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Rethinking Teaching in STEM Education in a Community College : Role of Instructional Consultation and Digital Technologies

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RETHINKING TEACHING IN STEM EDUCATION IN A COMMUNITY COLLEGE: ROLE OF INSTRUCTIONAL CONSULTATION AND DIGITAL TECHNOLOGIES

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We hereby approve the Dissertation

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ABSTRACT

RETHINKING TEACHING IN STEM EDUCATION IN A COMMUNITY COLLEGE: ROLE OF INSTRUCTIONAL CONSULTATION AND DIGITAL TECHNOLOGIES

by Shelley Chih-Hsian Kurland

Community college faculty members educate almost half of all U.S. undergraduates, who are often more diverse and more academically underprepared when compared to undergraduate students who attend four-year institutions. In addition, faculty members in community colleges are facing increased accountability for meeting student learning outcomes, expectations to adjust their teaching practices to include active learning practices, and expectations to incorporate more technologies into the classroom. Faculty developers are one of the support structures that faculty members can look to in order to meet those challenges. A survey of literature in faculty development suggests that instructional consultation can play an important role in shaping and transforming teaching practices. Hence, this action research study examined my work using instructional consulting with four full-time STEM faculty colleagues in order to examine and shape their teaching practices with and without the use of digital technologies. The two foci of the research, examining shifts in faculty participants' teaching practices, and my instructional consulting practices, were informed by Thomas and Brown's (2011) social view of learning and the concept of teaching and learning in a "co-learning" environment. Two dominant factors emerged regarding faculty participants' shift in teaching practices. These factors concerned: 1) the perception of control and 2) individual faculty participant's comfort level, expectations, and readiness. In addition to

these two dominant factors, the instructional consultation process also supported a range of shifts in either mindset and/or teaching practices. My analysis showed that the use of digital technologies was not an essential factor in shifting faculty participant mindset and/or teaching practices, instead digital technologies were used to enhance the teaching process and students' learning experiences.

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DEDICATION

For Robert, my rock and my heart

&

For Amber and Jillian, my inspiration and my loves

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Rethinking Teaching in STEM Education in a Community College: Role of Instructional Consultation and Digital Technologies

Chapter 1: Introduction - Teaching and Learning in Community Colleges

In recent years within the United States, there have been many efforts to rethink teaching and learning in higher education to meet the demands of the general public, policymakers, and businesses (American Academy or Arts and Sciences, 2017, Bailey, Jaggars, & Jenkins, 2015; Berret, D., 2016; Brown & Adler, 2008; Christensen, Horn, & Johnson, 2011; Collins & Halverson, 2011; Fisher, 2012; Ito, 2017; Monaghan, 2017; New Media Consortium, 2016; President's Council of Advisors on Science and Technology, 2012). These efforts have included the exploration of various teaching practices, incorporation of technology in classrooms, and reforms for, among others, the preparation and retention of Science, Technology, Engineering, and Mathematics (STEM) students. STEM Students in postsecondary education, in particular, have garnered increased attention in recent years due to the economy focused predictions of extensive need for STEM professionals through and beyond 2020 (President's Council of Advisors on Science and Technology, 2012). Community colleges, in particular, garnered both attention and funding from the Obama administration with *Building American Skills through Community Colleges* (White House, n.d.) and the *Free Community College Plans* (White House, 2015). Community colleges, also referred to as associate's colleges (The Carnegie Classification of Institutions of Higher Education, n.d.) or junior colleges (Department of Homeland Security, 2012), are best described as two-year postsecondary schools that provide affordable education as a pathway to a four-

year degree or to a career (American Association of Community Colleges, n.d.; Department of Homeland Security, 2012). This is notable as the context for this study lies within a Center for Teaching and Learning in a community college in the northeast region of the United States. The main responsibility of the Center for Teaching and Learning is to provide a variety of professional development opportunities, including instructional consulting, for faculty and staff. Thus, within this context of increased focus on the quality of teaching and learning in community colleges, specifically in STEM disciplines, this study is designed to examine the role of instructional consultation in shifting teaching practices with and without digital technologies.

In their description of the coaching-model of instructional consultation, Little and Palmer (2011) explained that, fundamentally, instructional consultation practice is about learning and transformation for educators. Instructional consultation is one of the methods which faculty developers use to collaborate with teachers to try new teaching approaches, to implement technology, and/or to address various challenges that teachers encounter. In the present study, the faculty participants determined their own individual pedagogical goals prior to starting the instructional consultation process and shared it with me during the first interview. We addressed those pedagogical goals in ways that aligned with the purpose of the study, which is to shift from a more lecture-centric practice to a more active learning approach. Furthermore, new goals and/or revisions of goals were made throughout the study as a result of conversations after classroom observations. As such, this study warranted an action research design due to the iterative

nature of the instructional consultation process. This study also engaged in a systematic approach to examining my *own* practices as an instructional consultant.

During my tenure at the Center for Teaching and Learning, I have been tasked with developing numerous professional development or professional learning opportunities, such as grants and workshops, for my faculty colleagues. I will use the terms *professional development* and *professional learning* interchangeably because in this study I work with the faculty participants reflect on and shift their current teaching practice to better serve the students. As I look to develop experiences that encourage faculty colleagues to become involved in their own professional growth, I ask myself: "How can I support my faculty colleagues in exploring various teaching strategies in order to expand their teaching practices and increase student participation in lecture sections?" It is this very question that initially shaped this study. The majority of grant offerings, workshops, and other activities that I offer in my day-to-day work address teaching practices deemed effective in academic literature. But after reflecting on the Center's offerings, I realized that I have a very specific agenda in my approach to faculty development. Therefore, I begin here with examining teaching and learning within the higher education and the community colleges contexts and unpack this agenda explicitly. Then I examine who I am as an educator and a teacher educator/consultant in order to be transparent in my positionality.

Teaching and Learning in Higher Education Institutions

To better understand current widespread efforts to rethink teaching and learning experiences in higher education institutions, I examined current trends and practices in

higher education with a specific focus on community colleges. A recent source (Eagan et al., 2014) indicates that a high percentage of faculty members are making efforts to incorporate a variety of teaching practices and use of digital technologies in their courses to meet student needs and expectations. Faculty members in community colleges may experience more challenges than their counterparts at four-year institutions because community colleges serve a less academically prepared population and a more racially diverse student population when compared to the student population in four-year institutions while serving almost half of all U.S. undergraduate students (American Association of Community Colleges, 2014; Association for the Study of Higher Education, 2007; Bailey, Jaggars, & Jenkins; Bellafante, 2014; Murray, 2002). Hence, further examination of faculty development practices and opportunities in community colleges is needed to address how various teaching practices may impact student learning experiences due to the student population's general diversity and prior academic experiences.

Higher Education Teaching Practices

The 2013-2014 Higher Education Research Institute at University of California – Los Angeles released a report (Eagan et al., 2014) based on a national survey of higher education faculty members, which noted that faculty members are moving away from a heavy reliance on lectures. The report showed that about 50.6% of the faculty members surveyed were deliberately diversifying their teaching practices and were attempting to use new strategies to actively involve students during face-to-face meeting and teaching

times. That being said, the report still found nationally that faculty members who still lecture in all or most of their courses remain abundant (i.e., 49.4% of respondents).

In a lecture-centric approach, the dominant social assumption is that the teachers are the individuals who hold all the needed or desired knowledge and it is their responsibility to transmit or give this knowledge directly to their students. Students within this construct of teaching are passive learners; they sit and passively consume information provided to them by their teachers (usually by means of a lecture or a more specifically content presentation). However, within the context of the present study, some of the study institution's faculty colleagues are beginning to question the effectiveness of the lecture-centric approach that has long been the traditional and dominant approach to teaching at this institution. Study institution refers to the institution providing the context for this study. For the past several years, many faculty colleagues at this institution have expressed concerns that there is a breakdown in the teaching-learning process which is manifesting as a lack of student preparedness when attending class (e.g., not completing assigned readings), low achievement, and apathy. These problems, long voiced by faculty, have generated ongoing conversations about the role of educators, the role of students, and teaching practices within and beyond the Center for Teaching and Learning. In addition, the study institution also expects the faculty colleagues to incorporate technology in their teaching.

Digital technologies in teaching. Digital technologies have the potential to be a disruptive or transformative force in teaching. They can be used by individuals to reconsider the role of teachers, the role of students, the learning environment itself, and

content. Digital technologies have long been seen as tools that can be used to provide personalized learning experiences for students (Alliance for Excellent Education, 2012; Bailey, Jaggars, & Jenkins, 2015; Christensen, Horn, & Johnson, 2011; Collins & Halverson, 2009; Felix, 2002). However, digital technologies are not the only influencer on teaching-learning experiences. For example, personal experiences, aptitude, learning preferences, expectations, along with external factors such as educational reforms (current and past), individual school cultures, and various teaching approaches may all contribute to uninspiring learning experiences. Digital technologies have the potential to change what and how educators teach as well as promote various desired workforce skills such as critical thinking, problem solving, collaboration, and communication across all content areas (Kong & Song, 2013; U. S. Department of Education, 2010). This includes designing in-class activities, both face-to-face and online, and assessments through vivid simulations (such as immersion in a virtual reality environment) or games (such as testing a circuit through the iCircuit app), interactions with experts in a particular field through virtual means (such as virtual worlds like Second Life), or the creation of a meaningful product by participating in a virtual community (such as creating a digital video by learning how to remix existing videos). However, it is worthwhile to keep in mind that adding digital technologies into courses and classes *does not* guarantee good teaching practices or learning experiences.

I will attend to teaching-learning concerns as well as the study institution's increasing expectation to make use of digital technologies in their teaching in Chapter 2. My research is guided by the overarching research question: "How can the instructional

consultation process at a community college shape faculty members' teaching practices with and without the use of digital technologies?"

Community Colleges

Community colleges in the U.S. have a unique overarching mission to provide open access to postsecondary education to any individual who aims to receive a degree or certificate from a higher education institution. Open access in higher education refers to institutions "that admit at least 80% of applicants" (Doyle, 2010, p. 1). Due to this open access policy, community college faculty members often work with a very diverse student population.

Community colleges' students. Multiple reports (American Association of Community Colleges, 2014; Association for the Study of Higher Education, 2007; Bailey, Jaggars, & Jenkins, 2015; Bellafante, 2014; Murray, 2002) have noted that community colleges serve a racially diverse student population (e.g., White, 51%; Hispanic 19%; Black, 14%; Asian/Pacific Islander 6%; and other 9%). Furthermore, community colleges' open access policy allows them to serve a less academically prepared population (e.g., first generation to attend college, 36%; non-U.S. citizens, 7%; students with disabilities, 12%; recipients of financial aid, 58%) when compared to the student population in four-year institutions. According to the American Association of Community Colleges, there are a total of 1132 community colleges in the U.S. at which about 45% of all U.S. undergraduates are educated. With the various challenges that community college faculty members face, several researchers have explicitly mentioned the need in research to understand faculty development in community colleges (Maxwell,

1992; Murray, 2002; Ouellett, 2010; Twombly & Townsend, 2008). However, at this time, there is little in-depth field-based examination of how instructors may change their teaching practices with assistance from faculty developers at their institutions.

Community colleges and faculty development. As already established, community colleges serve a diverse population for academic and/or career-readiness preparation. Faculty members are expected to possess teaching practices that not only address discipline-specific knowledge, but also skills that include helping students in developing fundamental academic study aptitude, with job preparation, and with personal development Association for the Study of Higher Education Report, 2007; Burnstad & Hoss, 2010; Center for Community College Student Engagement, 2016; Rifkin, n.d.; Smith, 2013). To help address these expectations, many postsecondary institutions offer formal faculty development opportunities. The focus of faculty development in community colleges and other postsecondary institutions has tended to be on instructional development through sabbaticals, tuition reimbursements, and pedagogical workshops (Association for the Study of Higher Education Report, 2007; Austin & Sorcinelli, 2013; Brawer, 1990; Lewis, 2006; Murray, 2002; Ouellett, 2010). That being said, there nonetheless are other different ways in which community colleges facilitate faculty teaching development opportunities. Indeed for this study, my focus is on the Center for Teaching and Learning's approach to faculty development for both full-time and part-time faculty members with a particular focus on teaching practices and digital technology use within a particular community college.

The role and responsibilities of the Center for Teaching and Learning. At the institution providing the context for this study, the Center for Teaching and Learning is considered to be a support structure for faculty members and staff and is housed in the Academic Affairs division. The Center for Teaching and Learning's activities are generated through conversations with its Advisory Board. Board members include six faculty members, two external members, one distance learning coordinator, and one administrator. Conversations with other faculty colleagues and staff members, and administrator requests, along with reading of academic and pedagogical literature and professional conference attendance also inform and direct the activities and offerings of the Center for Teaching and Learning. Through the Center for Teaching and Learning, there are several types of professional learning activities and offerings available to faculty colleagues. There are stand-alone workshops as well as workshop series which are facilitated by faculty members, staff members, including myself, or external guest speakers. Webinars are facilitated by external experts in various fields. Instructional consultation is facilitated by me on a one-to-one basis to address various teaching/learning explorations in regard to pedagogy, incorporating technologies in the classroom, course design, and other teaching-learning topics depending on individual faculty colleague's needs. Summer Institutes are also offered, and are comprised of one-week or two-week institutes which address various topics in academia, such as hybrid/online course design and facilitation, teaching 21st century students, and inverted/flipped classrooms. I oversee and facilitate full-time faculty orientations which are face-to-face sessions addressing teaching-learning matter, college culture, support,

and expectations. I developed and maintain an online, self-paced adjunct faculty orientation which addresses the same topics as the full-time faculty orientations. There are various institutional grants providing funding for external professional learning opportunities (i.e., attending professional conferences) and internal exploration of teaching practices (i.e., interdisciplinary collaboration). Participation in any of the professional learning opportunities is voluntary with the exception of new faculty orientation and the distance learning facilitation workshops. The distance learning facilitation workshops are required for any faculty colleagues planning and/or scheduled to teach distance learning courses. Inevitably, my experience over the past seven years shows that discussion regarding teaching practices ensues during the various professional learning opportunities taken by faculty, and often this discussion centers on the comparison of a lecture-centric approach to learning versus a more active learning approach.

Embracing active learning. Typically, educators who embrace an active learning approach believe that content transmission alone from an educator to a student is not enough to support an individual's learning. Instead, when students are active participants in the learning process, they tend to retain and have a deeper understanding of new knowledge. This means that students need to be able to experience as well as acquire the concepts, accepted practices, and norms of the overall context in which the content to be learned is generally found or generated (Brown & Adler, 2008; Lankshear & Knobel, 2011; Ray, Jackson, & Cupaiuolo, 2014). To guide me in developing opportunities to work with faculty colleagues on changing their teaching practices from a

more lecture-centric approach to a more active learning approach, I continued to think of the Learning-Teaching-Technology cycle (which will be discussed in Chapter 2) to guide how I helped faculty colleagues. From personal experience and examination of faculty development literature, I used the instructional consultation practice as a way to support faculty colleagues in this study (discussed in detail in Chapter 2). Instructional consultations provide opportunities for faculty developers to work one-on-one with faculty colleagues to customize their professional learning according to individual goals and needs. For the purposes of this study, instructional consultation sessions provided the space for me and faculty participants to converse, collaborate, and reflect on past, present, and future teaching practices. I also examined how and which digital technologies are used in the classroom in order to better understand their role in the teaching-learning experience. In an attempt to be authentic and transparent in examining my practices as an instructional consultant, I also reflect on who I am as a faculty developer and teacher educator/consultant.

My Approach to Teaching and Learning: How It Shaped My Study

Feiman-Nemser (2010) explained that "the practice of teaching involves both doing and thinking" (p. 238). She referred to the *doing* element as the visible aspects of teaching practices and the *thinking* element as the invisible aspect of teaching practices. The visible aspects of teaching practices involve a wide range of actions, such as explaining, organizing, assessing, listening, and demonstrating. The invisible aspects of teaching practices entail the teacher's cognitive actions such decision making, reflection, analyzing and assessing student work. Feiman-Nemser asserted that the practice of

teaching calls for the teacher to consider various domains of knowledge when making decisions and taking actions. These domains of knowledge are identified as bodies of knowledge associated with knowing the students, child development theories, subject matter, curriculum development and implementation, and pedagogy.

Central to my action research study is the examination of my own practices as an instructional consultant as well as the intervention element of the instructional consultation process and its role in helping a faculty participant to shift their teaching practices. An instructional consultant in this sense is an individual who supports faculty teaching practices. As I did not receive formal training in instructional consulting, I relied heavily on my training and experiences as a classroom teacher as well as my postsecondary coursework. Prior to working with any faculty participants, I reflected extensively on who I am as an educator and how I came to be a particular kind of educator. This was important as my personal experiences and my positionality might influence the way I facilitated the instructional consultation sessions. I recognized that I approach teaching holistically. That is, as I planned and facilitated lessons, I considered the various domains of knowledge (Feinman-Nemser, 2010) pertinent to the lessons; knowledge about the student, the content, the curriculum, and pedagogical stance. In addition, I usually considered the possibility of using available digital technologies to enhance the teaching-learning experience as they might provide opportunities to explore content through simulation, role-play, or in different scenarios. Since my theoretical position is from a social view of learning (discussed in Chapter 2), I focused on creating a co-learning environment in which the students and I were active participants in the

teaching-learning process, often interchanging roles as teacher and student. I viewed class time as a space for teachers and students within which to take risks, to dialogue, to collaborate, to question, and to grow. Inherently, I espoused a humanistic pedagogical orientation.

Tangney (2014) described how learning is seen by humanists as opportunities to foster personal growth. Chatelier (2015) expanded this idea in his analysis of existential humanism and its relationship to education. He stated that "knowledge itself is not something to be gained by the student because of its inherent importance. Rather, the emphasis on freedom and self-development of the student means that any knowledge must be appropriated and applied to these ends" (p. 88). Consequently, central to a humanistic orientation towards teaching-learning is the relationship between the student and what is being taught. Content is not the driving force of the teaching-learning experience. Accordingly, from this orientation to the classroom community, the student is active in the learning process both independently and with others (Schramm-Possinger, 2015).

The humanistic approach to teaching and Feinman-Nemser's consonant conceptualization of teaching practices which involve doing and thinking, reinforces my theoretical position with respect to a social view of learning. A social view of learning emphasizes that learning transpires by means of collaboration, sustained interaction, and knowledge sharing among all participants. Consequently, a social view of learning encourages a co-learning environment where students and teachers are participants in the teaching-learning process. As I reflected on my experiences as a student, teacher, and

faculty developer while developing this study, the experiences that I remembered and learned from most were the ones where I was doing something either on my own or with others. In addition, during my undergraduate work in Exercise Science and graduate work in teaching, I learned the importance of getting to know each athlete or student as an individual as well as the importance of establishing a relationship with them, not while sitting passively and listening to a lecture. Getting to know each athlete or student and establishing a relationship helped me better engage them in the healing or learning process. Undeniably, through personal learning experiences and formal education at the graduate level, active learning is ingrained in who I am as a learner and an educator.

The Puzzle Pieces Coming Together - The Learning Environment

The formal learning environment within many higher education institutions has changed with the availability and accessibility of digital technologies by providing opportunities to teach and learn beyond the classroom walls. Keeping in mind my focus on STEM disciplines in the United States, Jansen and van der Merwe (2015) argued that digital technology literacy must be part of teacher knowledge because "in order to reach today's learners, teachers need to be responsive to the learner's experience with their culture— which is what they experience through television, movies, YouTube, the internet, Facebook, music and gaming" (p. 191). That being the case, I used Collins and Halverson's (2009) work *Rethinking Education in the Age of Technology: The Digital Revolution and Schooling in America* as a cornerstone for this study. In 2015, I had the opportunity to attend the Emerging Learning Design Conference at Montclair State University where Halverson was the keynote speaker.

Halverson's keynote addressed the *7 Technological Changes that are Reshaping Teaching and Learning*. He discussed how "technology changes lives faster than it changes institutions" and rationalized "why IT doesn't influence teaching practices." Halverson noted that there are educators who are on the extreme ends of the spectrum regarding the use of technology in the classroom. Educators who are steadfast in excluding technology in the classroom for various reasons, such as level of comfort with technology, believe that technology is a distraction. And educators who embrace technology and are technology-tinkers may become frustrated with other educators who are resistant to using technologies in their classrooms. This dichotomy creates a conundrum for faculty developers who have to balance this passion or dispassion of technology as well as its benefits and hindrances in and out of the classroom.

Beyond hardware such as computers, Halverson also brought up the idea of "assembling our own learning environments." He explained that in these learning environments, learners are engaged in the digital world such as Twitter, Instagram, Pinterest, virtual communities. These learning environments resonate with the idea that formal learning does not need to be contained within the physical walls of an institution. Instead, educators and learners with access to the internet and/or digital devices could harness the opportunities that are available with those affordances. Halverson included a graphic during the keynote that depicted the division of **education: school** and **learners: world**. He explained that there seemed to be a distinction in how individuals in the U.S. perceived education and learning, in the sense that formal education occurred in schools, whereas learning occurred all the time as a person experienced life.

The distinction between education and learning reminded me of a quote from Joi Ito, Director of MIT Media Lab. Ito (2014) said, "education is something done to you and learning is something you do for yourself." Initially, I struggled with (and to a certain degree was offended by) the quote, but after some reflection, it is now one of my favorites. This quote reflects some students' learning experiences in school. Students may not be active participants in their learning or have a voice in the learning process. Thus, these students perceive that education is done to them instead of something that they want to do. I strive to keep that in mind when I teach. I also share Ito's quote with my faculty colleagues for them to consider in order to help close the perceived divide of education and learning when they teach.

I often share with students and my peers that, for me, teaching-learning has an interconnected, unbreakable relationship. We are co-learners in any given situation, meaning that we are both a teacher *and* a learner simultaneously. Consequently, each person has a responsibility, accountability, and ownership in the learning process. In this sense, the co-learners work together to close the gap between education and learning. Moreover, I see learning as something that is intricately intertwined with education as opposed to being separate entities. I approach faculty development with the same mindset.

Faculty development and professional preparation. Van Note Chism (2011) noted that faculty developers are "part of a relatively new group of practitioners who are still struggling with defining the boundaries of their work" (p. 260). Van Note Chism's international study indicated that individuals who hold a faculty development position

also hold advanced degrees (60% with doctorates and 35% with masters). However, the degrees tend to be in various disciplines with the majority of faculty developers holding degrees in education. From the same study, the respondents reported gaining entry-level knowledge through activities such as reading, teaching, attending conferences and workshops on teaching and learning. Entry-level knowledge is identified as knowledge of learning theories, active learning strategies, student assessment, instructional design, use of information technology, evaluation of teaching, knowledge of theories of organizational change, faculty development, and multicultural teaching. Interestingly, among the identified entry-level skills such as supervising staff, presenting at conferences, writing grant proposals, and managing budgets, respondents rated "performing teaching consultations" as one of their least potentially effective skills at 3.08 on a five-point scale (p. 266). The respondents valued consultation techniques as they were rated at 4.48 out of 5, being one of the skills future faculty developers should acquire (p. 268). It was difficult to discern from the research, which factors may have contributed to the low rating for performing teaching consultations as Van Note Chism did not specifically address them in her study. I postulate that some of the factors may be due to a lack of preparation to facilitate consultations, or even the working relationship between the faculty developer and the faculty member, to name a few possibilities. In addition, Condon et al. (2016) noted that teaching practices change when faculty members are motivated and invested. This, too, may have impacted Van Note Chism's study outcomes. As such, I purposefully selected faculty participants with whom I had already established long-standing working relationships and designed an instructional

consultation process based on coursework and personal experience in order to ensure that the participants of the study were already motived and invested in examining their current teaching practices.

Instructional consulting literature. As I was reviewing the literature on instructional consulting, I found that much of the existing literature was intended as a resource for individuals working in faculty development, such as, Brinko's *Practically Speaking: A Sourcebook for Instructional Consultants in Higher Education* and Little and Palmer's article *A Coaching-Based Framework for Individual Consultations*. There was little research that examined the actual process and the results of instructional consulting. Instead, I had to draw from personal experiences and readings on teaching, learning, and faculty development to look at my practices as an instructional consultant. This study provided an opportunity and space for me to reflect, explore, and document my own instructional consulting practices with faculty colleagues. I believe instructional consulting is an important process that is currently understudied. It warrants attention, as instructional consulting is a service that is commonly offered in higher education institutions at centers for faculty learning, such as the Center for Teaching and Learning in which I work.

Instructional consulting: My role. Even though the study institution does not have a formal description for instructional consultant as it falls under faculty development responsibilities, my intention as an instructional consultant is to help faculty colleagues meet their learning goals as teachers. As previously explained, an instructional consultant is an individual who supports faculty teaching practices. In

keeping with my humanistic approach to teaching, I begin the process by getting to know my faculty colleagues as individuals and pedagogues, fostering work relationships, and understanding their teaching within a particular context. Context here refers to each faculty colleague's discipline, subject matter, and conditions of work, especially course load, classroom space and departmental and institutional expectations. For the purposes of this study, I aimed to help faculty participants meet their goals by means of conversations, classroom observations, reflections, collaborations, and recommendations, which were part of my instructional consulting process. I am fully aware of my affinity towards a view of social learning and fostering a co-learning environment (discussed again in Chapter 2); therefore, in this study, I explicitly disclosed my teaching beliefs and practices to participating faculty colleagues. Regardless of my personal preferences and practices, however, the foci of conversations and consultations nonetheless were initiated and driven by individual faculty colleague's goals and needs.

My previous experiences suggest that faculty colleagues come into the consultations with many differences: different personalities, different prior teaching-learning experiences, different prior knowledge, different expectations, and different goals. These are some of the elements that make teaching such a unique and demanding endeavor. Furthermore, what I have learned from experience, coursework, and literature, is that for professional learning to be useful and for changes to happen, the educator has to "buy-in" and everything needs to be put into context (Condon et al., 2016). I find that changes in teaching practices seem to occur when it is complementing a current practice and not an overhaul of an entire practice. My approach to working with faculty

colleagues is to get to know each individual as a teacher, discuss current teaching practices, and consider specific learning goals. With all of that information in mind, we begin with conversations about applying slight changes to their current practices. In essence, we initiate the instructional consulting process.

I did not receive formal training specifically for faculty development and instructional consulting. However, I have had first-hand teaching experience as a high school special education teacher and as an adjunct faculty member in undergraduate and graduate level courses. As a result, my instructional consultation practice is a combination of personal experiences, literature (e.g., Little and Palmer's coaching-based instructional consulting model), and graduate coursework. As noted previously, this is not unusual for faculty developers.

Study Explorations

In the study reported here, there are two distinct explorations. One is a research project that addressed many of my colleagues' calls for changing their teaching practices. The second is the role that instructional consultation and digital technologies play in shaping four full-time community college STEM faculty participants' teaching practices. While most of the faculty members at my institution can be said to draw on both lecture-centric and active learning approaches, they acknowledge that the lecture is their dominant method of teaching. With that in mind, they are encouraged to be less lecture-centric and engage in active learning practices with the use of digital technologies as tools to provide more student involvement and more participatory learning opportunities in the classroom. This focus aligns with discussions about opportunities to use digital

technologies as tools, contexts, and mediums to enhance the teaching and learning processes (Alliance for Excellent Education, 2012; Austin & Sorcinelli, 2013; Christensen, Horn, & Johnson, 2011; Collins & Halverson, 2009; Felix, 2002).

Given my current responsibilities, I am often part of the conversation regarding teaching-learning matters which gives me opportunities to develop professional relationships with my faculty colleagues. Therefore, I am in a unique position to support faculty colleagues looking to change their teaching practices in a community college setting. Since the instructional consulting process is the element of intervention for this study, I am heavily implicated in each faculty participant's journey to potentially shift their teaching practices from a more lecture-centric approach to a more active learning approach resulting in a focus on my instructional consultation role within that process. Another implication of the study addresses a gap in academic literature regarding how faculty development programs are assessed. Within the faculty development literature, it has been noted that the effectiveness of faculty development programs is often assessed by the level of program participation such as workshop attendance rather than changes in the teachers or students (Bellafante, 2014; Maxwell & Kazalauskas, 1992; McKee, Johnson, Ritchie, Tew, 2013; Twombly & Townsend, 2008; Van Note Chism, Holly, & Harris, 2012). This study documents and analyzes my pedagogical support of four faculty colleagues over various points throughout an academic year.

