCH COMPLIANCE

INSTITUTIONAL REVIEW BOARD FOR HUMAN RESEARCH
APPROVAL LETTER for EXEMPT REVIEW

Scott Matteson
1625 Lake Dr
Apt 28
Haslett, MI 48840 USA

Re: **Pro00104598**

Dear Scott Matteson:

This is to certify that the research study ***Effect of Acadly Student Response Technology on Student Engagement*** was reviewed in accordance with 45 CFR 46.104(d)(1), the study received an exemption from Human Research Subject Regulations on **11/10/2020**. No further action or Institutional Review Board (IRB) oversight is required, as long as the study remains the same. However, the Principal Investigator must inform the Office of Research Compliance of any changes in procedures involving human subjects. Changes to the current research study could result in a reclassification of the study and further review by the IRB.

Because this study was determined to be exempt from further IRB oversight, consent document(s), if applicable, are not stamped with an expiration date.

All research related records are to be retained for at least three (3) years after termination of the study.

The Office of Research Compliance is an administrative office that supports the University of South Carolina Institutional Review Board (USC IRB). If you have questions, contact Lisa Johnson at lisaj@mailbox.sc.edu or (803) 777-6670.
Sincerely,

Lisa M. Johnson
ORC Assistant Director and IRB Manager

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APPENDIX B

QUALITATIVE INTERVIEW SCRIPT

Interviewer Script:

Good morning/afternoon. Thank you for taking the time to meet with me today. The

purpose of this interview is to gather your thoughts about the use of ACADLY

SRT in HDFS 447 Management of Human Services course this semester. I want

to assure you that your confidentiality is of the utmost importance to this research

and at no time will your identity be divulged to any other entities. Alias' will be

used to further protect your identity. The interview will be a basic question and

answer format. The interview should take roughly twenty to thirty minutes to

complete. If you need to contact me, I may be reached by email at

mattes25@msu.edu or by phone at (989)884-4558.

Do you have any questions or concerns about the interview or study at this time?

To accurately capture your answers today I will be recording the interview. Are you okay

with me recording you today?

Thank you. Let's begin. I have seven questions I will be asking you.

LIST OF QUALITATIVE INTERVIEW QUESTIONS

Q1 Self-motivation -Tell me a time when you felt motivated in a course?

Q2 Self-motivation – Can you give me an example of when you felt motivated in our

course?

Follow up question: Can you give me an example of how Acadly influenced this

Q3 Engagement – Tell me of a time when you reflected on and spent more time on a

course

Q4 Reflection – Can you give me an example of when you reflected on and spent more

time on our course

Follow up question: Can you give me an example of how the use of Acadly influenced

this

Q5 Collaborative, interactive voice – Tell me of a time when you had the opportunity to

share your voice in a course

Q6 Collaborative, interactive voice – Can you give me an example of an opportunity to

share your voice in this course.

Follow up question: Can you give me an example of how Acadly influenced this

Q7 Please provide any additional thoughts regarding your experience with Acadly.

APPENDIX C

ARTIFACT ASSIGNMENT INSTRUCTIONS

Self-Reflection

Utilizing the prompts below and the attached rubric, develop an in-depth reflection of your experiences thus far, **DO NOT** restate the prompts and provide an answer. *Follow APA 6th edition for formatting headings, subheadings, text, double spacing, page numbering, citations, and reference list. Please make sure font is NEW TIMES ROMAN 12 pt..*

Your writing should be reflective, not descriptive. A reflection paper is about learning, researching, and explaining. Don't forget to do a grammar check and include the proper citations. Each section should consist of two (2) to three (3) paragraphs with the total length of your paper being four (4) to six (6) pages at a minimum it is okay to exceed 6 pages.

1. What did you hope to gain from this experience?

2. What do you expect the outcomes to be in terms of your learning, growth, and classroom experience?

3. Thinking about your motivation, discuss how Acadly may or may not have had an influence. Identify aspects of Acadly that you feel lent to an influence in your motivation?