Previewing the Chapters

As mentioned already, there are two foci to this action research study. One is to look at the possible roles instructional consulting and digital technologies play in shaping

four full-time community college STEM faculty participants' teaching practices. The participants determine their own goals prior to starting the instructional consultation process and share it with me during the first interview. New goals and/or revisions of goals occur throughout the study as a result of conversations after classroom observations. The second focus of this study provides a systematic approach in examining my own practices as an instructional consultant, which is one of many ways I work with faculty colleagues.

In Chapter 2, I use literature to frame and situate this action research study. I begin by presenting a historical overview and discussion of the current state of professional development to better understand the role and responsibilities of faculty developers within the context of higher education. I go on to establish my theoretical framework, a social view of learning, from Thomas and Brown's work (e.g., 2011). With a social view of learning in mind, I draw from academic and education-related literature on how to work with STEM faculty members to consider teaching practices beyond lecture and use of digital technologies to increase student participation. I also propose a learning-teaching-technology cycle that connects the teaching-learning experience and the use of digital technologies as entities that inform each other.

In the methodology chapter, I explain why action research is the best fit for the two foci, shift in teaching practices and role of instructional consulting in that shift, of this study. I introduce the study participants, present data collection methods, disclose data sources, describe and explain Braun and Clarke's thematic analysis as applied to this study. To align with the standards of qualitative research, I present my positionality and

goals, as well as discuss ethics, trustworthiness, limitations, and my evaluation of the research design and process. I present the findings and discussions in the following three chapters.

In Chapter 4, I attend to my practices and approach to instructional consulting and discuss the role of digital technology in shifting teaching practices. In Chapter 5, I discuss various elements and impediments of four STEM faculty participants' capacity to be transformative in their teaching practices, shifting from a more lecture-centric approach to a more active-learning approach in lecture sections. The elements are either restrictive or encourage a faculty participant's capacity to be transformative in their teaching practices. They are complex in nature in the sense that they stem from both external factors, such as institutional protocol, and internal factors, such as a faculty participant's readiness. I also examine each faculty participant's system of teaching practices. Systems of teaching practices include a teacher's personal ideals and visions, goals, and teaching strategies. The instructors develop their own system of practices that will "optimally resolve the various challenges they face" (Kennedy, 2016, p. 955). It is important to understand individual faculty participants' system of practices so we can collaboratively resolve how to incorporate a new idea that works with their current practices. I then discuss each faculty participant's shift in mindset and/or practice and the unique journeys each faculty participants went through. The journey in making a shift from lecture-focused to a more active learning approach is vastly different for each faculty participant. The magnitude of the shift depends on many factors including openness and willingness to incorporate new practices in their classrooms. It is

worthwhile to point out that while digital technologies and/or resources may be used to facilitate or enhance active learning activities, they were not imperative to the teaching-learning experience. This study helps me systematically identify and gain an understanding of the potential of the methods I use throughout the instructional consultation process to collaborate with faculty colleagues to shift their teaching practices.

As mentioned earlier, community college faculty members educate almost half of all U.S. undergraduates, who are often more diverse and more academically underprepared when compared to undergraduate students who attend four-year institutions. In addition, faculty members in community colleges are facing increased accountability for meeting student learning outcomes, expectations to adjust their teaching practices to include active learning practices, and expectations to incorporate more technologies into the classroom. Faculty developers are one of the support structures that faculty members can look to in order to meet those challenges. A survey of literature in faculty development suggests that instructional consultation can play an important role in shaping and transforming teaching practices. With little in-depth field-based examination of how instructors may change their teaching practices, this study analyzes my work using instructional consulting with four full-time STEM faculty colleagues to reflect and shape their teaching practices with and without the use of digital technologies.

Chapter 2: Literature Review

To frame and situate my study I draw from academic and education-related literature on faculty development, active learning, social learning, digital technologies, and instructional consulting. I begin with a brief history and current state of faculty development in higher education to explain the role and responsibilities of faculty developers. I continue with an examination of active learning, social learning, digital technologies, and instructional consulting to provide a backdrop for the work of faculty developers and instructional consultants in higher education.

Brief History and Current State of Faculty Development in Higher Education in the U.S.

The practice of faculty development in the United States originated at Harvard in 1890 as sabbatical leave in support of faculty learning as scholars within their disciplines. Subsequently, higher education institutions supported a faculty member's learning as a scholar within their discipline through sabbaticals, travel to professional meetings, research, and the attainment of advanced degrees, and this continued to be the focus of faculty development until the late 1960s. It was during this period that the United States witnessed social and political turbulence (Austin & Sorcinelli, 2013; Lewis, 2006; Ouellet, 2010). During the late 1960s and early 1970s, the civil rights movement resulted in an increase in diversity among students who attended higher education institutions. The students demanded an increase in their student rights. They wanted more control in what they studied, the right to provide feedback to faculty members, and demanded that their learning be relevant to their experiences, concerns and expectations;

this ultimately led to a change in focus for instructional development (Lewis, 2006; Murray, 2002). Then there was another shift in the 1990s that brought increased accountability in U.S. higher education as the parents and legislators were concerned that they were not getting what they were paying for. This in turn led higher education institutions to create faculty development programs or centers for teaching and learning to foster the best possible teaching-learning environment to work with faculty members who were subject matter experts in their disciplines but did not necessarily have the training in how to teach (Lewis, 2006).

To better understand the role and prevalence of the units responsible for faculty development, Kuhlenschmidt (2011) presented descriptive information regarding teaching-learning development units in U. S. higher education institutions. Teaching-learning development units is a generic term used to describe centers within higher education institutions that are: (a) assigned to serve all postsecondary instructors (full-time, part-time, and/or graduate assistants); (b) assigned teaching development responsibilities; and (c) have mission statements that include opportunities to actively deliver *pure* pedagogy such as instructional design consultation and not just using technology in the classroom. Using data from the Carnegie Foundation for the Advancement of Teaching, Kuhlenschmidt reported that in the U.S., there are 4,390 postsecondary institutions, in which there are 1,267 teaching-learning development units within the data set at 933 unique institutions. Therefore, about 21.1% of all postsecondary institutions have teaching-learning development units. Kuhlenschmidt noted that this is a lower-bound estimate as the sample may have under-represented some

types of institutions. One such type is the associate or two-year institution. Kuhlenschmidt remarked that it was difficult to ascertain a more representative sample of two-year institutions because these institutions tend to have a greater variety of administrative locations and structures of teaching-learning development unit responsibilities as compared to four-year institutions. For example, in some two-year institutions faculty development resides with the human resources department instead of an academic department. To complicate the matter further, the public websites of the two-year institutions often tend to be more student-centric, therefore, they may not include information regarding the presence of a teaching-learning development units. Using the search parameters set by Kuhlenschmidt, the study institution's Center for Teaching and Learning encompasses characteristics as laid out by her pre-identified characteristics (i.e., support for postsecondary instructors responsible for actively delivering services that involve "pure" pedagogy and consultation on instructional design, not just teaching that incorporates technology.)

The core of instructional consultation is concerned with a faculty colleague's learning and pedagogical transformation. Transformation in this context is focused on "changing [faculty] perspectives and practices to improve student learning" (Little & Palmer, 2011, p. 104). However, often the instructional consultation is time consuming, resource intensive, and "hidden" from higher education administrators (Debowski, 2011; Hicks, 1999). One of my goals for the study was to make the instructional consulting process and the influence of the instructional consultation in transforming teaching

practices more transparent and explicit in order to understand its role in working with faculty members.

Theoretical Framework:

Seeing Teaching and Learning through a Social Learning Orientation

In this study, my understanding of teaching, learning, and instructional consulting is informed by a social view of learning. A social view of learning is heavily influenced by Vygotsky's work (discussed later in this section). From a social view of learning, educators may regard technology, for example, as a medium that can *change* or *transform* teaching and an individual's learning experiences rather than as a tool for content delivery or as a way to simply amplify their current teaching practices. An example of amplifying instruction is simply incorporating a digital version of a traditional practice such as substituting a PowerPoint presentation for a long-used set of overhead projector slides. Transforming instruction, instead, is when a teacher uses technology to really change the way they teach (Girod & Cavanaugh, 2001). For instance, when using technology to transform instruction, a psychology faculty member begins by shifting their teaching practices from talking about parts of the brain or having students read about it in an in-common book to having students use the 3D Brain app. In this case, the 3D Brain app allows the students to rotate and zoom in on the whole brain and the specific brain structures. But teaching is not transformative when it just replaces content from analog form to digital form. Therefore, in a transformative conception of pedagogy, in addition to using the 3D Brain app, the students are expected to participate in small groups such as a jigsaw activity to discuss the brain's functions, associated cognitive disorders, and

symptoms associated with damage, and then share their findings with the class. A jigsaw activity begins with students in a class being divided into small groups. The small groups become the students' home base. Each student in the group is assigned to an "expert" group to learn a specific topic and/or concept of a given content. After the students meet in their expert group, they return to their home base to put together the pieces of content which they have learned from collaboration with the expert group members (The IRIS Center, n.d.). This kind of analysis, discussion, and collaborative writing can be done using traditional learning tools of books, pens, and paper, however, technology provides an interaction with content that does not exist using traditional learning tools. The distinction between amplification and transformation is useful because technology is widely accessible in education (National Center for Education Statistics, n. d.), but how it is used affects teaching practices and learning experiences. Thus, even though technology is widely accessible and useful, the onus, nonetheless, remains on educators to design and facilitate learning experiences using technology that offer opportunities for students to direct their own learning and learning experience and not to just use the technology as the driving force.

Within the U.S., digital technology is available widely to educators and students in education settings (National Center for Education Statistics, n.d.) and educators at all levels report using technology in their lessons (Eagan et al., 2014; Gray, Thomas, & Lewis, 2010). Consequently, I was interested in examining the role that digital technologies may play in changing teaching practices and understanding the challenges in incorporating digital technologies in the classroom with active learning, such as the

jigsaw activity, through instructional consultation. For the purposes of this study, digital technologies are: digital tools, services, and networks used by educators to involve students in acquiring knowledge, know-how, and skills to analyze or critique in relation to a topic, issue, or task, and apply that knowledge confidently in an authentic situation. Digital resources in this sense include, but are not limited to, proprietary software, apps on mobile devices such as iPads or smartphones, and open digital resources like online videos or websites. When using digital technology in a transformative way, students are participants instead of observers in the learning process. Therefore, during the instructional consultation sessions, one of my goals is to work with faculty participants to design active learning activities for their lectures. Active learning is grounded in constructivist theory, which emphasizes student participation in learning activities that contribute to their knowledge construction (Chelliah & Clarke, 2011). Since my enacted theory of learning is a social view of learning based on Thomas and Brown's work (2011), in the section below I describe the distinctions between constructivism, social constructivism, and a social view of learning to explain my instructional consultation approach and practices.

Often educators attempt to make distinctions between constructivism and social constructivism, but these two theories of learning are often poorly delineated and poorly described in research-based articles (Bonk & Cunningham, 1998; Powell & Kalina, 2009; Simpson, 2002). Regardless, there are central tenets that seem to have a common thread among the various interpretations and definitions. Writing over twenty years ago, Duffy and Cunningham (1996) described two central tenets in constructivism, one being that

learning is an active knowledge construction process and the second being that *teaching* is to support that active knowledge construction process. These tenets appear especially foundational to studying teaching and learning when attending to digital technologies and the potential for using them to engage students in actively constructing their own knowledge when they are interacting in a thoughtfully designed learning activity that demands higher-order thinking skills, such as analysis, extrapolation, and synthesis. These tenets offer the possibility for students to participate deliberately in research, discussions, and collaborations throughout their learning activities. At the same time, in order to use digital technology effectively, educators act as facilitators and decision-makers to support students' learning processes and to reach the pre-identified learning outcomes of the lesson. Both of these tenets, learning as an active process and teaching as a support for that process, remain highly relevant today in any discussion of constructivist theory, regardless of whether the researcher is referring to a constructivist or social constructivist theoretical framework.

Social constructivism emphasizes the importance of a student's social interactions with others along with a personal critical thinking process. This theory of learning tasks teachers with ensuring that collaboration and social interactions are incorporated into learning activities (Powell & Kalina, 2009). Similarly, a social constructivist theoretical framework within a research study requires the researcher to examine how the students are actively participating in the knowledge construction process and engaged in social activities. For example, after a teacher demonstrated the process of how to complete a

business case analysis, the students in small groups examine a given case and write an analysis using the same process.

Social constructivism emerged from Vygotsky's research conducted in the 1930s, however, it has not been a static theory and remains a useful way of looking at how teaching and learning are conceived in research studies. Vygotsky (1978/1997) argued that learning precedes the developmental process, which is different from Piaget's cognitive constructivism view, where development is a prerequisite for learning. It is due to this particular distinction that Vygotsky emphasized that a student has a higher capacity to solve a complex problem with the support of others who are more capable compared to solving the same problem independently. That is, other individuals can influence one's learning rather than some cognitive developmental stage. Interactions and collaboration with other individuals are critical to the student's learning and development process. Vygotsky emphasized time and again the importance of social interaction in one's learning. It is from this perspective that Vygotsky's work is often hailed as the foundation of constructivism and social constructivism. This is a theory of learning that explicitly recognizes the powerful effects that social interaction and cultural influences have on a student and the learning process (Bonk & Cunningham, 1998; Kuiper & Wilkinson, 1998; Kundi & Nawaz, 2010; Powell & Kalina, 2009). Moreover, social constructivism resonates strongly with Brown and Adler's (2008) "we participate, therefore, we are" social view of learning. This alignment is important because it emphasizes the preference of many current students to be connected to others, and to be participants and collaborators within a community or culture. This social view of

learning speaks to my affinity for active learning practices, for fostering a co-learning environment in my classroom and in the instructional consultation sessions. Thomas and Brown applied this social view of learning to examining learning in the current knowledge age with technology and, as such, offers important insights into learning not necessarily addressed by Vygotsky's original work.

Thomas and Brown (2011) did not declare an explicit theoretical framework in their book, *A New Culture of Learning.* However, the new culture of learning they describe does resonate with key characteristics of social constructivist theory such as the importance of social interaction in learning and collaboration. There is an important difference between social constructivism and a social view of learning. Social constructivism focuses on how a student can learn from others who are more capable, like a teacher, while a social view of learning emphasizes learning from others through collaboration and knowledge sharing, and thus all learners function as equal participants in the learning process regardless how much they already know. This collaboration and knowledge sharing occurs even when those involved in the collaboration are not more knowledgeable. As such, Thomas and Brown (2011) challenge educators to think about how technology can be used to create new social practices, skills, and learning opportunities. They point out that individuals have access to more knowledge than ever. In this, the network age, individuals have access to what seems like an infinite amount of knowledge and information and can easily connect with others all over the world, provided they have access to the Internet and digital technologies. This phenomenon necessarily calls for educators to rethink formal teaching and learning experiences

because a traditional view of education highlights and emphasizes the teacher's knowledge and the process of giving this knowledge to the students.

Also in this digitally-mediated learning-scape, formal learning no longer occurs within the physical walls of a classroom, but also in the virtual or networked world. The shift of formal learning beyond physical walls is already happening. There are educators using Twitter to facilitate and enrich the learning experience by engaging students in conversations outside of the classroom. In fact, these conversations often engage individuals who are not part of the class, but who can add value and/or new ways of thinking. Of course, Twitter itself does not always ensure high quality discussions; however, it can be turned into a teaching opportunity by becoming part of and contributing to a conversation and/or a community. Learning and communities occur organically over and over again in this new culture of learning both inside and outside formal school contexts.

In this learning environment, along with the ease of access to knowledge and being *connected*, there is a need to redefine who the "expert" is. Experts are no longer necessarily individuals who have either academic credentials or personal experiences, but may be non-credentialed individuals with a passion for a given interest, topic or skill. Instead, the teacher and students work in a distributed expertise learning environment. Working in a distributed expertise environment, the teacher and students acknowledge multiple "experts" in the classroom and allow the experts to teach when appropriate (Brown et al., 1993). Once the "expert" is redefined like this, the need to rethink teaching arises, which leads to the need to rethink learning because the role of the student

also changes. In other words, within the kinds of learning contexts prized by Thomas and Brown and others, "learners and instructors take on roles of working together as part of a community structure that values both the individual's contributions to the community and the knowledge constructions of the collective" (Gallini & Barron, 2002, p. 149). Keeping in mind the new culture of learning, it seems that educational institutions are served well by adopting a participatory model of teaching and learning. The participatory model (see Jenkins, Clinton, Purushotma, Robison, & Weigel, 2006) encourages imagination, innovation, and play in students and pushes educators to reshape their conceptual lens and rethink the learning-scape.

Thomas and Brown (2011) introduced the term *learning-scape* to expand the traditional context of where learning occurs. Learning-scape includes both physical space (i.e., classroom) and virtual space (i.e., a social media platform). Consequently, educators must provide space in which students can drive the creation of meaning, content, and contexts inside the classroom. However, consistent with the social view of learning, educators and students become resources for each other and learn from each other. It is in this co-learning environment that true collaboration and knowledge sharing take place. In sum, the new culture of learning described by Thomas and Brown demands that through activities, the learner—educator and student alike—be active, contribute, and become part of a community or collective throughout the learning process. While existing digital technologies, such as social media platforms, provide a space for faculty members to teach in the new culture of learning, the "how-tos" of teaching need to be considered when incorporating technologies in their teaching.

Digital Technology Use

Chelliah and Clarke (2011) sought to identify pedagogical considerations in higher education where Web 2.0 collaborative technologies are available and useful to increase individual creativity, contribute to communication and to build communities that support a social constructivist approach. Anderson (2005) described Web 2.0 collaborative technologies, or social software, as a group of tools that support and encourage individuals to learn together anytime and anywhere while maintaining control over their own identities and relationships. A broad range of tools falls under this description: web-conferencing tools, email, Flickr, YouTube, Second Life, Facebook, Twitter, blogs, wikis, social bookmarking tools and more (Anderson, 2005; Minocha, 2009a; Minocha, 2009b).

Several themes emerged when Chelliah and Clarke (2011) examined different pedagogical approaches when using Web 2.0 tools in teaching. These included: active learning, engaging students in the learning process, increased individual creativity that benefits many, development of 21st century learning and employability skills, and the provision of a learning environment that supports social construction of knowledge. Active learning is grounded in constructivist theory as it emphasizes student participation in learning activities that contribute to their knowledge construction (Chelli & Clarke, 2011). In this case, and as already mentioned, the student's role in the learning process is not passive (i.e., listening to lectures). Instead, the student is participating in discussions and hands-on activities. Furthermore, when active learning approach is applied from the lens of a social view of learning, the students are learning from both the teacher and each

other. Similarly, when engaging students in the process of *learning to learn*, they have the opportunity to develop self-directed, problem-solving research, and collaboration skills which are desirable 21st century learning and employability skills.

The use of Web 2.0 tools in formal learning contexts can support students' social construction of knowledge by providing virtual spaces in which to represent this knowledge. For instance, educators can use Pinterest for students to brainstorm, plan, and finalize their project (e.g., students in an Events Planning course can upload the menu, centerpieces, etc. to a Pinterest board and the teacher and peers can critique by using the blog feature). With the availability and accessibility of social media platforms, educators are afforded the space and opportunity to create a collaborative learning environment that extends beyond the physical walls and digital boundaries of learning management systems. However, this open learning environment may not be appropriate or suitable for all faculty members. Nonetheless, faculty members can foster a social view of learning through a participatory learning environment within the physical and digital boundaries by designing active learning activities with the transformative use of digital technologies. It is from this lens that I approach working with faculty colleagues during instructional consultation sessions.

Supporting Educators' Learning and Teaching through Instructional Consultation in a Community College

Faculty developers look to respond to the needs of faculty members and students, as well as institutions. Austin and Sorcinelli (2013) suggest that faculty learning initiatives should help faculty members learn to use technology in new ways and to help

faculty members learn teaching skills that foster active learning opportunities. With these two recommendations in mind and a report by the President's Council of Advisors on Science and Technology (discussed in the following section), I chose for this study to focus my work with STEM faculty colleagues.

Active Learning

For the purposes of this study active learning is defined as an approach to learning in which activities are designed to provide opportunities for individuals to participate in their learning experiences either independently (e.g., explaining how to solve a quadratic equation) or with others (e.g., analyzing a case study within a small group), specifically with both experts and novices. I built my definition upon Prince (2004) and other researchers' definitions (Braxton, Milem, & Sullivan, 2000; Drew & Mackie, 2011; Grabinger & Dunlap, 1995). Prince (2004) emphasized that "the core elements of active learning are student activity and engagement in the learning process" (p. 224). Educators may choose to use independent, pair, small group, and/or large group activities to encourage and support student participation (Drew & Mackie, 2011; Prince, 2004; Srinath, 2014; Welsh, 2012; White, 2011). The concept of active learning disrupts the traditional view of the college classroom in the sense that content presentation is the major consideration for faculty members which typically results in lectures being the primary teaching practice. Therefore, it is understandable that educators, especially higher education faculty members, may hesitate to incorporate active learning in their classrooms, even though research has supported the use of active learning to increase student participation and better student performance (Bernot & Mentzer, 2014; Eddy &

Hogan, 2014; Freeman, et al., 2014; Jensen & Mummer, 2015; Mastascusa, Snyder, & Hoyt, 2011; Prince, 2004; Richmond & Hagan, 2011; Yoder & Hochevar, 2005).

With active learning, students become participants in the learning process enabling them to consider various perspectives with which to think through a problem. In an active learning classroom, students are not sitting and passively receiving information. Instead, they are expected to participate in building knowledge through contributing to discussions, participating in collaborations, and/or interacting with content independently by applying a theory in a given scenario. Faculty members may have some hesitation with incorporating active learning due to the increased time needed for activities during class time and some educators may be concerned with loss of time to cover content (Yoder & Hochevar, 2005). In addition, some educators have concerns regarding the "shift in teaching role, classroom culture, and student role" (Drew & Mackie, 2011, p. 459) when adding active learning activities to their lessons. Beyond these considerations, students themselves may present a challenge as well. Some students may resent having to take a more active role in the classroom (Bernot & Metzer, 2014; Ward, 2015; Welsh, 2012). For example, sitting back and just taking notes is so much easier than working with a partner to write a position paper on a specific topic. Another example would be having to deal with students who prefer independent work and refuse to work with a peer or a team. Keeping in mind the hesitations from the faculty members and potential challenges posed by students, I realize that it is not easy to shift a faculty member's existing practice to a new practice.

Teaching and Learning: STEM Educators

Research has suggested that an educator's belief system is very difficult to change, thus, the resistance to changing one's teaching practices is often high (Belland, 2009; Girod & Cavanaugh, 2001; Jacobsen, Clifford, & Friesen, 2002; Kim, Kim, Lee, Spector, & DeMeester, 2013; Ottenbreit-Leftwich, Laszewski, Newby, & Earther, 2010.) As described in more detail in the Research Design and Methods chapter (i.e., Chapter 3), I worked with faculty colleagues who have expressed interest in incorporating active learning practices in their teaching. For the purposes of this study, a change in practice is marked by a shift from a more lecture-centric approach to a more active learning approach. My hope is that the shift in teaching practices will allow deeper transformation in the way faculty members approach content and student learning.

In a 2012 report to the President of the United States, higher education institutions were tasked to prepare and graduate an additional one million undergraduates majoring in STEM disciplines over the next ten years (President's Council of Advisors on Science and Technology). The report noted the need to improve STEM student recruitment and retention for the first two-years in a postsecondary education institution. To this end, the first recommendation by the 2012 President's Council of Advisors on Science and Technology was to "catalyze widespread adoption of empirically validated teaching practices" (p. 2). The Council of Advisors went on to specify that STEM educators needed to consider classroom practices that involved students in active learning over the sole reliance on lecturing as research has shown that active learning enhances learning and persistence of students.

Freeman and colleagues' (2014) meta-analysis of 225 studies in published and unpublished academic literature confirmed the positive effect of active learning on examination scores and failure rates. In the meta-analysis, the researchers found that active learning increases student performance across all STEM disciplines and class sizes, with the highest impact on small class sizes (>50). They also found that students in traditional lecture classrooms are more likely to fail (33.8%) than students in active learning classes (21.8%). STEM educators are often perceived as more traditional in practice, preferring lecture-based lessons with little active learning outside of labs (Belland, 2009). However, that is not to say all or even the majority of STEM educators use lecture as their main method of teaching. In fact, Smith, Vinson, Smith, Dewin, and Stetzer (2014) found in their study of forty-three STEM faculty members that teaching practices cannot be divided into two distinct groups. Instead, they observed that the amount of time faculty members solely presented in a class session ranged from two to 98% (p. 627). Keeping the research in mind, I decided to bind my study by working with four STEM faculty colleagues who expressed interest in including active learning in their classrooms. With active learning and digital technologies relevant in current educational conversations, it seems a natural place to begin to explore a shift in STEM faculty colleagues' teaching practices in the use of digital technologies via active learning activities.

Transforming Teaching Practice to Involve the Student: Changing the Learning-scape

Technology alone does not promote active or participatory learning. It is how the educator uses it that facilitates the desired learning experience. Technology, for my purposes here, is broadly identified, from books through more advanced technologies such as the Internet and digital simulations. For effective technology use within teaching and learning, technology cannot be treated as a separate entity from content and pedagogy (Jang & Chen, 2010; Koehler et al, 2005). In fact, technology incorporation should be connected to the educator's subject matter and teaching practices (Jang & Chen, 2010), which resonates with Shulman's (1987) the construct of pedagogical content knowledge. Shulman (1987) argues that pedagogical content knowledge is of special interest to educators because "it represents the blending of content and pedagogy into an understanding of how particular topics, problems or issues are organized, represented, and adapted to the diverse interests and abilities of learners, and presented for instruction" (p. 8). In other words, specific content areas necessitate a particular teaching practice or teaching practices.

In the participatory learning environment, or what Thomas and Brown (2011) call learning-scape, educators serve as facilitators. As facilitators, they help students to bridge their prior knowledge base and experiences to the new learning context, to design activities that involve students in deeper cognitive activities, to encourage students to take ownership in their own learning, and to become part of the learning process (Alliance for Excellent Education, 2012; Hooper & Rieber, 1995; Kong & Song, 2013;

McCombs, 1997; U.S. Department of Education, 2010). Within this learning environment, students have more opportunities to interact, collaborate, and negotiate with others in the class; therefore, they necessarily are more actively involved and have more control over their own learning. Students also tend to participate in activities that involve creativity, problem-solving, and critical thinking because the faculty members purposefully design more opportunities to facilitate the students' knowledge construction (Chen, 2008; Hunt, Eagle, & Kitchen, 2004; Liaw, 2001; U.S. Department of Education, 2010). With a social view of learning as the foundation for making teaching and learning decisions, the roles of a teacher and a student change and so does the learning environment, which leads to considerations for using digital technologies to support transformative teaching.

Digital Technologies in Education

Digital technologies have the potential to be a disruptive or transformative force in teaching and shift the role of teachers, the role of students, the learning environment, and the curriculum (American Association of Colleges for Teacher Education Committee on Innovation and Technology, 2008; Bonk, 2016; Christensen, Horn, & Johnson, 2011; Lankshear & Knobel, 2011; Rheingold, 2012; Thomas & Brown, 2011). They are transformative in the sense that they have the potential to change what and how teachers teach and to promote desired workforce skills, such as collaboration and tapping into distributed expertise and know-how. In this study I was particularly interested in examining the ways in which using digital technologies do (or do not) contribute to the learning-scape of teaching and learning within a community college setting. The

learning-scape, as I have defined it, entails redefining the role of the expert, the role of the educator, the role of the student and takes into account the ability to be *connected* and requires the teaching-learning interplay to be a participatory experience.

Christensen, Horn, and Johnson (2011) argued that historically schools have met various measures, such as preserving democracy, preparing individuals for a job, keeping America competitive, and teaching all children, but rarely to anyone's satisfaction because the measures keep on moving. Disruptive innovation is generally used in the business sector to provide a predictive model of and explanations for an organization's interactions with innovations. Furthermore, disruptive innovation is not necessarily concerned with a breakthrough improvement of a service or product. Instead, it simply disrupts an established, exclusive practice to make it more widely available. For instance, the personal computers are a disruptor of mainframe and minicomputers, and community colleges are a disruptor of four-year colleges (Christensen, n.d.), and online learning is a disruptor of traditional face-to-face learning. Even though disruptive innovation does not have to be technology based, technology has and continues to have influences on changes in schools. In this sense, educational institutions in many instances have embraced and have often succeeded in implementing disruptive innovations. However, expectations for educational institutions keep on changing; therefore, the perception of schools not meeting larger social expectations persists.

I examined literature on teaching and professional learning settings where digital technology is being used to transform teaching, for example, from teacher-centered to learner-centered and/or learning processes, for example, from passive to active, to a

social view of learning. From the extant studies, it appeared that there were two uses of digital technology in schools: one was a macro-level use of digital technologies and the second was a micro-level use of digital technologies. Macro-level use of digital technologies occurred when the researchers used a specific digital technology or technologies to accomplish a larger purpose (Cesareni, Martini, & Mancini, 2011; Joia, 2001; Roberts, 2004; Keskitalo, Pyykkö, & Ruokamo, 2011; Seaba & Kekwaletswe, 2012; Tsaushu, Tal, Sagy, Kali, Gepstein, & Zilberstein, 2012; Wu, Yen, & Marek, 2011). For example, researchers used digital technologies such as a learning management system like Blackboard to deliver content in order to allow more student active participation in a lecture setting. Micro-level use of digital technologies referred to the researchers use of specific digital technologies to accomplish a specific goal within a specific context (Cooner, 2010; Fominykh & Prasolova-Forland, 2012; Lavonen, Meisalo, & Lattu, 2002; Mhlongo, Kriek, & Basson, 2011; Rosen & Beck-Hill, 2012); for example, using a simulation like the iCircuit app in a physics laboratory setting to increase the student's conceptual understanding of the subject matter. So aside from considerations concerning *which* digital technology to use, faculty members should also consider *how* to use the digital technology in their teaching.

A review of the research literature also suggests that two main factors have impeded the incorporation of digital technologies in education. One of the factors is that often when educators use digital technologies in their teaching, it is not grounded in theory (Selwyn, 2014). Therefore, digital technologies are often used as a tool to amplify teaching instead of transforming teaching. The other factor is that frequently there is a

disconnect between the use of digital technology and the consideration of the educator's teaching practices, the learning environment, and specific content/subject matter that is being taught (Hooper & Reiber, 1995; Schwartz, 2008; see also, Figure 1). The inattention to these factors in the use of digital technologies in education along with the common practice of offering standalone courses and professional learning opportunities that only address the *mechanics* of specific technologies may well explain why educators have a tendency to use technologies to amplify their teaching instead of transforming their teaching.

An a-theoretical approach to technology use and limited teacher training methods further exacerbate the disconnect between expectations of educators and the actualities of the real-life academic environment. Figure 1 below visually captures this disconnect. The theories of learning set the foundations for the teaching and learning experiences. Furthermore, they inform the pedagogy (method and practice of teaching), the learning environment (role of the educator, role of the student, culture, and context of the classroom), and the tools (such as digital technologies) that may be used during the lesson. As it is depicted in Figure 1, often in education there is a reciprocal relationship between pedagogy and learning environment as informed by the instructor's enacted theory/theories of learning. However, the way in which the digital technologies are used is often treated as a separate, stand-alone entity. For example, each student uses a tablet to create a mind map, but when it is not connected to a theory, the students may not be working collaboratively (if the theory is a collaborative one, or the teacher may have no clear reason for having students create such maps and so their learning value is

undermined because the act of creating the map itself becomes the goal, rather than the map being an extension of theory of mind and learning that focusses on conceptual understanding or the like. However, if the teacher designs the tablet activity using a social view of learning then the students may be expected to discuss and debate the elements that are essential to create a cohesive mind map collaboratively in a Google Doc during and outside of class time. The disconnect is also exacerbated and remains mostly unaddressed due to the perceived *potential* of digital technologies in education, such as when technology is expected to help increase a teacher's efficiency in content delivery and personalize students' learning experiences (Henderson, Selwyn, & Aston, 2015). However, the reality of the role that digital technologies play in education is not always consistent with its perceived potential. One of the reasons is due to the a-theoretical approach to using digital technologies in education. Another reason is that the use of digital technologies in teaching and for learning is inconsistent among institutions and academic disciplines (Selwyn, 2014).

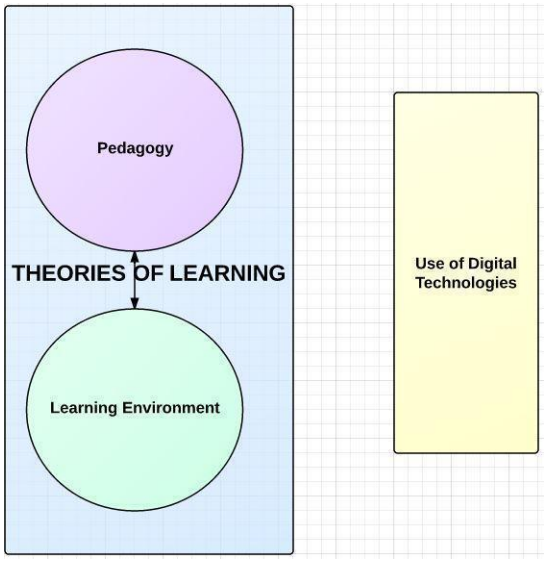


Figure 1. Typical relationship between teaching/learning and use of digital technologies within the education technology field in higher education.

In addition to widespread expectations regarding the take-up of digital technologies in postsecondary teaching, educators have been experiencing a strong push from policymakers and researchers that emphasizes personalized learning that takes into account the student's needs, interests, and aptitudes (Bonk, 2016; Cavanagh, 2014; Collins & Halverson, 2009; Feldstein & Hill, 2016). Collectively, this helps to explain how in this study, I look to examine the role of instructional consultation in working with faculty colleagues to incorporate digital technologies as guided by a proposed Learning-Teaching-Technology cycle that considers learning theories, pedagogy, content, learning environment, and digital technologies as inextricably intertwined and interdependent.

Getting Focused: Digital Technology and Instructional Consulting

To guide my instruction consulting process, I looked to the academic literature for existing frameworks that address teaching-learning and digital technologies as constructs

that inform each other. DiPietro and Norman (2013) suggest that providing an organizing framework may help instructors internalize and contextualize the conversations with the instructional consultant so they can more easily adapt new or different teaching practices. However, I was not successful in identifying any existing frameworks that took into account concepts of teaching and learning to inform how digital technologies *per se* can be used in the classroom.

There is a plethora of frameworks for teaching (e.g., pedagogical content knowledge, see Shulman, 1987), technology integration (e.g., mobile learning, see Peng, Su, Chou, and Tsai, 2009), teacher learning/teacher preparation (e.g., TPACK, see Koehler, Mishra, & Yahya, 2005.) There is also technology use in a specific context (e.g., engagement theory, see Kearsley & Sneiderman, 1999) such as distance learning, or in subject matter such as science (e.g., technology-enhanced inquiry tools in science education, see Kim, Hannafin, & Bryan, 2007). However, none of these suited my research purposes because they were addressing the teaching-learning experience and the use of digital technology as separate entities directly and inextricably. In other words, technology appears to be more of an "add-on" than anything else within these frameworks. That being said, two different frameworks nonetheless resonated to some extent with the purposes of my study. One is the previously discussed Thomas and Brown's (2011) new culture of learning. Thomas and Brown (2011) emphasized the concept of individuals being connected through technology that creates new social practices, skills, and teaching-learning opportunities. The other is drawn from the National Research Council (2000) with respect to learning environments that apply to the

overall classroom practice and not specifically with the incorporation of digital technologies, which I will discuss below. By weaving the two frameworks together, I was able to map out a learning-teaching-technology cycle that connected the teaching-learning experience and the use of digital technologies that inform each other. Then I introduced the Learning-Teaching-Technology Cycle (see Figure 2) to this study as a consideration to amend the disconnect between teaching-learning and technology use in the classroom.

In 2000, the National Research Council released *How People Learn: Brain, Mind, Experience, and School*, which explored the critical issue of linking the science of learning to actual classroom practices. In the research-based work, the authors discussed designing effective learning environments that are learner-centered, specifically "environments that pay careful attention to the knowledge, skills, attitudes, and beliefs that learners bring to the educational setting" (National Research Council, 2000, p. 133). The National Research Council noted the complexity of the learning environment, as it is a space that goes well beyond the physical classroom. Instead, a learning environment is demarcated by the interconnection of learner-centered, knowledge-centered, and assessment-centered learning environments all informed by the community: the classroom, the school, and the larger community of homes, nation, and world.

In a learner-centered learning environment, educators acknowledge the importance of recognizing and building on the knowledge, skills, attitudes, and beliefs each student brings into the educational setting. The intersection of learner-centered and knowledge-centered learning environments is where the educators take into account the

student's preconceptions and pre-existing knowledge about the subject matter to be learned. The authors of How *People Learn: Brain, Mind, Experience, and School* noted that the challenge in designing a knowledge-centered learning environment is to create a balance between activities that promote understanding and automaticity of the skills necessary to function. Thus, the activities are designed to go beyond the rote memorization of a concept, and go on to nurture understanding and develop the necessary skills related to the concept. For example, instead of memorizing the scientific method, the students are tasked to use the scientific method to create an experiment that explains a given phenomenon. In examining the third interconnected learning environment in their proposed framework, the assessment-centered learning environment, the National Research Council (2000) discussed the merits of both formative and summative assessments with particular emphasis on feedback and alignment. The editors noted that feedback should be occurring continuously throughout instruction. It is also critical that the assessments align with the learning goals which determine what is taught and how it is taught. In addition to considering the student and the learning environment, I also considered the process of incorporating digital technologies in the classrooms.

Thomas and Brown's (2011) view of teaching and learning resonates with The National Research Council's (2000) view that the learning environment is no longer restricted in a physical setting. More importantly, both Thomas and Brown and The National Research Council emphasized the complexity of the learning environment that is influenced by the individuals and the communities in which we reside. Thomas and Brown's (2011) learning-scape is virtual, existing in social media platforms such as

Twitter, discussion forums like Reddit and others, whereas The National Research Council's learning-scape is in the physical sense including school community and community surrounding the home. Consequently, the teaching-learning process is not isolated; it is a dynamic, interconnected, and inter-informed process that ideally involves the student, the educator, the family, and the larger community. In Thomas and Brown's *New Culture of Learning*, they challenged educators to think about how technology can be used to create new social practices, skills, and learning opportunities. With that in mind, I proposed the Learning-Teaching-Technology Cycle (see Figure 2). As depicted, each element of the cycle is critical, connected, and they inform each other without a set starting point.

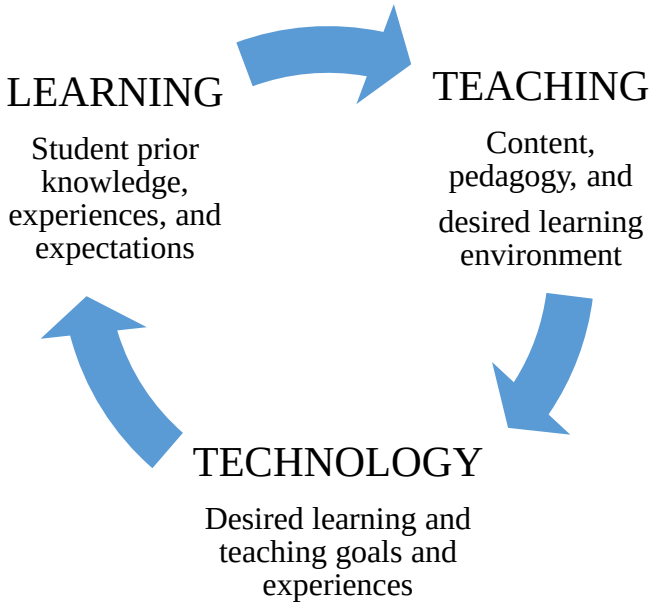


Figure 2. Learning-Teaching-Technology Cycle

The consultation sessions I ran for this study provided opportunities for faculty participants and me to collaborate in order to meet their vision of how to provide students

with participatory opportunities in the teaching-learning process. The participatory opportunities were usually in the form of active learning activities designed with or without the use of digital technologies. During the sessions, we discussed learning theories, teaching beliefs, learning objectives, possible challenges, activity designs, feedback, and reflected on current teaching practices.

Drawing on the work of the National Research Council (2000) and Thomas and Brown (2011), I propose the learning-teaching-technology cycle that resolves the typical disconnected relationship between teaching-learning and using digital technologies, as it was discussed previously (also see Figure 1). The learning-teaching-technology cycle (see Figure 2) depicts the complex interplay between teaching, learning, and technology. The learning element takes into consideration the student's prior knowledge, experiences, and expectations. The teaching element takes into consideration the educator's content, pedagogy, and desired learning environment. The selection of and the use of digital technologies are informed by the learning *and* teaching elements, although there are also instances where the availability of a specific digital technology can inform teaching and learning. For example, if faculty members decide to use a learning management system such as Blackboard, they may decide to have content readily available on the learning management system and spend the majority of the class time facilitating various highly interactive activities such as debates. I kept the learning-teaching-technology cycle in mind as I collaborated with my faculty colleagues in an effort to increase student participation during lecture sections. This is discussed in more detail in Chapters 4 and 6.

Instructional Consultation

Faculty developers in the U.S. often use instructional consultation to change teaching practices (Knapper & Piccinin, 1999; Lewis & Lunde, 2001; Little & Palmer, 2011; Sunal et al., 2001). Consultations may be conducted in small groups, but it is most often conducted in a one-on-one setting. Typically, faculty members seek assistance to discuss a teaching-learning matters that they would like to examine or implement. The role of the instructional consultant is to provide a perspective on the faculty member's teaching practices through dialogue, observations, and reflections (Lenze, 1996). Instructional consulting is mainly a support service that is not required to be taken up by faculty members, so the faculty member seeking assistance typically sets the agenda (Hicks, 1999). The instructional consultation process is often confidential but has the potential to have a major impact on the teaching-learning process thus, it should be examined thoughtfully to better understand this commonly used approach to changing teaching practices.

Henderson, Beach, and Finkelstein (2011) conducted an analytic review of the literature regarding facilitating change in undergraduate STEM instructional practices. From the 191 conceptual and empirical journal articles reviewed, the researchers identified three groups of researchers conducting studies regarding undergraduate STEM instructional practices: STEM education researchers, higher education researchers, and faculty development researchers. According to Henderson and colleagues (2011), STEM education researchers generally study change under the category of disseminating curriculum and pedagogy while higher education researchers'

studies focus on change under the category of enacting policy. Some faculty development researchers study change under the category of developing reflective teachers. The researchers also found that the majority of faculty development researchers are situated in centers for teaching and learning. Typically, their focus is on providing faculty members with more general pedagogical skills and tools for improving teaching practices (Henderson, et al., 2011). Since my study is firmly situated within the faculty development context, I will only focus on their findings regarding faculty development.

When developing reflective teachers, the focus is on individual educators and the emergent outcomes of the intervention. Reflection is a practice that encourages educators to improve instructional practices by analyzing and evaluating their own knowledge, experience, and/or skills as applied to a particular context and a group of students (Campoy, 2000; Feiman-Nemser, 2001; Henderson et al., 2011; McCombs, 1997). Instructional change, as I have already established in this chapter, is typically accomplished through a particular activity like learning communities or digital technology incorporation in which the educators will engage in order to develop new teaching practices. As such, promoting reflection on practice is an important dimension of the work of an instructional consultant.

The faculty developer usually works in the role as an instructional consultant with individual educators or small groups of educators but support levels vary widely. The main responsibility of an instructional consultant is to support a faculty member's professional learning goals through dialogue, collaboration, and reflection. Related to the category of developing reflective educators, two key elements identifying successful

faculty development change strategies can be identified in academic literature review. First, faculty developers tended to focus on providing feedback to the educators. Feedback is most valuable when the learners (in this case faculty colleagues) have the opportunity to reflect on it, use it, discuss it, and revise their thinking throughout the teaching process (see also National Research Council, 2000). Second, the educators were encouraged to reflect on their experiences. Even though the two major elements discuss feedback and reflection, there is little literature on exploring the instructional consultant's role as a guide for the faculty colleague through the reflective practices. The researchers also found that there is a focused approach to change practices.

Change practices are specific methods that faculty developers use to promote instructional change (Henderson et al., 2011). Four categories of change practices that are most often used by faculty developers are: (a) interventions by consultants or facilitators, (b) workshops, seminars, and courses, (c) mentoring programs, and (d) action research (Emerson & Mosteller, 2000 as cited in Henderson et al.). Henderson and colleagues also pointed out that for a change practice to be effective, it needs to be collegial, focused, concrete, and be at least one full semester in duration. The faculty development community's goals for change practices tend to focus on improving teaching practices via self-reflection or integrating technology in the classrooms (Henderson et al., 2011).

Conclusion

There are two foci to this study. One focus is to examine possible shifts in faculty participants' teaching practices from a more lecture-focused approach to a more active

learning approach through instructional consulting and uses of digital technologies. The second focus is to examine my role as an instructional consultant and the process I used as I collaborated with the faculty participants. A social view of learning and active learning set the foundation of the instructional consultation sessions. Interestingly, assisting faculty with technology incorporation into instruction was ranked first in service needs in the "2013 Campus Computing Survey," which surveyed Chief Information Officers, Chief Technology Officers, and other high-ranking Information Technology officials regarding IT as a service in higher education (Straumsheim, 2013). Both self-reflection and technology incorporation were goals of my study. Furthermore, in alignment with the common change practices used by faculty developers, I designed an action research study that looked at how my role as an instructional consultant might encourage a shift in faculty participants' teaching practices. Thus, my research is guided by the following overarching questions and sub-questions:

> How can the instructional consultation process at a community college shape faculty members' teaching practices with and without the use of digital technologies?
>
> 1. How does context (personal experiences, community college, department culture, and/or discipline) shape faculty members' current teaching practices and their capacity to be transformative in their teaching practices?
> 2. In what ways do the various elements (dialogue, collaboration, and reflection) of the instructional consultation process shape and/or support a faculty member's teaching practices?

3. In what ways do the various elements (dialogue, collaboration, and reflection) of the instructional consultation process shape and/or support a faculty member's use of digital technologies in the classroom?

In the next chapter, I will discuss the research design and methods I used to address the overarching and sub-questions.

Chapter 3: Research Design and Methods

In this chapter, I address the rationale of the study, the research design, data collection tools, data analysis, and the standards of qualitative research such as ethics, trustworthiness, and limitations. I also provide my researcher's evaluation of the research design and process. As already established, there are two foci to this action research study. One is to look at the possible roles instructional consulting and digital technologies play in shaping four full-time community college STEM faculty participants' teaching practices. The second focus is to examine my identity and practices as an instructional consultant. The research question, "How can the instructional consultation process at a community college shape faculty members' teaching practices with and without the use of digital technologies?*"* addresses both foci of the study.

The idea for this study grew out of curiosity about my own work with faculty members and wanting to better understand the role of instructional consulting in shifting faculty colleagues' teaching practices. For this study, I worked to collect evidence to examine my support efforts for my faculty colleagues through instructional consultation in shifting their teaching practices from a more lecture-focused to a more active learning approach. In classes where lecture dominates the learning culture, faculty members are the focus of any action and the students passively receive information. Consequently, the students are less active and have fewer responsibilities in the learning process. To promote the shift in teaching practices of faculty participants, I used change strategies. The change strategies for this study are two-fold. First, I set up formal observations and

consultation sessions to reflect and to discuss current teaching practices followed by opportunities for the faculty colleagues and me to collaborate on the possibilities of adding active learning activities into lessons. Second, when appropriate, I incorporated digital technologies, typically with iPads, in the classroom. To guide the conversation in regard to incorporating active learning activities and/or digital technologies in the classroom, I used the learning-teaching-technology cycle outlined in Chapter 2.

Rationale for This Action Research Study

At the heart of the study was an examination of my own practices as an educator, a teacher educator, and an instructional consultant. The rationale of the study was to examine the possibility and challenges of shifting my faculty colleagues' teaching practices with and without the use digital technologies in their classrooms. Even though having two foci complicated the study, I believed it was necessary to present a more complete picture regarding the possible effects of instructional consulting in shaping teaching practices. The faculty colleagues and I examined each of our own teaching practices as critical learning partners (McNiff & Whitehead, 2002) throughout the experience. Thus, action research was the most appropriate research design for my dissertation study.

Research Design

Using Qualitative Research

Qualitative researchers are interested in the meaning of a people's experiences, the way they interpret these experiences, and how they construct the world around them (Merriam, 2009; Miles, Huberman, & Saldaña, 2014). Essentially, qualitative research

aims to understand the "how" (Pratt, 2009; Spencer, Ritchie, Lewis, & Dillon, 2003), the "what is", and the "why" questions (Spenser et al., 2003). Since qualitative researchers are interested in making sense of a phenomenon, research is typically conducted on one specific phenomenon within its natural setting, therefore, data tends to be bounded, but rich and holistic in relation to that specific phenomenon. Qualitative research is also used for evaluative purposes, such as evaluation of programs, services, or interventions (Spencer et al., 2003). Since I am looking at the *how* and *why* of instructional consultation as a service and as an intervention, qualitative research is an appropriate methodology for this study.

As the main task of qualitative studies is "to describe the ways people come to understand, account for, take action, and otherwise manage their day-to-day situations" (Miles, Huberman, & Saldaña, 2014, p. 9) data is collected through a variety of ways. Data is collected through interviews, field observations and notes, images, documents, and/or by means of collecting artifacts that are relevant to the identified context or phenomenon (Merriam, 2009; Saldaña, 2013). In qualitative studies, the researcher is the primary instrument for data collection and analysis (Merriam, 2009; Miles, Huberman, & Saldaña, 2014); therefore, it is critical that the researcher is clear and transparent about their theoretical framework, chosen methodology, and the decision-making process used throughout the study (Braun & Clarke, 2006).

Action Research

Action research is a type of applied qualitative research design used to address a specific problem within a specific context (Merriam, 2009). Its roots, in educational

research, lie in Dewey's attention to human experience and active learning in knowledge generation (Herr & Anderson, 2015; McNiff & Whitehead, 2002). Action research is a methodology in which the researcher makes inquiries into their own practices and/or the effects of their own actions on others within a given context, typically in their professional work space (Anderson, Herr, & Nihlen, 2007; Cochran-Smith & Lytle, 2009; McNiff & Whitehead, 2002). In action research, the researchers are often conducting deep inquiry into their professional practices and are *insiders*, which is an integral part of an action research study (Anderson, Herr, & Nihlen, 2007; Herr & Anderson, 2015; McNiff & Whitehead, 2002; Merriam, 2009; Riel, n.d.). This deep inquiry into one's professional practices is commonly aimed at some type of transformation of a professional workspace and may be conducted either independently or collaboratively with others (Anderson, Herr, & Nihlen, 2007; McNiff & Whitehead, 2002). As such, the researcher, and the participants, if appropriate, rely heavily on reflections on their actions as the driving force of the research. Furthermore, Herr and Anderson (2015) and Riel (n.d.) noted that the change sought out by action researchers requires an intervention of some kind. Intervention may be in the form of a new teaching practice, such as the flipped classroom approach or, as in this study, instructional consultation is an intervention aimed at shifting a faculty participant's teaching practice.

Fundamentally, the action research process comprises a dynamic cycle that involves a plan of action (including the intervention to be applied), implementation of the plan, observation and data collection regarding the outcomes or effects of the plan, reflection on the part of the faculty developer and the participant experience, reactions,

and thoughts throughout the study, and subsequent action of the plan (Anderson, Herr, & Nihlen, 2007; Herr & Anderson, 2015; McNiff & Whitehead, 2002; Merriam, 2009; Riel, n.d.). As action research is emergent and ongoing in nature, there may be possible changes to the consultation goals, participant goals, and the learning-teaching-technology cycle during the research process depending on the experiences and the reflections of the instructional consultant and faculty colleagues. Due to the fluid nature of action research, the action research cycle may end after one round of data collection or may be recursive depending on the faculty developer's *and* faculty colleagues' experiences, outcomes, and reflections.

As already mentioned, when conducting action research, the researcher is an *insider* within the given study setting and is often, although not always, at the center of the research study (Anderson, Herr, & Nihlen, 2007; Herr & Anderson, 2015). Consequently, the researcher often is the primary research instrument and primary data-gathering tool. Due to their familiarity with the setting, researchers are expected to consider and question their existing knowledge. In a sense, action researchers step back and purposefully make "what is familiar strange" (Anderson, Herr, & Nihlen, 2007, p.160). Furthermore, action research is considered to be *political* (Anderson, Herr, & Nihlen, 2007). It is political in the sense that there is potential for a social change due to the transformative focus to the researchers' deep inquiries into their own professional practices. The change may be localized such as changing a teaching practice, or adding technology to a previously wholly analogue classroom, or it may be a change that affects an entire community, such as a departmental or institutional adoption like Quality

Matters™ which is a standard for assessing the quality of distance education courses that leads to an overhaul of the course design process. Regardless of the magnitude of change, action research involves learning about what is known and how it is known through experience and reflection (Anderson, Herr, & Nihlen, 2007; Cochran-Smith & Lytle, 2009; McNiff & Whitehead, 2002). Specifically, for this study, I particularly address what Anderson, Herr, and Nihlen (2007) call "micropolitics." By their definition, micropolitics deals with "behind-the-scenes negotiations over material resources, vested interests, and ideological commitments" and often exists in private conversations among teachers (Anderson, Herr, & Nihlen, 2007). Thus, in the present study, faculty participants and I explored teaching-learning expectations, professional goals, and available resources. More importantly, we examined possible institutional and personal impediments to being transformative in their teaching as well as my own instructional consulting practices.

Feinman-Nemser (2010) asserted that "the study of teaching requires skills of observation, interpretation, and analysis" (p. 111). This study provided opportunities for the faculty participants and me to reflect on and discuss both the visible and invisible aspects of each of our own and each other's teaching practices. There was a structured approach to the study (consultation-observation-consultation) in which the faculty participants determined their own goals and/or areas that each of them would like to explore while participating in the study. Even though faculty participants were not asked to collect data *per se*, they were asked to complete a digital technology activity planning/reflection table (discussed further in the Documents section below). Moreover,

each consultation included faculty reflections on an observed lesson and their teaching practices, my feedback regarding the lessons, and collaboration on identifying and addressing areas of focus and considerations to change. In addition, as stated previously, at the heart of the study was an examination of my own practices as they manifested in my role as an instructional consultant to my faculty colleagues. To guide me in developing opportunities to work with faculty colleagues on shifting teaching practices and examining my own practices, I used the research methodology of action research to ask the question: "How can the instructional consultation process at a community college shape faculty members' teaching practices with and without the use of digital technologies?"

To begin, I critically examined and documented my own affinities, biases, and beliefs as a teacher educator in a reflection journal. Then, I examined my practices through my observation field notes and especially the transcripts of consultation sessions. Through critical analysis of and reflection on the field notes and consultation transcripts, I assessed how faculty participants perceived my role in their teaching and learning, and my consultation approach and practices. It was important for me to evaluate my practices to determine whether or not I am holding myself accountable for providing a participatory and active learning space for the faculty members. Equally important, it was necessary for me to critique my own practices to ensure that I was not imposing my own affinities, biases, and beliefs on the faculty members, while recognizing at the same time that I *am* invested in shifting pedagogy from a more lecture-centric approach to a more active learning approach. Furthermore, much existing literature for instructional

consulting is intended as a resource for individuals working in faculty development. There is not as much literature that examines the actual process and the results of instructional consulting. My action research study attempts to close some of that gap in the literature.

Positionality

Action research is a dynamic process that allows researchers to deeply inquire into their practices and the effects of those practices on others within a specific context. By its very nature of this approach, the researcher necessarily has intimate knowledge of the study site and familiarity with the participants. The researcher is an *insider.* A key element of this study involved myself and how I reflected on and analyzed my interactions with faculty colleagues at my institution across the life of the project. Concurrently, my faculty colleagues also reflected on their actions and experiences throughout the study. I also asked them to provide me with feedback on my work as an instructional consultant. We worked as critical learning partners, learning from our own and each other's practices and reflections. In my position as the faculty developer, I have the unique opportunity of being both an *insider* and an *outsider*. I am an *insider* because I operate within the same institution as the participants. I understand the culture and expectations of the College especially on the academic side since I am situated within Academic Affairs and am often involved in conversations regarding teaching and learning. I am also an *outsider* because I am considered to be part of support personnel and I operate independently of all academic departments. I also am able to work with the participants on their own terms and expectations without holding any authoritative or

administrative powers over them beyond what is inherent in my formal role as a faculty developer.