4. Did you notice a difference in the amount of feedback you received in class through the use of ACADLY? Why? Why Not?

5. Do you feel participating in a more collaborative learning environment allowed for more immediate feedback? Why? Why not?

Student Course Engagement Questionnaire (SCEQ)

To what extent do the following behaviors, thoughts, and feelings describe you, in this course. Please rate each of them on the following scale: 1 = *not at all characteristic of me*, 2 = *not really characteristic of me*, 3 = *moderately characteristic of me*, 4 = *characteristic of me*, 5 = *very characteristic of me*

To what extent do the following behaviors, thoughts, and feelings describe you, in this course. Please rate each item by circling only one selection.

	Not at all characteristic of me	Not really characteristic of me	Moderately characteristic of me	Characteristic of me	Very characteristic of me
Taking good notes in class	1	2	3	4	5
Listening carefully in class	1	2	3	4	5
Coming to class every day	1	2	3	4	5
Raising my hand in class	1	2	3	4	5
Asking questions when I don't understand the instructor	1	2	3	4	5
Having fun in class	1	2	3	4	5
Participating actively in	1	2	3	4	5

small group discussion					
Going to the professor's office hours to review assignments or tests or to ask questions	1	2	3	4	5
Helping fellow students	1	2	3	4	5

POST LEARNING ASSESSMENT

Post- Learning Assessment

Please read carefully and select one answer for each of the questions below.

* Required

1. Name *

   _____

2. Email *

   _____

3. What is NOT true regarding what current research shows about nonprofit   * 1 point
   organization executive directors?

   Mark only one oval.

   ◯ Almost all executive directors have a bachelor's degree, and more than half have a
   master's degree

   ◯ Corporate experience is the quickest path to an executive director position

   ◯ More than 40% of executive directors relocated during their careers

   ◯ Nearly two out of three executive directors were hired externally

4. What is the goal of strategic planning? *   1 point

   Check all that apply.

   ☐ Addresses complex and dynamic environmental conditions by outlining the overall
   direction of the organization

   ☐ Designs service delivery programs to achieve outcomes for clients and communities

   ☐ Provides details on expected revenues and expenses to implement programs and
   projects

   ☐ Provides specific guidance on day-to-day activities

5. Schmidt, as the CEO of a nonprofit organization, was no stranger to the   * 1 point
    discussions that more often than not pitted one charitable organization
    against another. But now the situation was different. It was a matter of
    whether he would present an image and voice that was consistent with his
    own deeply held beliefs.   Utilizing the passage above, what leadership
    skills has Schmidt neglected?

    Mark only one oval.

    ○ He hasn't listen to those around him

    ○ He has put himself at risk by going it alone

    ○ He has prioritized stakeholders

    ○ All of the above

6. When basing your decision on your own opinions and beliefs, you neglect   * 1 point
    to understand the valuable critical skill of:

    Mark only one oval.

    ○ Experiences of others are not important to leadership

    ○ Leadership is not shared

    ○ Partnerships are not a viable option

    ○ Understanding you are not on top of anything

7. The decision making process needs to include *   1 point

    Mark only one oval.

    ○ Another organization's CEO

    ○ Former employees

    ○ The CEO and only the CEO

    ○ The people around you

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8. Which of the following are characteristics of a public benefit nonprofit organization? * 1 point

Mark only one oval.

( ) Profits may only be applied to the mission

( ) They are incorporated

( ) They are governmental

( ) They provide no societal benefit

9. Which category of nonprofits have the highest revenues, expenses, and assets? * 1 point

Mark only one oval.

( ) Education

( ) Health

( ) Human Services

( ) Religion

10. The type of plan detailing the steps to be taking when an employee becomes terminally ill is considered? * 1 point

Mark only one oval.