Context and Instructional Consultation Goals

Well prior to the study, an opportunity to collaborate with faculty colleagues to change teaching practices presented itself when Apple Inc. released its tablet, the iPad, during the spring of 2010. The iPad generated a lot of conversation among educators because it created new opportunities for mobile learning in the classroom. Prior to the introduction of the iPad, the term "mobile" was typically limited to smartphones. Using the excitement and curiosity surrounding iPads, I worked since spring of 2010 to recruit faculty colleagues who were interested in incorporating this digital technology in their classrooms. While the incorporation of digital technology is important, the ultimate purpose of using it in the classroom is to increase student participation, not to simply "use an iPad." That being said, participating faculty were also invited to use any kind of technology and were not restricted to iPads alone. To best work with faculty colleagues' teaching practices and preferences for digital technologies, this present study did not dictate the type of digital technology that must be used in the classroom. However, iPads were accessible to faculty colleagues and their students throughout my study.

Thus, iPads were readily available to participating faculty colleagues for this study from the Center for Teaching and Learning to ensure equal access for all students in their classes. Depending on the needs of each faculty colleague, the digital resources they used could be websites, videos, free apps, and/or proprietary apps. The availability

of iPads also alleviated the lack of access to hardware and/or any possible additional financial burden on the students.

Background Context for this Study: The iPad initiative. Using the curiosity and the interest generated by the incorporation of iPads in the classrooms to my advantage, faculty colleagues have shown an eagerness to be part of the iPad initiative since the fall of 2010. As part of the iPad initiative at my institution, I created an iPad Grant for which full-time and part-time faculty members could apply for through the Center for Teaching and Learning. The grant provided a stipend to the participating faculty colleagues to design active learning activities using iPads. The initiative was very successful in attracting faculty colleagues from various disciplines. Since the iPads (for both faculty and student) were only available through my office, the Center for Teaching and Learning, I leveraged specifically *how* the iPads were to be used in the classes. Participating faculty colleagues were required to (a) attend a one-hour consultation session, (b) incorporate at least one digital resource into their teaching per semester, and (c) submit a digital technology activity planning/reflection table (see Appendix A).

During the first portion of the consultation, I explained to each faculty colleague the purposes and requirements of the iPad initiative. Much of the conversation surrounded using the iPads to design activities to not only increase student participation, but also to develop some desired skills as identified by *Partnership for 21st Century Skills* (Framework for 21st Century Skills, n.d.), specifically problem solving, critical thinking, collaboration, and communication skills. Coincidentally, these skills were also

skills that were identified as lacking in current graduates coming out of higher education institutions by numerous business leaders (Fisher, 2012). Consequently, it made sense for the iPads to be used either in a 1:1 (one device: one user) manner or used in a 1: multiple (one device: pair or small group) manner depending on the faculty member's determination for learning outcome, digital resource, and activity. The remainder of the consultation session, focused on each faculty colleague's interest, possible learning outcomes, possible digital technologies, and possible activities. With the complexity of the instructional consultation intervention, various data sources were needed to provide the information needed to assess the role of instructional consultation in helping faculty colleagues to use digital technologies to increase student participation in the classroom. This initiative continues to run at my institution through the Center for Teaching and Learning. It also provided a useful entry point for the present study.

Setting

The study institution is a mid-sized, two-year college in the northeast region of the United States. The study institution offers 50+ associate degrees, 25+ certificate programs, and a variety of career and professional programs. It serves more than 8,000 full-time and part-time students. It has one of the highest graduation and transfer rates within its state.

Participants

Participant selection for this study was nonrandom and purposeful (Anderson, Herr, & Nihlen, 2007; Merriam, 2009) and selection was based on "relevance to the research question" (Anderson, Herr, & Nihlen, 2007, p. 161). For this study, I decided to

work with four full-time faculty colleagues at the study institution. In addition, I also took into consideration my work relationships with these faculty colleagues and their level of interest in wanting to do something different in their classes. It also made sense for me to select faculty colleagues who had received a Center for Teaching and Learning iPad Grant. Thus, from the iPad Grant faculty cohort, I selected and invited these four faculty colleagues to participate in this study (see Table 1 for a summary of participants and the year they took up their iPad Grant). The four selected faculty colleagues and I had already established a working relationship and formed what I deemed a mutual respect for each other. The four faculty colleagues readily accepted without hesitation, even after understanding the time commitment and required classroom observations. Due to the focus of the study, the selected faculty colleagues were from STEM disciplines.

The participants were a mix of early-career and mid-career faculty colleagues. The participants were chosen because of their expressed interest in changing their teaching practices with or without the use of digital technologies. To protect the faculty participants' privacy, I have assigned pseudonyms. Each of the participants is described in more detail below with a summary in Table 1 *Pertinent Participant Demographics*.

Catherine. Catherine is a mid-career bioscience teacher who has taught in various settings since 2005: art institute, high school, and community college. She has spent the last six years teaching at the current community college study institution. Catherine received her tenure in 2015 and was promoted to Associate Professor in 2016. Catherine holds a Master of Science in Molecular Biophysics and Biochemistry. She also earned two undergraduate degrees Bachelor of Science in Biochemistry and a Bachelor of

Arts in Psychology. Catherine was an author and recipient of the National Science Foundation Grant that the study institution's Biology and Chemistry Department received to incorporate the Structured Instructional Strategy[1] in the classroom. She received the iPad Grant in September 2013.

Christian. Christian is an early-career health and exercise science teacher who has taught in the community college setting since 2012, the first three years as an adjunct professor and since spring 2015 as a full-time tenure track professor at the study institution. Christian has a Master of Science in Clinical Exercise Physiology and a Bachelor of Science in Exercise Science. He also holds two professional certifications: Registered Clinical Exercise Physiologist from the American College of Sports Medicine and Certified Strength and Conditioning Specialist from the National Strength and Conditioning Association. Christian received the iPad Grant in January 2013.

Jamie. Jamie is a mid-career chemistry teacher who has taught in the community college setting since 2008. His first five years were as an adjunct professor and in 2013, was hired as a full-time tenure track professor at the study institution. Jamie holds a doctorate (Ph. D), a Master in Science, and a Bachelor of Science degrees in Chemistry. He also has an Associate of Science in Biology and an Associate of Science in Business Administration. Jamie was a participant in the National Science Foundation Grant that the study institution's Biology and Chemistry Department received to incorporate the Structured Instructional Strategy in the classroom. He was asked to be part of the grant in year two after another faculty member left the institution. Jamie received the iPad Grant in October 2014.

[1]I changed the name of the proprietary pedagogy and teaching strategy for anonymity purposes.

Marcus. Marcus is an early-career engineering teacher who has taught in the community college setting since 2010. His first year and-a-half was as an adjunct professor and since fall 2011, he was hired as a full-time tenure track professor at the study institution. Marcus is currently pursuing a doctorate in Communications (Voice for Engineering). He has a Masters degree in Management Science and Engineering (Operations Research), and two Bachelor of Science degrees in Electrical Engineering and Bioengineering. Marcus received the iPad Grant in October 2011.

All four faculty participants and I began a formal and more structured working relationship after receiving the iPad Grant through the Center for Teaching and Learning.

Researcher as Participant - Shelley. Since this is an action research study, I am also a participant. I have been an educator since 1999. I was a high school special education teacher (focus in math and sciences) for about nine years. I have been in higher education since August 2006. Most of my higher education experience has been in faculty development. Throughout the duration of this study, I was situated in the Center for Teaching and Learning at the study institution. While I was completing the final draft of this study, I moved into an administration position. I am currently pursuing a doctorate in Teacher Education/Teacher Development and hold a Masters in Teaching, both from Montclair State University. I received a Bachelor of Science from Rutgers University in Exercise Science and Sports Studies. For the purposes of complete transparency, my goals established long before this study as an instructional consultant follow Table 1.

Table 1.

Pertinent Participant Demographics

Participants	Academic Department	Courses Taught	Total Years Taught (as of 12/2015)	Years Taught in Community College (as of 12/2015)	Terminal Degree	Relevant Professional Certifications
Catherine	Biology & Chemistry	Biochemistry: Lecture & Lab Microbiology: Lecture & Lab	10 Years	6 Years	M.S. in Molecular Biophysics and Biochemistry	
Christian	Health & Exercise Science	Exercise Physiology: Lecture & Lab Field Experience First Aid & Emergency Care Nutrition	3 Years	1 Year	M.S. in Clinical Exercise Science	Registered Clinical Exercise Physiologist from the American College of Sports Medicine Certified Strength and Conditioning Specialist from the National Strength and Conditioning Association
Jamie	Biology & Chemistry	Elements in Chemistry General Chemistry	7 Years	2 Years	Ph.D. in Chemistry	

		I & II: Lecture & Recitation General Chemistry II Laboratory Introductory to Chemistry Laboratory			
Marcus	Engineering	Active Circuits Components: Lecture & Lab Active Circuits Design (Capstone course): Lecture & Lab Intro to Engineering Technical Physics I: Lecture & Lab	5 Years	3.5 Years	M.S. in Management Science and Engineering (Operations Research) Ph.D. in Communications (Voice for Engineering) - In Progress

Instructional Consultant Goals

The faculty colleagues shaped the conversation topics that we engaged in during the consultation process depending on their beliefs, current teaching practices, the content they were teaching, concerns, and needs. I also set goals for myself in my instructional consultant role. Specifically for this study, these goals were designed for me to help focus the dialogue, collaboration, and reflection with each faculty colleague. These goals also attended to the examination of my instructional consulting practices by providing a foundation for discussing teaching practices and the use of digital technologies. While the intention of the consultation sessions was to work with faculty colleagues to incorporate digital technologies into their classrooms, the focus was on student learning through increased student participation in the classroom. Even with that in mind, our discussions around teaching practices and/or teaching activities did not always involve digital technologies.

I set three goals for myself during the instructional consultation sessions conducted for this study. The first goal was to collaborate with faculty colleagues in order to increase student participation in their classrooms by incorporating active learning activities. I had set this goal several years ago after I realized the importance of this goal after reading Fisher's (2012) "Executives to New Grads: Shape Up!" article on the CNN Money website. Fisher (2012) discussed the results of a study by Global Strategy Group that surveyed about 500 senior managers and C-suite executives about the preparedness of undergraduates. Of the business leaders surveyed, 65% reported that recent graduates applying for jobs were only somewhat prepared for success in business. The business

leaders identified the most sought-after skills: problem solving, collaboration, critical thinking, and communication, both verbal and written. All of the identified skills aligned with the 21st century learning and innovation skills established by the *Partnership for 21st Century Skills* (Framework for 21st Century Skills, n.d.). Interestingly, all four faculty colleagues had similar goals in mind which were revealed during the pre-observation interviews. Through collaborations with faculty participants, we designed active learning activities that purposefully provided opportunities for students to participate in their own learning and to practice these sought-after skills.

My second goal was to collaborate with faculty colleagues to design activities using digital technologies in order to increase student participation in their own learning process (i.e., active learning). Girod and Cavanaugh (2001) remind us that, while educators may be using technology in the classroom, they might not be engaging their students in meaningful ways. They draw a distinction between merely *amplifying* their instruction by incorporating a digital version of a traditional practice (such as substituting a PowerPoint presentation for an overhead projector to present content) and actually *transforming* their instruction by relying on digital technologies to allow them to encourage student participation in the class in ways that they would not be able to *without* the technology. During the consultation sessions, we worked to design activities using relevant digital resources that were aimed to transform not only the teaching practice but also the learning experience.

The final goal for my instructional consulting process was to involve faculty colleagues in reflective practices that examined their decision-making process and

teaching experiences. This reflection process helps educators assess their fundamental beliefs and assumptions about teaching and learning (McCombs, 1997). Since the planning/reflection table (see Appendix A) was also designed to assist faculty colleagues in the activity planning process, they were encouraged to reflect on their planning, examine the results of the use of digital technology in their teaching, and consider possible revisions for future courses. I met individually with the participants in consultation sessions to reflect on their experience after incorporating active learning activities and/or digital technology in the classroom. I decided to meet with participants individually to best meet their individual professional learning goals in a co-learning environment between myself and each faculty colleague.

The planning/reflection table (discussed in the Data Source section below) provided a visual guide for analysis to my three goals during the consultation sessions. Faculty participants and I used the planning/reflection table to record the final decisions regarding digital technology identification, student learning outcomes, and activity descriptions. It also documented each faculty participant's own reflections about the results of the activity using a specific digital technology. Using a researcher reflective journal, consultation sessions, classroom observations, observation field notes, and planning/reflection tables, I examined my practices as an instructional consultant and the role of digital technology in facilitating change to faculty colleagues' teaching practices.

Data Collection Methods

As stated previously, qualitative research aims to examine the "how," the "what if," and the "why" of a given phenomenon and often requires a variety of data sources for

a single study. As this action research study looked to examine possible changes in teaching practices of faculty participants as well as my instructional consultation practices in supporting faculty colleagues to transform their teaching practice, multiple data sources were needed to best capture data from both the instructional consultant (self) and participants (self and faculty participants). The data sources (discussed in detail in a later section in this chapter) comprised a practitioner reflective journal (self only), interviews/consultation sessions, classroom observations, observation field notes, researcher generated documents (i.e., planning/reflection table and end-of-study self-report), and other documents (i.e., iPad Grant application, and email correspondence). An overview of the data collection time table is provided in Table 2 later in this section.

Data collection began in late April 2015 after obtaining Institutional Research Board (IRB) approvals from the sponsoring and the study institutions. At this time, I began consciously and systematically reflecting on my teaching and learning experiences, preferences, and mishaps in order to better understand who I am as a teacher and teacher educator. I documented my reflections and analysis in the practitioner reflective journal (details later in this section). I continued my reflections throughout the study. Also in April, I began the participant recruitment process. After receiving the signed informed consent forms, I emailed each faculty participant to set up pre-observation interviews in May.

The pre-observation interviews (see Appendix B) were semi-structured in the sense that I had a set of questions that I asked all faculty participants. However, my follow-up questions depended on the answers from the faculty participants. Merriam

(2009) stated that the use of semi-structured interviews makes the assumption "that individual respondents define the world in unique ways" (p. 90) which is the position I took as a researcher. The pre-observation interviews were designed to assess positionalities regarding the teaching and professional learning of each faculty participant. I asked questions such as: "What is the role of the teacher?" "If I sat in your class, what would I see?" and "What is the role of the student?" (Please note that in this study there is no distinction between the use of *student* and *learner* when discussed in reference to faculty participants' students.) Similar to the purpose of pre-observation interviews, the first classroom observations were meant to see each faculty participant in the natural setting of their classroom. I looked to see how faculty participants taught by noting their content presentation methods, their teaching practices, their questions and answers to the students, their interactions with the students, and digital technology use or nonuse. I took descriptive field notes (see an example in Appendix C) throughout each classroom observation during the study. I observed each faculty colleague teaching two to four times. I will discuss these variations in the Observation and Field Notes section later in this chapter. Field notes were written accounts of observations (Merriam, 2009). The field notes were used during consultation sessions to guide faculty participants' reflections upon the lessons, to focus discussions, and to facilitate the collaborative effort of designing activities to increase student participants in future lessons.

Consultation sessions typically occurred after a classroom observation, however, there were a few exceptions. I will discuss the exceptions in the Interviews and Instructional Consultation Sessions section below. As stated before, the consultation

sessions were for lesson reflections, teaching-learning discussions, and collaborative efforts to incorporate active learning in the classroom. Similar to the interviews, the consultation sessions had a set of prepared questions (see Appendix D) to guide the reflections, discussions, and collaborations. Furthermore, at the conclusion of the study, I conducted end-of-study interviews (see Appendix E) between late October and early December. The end-of-study interviews were also semi-structured with a majority of the questions mirroring the pre-observation interview to assess if there were any changes in faculty participants' positionalities. In addition to positionality questions, I also included questions regarding their experiences with me as an instructional consultant. Communications between faculty participants and me were not limited to consultation sessions.

Emails were used for the duration of the study as a communication tool to set up observations, consultation sessions, interviews, clarification and/or confirmation of data (i.e., to verify a quote). I also used email to send an end-of-study self-report (see Appendix F) to the four faculty participants in January 2016. The faculty participants responded using email as well. I will discuss the rationale and content of the self-report in the End-of-Study Self-Report section.

In the following sections, I provide the rationale, content, exceptions, variations, and experiences for each data source. Table 2 at the end of the next section provides the data collection timetable for my study.

Data Sources

Practitioner Reflective Journal

A researcher begins a study with preconceived notions and certain opinions about the topic or phenomenon that is being studied. Thus, it is important to reflect and document those preconceived notions and opinions prior to the start of the study. Malterud (2001) stated that reflection begins "by identifying preconceptions brought into the project by the researcher, representing previous personal and professional experiences, pre-study beliefs about how things are and what is to be investigated, motivation and qualifications for exploration of the field, and perspectives and theoretical foundations related to education and interests" (p. 484). Reflection is also a practice that encourages educators to improve their practices by reflecting on their own knowledge, experience, and/or skills (Campoy, 2000; Feiman-Nemser, 2001; Henderson et al., 2011; McCombs, 1997) and it is a critical component in action research. The journal is a "narrative technique and records events, thoughts and feelings that have importance to the writer" (Anderson, Herr, & Nihlen, 2007, p. 208). The journal serves many purposes for the researcher. It helps the researcher keep track of the process and progress of the study. It also helps the researcher make ongoing decisions based on the log entries for each day and reflections. I kept a reflective journal throughout the study.

I used the journal to examine my instructional consultation practices, to critically analyze the experience of the consultation sessions and other interactions for both myself and each faculty participant, and to continue to learn and to grow from the process. In addition, I periodically journaled throughout the study beyond the experiences with the

participants. I reflected on my thoughts, questions, decisions, interactions with other faculty colleagues, and any possible existing tensions in order to obtain a more complete picture of my practices as a faculty developer and instructional consultant. Through this reflection process, I also examined how individual faculty participant perceived my role and responsibilities within the study institution. Accordingly, I was able to critically analyze my own perceptions of my role and responsibilities within the institution in hopes to resolve any dissonance or tension that currently existed or may have arisen in the future.

Interviews and Instructional Consultation Sessions

For my study, the majority of data came from interviews. Interviews are necessary when researchers are trying to understand and/or examine when they "cannot observe behavior, feelings, or how people interpret the world around them" (Merriam, 2009, p. 88). Interviews are also what Kennedy (2005) considered to be "social events." Kennedy contended that "when people are interviewed about what they just did…they are motivated to come up with defensible reasons, to look good, and to appear thoughtful" (p. 251). Therefore, I consider instructional consultation sessions as interviews since those sessions were used for faculty participants and me to reflect, to discuss, and to collaborate regarding past, current, and future teaching considerations and practices.

Initially, I had planned to have five interviews/consultation sessions with each participant for the duration of the study. Included in the five planned sessions were a pre-observation interview and an end-of-study interview. As previously mentioned, the purposes of the pre-observation and end-of-study interviews were to understand and to

examine faculty participants' positionalities on matters regarding teaching and learning. The other three consultation sessions were designed to take place after each classroom observation. Typically, after each classroom observation, I met with each of the faculty participants for approximately an hour. The purposes of the sessions were to discuss what happened in the classroom, their rationale for the teaching practices used/engaged in, the rationale for the use of various teaching resources, to examine the use of digital technologies, what did work, what did not work, and whether the students had met the learning outcomes. During the consultation sessions, I followed one of Kennedy's interview strategies.

When Kennedy and her research team members (2005) interviewed a teacher after a lesson, they focused on specific events as opposed to a broad overview of their teaching. For example, I would begin the consultation sessions with two questions to get at a broad overview of their teaching: "How did you think your lesson went? And, how do you know?" Further into the consultation sessions, I utilized my classroom observation field notes (details in the following section) to discuss specific teaching instances during a particular lecture. By focusing on a specific teaching instance within the context of the lesson, the faculty participant and I were able to examine the rationale behind the teaching decision, the execution of the teaching practice, and possible consideration of a different approach to presenting the content or to teaching the topic. While I was able to keep to the five planned interviews/consultation sessions with Christian and Jamie, there were circumstances that lead to variations in the number of consultation sessions for Catherine and Marcus.

Unlike the other three faculty participants, I began working with Catherine during the 2015 summer session (I began working with the other three faculty participants during the 2015 fall semester). During the pre-observation interview, Catherine suggested that since she was teaching a microbiology class beginning in the middle of May, we should consider starting the study process then instead of waiting until the fall semester as I had originally planned. I readily agreed. During our consultation session after my second classroom observation of her teaching, I asked Catherine if she taught the same microbiology course in the fall. Catherine confirmed that she did. I suggested that we delay the last classroom observation until the fall semester so I could observe one of the two lessons that I had already observed during the summer session. I explained to Catherine that if she agreed to postpone the last classroom observation, that we would need to meet for an additional consultation session prior to the lesson. The purpose of the additional consultation session was to discuss possible changes to content presentation and/or classroom activities to meet the mutual goal of the increasing student participation. Catherine agreed and decided that she would like to focus and collaborate on her DNA/RNA replication lesson. The additional consultation session took place on September 16, 2015, a few weeks prior to the third observation. During the additional consultation, we discussed my feedback and recommendations for the DNA/RNA replication lesson and collaboratively determined the specific teaching instances that should be revised to include active learning activities. I will discuss the outcome of the revised DNA/RNA replication lesson in Chapter 5. The circumstances that altered the number of consultation sessions were different with Marcus.

Since the beginning of the study, Marcus and I had to work through some issues, specifically dealing with scheduling. Unfortunately, due to those scheduling conflicts and time constraints, I was only able to conduct three consultations (pre-observation and end-of-study interviews and one post-observation consultation session) and two observations (more details in the Classroom Observations and Field Notes section) with Marcus. I decided to keep Marcus in the participant pool because from my experience, it was not unusual that as a faculty developer, I had to be flexible with scheduling appointments and meetings due to faculty colleagues' schedules and time constraints. In addition, despite the limited number of conversations, our discussions were rich and provided specific learning and teaching considerations for both Marcus and me to consider and reflect on beyond the study. The discussions with Marcus also were somewhat different from the other three faculty participants. Much of the conversations with Marcus were philosophical in nature within the field of engineering which then influenced the way Marcus thought about teaching. It was also during those conversations that Marcus and I discussed the disconnect between how he thought about teaching and how he approached teaching. I will discuss those conversations in more detail in the next two chapters.

All of the interviews and consultation sessions were audio recorded. I followed a general transcript format as suggested by Merriam (2009) and Creswell (2013). The format included line numbering down the left-hand side of the page, single spacing with double spacing between speakers, and I included a vertical line between the conversation and margin on the right-hand side for my notes and codes. The transcripts were mostly

verbatim, meaning that words such as "um" were often left out. At the beginning of the data collection phase of this study, I transcribed the audio recordings as I collected them. However, the practice proved to be burdensome and became a hindrance to the progress of data collection, reporting, and analysis. After transcribing all of the pre-observation interviews, I secured a transcription service to complete the remaining audio recordings. Once I received a transcript, I would read it while listening to the audio recording to correct any misspellings or missed words. I also took the time to capture the intonations and the pauses from the faculty participant and me. I would immediately journal my thoughts, critiques, reflections, and how to best help a faculty participant. For example, after meeting with Christian, I realized that he often reflected on his lessons and was open to asking peers and students for feedback. Therefore, I recommended some questions for him to reflect on after each lesson. Two such questions were "Did I meet my learning objectives for this lesson? How do I know?" I found this process, albeit time consuming, to be more comprehensive in capturing the essence of dialogues, collaborations, and reflections that had occurred throughout the interviews and consultation sessions. The immediacy of this journaling allowed me to reflect and to learn about my own practices as an instructional consultant and faculty developer thus influencing my approach in future conversations and collaborations with individual faculty participants.

Classroom Observations and Field Notes

One focus of the study was to examine possible shifts in teaching practices of faculty participants by using digital technologies and/or while working with me as an instructional consultant. Since I was examining shifts in teaching practices, it made sense

for me to conduct observations in faculty participants' classrooms. Observations take place naturally in settings where the phenomenon of interest is (Anderson, Herr, & Nihlen, 2007; Merriam, 2009), in this case, in the faculty participants' classrooms as they were teaching. Observations become a research tool "when it is systematic, when it addresses a specific research questions, and when it is subject to the checks and balances in producing trustworthy results" (Merriam, 2009, p. 118). Qualitative researchers also use observations to focus on and to record behavior as it is happening instead of relying on one's assumptions or a participant's feedback (Anderson, Herr, & Nihlen, 2007).

Participant observation technique. For this study I used Anderson, Herr, and Nihlen's (2007) participant observation technique. For the participant observation technique, there are varying degrees of involvement, ranging from passive or uninvolved to total and complete participation. When researchers attempt to maintain a balance between observing and participating, they are considered to be moderately participating, whereas an active participant observer engages in the study setting to better understand the phenomenon of interest. As my study looks to examine teaching practices, it made sense for me to be a passive participant observer or what Merriam (2009) referred to as a complete observer because instructional consultation was the intervention and the consultation sessions occurred outside of the classroom setting.

The purpose of the classroom observation was to observe the faculty participants' teaching practices and how they used digital technologies in a particular lesson, to note any challenges and successes with the digital technology used and to note teacher-student interactions and reactions. All of the observations occurred in various classrooms on the

campus of the study institution. The classrooms varied in size from a classroom (24 seats) with a functional exercise physiology laboratory to a lecture hall (123 seats). Regardless of the type of classroom, I typically arrived at the observation site ten minutes prior to the start of class and sat in one of the seats in the last row in an attempt to be as unobtrusive as possible. All of the lessons were seventy-five minutes in length, except for Catherine's session. Catherine's first two observations took place during the study institution's first summer session, meaning that the microbiology course was on an accelerated schedule and all lecture sessions were three hours in length. I stayed for the duration of the lesson for all classroom observations except Catherine's second observation when I stayed until the class took a break about 1 hour and 23 minutes into a three-hour class due to a scheduling conflict. I sketched a map of each classroom (Anderson, Herr, & Nihlen, 2007; Merriam, 2009). However, the maps were not extremely detailed because I was not concerned with the flow of the room and the classroom traffic during the observations. I noted the approximate size of the classroom (i.e., number of rows), where the faculty participant was situated, where the students sat, and where I located myself in the classroom.

I was successful in being unobtrusive in all of Catherine and Jamie's classes as they tended to have a larger number of students per class than those of Christian and Marcus. In the classroom observations that I did for Christian and Marcus, there were less than twenty-five students in each class. In addition, all of Marcus' students were male; therefore, it was more difficult for me to blend in with the students. Despite that, I did not interact with the students and faculty participants in nine of the twelve

observations. During three of the four observations in Jamie's classes, one student from each class asked me questions regarding the content or the activity that were assigned. As I was unfamiliar with the subject matter, chemistry, I clarified to the students that I was just observing the class.

While I conducted three planned classroom observations for Catherine and Christian, it was different with Jamie and Marcus. I conducted four observations for Jamie and two for Marcus. Jamie and I decided that to get a better sense of the different approaches he used in various classroom settings, four observations were necessary. For example, during the pre-observation interview, Jamie admitted that he taught differently during lecture sections, recitations, and laboratories. Jamie also acknowledged that he was more structured with Chemistry I students than he was with Chemistry II students. Jamie explained that in Chemistry I, he would be less likely to deviate from his lesson plan and display a sense of humor. I conducted three classroom observations of his Chemistry I classes. Two of the observations were in lecture settings. The first one took place during the second week of the semester in September and the other about midway through the semester after the first exam in October. The remaining Chemistry I course observation took place in late September in a recitation class. The fourth observation was of Jamie's Chemistry II class.

In Marcus' case, we were successful in scheduling and completing two observations in mid and late October due to the aforementioned scheduling conflicts and time constraints. Unfortunately, since Marcus and I were not able to schedule the first consultation session until November 16, 2015, we were forced to discuss both

observations during that session. It was also due to the late in the year consultation session that we were unable to schedule the third observation prior to final exams. However, as I had explained in the previous section, I decided to keep Marcus in the participant pool.

First observations were designed to occur without any prior discussions between myself and faculty participants aside from the pre-observation interview which aimed at establishing each faculty participant's teaching approaches and identify which lesson I would be observing. I used the first observation to observe each faculty participant's teaching practices with and without digital technologies without any prior interventions from me. I also used the first observations to inform myself about some of the digital technologies that each faculty participant used in their classes. I attempted to schedule at least two observations in the same course with each faculty participant. The rationale for two classroom observations in the same course was to attempt to incorporate one or more of the possible changes in teaching practices and/or activities that come out of the first consultation sessions. To guide and focus the reflections, discussions, and collaborations during consultation sessions, I used the classroom observation field notes.

Field notes. I took field notes and at times, photographic images of the faculty participant's teaching activities. Field notes are written records of observations and become raw data for the study (Anderson, Herr, & Nihlen, 2007; Merriam, 2009). In alignment with recommendations by Anderson, Herr, and Nihlen's (2007), my classroom observation field notes were systematic and written in non-judgmental language. In addition, I used timestamps instead of consecutive line numbering as I wrote my field

notes. I decided to use timestamps to denote changes in teaching practices throughout the lesson. For example, I would note the time when faculty participants began to lecture (e.g., 8:04 A.M.) and the next time stamp would be when they stopped lecturing and showed a video (e.g., 8:33 A.M.). The timestamps were helpful to both faculty participants and me during consultation sessions when either one of us wanted to focus on specific teaching instances. Faculty participants received a digital copy of the field notes prior to each consultation session so they could review them prior to each session. I recorded my field notes on an iPad using the Notability app. I decided to use the Notability app for the study after attending a workshop where the presenter shared that many K-12 administrators use the app for classroom observation purposes. Prior to the study, I piloted the Notability app by using it to observe one of the workshops offered in the study institution's Center for Teaching and Learning. The app has note taking, audio recording, video recording, and camera features. For the study, I only used the note taking and camera features. I did not use the audio and video recording features as I did not have permissions to do so from the students. Since I used the Notability app for my observation field notes, I added my notes within the body of the field notes typically right after a specific teaching instance. My notes were identified by bolding words or enclosing words in parentheses. I revisited my field notes on the same day to add in any additional information that I recalled and/or had emailed faculty participants regarding any questions I might have had pertaining to that lesson. The classroom observations and field notes were not only crucial data sources; I found them to be invaluable to the instructional consulting process.

Classroom observations allowed me to see faculty participants teaching in their natural settings which allowed events, such as student response or nonresponse, to occur without prior planning, which in turn allowed me to document teaching practices and classroom activities as they occurred in the observation field notes. With the field notes, I was able to help faculty participants reflect on the lesson, discuss teaching practices and activities, and to collaborate on possible changes for future lessons. Moreover, with the timestamps, faculty participants and I were easily able to identify and focus on specific teaching instances and discuss either the teaching practices or activities within the context of a particular lesson. Without prompting, all four faculty participants commented on the usefulness of the field notes. For example, Catherine pointed out during the consultation session after the first observation that she did not realize that she strictly lectured, meaning presented content, for fifty-five minutes. Jamie also acknowledged during the first consultation session that he did not realize that he moved very quickly from one topic to the next during his lecture sections. Both Catherine and Jamie made immediate changes to their teaching practices after our initial discussions. I will discuss those changes in the next chapter.

Documents

Document data, sometimes referred to as written data, in a qualitative study typically includes "written, visual, digital, and physical materials relevant to the study (Merriam, 2009, p. 139; *see also* Creswell, 2013; Lankshear & Knobel, 2004). In the present study, document data is comprised of both researcher generated documents (i.e., digital technology activity planning/reflection table) and other documents (i.e., emails).

Researcher generated documents. Researcher generated documents are documents that the researcher prepared or were prepared by the participants for the researcher with the specific purpose of learning more about a situation, individual, or the phenomenon being investigated (Merriam, 2009). I included the Center for Teaching and Learning iPad Grant applications in the researcher generated documents section even though the applications were written and submitted by faculty participants prior to being recruited for the study. According to the Center for Teaching and Learning website, iPad Grant applications were generated by interested faculty members. Within the application, faculty members had to include the following:

1. Your Name
2. Department
3. Date of Application
4. The course you would like to incorporate the iPads into
5. Determine the learning outcomes/goals for the course (both for the instructor and for the students)
6. Obtain approval from Department Chair

As stated in the Participant section of this chapter, I selected the participants who were recipients of the iPad Grant so it was important to include the faculty participants' applications as part of my data source. This made sense because applications contribute to insights into reasons why each faculty participant wanted to use digital technology and/or digital resources to design activities to increase student participation. In addition, I also prepared two documents for the study: a digital technology planning/reflection

table and an end-of study self-report. Both were distributed to the faculty participants via email. The planning/reflection table was a Microsoft Word document and the self-report questions were in the body of an email.

Center for Teaching and Learning iPad Grant applications. I included the iPad Grant applications in my data set since the participants were recruited from this pool of faculty colleagues. Faculty colleagues who were interested in incorporating iPads into their classrooms had to complete an application. Within the application, faculty colleagues were asked to state their proposed learning outcomes in regard to the use of iPads for both themselves and for the students. This information was used to identify each faculty participant's initial goals in digital technology use at the time of application. I also used the applications to compare faculty participant's goals and use of digital technology use at the time of the study.

Digital technology planning/reflection table. I developed the digital technology planning/reflection table at the same time that I launched the iPad Initiative in fall 2010. I have revised the planning/reflection table several times based on implementation feedback and my own reflections prior to the version that I used for the current study. The purpose of the digital technology activity planning/reflection table was to facilitate the process of digital technology identification, writing student learning outcomes, activity planning, digital resource incorporation, and faculty participants' reflections on an activity. The planning/reflection table was a tool used to help the faculty participant in this study to reflect on experiences while teaching with the identified digital technologies and accompanying activities. I used the planning/reflection table, and, specifically,

faculty participants' reflections, to get at each faculty colleague's experiences when using a specific digital technology.

End of study self-report (via email). The end-of-study self-report came about after I did an initial read of all collected data (this occurred in January 2016). After reading the data, I realized that I needed more information regarding faculty participants' perceptions with respect to their teaching since working with me. I included three questions in an email on January 27, 2016 to each of the faculty participants. The questions are below:

1. How would you describe your teaching process/planning and teaching style/practice prior to working with me? (This precedes the study, so it may be 5 years ago.)
2. How would you describe your teaching process/planning and teaching style/practice since working with me?
3. What is the biggest difference you see in your teaching (process/planning, practice) after working with me during this study through the instructional consultation process?

Every faculty participant responded by April 2016.

Other documents. I also included other documents that were "produced to convey information, ideas, thoughts and reflections, memories, visions, pictures, procedures, goals, intentions, aspirations, prescriptions" (Lankshear & Knobel, 2004, p. 247). The documents I included in my data sources are emails.

Emails. Emails were used throughout the duration of the study as a communication tool to schedule interviews, classroom observations, and consultation sessions. To perform member checks, I used emails for clarification and/or confirmation of information such as verifying a quote.

Timetable

The table below illustrates the data collection timetable for the study.

Table 2.

Data Collection Timetable

Participants	Document Gathering - iPad Grant Applications	Practitioner Reflective Journal	Interviews: Pre-observation & End of study (Approximately 40 minutes to 1 hour each in Practitioner's office) *Over the phone **Faculty Classroom	Consultation Sessions - conducted after observations: (Approximately 40 minutes to 1 hour each in Practitioner's office) *Faculty Classroom	Classroom Observations: (Approximately 75 minutes each) *Approximately 2 hours and 45 minutes	Document Data (Participant emails and participant publication)	Researcher Generated Document Data (Reflection Tables and End-of-Study Self Report)
Catherine	September 13, 2013		May 8, 2015 October 28, 2015	May 25, 2015 June 16, 2015 September 16, 2015 October 12, 2015	May 28, 2015* June 8, 2015 October 10, 2015*	Emails: May 2015 June 2015 September 2015 October 2015 January 2016 February 2016	October 10, 2015 February 4, 2016
Christian	January 9, 2013		May 19, 2016 November 9, 2015	September 29, 2015 October 6, 2015 October 27, 2015	September 23, 2015 October 6, 2015 October 22, 2015	Emails: May 2015 September 2015 October 2015 November 2015 January 2016 February 2016	November 9, 2015 February 3, 2016
Jamie	October 31, 2014		May 15, 2015 October 20, 2015	September 22, 2015 October 6, 2015 October 14, 2015	September 14, 2015 September 21, 2015 October 1, 2015	Emails: May 2015 September 2015 October 2015 January 2016	October 14, 2015 January 28, 2016

					October 7, 2015	February 2016	
Marcus	October 10, 2011		September 17, 2015* December 14, 2015**	November 16, 2015*	October 15, 2015 October 29, 2015	Emails: May 2015 September 2015 October 2015 November 2015 December 2015 January 2016 February 2016 March 2016 April 2016	December 14, 2015 April 18, 2016
Shelley	May 2015	April 2015 - January 2017				Emails: April 2015 May 2015 June 2015 August 2015 September 2015 October 2015 November 2015 December 2015 January 2016 February 2016 March 2016 April 2016	

Data Analysis

Data Analysis: Importance and Function

Qualitative data emphasizes "the meanings people place on the events, processes, and structures of their lives" (Miles, Huberman, & Saldaña, 2014, p. 11). Data analysis enables the researcher to look deeply at the data to identify meaningful patterns that can be interpreted in light of a study's research question and framing theory. Merriam (2009) defined data analysis as the process used to address research questions and make sense of the collected data. She also recommended that the processes of data collection and analysis should be dynamic, recursive, and occur simultaneously so that the researcher is informed throughout the research process. Braun and Clarke (2006) asserted that there are two approaches to qualitative analytic methods. In one approach, the study is tied to a specific theoretical or epistemological position (i.e., conversation analysis), which means there is relative variability in how the method is applied (e.g., grounded theory). The second approach includes specific methods that are extremely flexible because they are relatively independent of theory and epistemology, or, better put, they can be framed and reframed by a range of theories and epistemologies. Thus, they can be applied across a range of theoretical and epistemological approaches. Thematic analysis falls under Braun and Clarke's second approach to qualitative analysis which is the data analysis method I chose to use for this study.

Despite the various methodologies and data analysis methods available in qualitative research, there are some common features across them all. Miles et al. (2014) identified those common features as: 1) assigning codes of some sort to the collected

data, such as field notes; 2) looking for relationships within the codes to establish patterns, themes, categories, and distinct differences to help plan the next set of data collection; 3) further isolating the established patterns, themes, categories, similarities and differences and integrating them in the next set of data collection; 4) recording one's own researcher reflections, notes, thoughts in jottings, journals, and analytic memos; 5) elaborating on the "consistencies" or generalizations within the data; and 6) comparing the generalizations with existing literature or theories. Merriam (2009) outlines similar features in the basic qualitative study methodology. All of these listed features are part of the thematic analysis process.

Braun and Clarke's Six-Phase Thematic Analysis Approach

Although thematic analysis is not well-defined, it is a useful, flexible, accessible, and widely used method in qualitative research (Boyatzis, 1998; Braun & Clarke, 2006). Clarke and Braun (2013) defined thematic analysis simply as "a method for identifying and analyzing patterns in qualitative data" (p. 120). Boyzatzis (1998) defined thematic analysis eloquently as a way of seeing and making sense of materials that seem to be unrelated. Thematic analysis is also useful in that it accommodates a range of theoretical frameworks, research questions, or types of data, thereby making it enticing to most qualitative researchers regardless of the foci and/or purposes of the studies. Thematic analysis is also a useful and appropriate method to use when a researcher is investigating an under-researched area or when working with participants whose views on the area of research is unknown as it allows analysis across multiple data types (e.g., transcripts,

images) in a systematic way that increases accuracy or sensitivity while attempting to understand and interpret a phenomenon (Boyatzis, 1998; Braun & Clarke, 2006).

Thematic analysis aims to search for themes that emerge from the collected data that are relevant and important to the area of study or phenomenon. Since it involves a process of analysis across all data sources, for example interviews and images, thematic analysis can highlight similarities and differences as well as generate unanticipated insights (Braun & Clarke, 2006). Within the thematic analysis process, researchers carefully code, identify patterns, and then sort them into themes. A theme captures something important in the data that is relevant to the research question and represents meanings or patterned responses. As thematic analysis allows the same analytical process across all data sources, the researcher may see emerging themes and/or relationships between themes that were not expected. Not only is the thematic analysis procedure accessible, its results are also generally accessible to the educated general public (Braun & Clarke, 2006), which further positions thematic analysis as a valuable qualitative research data analysis method. Thematic analysis requires researchers to be systematic and thoughtful as they collect, familiarize, and analyze the data. It also requires the researcher to identify, simplify, and justify and define the relationships between the themes in the study. Similar to all other qualitative research narratives, the thematic analysis reporting process mandates that researchers be clear and transparent in the theoretical stance and values that they bring to the study. Lastly, since thematic analysis is a recursive process and allows analysis across all data sources, it provides the foundation for a rich and thick narrative of the study.

I chose to use Braun and Clarke's (2006) six-phase thematic analysis approach because the authors laid out the often "messy" data analysis process in a clear and concise outline which I appreciate as a novice qualitative researcher. Braun and Clarke also emphasized that although the six-phase thematic approach is outlined in a linear fashion, the analysis process is in fact a recursive process. The researcher is expected to move back and forth within the six-phrases as often as needed. Moreover, the authors point out that the thematic analysis process begins when the researcher starts to notice and/or look for patterns of meaning and topics of potential interest in the collected data. Ideally, this process should begin as soon as the researcher starts the data collection process and not at the end after all of the data have been collected. Thematic analysis helped me to examine the roles of the instructional consultation process and digital technologies in shaping teaching practices in STEM educators in a community college and my instructional consulting practice. Below I will detail the six phases of the thematic analysis approach to the analysis of data pertaining to changes in teaching practice.

Six Phase Thematic Analysis Approach: Looking at Shifts in Teaching Practice and Attending to My Instructional Consultation Practice

Even though I address two foci, teaching practices and my instructional consulting practice in the present study, I used the same multiple data sources but with two different lenses. I first focused on examining each faculty participant's pre-instructional consulting and post-instructional consulting teaching practices. The data sources I used were: iPad Grant applications, transcripts of the interviews, transcripts of

consultation sessions, observation field notes, planning/reflection tables, emails, and one faculty participant's publication was taken into consideration. All of the interviews and consultation sessions were semi-structured with some predetermined questions to start the dialogue, to focus the conversations, and to be used as points of reference.

I began looking at the data to see if there were any changes to a faculty participant's teaching practices and if so, why? I looked at data in two different phases. Initially, I familiarized myself with the data by reading and examining across all four faculty participants' collected data. At that point, I had only collected the iPad applications and transcripts for the pre-observation interviews. Then in September, as I attempted to read the data across all four faculty participants, I became overwhelmed by the volume of data of which I needed to make sense. So, after taking a few days off to reflect on what had happened, I decided to reread and reexamine the data set of each individual faculty participant. My decision to examine individual faculty participant's data sets was done as a result of the realization that my sense of being overwhelmed and disorganized was due to the increased amount of data I collected when I was working with Christian, Jamie, and Marcus in September, whereas over the summer I had only been working with Catherine. After reading and coding each faculty participant's data set separately, I then revisited the codes across all four participants to see if there were any common themes.

A week later, I returned to the same data set with the addition of my reflective journal to begin the data analysis process again, but this time focusing on my practices as an instructional consultant. To prepare for examining the same data set with a different

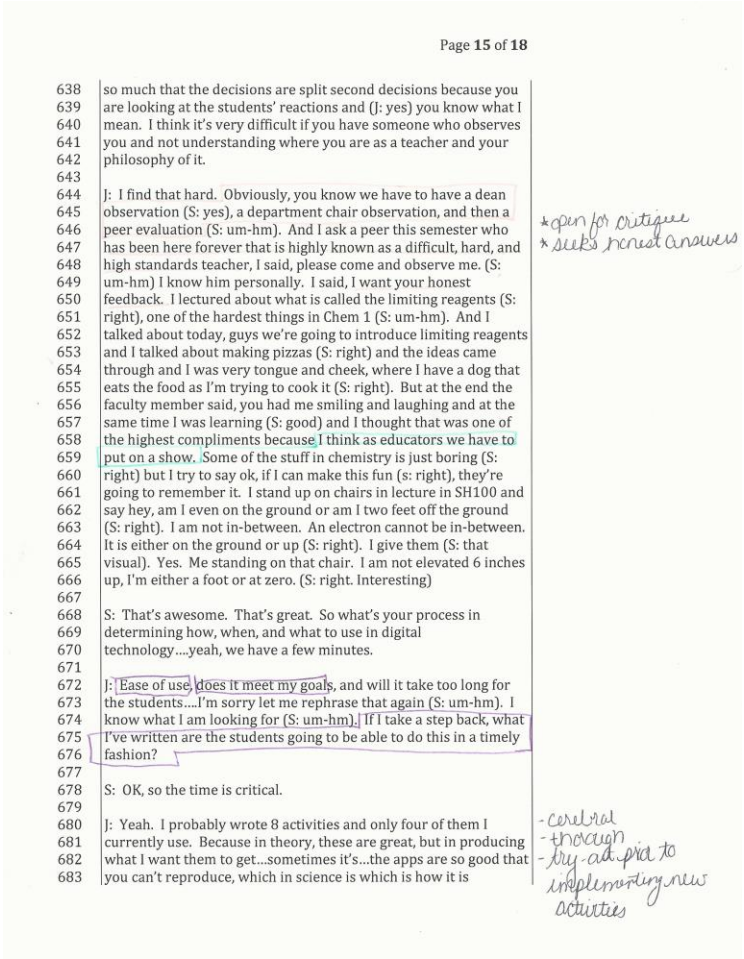
perspective, I printed out all of the data sources again so I could begin the data analysis with a "clean" set of data. Prior to the data analysis, I critically analyzed who I was as an educator and how it came to be. In addition, I also considered how I used digital technologies in my own teaching. These three considerations necessitated deep reflections on my experiences as a student, a teacher, and a teacher educator/consultant. It was apparent that my experiences shaped my affinity towards a social view of learning and consequently an inclination to foster a co-learning environment with active learning practices. The same experiences shaped my approach to instructional consulting. I wanted to keep my reflections and affinity in mind as I began the thematic analysis process to attend to my instructional consultation practices. In an attempt to streamline the six phases, I used the teacher practice data set to provide examples.

Phase 1: Familiarizing yourself with your data. I began the study with the theoretical position of Thomas and Brown's social view of learning and an emphasis on active learning as a teaching practice. In the previous chapter, I made my theoretical position and teaching practice preferences clear and transparent as they most likely influenced the way in which I looked at, analyzed, and interpreted data. Just as important was for me to be familiar with and engage with the data as much as possible, both in breadth and in depth (Braun and Clarke, 2006). I needed to be familiar with all of the collected data both in the amount that was collected and the information that it was providing to me. The authors also suggested that data must be read multiple times and read *actively*. Reading "actively" means that throughout the process I read the data with an emphasis on making sense of what was being said or done, while at the same time

remaining alert to patterns. Throughout the study, my process began with multiple readings of each piece of data, such as an interview transcript, and making notes for possible coding ideas. I then assigned a color for each possible code. After assigning colors for the codes, I moved to Phase 2: Generating Initial Codes.

Phase 2: Generating initial codes. During phase two I used the notes, jottings, initial ideas about codes from the first phase to identify initial codes relevant to the study. *Code* is "most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (Saldaña, 2013, p. 3). Coding is different from generated themes which are repeated patterns, and focusses units of analysis. Units of analysis is the major entity that is being analyzed, and can be a person, a group, text, image, or sounds. In this case, the unit of analysis comprised teaching practices. I decided to code manually.

Using Braun and Clarke's (2006) recommendations, I worked systematically through the entire data set to identify relevant data items that formed themes across the data set. Since I was coding manually, I did so by writing notes on the actual data texts using colored pens and highlighters to indicate possible patterns (see Figure 3). For example, a statement in *orange* referred to some type of institutional practice or influence. *Green* referred to teacher reflections and teaching practices/preparation was coded in *purple*.



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638 so much that the decisions are split second decisions because you
639 are looking at the students' reactions and (J: yes) you know what I
640 mean. I think it's very difficult if you have someone who observes
641 you and not understanding where you are as a teacher and your
642 philosophy of it.
643
644 J: I find that hard. Obviously, you know we have to have a dean
645 observation (S: yes), a department chair observation, and then a
646 peer evaluation (S: um-hm). And I ask a peer this semester who
647 has been here forever that is highly known as a difficult, hard, and
648 high standards teacher, I said, please come and observe me. (S:
649 um-hm) I know him personally. I said, I want your honest
650 feedback. I lectured about what is called the limiting reagents (S:
651 right), one of the hardest things in Chem 1 (S: um-hm). And I
652 talked about today, guys we're going to introduce limiting reagents
653 and I talked about making pizzas (S: right) and the ideas came
654 through and I was very tongue and cheek, where I have a dog that
655 eats the food as I'm trying to cook it (S: right). But at the end the
656 faculty member said, you had me smiling and laughing and at the
657 same time I was learning (S: good) and I thought that was one of
658 the highest compliments because I think as educators we have to
659 put on a show. Some of the stuff in chemistry is just boring (S:
660 right) but I try to say ok, if I can make this fun (s: right), they're
661 going to remember it. I stand up on chairs in lecture in SH100 and
662 say hey, am I even on the ground or am I two feet off the ground
663 (S: right). I am not in-between. An electron cannot be in-between.
664 It is either on the ground or up (S: right). I give them (S: that
665 visual). Yes. Me standing on that chair. I am not elevated 6 inches
666 up, I'm either a foot or at zero. (S: right. Interesting)
667
668 S: That's awesome. That's great. So what's your process in
669 determining how, when, and what to use in digital
670 technology....yeah, we have a few minutes.
671
672 J: Ease of use, does it meet my goals, and will it take too long for
673 the students....I'm sorry let me rephrase that again (S: um-hm). I
674 know what I am looking for (S: um-hm). If I take a step back, what
675 I've written are the students going to be able to do this in a timely
676 fashion?
677
678 S: OK, so the time is critical.
679
680 J: Yeah. I probably wrote 8 activities and only four of them I
681 currently use. Because in theory, these are great, but in producing
682 what I want them to get...sometimes it's...the apps are so good that
683 you can't reproduce, which in science is which is how it is

* open for critique
* seeks honest answers

- cerebral
- through
- try-adapt to implementing new activities

Figure 3. Sample reading and note taking: Teaching practice

Phase 3: Searching for themes. Once all of the data were coded and organized, I began looking at how different codes might be combined into a theme. I looked at the relationship among codes, among themes, and among various levels of themes (i.e., overarching theme or sub-theme within an overarching theme).

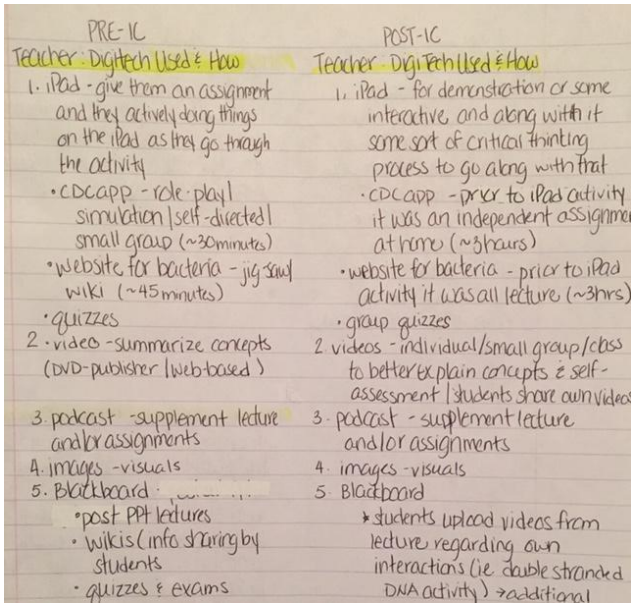
During the initial coding process, three broad themes emerged. The themes were: teacher, digital technologies, and institutional influences. As I reexamined these broad themes, sub-themes emerged, too. There were several sub-themes that emerged from the *teacher* theme: definition of teaching, the role of the teacher, definition of learning, the

role of the student, teacher reflections, teacher practices, teacher goals/objectives, instances of teacher learning, and professional learning. Two sub-themes arose with respect to *digital technologies;* they were *which* and *how* digital technologies were being used. After reading the collected data several times, it was apparent that the institutional and department cultures also influenced and constrained faculty participants' teaching choices. Two distinct sub-themes emerged under *institutional influences* specifically, structure and classroom observations. The structure sub-theme captured institutional and department expectations, such as promotion application and contractual obligations. The observations sub-theme captured the contractually obligated observation process and faculty participants' experiences with that process. As the present study also included classroom observations, it was important to capture faculty participants' experiences and perceptions for both the institutional observations and the study observations. Overall, the institutional observations, with the exception of peer observations, were for evaluative purposes. The purpose of the study observations was significantly different, as we used the classroom observations as a basis for discussions regarding a faculty participant's teaching practices and collaboration to implement active learning activities. With multiple data sources for each faculty participant, the number of codes were vast. This resulted in the use of spreadsheets to help organize the codes under the themes. To keep the spreadsheet size manageable and printable, a separate color-coded spreadsheet was assigned to each faculty participant. For example, Christian's spreadsheet was done in *blue* (see Figure 4).

Teacher: Role	Teacher: Learning	Teacher: Reflections	Teacher: Practice
"The role of the teacher is similar to what I said before is to pass on my knowledge and my experiences and to be able to guide students, to be able to reach their end goal. And also be able to be proficient in the areas that they want to pursue" (pre)		"I can see myself throughout the semesters growing, experimenting, and seeking out help when I was unsure. My creativity also grew tremendously which made the classroom experience and learning better for the students. I would have to say I was all content and no education in the beginning but grew immensely with help"(SR)	"...then next time I can ask a question to check to see if they really learn. Again, I find that using that technology they learn" (pre)
"The way I find it to work with the role of the teacher is again, it's helping with thinking critically and again it's going back to what I've said a couple of times, it's helping studetns with the material" (pre)	immediate use of recommendation - jig-saw: "I like that jigsaw type of thing" (C2, p14); "You know, it's funny. I kind of do -- I never realized that's what it's called...I do something like that allthe time with my online courses" (C2, p15)	"I was already a product of Shelley's guidance; however, I was able to be challenged more and learning more about being an educator. The one big thing I changed and found extremely useful is the method known as jig-saw. I briefly implemented the idea in some material however, didn't know it was an actual technique. I tested it out last semester during the coaching process and it was highly effective. The learning outcomes and retention was great. The studetn feedback was also wonderful" (SR)	info lit (hidden agenda and overt conversations as well) (pre)
"to relay information..also to answer questions because these things should be, people should be asking questions, people share their questions...I think another role of teaching is also that you can teach yourself. the content for sure always being up-to-date, also for guiding" (Exit)	want to have the students start to teach each other: "[from NFO] his question to us was, 'okay, so you did the material before pretty well, right? You'rein your perspective field in content. How much better did you know about it after you taught it....So I was trying to think like how do I get the students to teach each other" (C2)	"I understand how to implement some materials better. I was able to design my PowerPoints more effectively especially when implementing an animation. I learned to how to place and lead up to it more effectively. I was also able to learn how to use the method called jig-saw much more effectively and the actual technique behind it" (SR)	uses digital tech to create assignments (pre)
	re: recommendation to self-assess - "So next week, I'm going to do that. I'm going to put into their classes" (C2...And they're going to put in per group, have them work together. No notes, nothing. See what you remember. Because instead of doing a review like I did today for the energy systems last time, now I can be like, 'Okay, let's give the review of the topics with each other....well now, that's like taking collaboration to a whole new level and that brings everything to a whole new level" (C2)	"I find that the more confident I am with the material, it's almost like the more time that I use. So I don't know if it is because I generate more interaction...if I am more comfortable so I talk a little slower...I adlib more...I don't know, but I just find that as I become more confident" (pre)	pair work (for communication purposes), independent work, small group work (pre); "Communication, I always want to work with communication because that's one of the most important things in life and that's one of the biggest that people are lacking today" (Exit)
	"...because I can stand up there and I can lecture again. And then I lecture again and I can go over it out loud. But why don't they figure out themselves...you could hear them collaborating back and forth and working thogether on it. Just came faster and then so they're teaching each other, which is one of my goals instructed how to do that. So I finally got that and figured out how	"I had the usual people participate. And I try to pull them in as much as possible. and you have some others that usually don't participate that did. But it..overall, it seemed like they really got it and when I really put videos into it" (C2)	digitech process: 1. analyze how can make it into an assignment..why am I using this or how can I even do this? 2. search via app store, internet -- "first I create a reason of why do I do this or can I even do this or why do I want to do this and move on to how do I do this" (pre)

Figure 4. Sample Organized Codes: Teaching Practice

Phase 4: Reviewing themes. The goal for Phase 4 of Braun and Clarke's thematic analysis process is to have clear, identifiable distinctions among themes. The data within the themes should be coherent and meaningful. Braun and Clarke (2006) described two levels of reviewing and refining themes. The first level required me to review all of the coded data within each theme and determine whether they seemed to form a coherent pattern. In this case, I printed out each faculty participant's spreadsheet and I reviewed codes in each sub-theme across all four participants to make sure the codes were indeed under the appropriate sub-theme. As I reviewed all of the *teacher* themes and sub-themes, I realized that the codes needed to be distinguished further by pre-instructional consultation and post-instructional consultation since some of the faculty participants' answers had changed. Therefore, I went back into the data and reorganized it into pre-instructional consultation and post-instructional consultation (see Figure 5).