( ) A business plan

( ) An operational plan

( ) A program plan

( ) A strategic plan

11. In order for the Alzheimer's organization in our case study to have a successful plan in place for terminal illness pertaining to employees they need to: * 1 point

Mark only one oval.

( ) Define success for each strategy

( ) Listen to funders

( ) Never revise it once it is set

( ) Not be concerned about where the money will come from

12. The person Susan Schroeder should have conferred with in regard to Martin and his illness is?   * 1 point

Mark only one oval.

( ) The Board of Directors President

( ) The Chief Financial Officer

( ) The Human Resources Specialist

( ) The Receptionist

13. What are good practices to follow in terms of engaging your stakeholders?   * 1 point

Mark only one oval.

( ) Create mechanisms for input from the stakeholders

( ) If you fail at something, embrace transparency by gathering your stakeholders to involve

( ) Unite your stakeholders around common interests to promote working together

( ) All of the above

14. What is a way to become a good storyteller? * 1 point

Mark only one oval.

◯ Always end with "what are your suggestions to improve our program."

◯ Dive right in to what you do

◯ List off the names of all your programs

◯ Tell your audience a story about someone you have helped and use it as a centerpiece

15. What is the key to building an effective partnership with your board chair? * 1 point

Mark only one oval.

◯ Motivating each other is not a concern

◯ Motivating the entire team is of no concern

◯ Power is strictly defined, rather than nuanced

◯ You are both deeply dedicated to the organization

16. What is the best way to get to know the community you are working with? * 1 point

Mark only one oval.

◯ Listening to those you aim to serve

◯ Researching all of the available literature on the topic

◯ To spend time in the field, living and working with those you aim to serve

◯ Volunteer at the local soup kitchen

17. A human service organization's workforce should be? *   1 point

Mark only one oval.

( ) Diverse

( ) Focused on a single demographic

( ) Non-inclusive of wider segments of society

( ) Uniform

18. What is the final phase in the process of strategic planning?   1 point

Mark only one oval.

( ) Agree on priorities

( ) Assess your situation

( ) Evaluate and monitor the plan

( ) Implement the plan

19. Having a succession plan to account for the CEO's retirement is considered * 1 point
    what kind of mandate in the strategic planning model?

Mark only one oval.

( ) Formal

( ) Informal

( ) Operational

( ) Temporary

20. When organizational programs have fundamental changes over a course of * 1 point
years, a strategic plan needs to...?

Mark only one oval.

◯ Be a generic process

◯ Be developed and revised

◯ Have ignored board input

◯ Have overemphasized staff buy-in

21. Changing the title of a position because the organization hired a woman * 1 point
instead of a man is know as?

Mark only one oval.

◯ Centrism

◯ Ethnocentrism

◯ Machoism

◯ Sexism

22. When building internal organizational partnerships as a leader it is * 1 point
important to form an alliance with?

Mark only one oval.

◯ Board President

◯ Janitor

◯ Receptionist

◯ You shouldn't form internal partnerships

23. A human service organization's workforce should be? *   1 point

Mark only one oval.

- ( ) Focused on a single demographic
- ( ) Non-inclusive of wider segments of society
- ( ) Representative of its clientele
- ( ) Uniform

APPENDIX F

MICHIGAN STATE UNIVERSITY DEPARTMENTAL APPROVAL

October 23, 2020

Support for Scott Matteson's research

To whom it may concern:

I am writing in support of Scott Matteson's doctoral dissertation research project titled: Effect of Acadly Student Response Technology on Student Engagement.

Scott will be exploring the use of an online platform, Acadly, and its influences on student engagement in the classroom. He will be studying this topic in his class titled HDFS 447 Management of Human Service Organizations in Spring of 2021. This project has my full support.

Please do not hesitate to contact me at (517) 432-7092 or blowa@msu.edu if you have any questions.

Yours sincerely,

Adrian Blow, Ph.D.
Professor and Chair
Department of Human Development and Family Studies
Michigan State University