PRE-IC

Teacher - DigiTech Used & How

1. iPad - give them an assignment and they actively doing things on the iPad as they go through the activity
   - CDCapp - role-play/ simulation/self-directed/ small group (~30minutes)
   - website for bacteria - jig saw/ wiki (~45minutes)
   - quizzes
2. video - summarize concepts (DVD-publisher/web-based)
3. podcast - supplement lecture and/or assignments
4. images - visuals
5. Blackboard
   - post PPT lectures
   - wikis (info sharing by students
   - quizzes & exams

POST-IC

Teacher - DigiTech Used & How

1. iPad - for demonstration or some interactive and along with it some sort of critical thinking process to go along with that
   - CDCapp - prior to iPad activity it was an independent assignment at home (~3hours)
   - website for bacteria - prior to iPad activity it was all lecture (~3hrs)
   - group quizzes
2. videos - individual/small group/class to better explain concepts & self-assessment/students share own videos
3. podcast - supplement lecture and/or assignments
4. images - visuals
5. Blackboard
   - students upload videos from lecture regarding own interactions (ie. double stranded DNA activity) → additional

Figure 5. Reorganized Data: Teaching Practice

For the second level, I underwent a similar review process, except at this level I looked at the entire data set. I re-read the entire data set for two purposes. The first purpose was to determine whether each of the themes worked in relation to the data set. In this case, I reviewed the sub-themes first to make sure they were appropriately situated under the broader themes and then considered how each theme and sub-theme related to each other. The second purpose was to code any data that was missed in earlier coding stages. For example, there were a lot of conversations that made references to students, or more accurately, faculty colleagues' perceptions of students and student behaviors. Since the present study did not focus on students, I was not sure what to do with those data. After reviewing the entire data set, I decided to include this set of codes and I named the theme *students*. I then reassigned "the role of students" (originally under the *teacher* theme) to the *students* theme. This resulted in two sub-themes: role of the student and student feedback/behavior changes. It is important to include the *students* theme in the overall data set as this study is making the assumption that by changing teaching practices, the students will have a different learning experience. After all of the reviewing and reorganization of themes and sub-themes, I developed a thematic map (see Figure 6) that depicts the different themes and sub-themes, their relationships with each other, and the overall story that the themes and sub-themes told about the data.

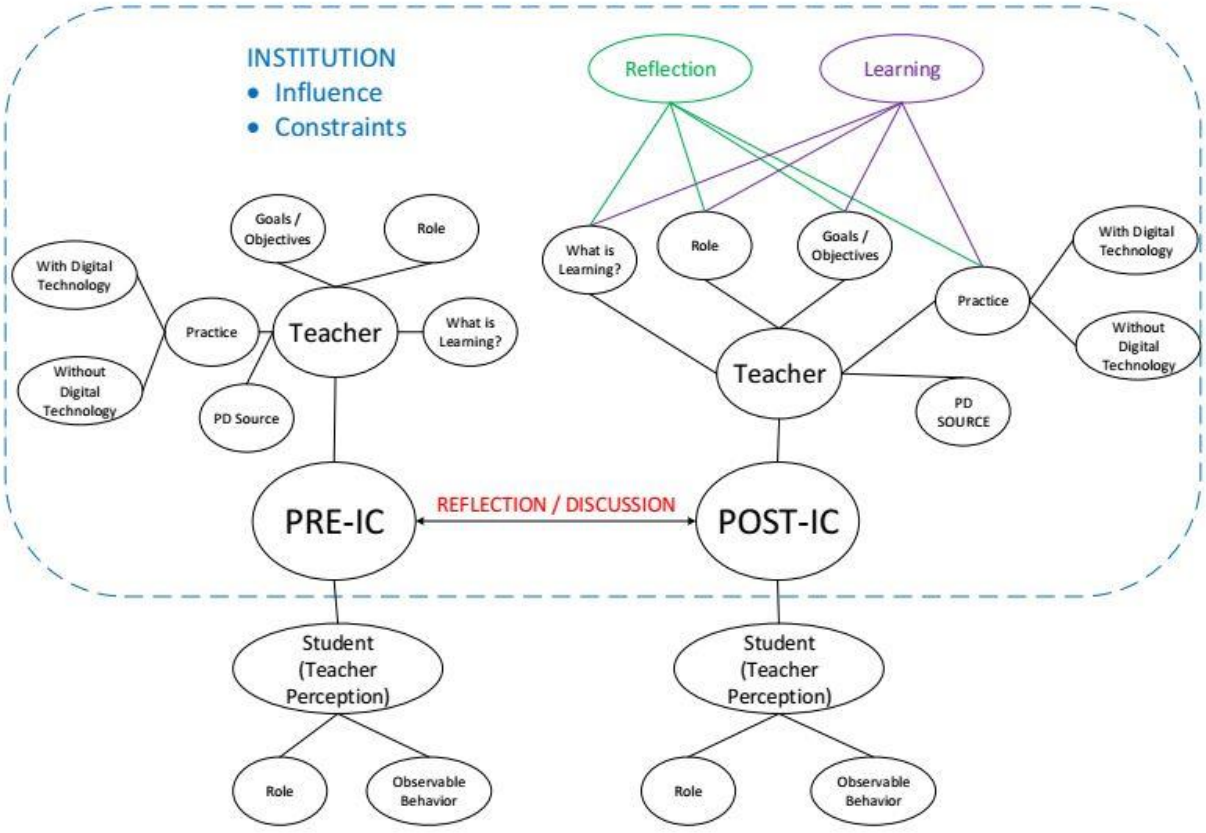


Figure 6. Graphic organizer showing interplay between themes and sub-themes - Teaching Practice

Phase 5: Defining and naming themes. There are two processes in phase five: defining and refining. For the defining process, I identified the essence of each theme and determined what aspect of data each theme captured. As I looked across the data, three dominant themes emerged regarding a faculty participant's capacity to be transformative in their teaching practices. These themes were: 1) perception of control; 2) comfort level and expectations; and 3) readiness. For each theme, I wrote detailed analyses, identified the story that the theme was telling, and considered how the theme

related to the research question. For example, looking at the *perception of control* theme, I had to first understand how the perception of control affected faculty participants' teaching decisions. Continuing on to the refining process, I identified whether or not a theme had any sub-themes. A sub-theme can provide structure to a complex theme. For instance, staying with the *perception of control* theme, two sub-themes emerged. The sub-themes were: 1) lecture as giving the perception of control; 2) control as a reaction to fear; and 2) unintended consequences due to forced cession of control. Moving to the final step of this process, I was able to clearly define and describe each theme in a couple of sentences. For example, to succinctly and clearly define *influences of context on practices,* I wrote the following: "The perception of control was a powerful factor in faculty participants' teaching decisions and teaching practices. Faculty participants explained that lecturing provided them with a sense of control over what students were presented and therefore, control over what the students learned. Beyond the perception of controlling student learning, control was also a reaction to "fear." Once I completed defining and summarizing each theme, I moved to the last phase of Braun and Clarke's thematic analysis process.

Phase 6: Producing the report. The final phase of thematic analysis involved final analysis and report write-up. The purpose of the report is to share the results of the data in a way that the readers find the report to be trustworthy and valid. The write-up is expected to present the study in a concise, coherent, logical, non-repetitive, and interesting manner that gets to the relationship within and across the themes. Braun and Clarke (2006) also stated that at this point the researcher must also be able to make an

argument in relation to the research question(s) along with the analytic native. My write-up regarding participants' shifts in practices is in the following three chapters.

Data Analysis and Critical Friends

Throughout the research process I met periodically with a small group of doctoral candidates who acted as critical friends. During our face-to-face and virtual meetings, these critical friends thoughtfully questioned, critiqued, and discussed each step of my research process. For example, I vetted the pre-observation and end-of-study interview questions with my critical friends prior to the interviews. I always took their feedback seriously and applied many of their suggestions to the study and the writing processes. For example, I was struggling with organization of the chapters, specifically with the use of headings and subheadings. My critical friends would read over the chapters and make suggestions regarding headings and subheadings. I also relied on my husband, who received his Ph.D. in social psychology several years ago, and used him as sounding board, especially when I was trying to make sense of the data, looking for codes, and identifying themes. The support I received from my critical friends and my husband was invaluable throughout my dissertation writing process.

Ethics

Within educational research, ethics deals with ensuring as much as possible that no harm is done to participants as a result of the study (Herr & Anderson, 2015; Lankshear & Knobel, 2004; Merriam, 2009; Miles, Huberman, & Saldaña, 2014). Harm to a participant includes physical (such as injury), emotional (such as increased stress), and social (such as an individual's professional reputation) distress. Because I was an

insider conducting the study, I had an understanding of the culture of the institution and its expectations of the participants. At the time of the study, I did not have any authority over the participants, as my responsibility is to provide support to faculty colleagues. Therefore, there is no conflict in my role as a researcher with the faculty participants. In addition, to minimize harm, proper Institutional Review Board (IRB) process was completed and approvals at both the sponsoring and site institutions were obtained to conduct the study. All participants were notified of the purpose and nature of the study, possible benefits and risks, and that their privacy, confidentiality, and anonymity would be respected. The participants were also provided with an Informed Consent Form prior to their commitment and participation in the study.

Trustworthiness

Trustworthiness deals with the reliability and validity of a study. Reliability refers to the consistency, stability, and replicability; whereas validity refers to how the research findings match with reality (Lankshear & Knobel, 2004; Merriam, 2009; Miles, Huberman, & Saldaña, 2014). To better ensure validity, the study data is triangulated or crystallized through the use of multiple data collection methods and the use of systematic data analysis that makes use of multiple data sources. *Triangulation* is the use of multiple independent measures or data sources to measure one finding.

To better ensure the validity and reliability of the study, the data sources, data collection, and data analysis processes were made as transparent as possible in my dissertation. Due to the nature of action research, I was fully immersed and involved in the data collection and conducted member checks throughout the study to confirm

participant responses and experiences. Member checks or respondent validation is used to ensure internal validity or credibility (Merriam, 2009). Member checks are conducted through confirmation of statements or quotes by individual participants (Merriam, 2009) on the relevant data sources, such as the consultation sessions. In addition, I shared the appropriate narratives with each faculty participant via Google Docs using unique and anonymous links. Faculty participants were asked to read, provide feedback, and approve their own narrative as written by me. Faculty participants read and made minor revisions to their individual narratives. For example, I initially reported that Jamie used two iPad apps. After reviewing the written narrative, Jamie added via a comment in Google Docs "actually used four apps total: Titration Simulator and ODYSSEY Theory [are the additional apps]" (Member check, July 9, 2016). All comments and revisions were taken into account and incorporated into the narratives. After I revised each narrative, I emailed each faculty participant to confirm that I had represented their experience accurately. After receiving confirmation, I was able to finalize the narratives. In addition to member checks, I also asked my critical friends to do peer reviews.

Peer-reviews by fellow doctoral candidates occurred periodically throughout the data collection and data analysis processes. Throughout the data analysis and write-up portions of the study, I was consciously aware of the practical limitations of educational studies. Prince (2004) reminded educational researchers that "…educational studies tell us what worked, on average, for the population examined and learning theories suggest why this might be so. However, claiming that faculty who adopt a specific method will see similar results in their own classrooms is simply not possible" (p. 225). It is critical

to attend to ethics and trustworthiness because they hold the researcher accountable to be transparent throughout the study, to justify worthiness and to secure credibility of the entire study process from study design to data analysis.

Limitations

There were some limitations to this study. The population was limited to four STEM full-time faculty members from a community college located in the northeast region of the United States. The length of the study in terms of interviews/consultation sessions and classroom observations was limited from May 2015 to December 2015. Moreover, three of the four faculty participants were only available during the fall semester (late August through early December). The study can only present a snapshot of each faculty participant's teaching practices since I was limited to 2-4 classroom observations per faculty participant. Since this study was bounded by time, formal follow-up with faculty participants was not included, thus, longitudinal effects of instructional consulting were not measured. The study methodology was carefully designed to align with sound qualitative research and action research expectations. Consequently, the study findings will be able to contribute to the conversations around faculty development, instructional consulting, and using digital technologies purposefully to increase student participation in a community college setting. That in itself is a worthwhile accomplishment since those areas are currently understudied.

Researcher's Evaluation of the Research Design and Process

As I look back on my experiences as a novice qualitative researcher, I realize that I have grown tremendously, especially in that I have become more reflective, more self-

aware, and more honest with myself. The entire journey as a novice researcher, beginning with the dissertation proposal, has been replete with a myriad of emotions, ranging from confusion to frustration to elation. Regardless of the emotions, the journey has been rewarding as I studied my own practices and the role I may have had in shifting faculty colleagues' teaching practices. However, there were numerous times where I doubted my choice in conducting an action research study.

Action research proved to be a challenging methodology for me. Although, I experienced no difficulty with reflecting on and critiquing my practices, I struggled putting my voice into writing up my findings. Researcher voice is important, especially in qualitative research, because a lack of voice threatens accuracy of the findings (Finlay, 2002; Merriam, 2009; Roller, 2012). I also understand that the researcher's voice needs to be present especially in action research due to its cyclical process (Anderson, Herr, & Nihlen, 2007; Herr & Anderson, 2015). This was expected as it was something that I acknowledged having trouble with and had to work on throughout my doctoral program. Much of it is an extension of my undergraduate background in science in which it was ingrained that research is reported objectively and succinctly. In addition, one of my critical friends pointed out that one of the reasons that I was struggling in identifying themes in the study was because I interpreted the *how* in my research question from a quantitative perspective. Thus, I pointed to a set of elements, conversations, questions, observations, actions as my answer to *how* instructional consulting helped to shape a faculty colleague's teaching practices. Essentially, I was looking for facts that backed up the value of instructional consultation. Instead, I needed to look at my data from the

qualitative perspective which is *in what ways* did instructional consulting help to shape a faculty colleague's teaching practices. This nuanced distinction led to several weeks of frustration and unproductiveness because I was not analyzing my data appropriately and this often led me to look for an answer or a solution instead of the "story." In hindsight, I appreciate the challenge and struggle as I learned more about myself as a researcher and about the qualitative research process itself.

Conclusion

This chapter provided an overview of the research design and methods for this study. I discussed my rationale for using qualitative research, specifically an action research study, which was the most appropriate research design to use to examine the two foci of the study: faculty participants' shift in teaching practices and examination of my own practices and the role of instructional consultation in that shift. I also was as transparent as I could be in my positionality, my goals for the study, and my evaluation of the research design process. Setting, participants, data collection methods, data sources, and data analysis method (Braun and Clarke's thematic analysis) were also addressed. In the following two chapters, I will discuss the findings and my analysis of this action research study. I begin with the examination of my instructional consulting practice and the role it played in shifting faculty teaching practices and their use of digital technologies. Then in Chapter 5, I discuss the various elements that impacted the faculty participants' capacity to be transformative in their teaching practices. Finally, in the same chapter, I look into the faculty participants' journey to shifting either their mindset and/or practices.

Chapter 4: The Role of Instructional Consulting and Digital Technology in Transformative Teaching

In this action research study, faculty participants and I explored teaching-learning expectations, professional goals, and available resources in a cycle of consultation, implementation, reflection, consultation, and revision. Together, we examined factors that influenced the faculty participants' capacity to be transformative in their teaching, which I will discuss in Chapter 5. I also discuss the shifts in mindset and teaching practices that occurred during the study in Chapter 7. In this chapter, I examine my instructional consulting practices and the role they played in the faculty participants' shifts in mindset and practices. In addition, I also explain the outcome of using digital technologies as a catalyst to transformative teaching. Together these results provide insight into the potential of my own instructional consulting with or without the use of digital technologies to encourage shifts in a faculty colleague's teaching.

Regardless of the magnitude of shift, action research involves learning about what is known and how it is known through experience and reflection (Anderson, Herr, & Nihlen, 2007; Cochran-Smith & Lytle, 2009; McNiff & Whitehead, 2002). Specifically, for this study, I addressed what Anderson, Herr, and Nihlen (2007) call *micropolitics* which deals with "behind-the-scenes negotiations over material resources, vested interests, and ideological commitments" and often exist in private conversations among teachers (Anderson, Herr, & Nihlen, 2007, p. 49). Prior to analyzing the micropolitics identifiable in my data, actual shifts in practice, and the magnitude of the shifts, I examined where each participant was "at" the start of the study.

This chapter is devoted to attending to my approach to and practice of instructional consulting. There is also a focus on digital technology as a catalyst to encourage faculty colleagues to design active learning activities to include in their courses because this was a key focus for me within my consultation process for this study. I noted and documented which and how digital resources and/or technologies were used by faculty participants. The discussions in this chapter provide some explanations for the following study's sub-questions:

1. How context (personal experiences, community college, department culture, and/or discipline) shape faculty members' current teaching practices and their capacity to be transformative in their teaching practices?
2. In what ways do the various elements (dialogue, collaboration, and reflection) of the instructional consultation process shape and/or support a faculty member's teaching practices?
3. In what ways do the various elements (dialogue, collaboration, and reflection) of the instructional consultation process shape and/or support a faculty member's use of digital technologies in the classroom?

Researcher as Participant

Instructional consultation is a method used to support faculty colleagues' teaching inquiries and teaching practices. As established in Chapter 2, an instructional consultant's responsibility is to support a faculty colleague's professional learning. Ideally, the process is a collaborative one in which both the faculty member and the instructional consultant frequently exchange being in the roles of the expert and the

learner. However, there are inherent tensions as well as opportunities within the instructional consulting process. There is also an intricate power balance that can manifest between the faculty member and the instructional consultant as both are experts in their respective field; the faculty member in a particular subject matter and the instructional consultant in teaching-learning. Despite the many institutional constraints that inhibit the freedom of instructors, within the faculty-instructional consultant relationship, faculty members are the decision-makers as to what happens in their respective classrooms. The instructional consultant is customarily relegated to a supportive role. Furthermore, the faculty members ultimately determine whether they will apply the new learning.

Intentions and Responsibilities of an Instructional Consultant

My intention as an instructional consultant is to help faculty colleagues meet their learning goals as teachers. Within the context of this study, their goals specifically involve examining and perhaps shifting their teaching practices from a more lecture-centric approach to a more active learning approach. I have always approached instructional consulting as a collaborative effort within a co-learning environment. As such, during the consultation sessions, the roles of expert and learner are interchangeable between the faculty participant and myself. As an instructional consultant, I have several roles: an active listener, an observer, and a facilitator. In these roles, I specifically focus on teaching practices to provide faculty colleagues with a peer perspective, to expose to them to different teaching approaches, and to make appropriate suggestions and/or recommendations within a specific context as needed by the faculty participant.

In the present study, one of my responsibilities in the instructional consultation process is to establish an understanding of each faculty participant's comfort level with the instructional consultation process, the use of digital technologies, and the possibility of experimenting with different teaching practices through dialogue and reflection. For example, I have been working with Christian since the spring semester of 2011 which was his second semester teaching. Throughout our working relationship, I found Christian to be open, eager, and always ready to try something new. He also enjoyed using digital technologies in his courses. He had commented that all of our conversations always sparked new ideas that he could implement in all of his face-to-face and online courses (Consultation Sessions: September 29, 2015, October 6, 2015, October 27, 2015; Post-study interview, November 9, 2015; End-of-study self-report, February 3, 2015). Having an understanding such as Christian's openness for critique and recommendations, comfort in using digital technologies, I approached the consultation sessions conducted during the course of this study with less hesitation about critiquing and providing recommendations than I might have if the faculty member was less familiar to me.

As an instructional consultant, I strive to be an active listener and a collaborator, and this was certainly a key goal for me within the context of this study. I recognized the strengths, challenges, and potential of each faculty colleague (Reflective Journal Entries: May 10, 2015; May 15, 2015; September 20, 2015; September 25, 2015). I also often relied on my intuition and past experiences to make both in-the-moment and premeditated decisions (Classroom Observation Field Notes; Reflective Journal Entries). I also realized that to be a more successful consultant, being flexible and cognizant of

what each faculty colleague is looking to achieve were critical aspects to my approach. Regardless of my affinities and subscribed view of learning, it would be counterproductive to force them on faculty colleagues in order to initiate a shift in their teaching practices as the collaborative environment would break down due to judgement and prescriptive suggestions or recommendations (Reflective Journal Entries: April 22, 2015; May 10, 2015; September 25, 2015; October 6, 2015; October 28, 2015). My analyses also suggest that there was a shift in the roles I play as an instructional consultant. In addition to the aforementioned roles (active listener, observer, and facilitator) I deliberately tried to enact right from the start of the study, I also assume the role of a resource provider and a cheerleader. That being said, despite going into this study feeling experienced as a consultant and having a range of ideal dispositions I felt I was practicing, I nonetheless learned much about my approach and practices as an instructional consultant. Taken together, my analytic outcomes suggest my instructional consultation approach corresponds with Little and Palmer's (2011) coaching-based framework for individual consultations.

The details of the shift in my ideas regarding the role of instructional consultation in shifting teaching practices in faculty colleagues across the life of my action research study will unfold throughout the next two chapters.

Setting Goals and Tone for the Instructional Consultation Process

To iterate, in this study four faculty colleagues and I worked towards shifting their teaching practices from a more lecture-centric approach to a more active learning approach with the use of instructional consultation. Throughout the instructional

consultation process, we functioned in a co-learning environment working towards a specific goal or a set of goals identified by each faculty colleague within the parameters I had set (i.e., shifting towards more active student learning). Faculty colleagues and I collaborated on meeting their learning goals and throughout the collaborative process, my analysis suggests we frequently exchanged roles as the expert and as the learner, which was I expected.

I spent much of the study working with faculty participants to design and incorporate active learning activities that provided opportunities for the students to assess their level of understanding at various points during a particular lecture. These active learning activities were often a slight adjustment to content presentation, such as adding a "big question" slide at the end of a concept explanation or a revision of how a video clip was used. These faculty participants were receptive to an active learning approach as they already had been incorporating it in their teaching albeit some of them in settings outside of lecture sections such as recitations and laboratory sections. At the study institution, recitations sessions are formalized class sessions where students can receive extra help in a particular course. Despite the faculty participants' receptiveness to incorporating active learning practices in their teaching, the journey to consider and to enact a shift in teaching practices was unique to each faculty participant.

The length, the rigor, and the time required for the journey to shifting teaching practices were dependent on many factors, such as openness to learning new approaches and willingness to consider changes to their preconceived definitions of the role of a teacher as well as structural limitations imposed by the institution and their content.

Catherine, Christian, Jamie, Marcus, and I attempted to unpack the journeys through thoughtful and focused conversations and reflections. Teacher reflection was one of my instructional consultation goals for this study. My analysis suggested that some of the factors that influenced a faculty participant's journey in shifting teaching practice mirrored Dewey's reflective individual. Dewey (1933) stated that a reflective individual is open-minded, responsible, and wholehearted. He identified open-mindedness as a willingness to listen and consider different perspectives. Responsibility was defined as a willingness to search for truths and to solve problems with information while wholeheartedness was characterized as the willingness to critically evaluate oneself, others, and society to overcome fears and uncertainty to make change. Ultimately, being a reflective individual and being on a journey to shift teaching practices required the faculty members to become humble and vulnerable as they acceded to peer and self-critiques. The conversations and reflections occurred during the consultation sessions throughout the study. In the next chapter, I will discuss that the occurrence of a shift in teaching practices as partly dependent on the readiness of the particular faculty colleague and my ability to foster this readiness. I also went along the journey with the faculty participants. Along with a shift a shift in practices, I focused on my identity as an instructional consultant and analyzed my own practices while working with faculty colleagues.

My Journey in Reflecting Upon My Role and Approach as an Instructional Consultant

In this study, I used instructional consultations as a professional learning

opportunity for faculty participants to examine and to shift their teaching practices from more lecture-centric approach to a more active learning approach. Professional learning ideally "is a period of ongoing intellectual and cognitive growth for teachers" (Terehoff, 2002, p. 70). In this study, faculty participants determined the pace, the focus, and goals of the study across the course of a semester or more while I acted as a collaborator and facilitator to assist in meeting each set of goals. Since each faculty participant came into the study with different learning experiences, teaching experiences, expectations, and goals for the study, I needed to understand and acknowledge those experiences and expectations. So, knowing each faculty participant was crucial to my instructional consulting process, especially since one of the purposes of the study was to encourage a shift in teaching practices.

While there are models or processes in instructional consulting (see Brinko, 1990; Brinko, 2012; Lewis & Lunde, 2001; Little & Palmer, 2011), research on the *influence* of instructional consultation on change in practices is limited in academic literature. This action research study looks to address that gap in literature. My analysis suggests that instructional consulting can be helpful in encouraging conversations regarding teaching practices as well as promoting a shift in a faculty colleague's teaching practices, at least within the context of the study institution and my own practice. The analytic results suggest that a key reason for the utility of our consultation process was that each of us acknowledged our personal responsibilities and accountabilities in this experience and made this opportunity a collaborative and co-learning experience as explained neatly by Thomas and Brown's (2011) social view of learning. Through this experience, each of us

had affirmation of our own existing practices, arrived at new or revised perspectives on the teaching-learning process, and reinvigorated our minds to rethink our teaching.

Indeed, the consultation sessions, classroom observations, and field notes from faculty participants' practices allowed me to develop a richer understanding of the impact of my consultation work. Even though my analysis suggests that instructional consultation supported faculty learning and helped with shifting teaching practices, the analysis also indicated that in order for it to be successful there needed to be faculty commitment in terms of time, openness to learning, willingness, and readiness to change. Of these commitments, a faculty member's willingness and readiness to change were the vital elements to their shift in teaching practices (discussed in Chapter 5). Realizing that genuine shift in mindset and practices was an individual process, I found that I had to cede my own control in the sense of attempting to force a shift in teaching practice regardless of a faculty colleague's willingness and/or readiness. I presented evidence to the individual faculty participants that their current teaching practices were not meeting their learning goals for students in order to help them understand that there was a disconnect between their goals for the student and their current teaching practice. This is what Chinn and Brewer (1993) called anomalous data and depending on how each faculty participant responded to the anomalous data, I found it led to different magnitudes of shift in mindset and practices. The presentation of anomalous data was done mostly through one-on-one conversations using reference to classroom observation field notes.

Reflection on Goals and Practices as an Instructional Consultant

As explained in Chapter 2, I approach teaching and instructional consulting with a

humanistic orientation in which learning is seen as opportunities for personal growth (Tangney, 2014). Since learning seen from this orientation comprises a series of opportunities for personal growth, it makes sense that it is important for me to get to know the individuals and their goals. Indeed, the data did show that I strove to understand, acknowledge, respect, and accept who they were as teachers and as learners. For example, when I revisited all of the first interview transcripts, I realized that the focus and goals of the four faculty participants centered on either teaching practices or content presentation and not digital technologies, which led me to ask, "So how do digital technologies fit in my study?" (Reflective Journal, February 17, 2016). I explain my response to that question later in this chapter, but my initial response was one of concern as digital technologies was an important element of my study and professional work. My emphasis as an instructional consultant during this study was on the personal learning of each faculty participant. Thus, data show that I provided opportunities for faculty participants to reflect on current teaching practices, consider student learning experiences, and discuss potential changes through conversations during the consultation sessions. Prior to the study, I had not specifically adopted a particular model or process, but my analytic results suggested that I implemented a form of coaching.

Identifying My Approach: Using the Coaching Model for Instructional Consultation

Coaching is relational work. In fact, Deiorio, Carney, Kahl, Bonura, and Juve (2016) suggest that the relationship between the participants, the coach and the faculty member is important to the success of the coaching process. I had already established a

collaborative working relationship with faculty participants by developing rapport and trust through years of working together. As a coach, I listened, asked questions, summarized, and helped the faculty participants achieve their learning goals (Little & Palmer, 2011; Thomson, 2014). The process of coaching can help faculty members make decisions more mindfully through providing a different perspective on a faculty member's teaching practices (Lenze, 1996, p. 2) or by assisting faculty members to organize their knowledge of teaching using an organized framework (DiPietro & Norman, 2013, p. 284).

The academic literature suggests that are different approaches to coaching that include technical coaching, problem-solving coaching, reflective-practice coaching, team-building coaching, peer coaching, collaborative coaching (Denton & Hasbrouck, 2009), directive coaching, and non-directive coaching (Thomson, 2014). My analysis suggests that I gravitated toward a non-directive coaching approach in the course of this study. Thomson (2014) described the non-directive coaching approach as being "about facilitating, not instructing, advising or guiding. It is about working with someone, not doing something to them" (p. 10). For example, during the course of our consultations, Marcus discussed an activity that he called Eureka Moments. The purpose of the activity was to have students make sense of theory and how it applied to real-life scenarios. Marcus used Eureka Moments to confirm student understanding of concepts (Consultation session #2, November 16, 2015). During the same consultation session, I used my field notes from the October 29, 2015 classroom observation to point out to Marcus that while the purpose of the Eureka Moments was for the students to connect

theory to practice, he was the one who made the connection for the students. Marcus did not realize that even though he purposefully designed the activity to access student understanding of concepts, he actually did not provide the opportunity for the students to do it themselves. With this realization through our conversation, Marcus considered changing the Eureka Moments activity from a class discussion to a small group activity (Consultation session #2, November 16, 2015).

The better I got to know my faculty colleagues over the course of the study, the more focused became my conversations and collaborations resulting in recommendations that became more focused and compatible with my faculty colleagues' current practices. Prior to this study, my work with the faculty participants had been limited to conversations regarding their interpretations of their teaching or the new practices that they would like to try. It was not until I observed their classes that I was able to have more focused conversations and make recommendations regarding their practices. In the Research Design and Methodology chapter, I noted that the purpose of classroom observations was not evaluative; instead, it was to comprehend who they were as teachers and to observe their teaching practices so I could better support them in their teaching as they considered incorporating different practices. During these focused post-observation conversations, I asked faculty participants to reflect on the particular lesson and to consider student responses. My goal became to encourage them to verbalize evidence of whether or not the students had met those learning objectives/outcomes. To meet that goal, during the consultation session after the classroom observations, I asked, "What were your learning objectives? Did you accomplish them? How do you know?"

Documenting My Instructional Consultation Process

Throughout the instructional consultation process the focus was always on a faculty participant's learning and goals. I listened carefully while we conversed and allowed the conversation to be directed by the faculty participant's questions, answers, clarifications, and rationale. I was aware that there were tensions and impediments surrounding a faculty participant's capacity to be transformative in their teaching practices (discussed in Chapter 5) as well as some inherent tensions and dilemmas in the instructional consultation process (discussed later in this chapter). Being cognizant of the inherent tensions of the process and intricate balance of power, I used my experience, intuition, observation of body language, and consideration of tone to help me better facilitate each consultation session. In the following section, I discuss how I used to questions and classroom observation field notes to help faculty colleagues meet their learning goals.

Asking Questions and Using Field Notes to Guide Instructional Consultation Sessions

Little and Palmer (2011) recommended that instructional consultants ask powerful questions, which through my analysis I realized that I have done long before I began this study. Powerful questions in this sense are questions that are faculty-focused and may lead to a change in a faculty member's thinking and/or behavior. These powerful questions are asked for clarification purposes, such as "What would you like to see happen?" (Little & Palmer, 2011, p. 108). Instructional consultants also ask powerful questions that create possibilities, such as "What other options can you think of? Would

you like to brainstorm ideas?" (p. 109). Since the process of coaching is "grounded in forward-moving change" (p. 109) powerful questions are also designed to prompt and permit faculty members to commit to an action such as goal setting or assessment.

The results of my data analysis strongly suggest that prompting participants to reflect on their practices was a key "move" in my own instructional consulting process and practices; one that I had not been consciously aware of prior to this study. I found I dedicated a significant portion of each consultation session to asking questions that would help faculty participants reflect on their teaching practices, the rationale for their teaching decisions, and consideration for possibilities for improvement or changes. For example, some of the questions I always asked were: "How did you think the lecture went? What were your learning objectives? Did you meet your learning objectives? How do you know? Would you change anything in the lecture that I just observed?" However, because of changes observed in their teaching practices, I asked Catherine and Christian additional questions like "How did you formerly teach this concept? What were the changes you implemented? Why the change? How did you think it went?" Interestingly, the academic literature suggests it is important to have the reflective responses link to their own practices to sustain motivation (Canning, 2014). It seems that this was a process I found important for the faculty participants to self-critique with evidence. The reflection questions as well as the feedback that I provided to each faculty participant were specific and relevant within their own context and experiences. For example, since all four faculty participants had used various digital technologies prior to participating in this study, I asked them during the pre- and post-study interviews to

reflect on the way they used digital technologies and if it aligned with the way they defined the role of the teacher and the role of the student. For example, one of the ways that Christian used digital technologies was for hands-on experiences and to apply to real-life scenarios so he designed activities such as using an iPad app, in which the students "explore the digestive tract and how it works to break down and use food" (Planning/Reflection Table, November 9, 2015). The way Christian used digital technology mostly aligned with how he defined the role of a teacher, "…pass on my knowledge and my experiences and to be able to guide students, to be able to reach their end goal. And also be able to be proficient in the areas they want to pursue" (Pre-observation interview, May 19, 2015).

Along with asking powerful and reflective questions, I found that classroom observation field notes unexpectedly became an important tool in my work with these four faculty participants. A digital version of the field notes was emailed to the faculty participant shortly after each classroom observation. For instance, after the first round of classroom observations, I pointed out to all four faculty participants my concern that the students were not afforded the time to reflect on their learning during class sessions nor were they given the opportunity to actively participate in learning. This was an area of concern for me since it directly contradicted all four participants' goals to provide opportunities for the students to participate in their learning, to assess their understanding of the content, and to develop into independent learners. I suggested to each of the faculty participants that this was an area that we could focus and work on throughout the study. They all readily agreed. I found that since the classroom field notes documented

the various events (teaching practices, type of activity, and length of activity) with time stamps, they were given a snapshot of what happened in their classes which led to realizations and consideration to change existing practices.

All of the faculty participants noted that my field notes gave them a better understanding of what they were doing in their classes. More importantly, the faculty participants pointed out that the timestamps on the field notes provided a clear picture of how they were using their time throughout the lecture sections. Jamie continued and explained that the field notes were "...helpful for me. I like reading--I like going through this. This is a benefit to me because I kind of get to see a different view...of this [his teaching], which I think is really great" (Consultation session #2: October 6, 2015). Even though I had planned from the start to use the classroom observation field notes to facilitate the consultation session dialogues, I underestimated their significance to the instructional consultation process.

The data clearly show that shifts in teaching practices were not a uniform process for each faculty participant, nor was it an automatic or guaranteed process. It took time. Not surprisingly, it was messy, meaning there was not a "one size fits all" process nor did it fit in a given timeline. My analysis suggests that shift in teaching practices was shaped by numerous factors such as the faculty colleague's past learning experiences, past teaching experiences, their openness to change, and their willingness to consider and try different approaches and different tools in their teaching and not just the consultation process on its own (discussed in Chapters 5 and 6). Faculty colleagues' assessments of how the students were learning in class as it was currently constituted was also important.

Incorporating active learning practices also required some changes in student expectations. This finding impacted my own understanding of the consultation process as one that cannot be decontextualized or divorced from what each faculty participant brought with them to the collaboration. This, too, reaffirmed to me the importance of getting to know each faculty participant as a teacher.

Through the process of instructional consultation, faculty participants and I discussed rationales and uncertainties about current practices, the use of digital technologies and resources, my recommendations for changes in practices, and meeting their professional goals. We addressed uncertainties with honest conversations threaded with questions. In each of our conversations, there were consistent features of my work that I used with all faculty participants. These features included dialogue, reflection, core practices, and discrete practices. I discuss each of these in turn below.

Elements and Practices of Instructional Consulting

Dialogue and reflection with the faculty participants informed my instructional consultation process. Dialogues and reflections helped establish an understanding of each faculty participant's perception and approach to teaching and learning. Through dialogue and reflection, I was able to discern what I considered to be each faculty participant's comfort level to be transformative in their teaching practices. For example, Jamie's agreement to be part of this study was to have the opportunity to exchange ideas and receive constructive criticism with the "end goal of becoming better at presenting" and from his perspective, we met his goal (Consultation session #4, October 7, 2015). So, despite the focus of the study on transformative teaching, during the consultation

sessions we focused on content presentations. Because the action research process forced me to offer a more systematic analysis of my practices, I became aware that my practices had two distinct, yet overlapping approaches: core practice and discrete practice.

Core practice refers to practices that I consistently used during consultation sessions with all four faculty colleagues, such as sharing personal experiences. For example, I shared with Catherine a challenging experience that I had as a student in a class that had all of the students participating in many active learning activities. Unfortunately, most of the activities, from my perspective, did not meet the faculty member's intended learning objectives because "the content was so dense and she did not really go over the content with us, so we became very frustrated and we really needed [the instructor] to summarize and debrief us before the activities" (Exit interview: Catherine, October 28, 2015). Some examples of core practices that my analysis shows I used regularly and consistently included establishing relevancy of my recommendations within a specific context, sharing pertinent personal experiences, offering a co-learning environment as we worked together to meet the goals of the faculty participants, and affording opportunities for faculty colleagues to be self-directive in their learning. In the context of this study, discrete practices are ones that are used specifically to address a particular faculty colleague's needs or goals, such as a focus on providing students opportunities to self-assess their level of understanding of a given content. In retrospect, many of the core and discrete practices followed the principles of andragogy, which I discuss below.

In naming core and discrete practices, I draw from the work of Knowles (1984)

who identified key areas of focus when designing learning experiences for adults or *andragogy*. These areas include that adults are rich resources for each other and typically have a higher motivation to learn after they have experienced a need in a life situation. Consequently, Knowles suggested that learning activities should be designed to be relevant to the adult student's life tasks and/or problems, which resonates with how I used discrete practices when collaborating with faculty colleagues. Discrete practices individualize the instructional consultation process. For example, throughout my interactions with Christian (prior to and during the study), I noticed that he often needed reassurance. Therefore, I purposefully included words of encouragement with my critiques or recommendations. For example, during one of the classroom observations, Christian included a lot of graphs in his lecture. He asked questions regarding the information the graphs provided, but very few students answered the questions. During the following consultation session, I addressed my observations with Christian using my field notes, "…those two graphs are really good. But my question is whether or not your students can interpret them because you're asking questions where they have to interpret the graph. I don't think they got it…have them practice reading graphs…where they can just sit in their seats and answer [the questions]" (Consultation session #3, October 6, 2015). Some examples of discrete practices that I used were focused conversations regarding reconsiderations of how to use a specific digital technology, recommendations based on specific need (e.g., classroom management or interdisciplinary opportunities), and critiques based on classroom observations such as lack of wait time. Discrete practices, in short, were a response to a faculty colleague's personal learning needs,

goals, and existing practices. Along with the instructional consulting approach and practices, however, I found there also are inherent tensions and dilemmas in the instructional consultation process.

Enduring Tensions and Dilemmas in My Instructional Consulting Process

Embedded in the instructional consultation process are an inherent tension and a struggle for a balance of power between the faculty member and the instructional consultant. The inherent tension stems from the instructional consultant's area of expertise – teaching and learning – encroaching a faculty member's domain – teaching practices. While ideally the instructional consultation process is collaborative, there is actually an imbalance of power stemming from a one-sided final decision as to what to incorporate into a lesson, which lies with the faculty member. In the context of this study, the inherent tension and balance of power of the instructional consultation process occurred when I, an outsider, stepped into a faculty colleague's classroom to observe a teaching practice (discussed later in this section). The way I used classroom observation to inform conversations around teaching practices is not a customary practice at the study institution where classroom observations are used for evaluation purposes (Consultation sessions: Catherine, September 16, 2015, October 28, 2015; Christian, October 27, 2015; Jamie, May 15, 2015; Study Institution's Self-Report for Middle States Commission for Higher Education, 2018). The data show that I had to help faculty participants to overcome the mindset of the normalized evaluative function of classroom observations, which is for the purposes of promotion and tenure, since the function of classroom observations for this study differed greatly. As discussed earlier, for this study,

classroom observations served as a tool to inform a faculty participant's professional learning needs. With classroom observations, I was able to observe each faculty participant's teaching practices and make appropriate recommendations within each unique context.

Understanding that there might be a hesitancy to allow me to observe classes, I had included classroom observation as a requirement of the study in the recruitment letter and in the Informed Consent Form. In addition, I included the statement "You may feel that your practice is being evaluated. None of the information gathered from the study will be identifiable or shared with your supervisor" under "Risks" in the Informed Consent Form. To further prepare and to remind faculty participants of the function of classroom observations, I answered questions and reassured faculty participants that I was not evaluating their teaching practices prior to the start of and at times during the study. The four faculty participants seemed to be comfortable with this and allowed me to observe their classes. In fact, as I have mentioned, in the end they regarded the classroom observations and the accompanying field notes as valuable elements in the instructional consultation process (Consultation sessions: Catherine, May 28, 2015; Christian, September 29, 2015; Jamie, September 22, 2015, October 6, 2015; Marcus, November 16, 2015).

Consequently, within the same process that embodied inherent tension and struggle with the balance of power, instructional consultation also presented opportunities for open conversations regarding goals for professional learning and honest assessment of current teaching practices and needs. During the consultation sessions, there were

opportunities for individual participants to contribute to and to make decisions regarding the changes they would like to incorporate in the lecture sections. Throughout the instructional consultation process, we engaged in conversations regarding each faculty participant's teaching practices and how to best meet desired professional learning goals. I was always cognizant of my role in the process. Since I function as a supportive structure for faculty in my daily work life, I did not make any teaching decisions, nor did I have the capability to demand changes to teaching practices. Teaching decisions and teaching practices were solely up to each faculty participant. This frustrated me (Reflective Journals, October 6, 2015, and February 17, 2016). Moreover, while I observed faculty participants' classes and provided active learning practice recommendations, the fact was that faculty participants unilaterally determined which, if any, active learning recommendations I made to incorporate into the courses. This caused some internal dilemma and tension for me.

For example, I had to consider how forcefully to encourage each faculty participant to incorporate the recommendation. The four faculty participants and I had many discussions about incorporating either active learning activities and/or digital technologies in their sections. Even though they understood that they could increase student participation, some were reluctant to implement anything that might interrupt the flow of a lecture. I was unwilling to use the study as a platform to force any faculty participant to add an activity or digital technology as all of them were finding the instructional consultation process to be beneficial. For example, Jamie found the instructional consultation process to be creative and "that we were on equal levels" and

that the process was empowering and helped him grow as a teacher (Post-study interview, October 20, 2015; Reflection Journal, October 20, 2015). If I had forced them to incorporate something new when it did not align with their goals and when they were not ready to do so, it may have been counterproductive and have damaged our working relationship. Furthermore, forcing recommendations might have damaged their perception of the instructional consultation process.

Working through the Tension and Balance of Power

In the context of this study, instructional consultation proved to be a collaborative process that functioned in a co-learning environment. In truth, I found it not to be an authentic peer collaboration as only the faculty colleagues had the final decision on what happens in their lessons. I actually found it to be disheartening that despite my expertise in teaching and learning matters and the study's focus on teaching practices that many of my recommendations were not implemented. It was disheartening because I believe that if the faculty participants had incorporated some of the recommendations, the students would have benefited. This in itself was an interesting insight for me and reminded me of how my own concept of "good teaching" is something that I brought to this study and how it did not always align with a faculty participant's concept of "good teaching." Consequently, I was always careful in crafting my words in conversations and in recommendations to align with my supportive role. For example, during the first consultation session with Jamie, I had some concerns regarding the level of student understanding after a lecture session. My concerns stemmed from observations of a lecture session and the subsequent recitation session. During the lecture session

observation, I noticed that Jamie covered multiple complex concepts at a rapid pace. Although he did pause to check for student understanding by asking if there were any questions, most of the time the students remained silent and Jamie continued with the lecture. A week later, I observed a recitation session. To reiterate at the study institution, recitations sessions are formalized class sessions where students can receive extra help in a particular course, in this case Chemistry 1.

Recalling that recitation sessions were optional and that the recitation session I observed was on a Monday at 8 a.m., I was surprised at the number of students who were in attendance. During the consultation session after the lecture, I had asked Jamie to reflect on the pacing of his lecture session. He confirmed that he covered the materials faster than he expected. Jamie stated that "...I actually made it there faster [covered all of the concepts], because of the fact I didn't get too much participation, too many questions" (Consultation session #1: September 22, 2015). I continued the dialogue with Jamie, trying to get a sense of how he was assessing the students' levels of understanding of the concepts. I asked Jamie if he was getting questions after the lecture session via emails, office hours, or by staying after the lecture session. Jamie explained that he did not get many questions from the students during the week, but he was surprised at the attendance at the recitation session. More interestingly, he was surprised at the level of engagement from the students during the recitation session as well. In response to Jamie's admission about attendance and high level of engagement, I tried to push Jamie more on his thoughts as to why the attendance and level of engagement was high at that particular recitation session.

Jamie: I was pleasantly surprised with the turnout and the level of engagement. Because sometimes it fluctuates. You know, "Oh, I got an iPad. Let's check out what else -- a lot -- from what I saw, I didn't see anybody deviate from what they were supposed to be doing.

Shelley: Yup, absolutely. So now why -- because you said that you were also a little surprised with the number, and...and why do you think that is?

Jamie: Just in general, 8:00 a.m. on a Monday. That's a tough sell.

Shelley: Okay. Do you – have you ever had an 8:00 a.m. previously?

Jamie: This will be my third one in a row. Third, fourth semester. 8:00 a.m. It's a third one.

Shelley: Now, has this been larger than what you would typically have...for this particular topic?

Jamie: I'd say, Yeah. I'd say larger.

Shelley: Okay. And do you think -- I am only asking because you said that, you know, they didn't ask a lot of questions in lecture, so I'm trying to see what your feeling is because...were they lost, where they just...just trying to get a little bit more clarification." (Consultation session #1: September 22, 2015).

Again, in a supportive capacity, I was careful with my wording. Beyond that, I also felt that I could not be direct in my assessment of why the students were attending the recitation session, because it was not my role in this situation to be evaluating teaching practices; instead my role was to make recommendations for faculty participants to consider. The inherent tension that I felt can be directly attributed to a conflict between

my supportive role and the realization that the balance of power in making teaching practice decisions is not equal. Despite that faculty participants collaborate in the instructional consultation process and have full authority in teaching decisions, inherent tension and struggle for balance of power also exists for them but in a different capacity and at a different level of awareness.

Although I was aware of the tension and power balance while working with each faculty participant, I was unsure if the faculty participants were aware of the inherent tensions and struggle for the balance of power since it was not an area this study addressed. That being said, not one of my colleagues mentioned any tension they may have experienced throughout the duration of the study. The disparity of awareness may have been due to the collaborative nature of the instructional consultation process in which my colleagues' perception was that both the faculty member and instructional consultant were peers with a stable balance of power. Other tensions and dilemmas were persistent and often restrictive in faculty colleagues' attempts to be transformative in their practice as they were either steeped in impediments established by traditions of higher education and/or the study institution's culture. Institutional impediments were difficult to overcome, as some of them, such as credit hour overload, needed institutional budget realignment and/or policy changes (see Chapter 5 for more on this). Some of the institutional impediments restricted a faculty participant's time to explore and consider new teaching practices, while others, such as classroom observations were used as high stakes evaluation processes that determined promotion and tenure. Other institutional impediments, such as course prerequisites which may have needed departmental review

and curriculum committee approval, could be less daunting because it is a procedural process as opposed to an institutional cultural shift. Nonetheless, keeping in mind a social view of learning as my enacted theory of learning, faculty participants and I frequently exchanged our roles as an expert and learner. For example, I learned from my faculty participants their teaching decisions, professional goals, and hesitations, while they learned different teaching strategies and the rationale for those teaching strategies from me. Furthermore, the non-directive approach I used for instructional consulting process fostered a collaborative environment, in which we worked together to meet each faculty participant's professional learning goals. The next section discusses the role of digital technology in transformative teaching.

Baseline Digital Technology Use and the Instructional Consulting Process

As described in Chapter 2, digital technologies and digital resources are often used at the study institution at both the macro- and micro-levels. All four faculty participants were comfortable with using digital technology and used a plethora of digital technologies throughout their courses at the start of this study. And, as I also explained earlier, I have a strong commitment to the use of digital technologies in teaching with thoughtful considerations to theory and pedagogy. In this section, I describe the various digital technologies and digital resources used by the faculty participants *prior* to the start of the study. This is important as I needed to understand which and how digital technologies were used so I can best support each faculty participant to critically reflect on their current digital technologies implementation. Since we did not add any new digital technologies and digital resources during the study, it made sense to establish a

baseline for the use of digital technology and resources prior to a discussion in order to understand how implementing minor changes could shift some of the students' learning experiences from passive to active.

Purposes of Using Digital Technologies and Digital Resources Prior to the Study

Data analysis results suggested that faculty participants seemed to choose to use a particular digital technology (i.e., an iPad) and/or digital resource (i.e., an app) depending on their familiarity with the tool, availability, and whether they were using it at a macro- or micro-level. For example, even though the faculty participants often used the same tools, such as websites, they used them differently to meet specific learning outcomes. For instance, websites may be used to provide information to supplement a given concept. Christian's students used the United States Department of Agriculture's website to research information on dietary supplements (Consultation sessions #2 & 3, October 6, 2015, October 27, 2015). Websites may also be used as a resource for students to do research and/or complete an activity such as a collaborative document. Students' in Christian's class used various restaurant websites to obtain nutrition information to determine which food selections on the menu would be the healthiest choices for a customer. After the research, students shared their food selections in a Google Doc (Consultation sessions #2 & 3, October 6, 2015, October 27, 2015). In what follows, I provide various examples of how faculty participants chose to use digital technologies and/or resources in their courses as part of their existing practices.

During the Pre-observation interviews, it became clear to me that faculty participants prioritized presenting content as their main teaching responsibility. Thus,

even though they were using digital technologies regularly in their classes, the technologies themselves did not necessarily engender active learning practices. Given their emphasis on content, it made sense that they had an interest in thinking about different ways for students to access content. They took it upon themselves to make sure that they presented content using different mediums such as lecture, videos, and websites.

Identifying Common Digital Technologies and Digital Resources Used Prior to the Study

All four faculty participants were comfortable and at ease with incorporating digital technologies in the classrooms when this study began, but the digital resources they used differed. At times, faculty participants used iPad apps, websites, publisher content, and other digital technology or resources in conjunction with an active learning activity which was designed to meet a specific student learning objective. But more often, faculty participants used digital technologies and digital resources to present content and/or provide resources using technology at a macro-level, which was to accomplish a larger purpose such as content distribution. PowerPoint and videos were frequently used by faculty participants throughout their lecture sections. PowerPoint was used to complement lectures as a content presentation tool. PowerPoint is an example of how technology is used to amplify a lesson as it is primarily used as a content presentation tool taking place of overhead projectors, whiteboards, and handouts. Catherine, Christian, and Jamie often included images within PowerPoint presentations as visuals for the lesson. For example, Jamie frequently included images of various molecular models. On the other hand, Marcus said that he no longer used PowerPoint

because he felt that it hindered the flow of teaching due to its linear format therefore, he presented content either through lecture, using websites, or by writing on the whiteboard.

Catherine, Jamie, and Christian also used Blackboard (the study institution's learning management system) extensively to share content (PowerPoint presentations, website links, videos, and images) for class announcements, to post student grades, and to assess the students through assignments and quizzes/exams. In addition, Catherine used the wiki tool in Blackboard for students to share information. Jamie used Blackboard to store recitation problem sets and activities and as the access point for the chemistry diagnostic assessment. Christian also used Blackboard's assignment feature. Christian specifically pointed out that the majority of his Blackboard assignments were not the typical upload and submit assignments. Many of Christian's assignments also expected the students to research and to engage with peers, so he frequently included assignments that used Blackboard's interactive tools such as discussion forums and blogs. His overall expectation was that the students had to be actively doing something even if the assignments were designed to be completed independently. Marcus was the only faculty colleague that did not use Blackboard extensively.

Each faculty participant also used digital technologies and/or digital resources at a micro-level and in a transformative way. Specifically, faculty participants used the selected digital technologies and/or digital resources to create better learning and teaching experiences as well as to meet student needs and to provide the opportunity to develop desired skills such as problem solving and communication skills. For example, Jamie used the Educalab Periodic Table for the students to analyze trends between the

elements in various groups. Even though all four faculty participants expected to continue to incorporate digital technologies into their courses, there were no additional digital technologies introduced throughout the duration of the study. Instead, the focus was to reconsider and revise how faculty participants were using the current digital technologies to increase student participation.

Looking at How Individual Faculty Participants Used Digital Technologies and Digital Resources Prior to the Study

Catherine. For several years, Catherine had been experimenting with incorporating active learning practices in a few of her classes. In addition, she was exposed to two types of approaches to incorporating active learning activities, self-designed and the Structured Instructional Strategy approaches (discussed in detail in Chapter 5). Because of her consistent use and firsthand account of positive student experiences with active learning practices, Catherine had already gained confidence in shifting her teaching practices from a more lecture-centric approach to a more active learning approach by the time this study began. However, that was not the case when she initially began exploring active learning with the use of iPads. Catherine's overall goal in wanting to incorporate iPads in her lessons was to increase student understanding by involving the students in the learning process. When applying for the iPad Grant in 2013, Catherine stated that she wanted to enhance student understanding of course material by incorporating "guided, student-centered computerized activities" (iPad application, September 17, 2013). During that time, she and I collaboratively designed two active

learning activities with the use of iPads. Catherine continued to use these two activities. I refer to these activities as self-designed activities.

Since the iPad Grant did not mandate regular consultation sessions, most of the interactions between Catherine and me were brief and informal during the duration of the iPad Grant in 2013. Most often, the interactions occurred when she came to the Center to pick-up or drop-off the iPads. During one of our interactions when I asked Catherine how the activities were coming along, she replied that it was going well but she was falling behind on her syllabus. When I asked why, it became apparent that Catherine was attempting to lecture the topics as she always had in addition to adding the new activities. Since each activity took about forty-five minutes, she fell behind in her overall semester schedule. I reminded her that these activities were meant to be a substitute for her lecture. Catherine was hesitant. She expressed concerns that if she were to allow the students to do the activities without her lecture, she would not be able to assess whether or not the students had learned. I asked how she assessed whether the students learned when she lectured. Catherine said that during lecture she would ask the students if they had any questions as well as tracking their performance on exams. I asked if the students usually asked questions. Catherine said sometimes. I continued to say that she could still assess the students using their performance on exams; however, by facilitating the small group activities, she might find that she could better assess the level of student understanding through their interactions and questions. I encouraged her to try. She was relatively reluctant, but agreed that she would try. After a few semesters, Catherine was encouraged by the positive results (increased student participation and consistent

successful assessment results) and she continued to incorporate active learning activities in her classes prior to the start of the semester. Jamie also began looking into using digital technologies in his teaching to provide students with opportunities to interact with content, such as the periodic table, and with peers.

Jamie. Jamie began using digital technologies and some exploration into active learning activities with academic literature. Like the other faculty participants, Jamie was comfortable with digital technology and used a variety of digital technologies throughout his courses. He attributed his confidence in using digital technologies in his courses due to academic literature, such as the *Journal of Chemical Education*, which reported increases in class participation and student exam grades when digital resources were incorporated into the classroom. In fact, Jamie wrote in his iPad Grant application and a peer-to-peer article:

> "I believe that tools such as iPad, apps, and simulations will provide students with the opportunity to go beyond straightforward lecturing to achieve a deeper and better understanding of important theories of chemistry. I hope that by introducing more technology into my course that students will be interested with better understanding of important key concepts through these innovative digital technologies (iPad grant, October 31, 2014).

In addition, he expected the students to take ownership of their learning and use the digital technologies to work with peers to complete the activities that accompanied them. Jamie also used digital technologies and digital resources to support student skills with the use of the Explain Everything app, Quizlet, and publisher-provided content.

The Explain Everything app allows the user to annotate and narrate over an image such as a screenshot or PowerPoint presentation. The sole purpose for which Jamie used this particular app was to provide asynchronous 1-on-1 tutoring, especially outside of class time. For example, students would send Jamie screenshots of their homework, typically on a weekend. Jamie would then upload the screenshots to the Explain Everything app. From there, Jamie would narrate and annotate his feedback and send the files back to the students. Jamie found this method to be very effective and it was well received by the students, often garnering multiple uses by individual students. Jamie used Quizlet to provide instructor-created digital flashcards for the students. He created these digital flashcards to help students focus on the specific course terminologies and concepts that he assessed to be important. Additionally, he used the textbook publisher's online learning system to create and allow access to homework assignments and quizzes to students. The textbook publisher's content was designed for the students to practice solving chemistry problems. Additionally, as a benefit to the students, it also provided immediate feedback (i.e., whether the answer was correct and sometimes the correct way to solve a problem) to the students so the students no longer had to wait for the faculty member to provide answers and correct their process. In contrast, Christian looked to use digital technologies to provide students opportunities to increase student participation in the class.

Christian. Christian's view on the potential of using digital technologies and digital resources for learning purposes showed that he possessed a deep personal interest and affinity towards technology and regularly followed technology trends through

various media outlets. This was evident in his comfort level and familiarity with using a plethora of digital technologies in all of his courses. Christian believed that

> "hands-on experiences really helped students learn and technology could provide those experiences. You can say it and show it as much as you want, but for them to actually apply it is a whole other world. A whole other level of learning" (Exit interview, November 9, 2015).

He expected the students to take ownership and to engage with the digital technologies along with the activities that accompanied them. For example, Christian used multiple iPad apps, including Anatomy Browser and Enjoy Learning Anatomy Model Puzzle, in his classes. Typically, the students worked in pairs or small groups to explore anatomy and physiological models and/or processes, to research, to collaborate, and/or to complete assignments. Christian worked towards having his students become independent learners. Marcus mostly used digital technologies to supplement content.

Marcus. Marcus stated that digital technologies serve a multitude of uses, but none of which is to the subject matter expert (Pre-observation interview, September 17, 2015). He used digital technologies to supplement and complement his teaching. For example, Marcus frequently used websites that had physics or engineering problem sets for him to demonstrate to the students about how to solve a particular type of problem and/or as additional practice problems for the students. Marcus also frequently used podcasts and videos in his courses.

He used podcasts and videos to reinforce concepts. At times, Marcus also used videos to compensate for the lack of equipment to which the study institution did not

have access in order for students to observe and to analyze the purposes and results with the equipment. He explained that using videos to supplement his teaching and students' learning was "huge, because it is no longer a lecture that is predicated by my constraint. Our school's constraint. It is now a 'bigger' school" (Pre-observation interview, September 17, 2015). So even though the study institution did not own various equipment used in the engineering field, with the use of videos, Marcus was still able to demonstrate to the students its purpose and functionalities. In this sense, student learning and experience within the engineering field was no longer restricted by budget and constrained within the classroom walls.

Additionally, Marcus used the iPad apps (Autodesk SketchPad, Force Effect, Force Effect Motion, and Easy Measure) for actual hands-on experiences during labs for the students. Marcus designed active learning activities with the use of iPads in which the students worked in either pairs or small groups in order to understand the importance of instrument configuration, data input, and data interpretation. The iPad activities were also designed to provide students with opportunities for peer training, collaboration, and to experience mutual accountability. But during lecture sections, Marcus relied heavily on lecture to present content and used question and answer sessions to encourage student participation.

Overall, these results suggest that the four faculty participants exhibited a clear understanding of the potential and benefits of using of digital technologies and resources in their teaching. The next section, therefore, moves on to discuss shifts in how the four faculty participants used digital technologies in their teaching after working with me.

Digital Technology as a Catalyst in My Instructional Consultation Process to Shift Teaching Practice

I came into this study firmly believing that faculty members could offer opportunities to students to actively participate in their learning through thoughtful use of digital technologies and digital resources. It was evident through the classroom observations and consultation sessions that faculty participants *were* using a variety of digital technologies and digital resources consistently throughout their courses. They also expressed interest in continuing and expanding the use of digital technologies and digital resources in their courses. However, analytic results also show that despite the enthusiasm and interest in the use and continued use of digital technologies and digital resources in their teaching, some faculty participants indicated that the technologies as currently available and constituted were inadequate in meeting many of their learning objectives.

During the study, faculty participants and I focused on *how* the digital technologies and/or resources were being incorporated and if it was used to amplify or to transform the teaching-learning experiences. The result was mixed. Faculty participants did not use digital technologies and/or resources in one specific way, for example. At times, faculty participants used digital technologies and/or resources to amplify the teaching-learning experience. To reiterate, amplifying the teaching experiences means that "students and teachers are using those new technologies simply to support conventional approaches in daily lessons" (Cuban, 2013, p. 131). For example, Marcus used a website that provided problem sets for the faculty participant to demonstrate how

to solve those problems. Therefore, the practice of demonstrating how to solve problems did not change, only the access to the problems changed from being in a textbook to being from a website. In a similar sense, Catherine and Christian also used videos to amply the teaching-learning experience. I used faculty participants' existing use of digital technologies to guide the conversation of shifting the use from amplifying to transforming the teaching-learning experience.

Shifting the Use of Videos from Amplifying to Transforming the Teaching-Learning Experience

Catherine and Christian often used videos to supplement content materials. They frequently used videos in the classroom and made them available in Blackboard as well. One of the most common ways they used videos in the classroom was to help summarize lectures. Catherine and Christian used summary videos at the end of a lecture segment to reinforce the preceding content presented through lecture. After observing how Catherine and Christian used videos in their classrooms, I encouraged them to be more thoughtful about the purposes of incorporating videos in their lessons.

In accordance with their goal to help the students to begin to understand what they knew and did not know, I suggested to the faculty colleagues to shift this practice slightly. I recommended to them that prior to viewing the videos during lecture sections, they should allow the students a few minutes to go back to their notes and jot down questions on topics about which they felt they did not have a good understanding. After the students self-assessed their areas of concern, the faculty colleagues would advise them to use the summary video to try and answer their own questions. As a result, the

students viewed the video with purpose which meant that they had a chance to reflect and assess their own level of understanding and then attempt to answer their own questions. Catherine implemented my recommendation soon after the consultation session. She stated:

> I think the suggestions you gave about having the students take some time to process what was just talked about and then come up with a question or if they still have questions, what are those questions, write them down, and then show the video. I think it was much more helpful for them to stay focused on the video and be involved with the video. I think it was a great suggestion (Post-study interview, October 28, 2015).

This non-intrusive, minimally time-consuming change in practice provided an opportunity for the students to process the content, assess what they knew, and then watch the video with purpose. My finding suggest that classroom observations were important to the instructional consultation process as I was able to witness how the faculty participants used videos in their classes and in real-time, which led to my recommendation of revising their use of videos in a transformative way.

Using Digital Technologies to Enhance Content Presentation

Since content was identified as the primary focus and responsibility for faculty colleagues, we discussed using either familiar or new digital technologies or digital resources to extend opportunities for students to review content. For example, I encouraged both Jamie and Marcus to use the Explain Everything app. Since Jamie's use of the Explain Everything app as an asynchronous 1-on-1 tutorial was well received by

the students, we discussed the advantages of extending that use from one individual student at a time to benefiting the entire class. One of my recommendations was for Jamie and Marcus to use the Explain Everything app to capture lecture content. Specifically, during lecture sections, instead of writing and solving problems on the whiteboard, Jamie and Marcus could write and solve problems while using the Explain Everything app to record the process. Even though both Jamie and Marcus acknowledged the benefits to the students when using the Explain Everything app to capture lecture content, neither of them was ready to or had the time to incorporate it as part of their lecture section at that time. This example highlighted the inherent tension and balance of power of the instructional consultation process that I had described earlier in this chapter.

Conclusion

Interestingly, while I used a social view of learning to construct a co-learning environment in which the faculty participants and I learned from each other, I realized that there were dimensions that I faced in this study that were not addressed within the context (i.e., virtual space and producing something new, such as a video mashup) in which Thomas and Brown (2011) described. Specifically, my study was set in a physical work place and the explicit focus was to shift practices. My study's context did not align with Thomas and Brown's described context, as such I had expected the journey to change for the faculty participants and me was messy and at times frustrating. Prior to the start of the study, I thought that as an instructional consultant I would be an agent of change in helping shift faculty participants' teaching practices, but in actuality many

other factors, such as the inherent tensions and struggle for the balance of power prevented an authentic peer collaboration.

Also within this study, I discussed how I used digital technologies and digital resources as a catalyst to encourage faculty participants to incorporate active learning practices. Digital technologies were used to support and/or enhance the teaching-learning experience while meeting learning objectives. They were not used to *drive* the lesson planning. In this sense, a faculty member would start with a learning objective, do research for the appropriate digital technology or resource, and then design an activity. Since all four faculty participants were already using digital technologies and resources to meet various learning objectives, in the event of the lack of one digital technology or resource to meet all of or a specific need, we collaborated to revise current uses of digital technologies and resources to be more purposeful and to increase student participation. As the findings show, while my instructional consultation process can guide conversations around teaching practices, facilitate self-reflections on teaching practices, and consider shifts in teaching practices, it has limitations. Other factors that will be discussed in the next chapter also determined a faculty participant's shift in teaching practices. Consequently, I argue in light of my study findings that an instructional consultant has the *potential* to be a change agent.

Chapter 5: Factors that Influenced Transformative Teaching

I examined the current teaching practices of four community college faculty colleagues to gain an understanding of the journey each of them undertook to potentially shift their teaching practices from a more lecture-focused approach to a more active learning approach as a part of an instructional consultation cycle. While this instructional consultation cycle was not a conventional professional learning opportunity at the study institution, it may be at other higher education institutions. Therefore, the results of this examination contribute to wider conversations regarding the current state and the future of education in educational institutions, and online platforms. With the rise of access to the Internet, social media platforms, and various technologies, it is inevitable that there is movement towards blending of formal and informal learning (Ito, 2017). Many formal educational institutions have capitalized on access to the Internet by offering hybrid/blended and/or online courses in addition to traditional face-to-face courses as formal learning opportunities (Allen & Seaman, 2015; Lokken & Mullins, 2015). Regardless of the different course delivery options, higher education institutions are giving serious considerations to students' learning experiences and faculty members' teaching practices. Specifically, there has been a lot of attention given to active learning approaches (see Donnelly & Fitzmaurice, 2005; O'Flaherty & Phillips, 2016) and their effects on learning environment and students (see, for example, Bernot & Metzer, 2014; Freeman, et al., 2014; Mastascusa, Snyder, & Hoyt, 2011). Some of this rethinking and redesigning of higher education teaching and learning experiences follows a social view of learning in which "expert" is redefined to embrace the concept of distributed expertise

and foster participatory learning opportunities. This chapter focuses on addressing one of this study's sub questions concerning whether context (personal experiences, community college, department culture, and/or discipline) shape faculty members' current teaching practices and their capacity to be transformative in those teaching practices as well as whether there were any shifts in mindset or practices. I discuss the time and effort spent on the instructional consultation process and faculty participants' acknowledgement that the benefits of implementing new practices and/or digital technologies do not guarantee any shift in teaching practices.

Data analysis identified a number of what I deem "influential factors." These factors appeared to shape or impede the faculty participants' capacity to shift either their mindset and/or their practices. These influential factors were complex in nature. Some factors were external, such as institutional procedures associated with the classroom observation process. Other factors were internal, such as the faculty colleague's perception of "control" and the value a faculty participant placed on it. Data analysis also suggested that individual faculty participants' readiness to shift their teaching practices was also dependent on their comfort with change, with trying new teaching strategies, with digital technologies, and with their perceived responsibilities at the study institution. Readiness refers to faculty members' openness to peer and self-critiques, willingness to consider and try new teaching strategies and digital technologies, and preparedness to shift their teaching practices from a more lecture-centric approach to a more active learning approach. Expectations were also an influential factor in a faculty participant's readiness. Specifically, faculty participants' expectations of student preparedness and

student responsibilities in learning often accounted heavily for their teaching decisions. To further complicate the journey for all four participants, there was a noticeable disconnect between each of their teaching practices and desired learning outcomes for the students. I discuss and examine several factors that influenced the capacity of the participants to be transformative in their teaching in this chapter.

The journey that the individual faculty participants took as they reflected on and considered revelations, feedback and recommendations was unique and revealing. It was unique in the sense that each faculty participant's learning goals were different, and they each functioned in different contexts (i.e., subject matter, physical classroom, etc.), along with other factors that contributed to the individualized learning and progress that had occurred throughout the study. They expanded, tinkered, deepened, or thought about including active learning practices in their classrooms. The results of my data analysis suggest that the nature of the journey depended on each faculty participants' readiness, comfort level and experiences with active learning and digital technologies, their teaching goals for the students, their goals for this study, and their openness and willingness to cede control in the class. The journeys were revealing as our conversations during the consultation sessions identified various factors that influenced and/or restricted their capacity to be transformative in their teaching practices. My analysis suggests the faculty participants' perception of control through using lecture was a major factor that interfered with their capacity to be fully transformative in their teaching practices. The differences in each faculty participant's journey and their access to me presented a challenge for me to discuss each participant equally in the description and analysis. Prior to discussing the

themes, I examine at the higher education structure and its potential influences on teaching practices in order to better understand the role it plays in a faculty participant's capacity to be transformative in their teaching.

Impediment to Shifting Practice: "Cafeteria-Style" Structure

Recent scholarly discussions suggest that the overall higher education structure contributes to a more lecture-focused teaching practice. Bailey, Jaggars, and Jenkins (2015), in their *Redesigning America's Community Colleges: A Clearer Path to Student Success*, argued that the "cafeteria-style structure" of most colleges may be the largest impediment "to shift the culture and practice of pedagogy toward a learning facilitation model" (p. 90) despite its professional learning efforts. The authors described the *cafeteria-style structure* as higher education institutions' focus on discrete and disconnected courses rather than on programs. With the focus on individual courses, individual faculty members determine the information that needs to be disseminated, design their courses around that knowledge, and prepare assessments of that knowledge. The courses, even within majors, do not necessarily connect with one another and as a result may lead to a lack of coherence within a program which in turn can impact whether the overall program meets learning outcomes or the institutional mission statement. Furthermore, the cafeteria-style structure leads to a culture of isolation in the sense that faculty members design courses and instruction in isolation. This culture of isolation is not conducive to deep conversations about teaching and learning and it does not foster collaboration among peers (Bailey, Jaggars, & Jenkins, 2015). I considered my approach to the instructional consultation process while working with the faculty participants

within the restrictions of the cafeteria-style structure. In the following sections, I discuss how a faculty participant's perception of control, comfort level, expectations, and readiness influence their capacity to be transformative in their mindset and/or teaching practices.

The Perception of Control

A key theme found in the data that perception of control was a powerful factor in faculty participants' teaching decisions and teaching practices. *Perception of control* in this sense refers to the view that when the faculty participants decide *what* the students learn (content) and *how* the student learn (teaching practices), then the students should be able to remember, recall, and apply the new information. Faculty participants explained that lecturing provided them with a sense of control over what was presented to students and therefore control over what the students learned. In addition to the perception of controlling student learning, findings suggest that control also seemed to be a reaction to fear. During the study, two of the faculty participants were forced to relinquish control in the way they designed and taught some of their classes, which caused some unintended consequences. Each is discussed in turn below.

Lecturing and Perception of Control

The teaching practices that the four faculty participants used varied across the life of this study, but dominant among their approaches was lecture. It made sense that lecture as a teaching practice dominated faculty participants' lecture sections as they identified transmitting content as their primary responsibility as a faculty member. Moreover, they asserted that lecture gave them a sense of control in the classroom. For

example, even though Marcus stated that he was a "believer in active learning," (Pre-observation interview, September 17, 2015) his definition for the role of a teacher seemed to confirm the perception of control instead. Marcus' definition of the teacher's role was to impart knowledge. "It should be imparting knowledge so that the student is empowered to apply the knowledge" (Pre-observation interview, September 17, 2015). However, none of the faculty participants strictly lectured for the duration of each class, more specifically lecture sections, not laboratory or recitation sections. Some other teaching practices that I observed included: traditional problem solving opportunities (such as asking the students to independently solve a chemistry problem during a class session), question and answer sessions (such as a verbal review session in an exercise physiology class), reflections (such as an engineering professor guiding students in "engineering reflection" which tasked the students to make sense of their work), pair-work, small group work (such as microbiology students role-playing as epidemiologists to solve a microorganism outbreak case), and large group discussions. It was evident through multiple conversations and from the first set of classroom observations that none of the faculty participants was strictly a lecturer even prior to participating in the study. Despite their efforts to use a variety of teaching strategies, *all* four faculty participants did not realize how much time they spent lecturing until we met individually and discussed the observation field notes.

Catherine, Jamie, and Marcus admitted that their preferred teaching practice was lecture because then they felt like they had control over what the students were learning (pre-observation interviews, Catherine, May 8, 2015; Jamie, May 15, 2015; Marcus,

September 17, 2015). Jamie added that since he had large numbers of students "in lecture, in order to control the class, I have to be much more rigid" (pre-observation interview, May 15, 2015). In a sense, the faculty participants' over-reliance on lecture seemed to inhibit their abilities to expand their repertoire of teaching approaches, therefore, not providing the opportunities for students to self-assess or check for their own degree of understanding. There is a sense of familiarity to lecturing, which may be due to a faculty participant's personal experience as a student. In fact, Jamie stated that, "I believe I taught as I was taught. Meaning, my teachers used handouts, overheads, and the board to convey information to the students and that is what I did" (End-of- Study Self Report, January 28, 2016). The need for "controlling" student access to information and the learning experience coupled with the sense of familiarity that lecture gave to the faculty participants became an impediment to their aspiration for the students to become independent learners. For example, Catherine perceived that since she had complete control of the content that was presented to the students, the students had all that they needed to be successful in the class. But her desire to increase student participation caused tension for her because it meant that she had to decrease the amount of lecture time. Despite that personal tension, Catherine started looking for ways to incorporate activities that would provide opportunities for her students to be active participants during lecture sections.

Lecture acting as an impediment. Throughout the study, the faculty participants and I regularly discussed the purpose of lecture—to present content—and the disconnect of their goals to develop independent learners and to provide opportunities for

the students to develop 21st century skills. The faculty participants and I reflected and worked collaboratively to examine their current teaching practices and to consider alternatives in order to increase student participation. For example, during lecture sections, Catherine, Jamie, and Marcus periodically included problems to be solved during class time. Although they verbally asked for student participation, in actuality, the format did not allow for the students to be part of the problem-solving process. Catherine, Jamie, and Marcus would have a problem projected on the screen, ask the students to solve it, and within a very short time (usually within a couple of minutes at most) would themselves begin to solve the problem verbally or written on the whiteboard, usually without student input. Classroom observations of these lessons showed that very few students attempted to solve these problems (e.g., through their behavior of not writing in their notebooks and/or sitting and looking around) and instead, waited for the faculty participants to solve the problems for them. It was not until I shared my field notes with the timestamps that the faculty participants became aware of the lack of traditional or active learning problem-solving opportunities available to their students.

As another example, Marcus had been adamant in that the focus in teaching should always be on the students and their learning. However, he also had consistently struggled with ceding his control of *what* and *how* the students should be learning, specifically in lecture sections. During lecture sections, Marcus primarily provided content to the students via lectures despite his attempts to solicit student participation through two self-designed activities: Eureka Moments and Engineer's Reflection

(discussed in detail later in Chapter 6). But at the same time, I had also witnessed his capacity to let go of the control and allow the students to be innovative, to create, and to take ownership of their learning, especially in the capstone course. Each year, Marcus' students in the engineering capstone course had to come up with and create working prototypes of an original product. Marcus provided the expectations but allowed the students the freedom to be innovative and creative. Subsequently, during the end-of-study interview, Marcus reflected on the consequences of maintaining control in the classroom. Marcus remarked that:

> "…if I didn't have consultants or mentors like yourself, I will maintain control. I will make sure that the kids learn. But the freedom of learning though disappears if I do too much of that. You have given me accountability… I prepare more now. I watch the authenticity of my lectures. I'm open to relinquishing control. Relinquishing control is really just from a quality standpoint. You've enabled me to realize that I can still maintain quality by relinquishing control to technology and to students (Exit interview, December 14, 2015).

Data strongly suggests that despite this realization, Marcus' reluctance to give up control of *what* (content) and *how* (content presentation) the students needed to learn during lecture sections severely limited his capacity to be transformative because during the life of the study, he did not make any changes to his teaching practices. However, the lack of change may also have been due to his unavailability and the limited of access I had to work with him due to scheduling conflicts and time constraints. The lack of access to work with Marcus in turn hindered the instructional consulting process due to the limited

time we had to reflect, to dialogue, and to collaborate. The result of Marcus' hesitation attested to the complexity and the individuality of each faculty participants' journey to shift their teaching practices.

Control as a Reaction to Fear

Control as a reaction to fear occurs when a faculty member perceives that disseminating content effectively to students is the primary responsibility. Therefore, presentation and lecture skills need to be perfected in order to demonstrate competence when being evaluated for tenure of promotion purposes. Many conversations took place during the interviews and consultations regarding this dimension for a need for control. For example, Catherine's struggled to find a balance between knowledge dissemination and student exploration. She revealed that she felt that active learning activities were not "giving [students] as much as I can give them. I guess that's part of me that is so used to lecturing that I am not doing enough. Like I'm not giving them what I can give them and that's where I feel like this isn't fair" (Consultation session #3, June 16, 2015). For the untenured faculty colleagues, there were serious concerns that poor evaluations might lead to unfavorable reappointment, tenure, or promotion considerations. Jamie conveyed that at this point in his career, even with the support from his department chairperson and division dean, he needed to make smart and safe choices. The non-tenure status also restricted Jamie's ability to say "no." He explained that when he was asked to participate in various activities at the study institution or to confer on a schedule change, Jamie felt the pressure to say "yes," despite never having been told to do so. In fact, in one of the consultation sessions, Jamie disclosed that it was his understanding that the study

institution's expectation of the faculty member was to be nothing more than a subject matter expert who was an effective lecturer. He stated, "…. But for right now, I have to kind of show I can lecture and I can lecture about all of the material. I feel confident. I feel less confident being a facilitator" (pre-observation interview, May 15, 2015). This position further exacerbated Jamie's concern about being non-tenured and "easily replaced" if he did not lecture. The data suggest that these concerns heavily influenced many of his teaching decisions and came up periodically throughout the study, especially when we discussed his experiences with Structured Instructional Strategy.

The Structured Instructional Strategy was a response by a small group of faculty colleagues to the study institution's call to increase student engagement in the classroom. Catherine and two of her colleagues in the Biology and Chemistry department applied and received a grant from the National Science Foundation to incorporate the Structured Instructional Strategy Project in the classroom to assess its impact on student learning and success. Jamie began participating during the second year of the grant life cycle. While the Structured Instructional Strategy Project was not a formal part of my study, I nonetheless discuss Catherine and Jamie's experiences with the Structured Instructional Strategy Project in the following section as part of understanding of perception of control and its influences on shifts in teaching practices.

Unintended Consequences Due to Forced Cessation of Control

The Structured Instructional Strategy Project is a nonprofit organization that provides faculty training and resources for implementing its proprietary instructional strategies. The Structured Instructional Strategy Project is based on student-centered

learning principles and uses active learning practices. It is specifically designed for STEM courses in high schools and postsecondary institutions. As part of the Structured Instructional Strategy Project, teachers use Structured Instructional Strategy Project's pre-approved activities to facilitate students in small group activities. The activities cannot be modified. The instructors facilitate students working in small groups where each student takes on a specific role, such as manager, spokesperson, recorder, or strategy analyst. Instructors using Structured Instructional Strategy Project must adhere to the prescribed activity with no deviations in all aspects of the activity including student roles and terminologies used.

Catherine and Jamie each used Structured Instructional Strategy activities in only one of their courses. Catherine implemented it in her Biochemistry course and Jamie in his Elements of Chemistry course. During the course of my study, both came in their own way to the same realization that Structured Instructional Strategy Project's activities were too rigid and restrictive.

Tension between "control" and rigidity. Analytic results for this study suggest various factors contributed to Jamie's hesitation to make changes to some aspects of his teaching practices in all of his courses. Jamie seemed to feel most comfortable when he had full control of his lessons, his classes, and his courses. As a practice, he created the majority of his own course content presentations (e.g., PowerPoint slides), resources (e.g., Quizlet flashcards), and assessments (e.g., exam questions) even though we had had numerous conversations concerning readily available digital resources that he could consider using. For example, Jamie mentioned wanting to create his own videos in his

Blackboard courses so the students could use them to review concepts. I recommended that he consider using some readily available digital videos as they might alleviate some of the pressure he felt to create his own. But Jamie hesitated to include existing videos in his Blackboard course because they might deviate from the way he taught a concept. Jamie also admitted that he could be very particular when it came to choosing tools such as digital technologies or hardware which often hindered his use of these resources as it took time that he did not feel he had. Jamie's need to be in control contributed to his frustrations with the Structured Instructional Strategy Project. Moreover, Jamie's involvement with Structured Instructional Strategy Project complicated finding his comfort level as a teacher.

Jamie explained that when he facilitated active learning activities, specifically when using Structured Instructional Strategy activities, he felt that he was "no longer a teacher" (pre-observation interview, May 15, 2015). Jamie clarified that although it was with hesitation that he labeled himself as a facilitator, it was still his goal. He continued to say that when he labeled himself as a facilitator, he felt that it took away his importance in the classroom (pre-observation interview, May 15, 2015). Further conversation revealed that much of the issue was caused by the rigidity of Structured Instructional Strategy. That rigidity often caused conflict between Jamie's teaching style, lesson objectives, and the activities themselves. This conflict was heightened because of Jamie's untenured status and his fear of being "replaceable." Jamie stated that:

> If I were to do all Structured Instructional Strategy Projects, especially when someone comes to observe me, what are they watching me do? I would be

> facilitating and I'm being helpful but anybody can do that and I hate to say that. "Why is *Jamie* the one doing it? Why can't we use someone else?" Especially in this time. We have had several people RIFfed [reduction in force]. I don't have tenure. I hesitate to do anything that is going to lower SORs [student opinion reports], lower any of that. So, it's fear for myself. I think going forward, once these couple of years are over, if I feel that it is a benefit to the students, I want them to succeed, I would do that. (Pre-observation interview, May 15, 2015)

But since Jamie also wanted to provide opportunities for the students to participate in their learning, he also designed his own active learning activities using four different iPad apps. To help distinguish different approaches to active learning practices, we compared and contrasted his experiences with and thoughts about the self-designed activities and Structured Instructional Strategy activities. Jamie explained that the biggest difference between the two activities was that he specifically designed the self-designed activities to meet the learning objectives of the course; therefore, they were customized. He rationalized that "…that the more customizable that I've made my pieces, the less likely that I will be replaced" (Pre-observation interview, May 15, 2015).

The rigidity of the Structured Instructional Strategy project became a source of frustration, cynicism, and tension between Jamie's perception of being more easily replaced if he took on the role of a facilitator, his desire to be more of a facilitator in his courses, and preference for being in complete control of the content, instruction, and resources. Jamie continued to create his own PowerPoint presentations, write problems for in-class demonstration purposes, and write problem sets for homework assignments

and exams. He acknowledged that he was much more comfortable working with resources that he had created. This translated into his teaching practices as well. Despite Jamie's adverse reaction to the active learning approach that Structured Instructional Strategy project espoused, his high comfort level with facilitating self-designed iPad activities was evident during my observations of his recitation class. Thus, much of Jamie's hesitation to be transformative in his teaching was due to the fear of not being granted tenure, being replaceable, and being irrelevant in student learning. This fear was compounded by Jamie's espoused need to feel that he was in control in all of his teaching decisions from content delivery and the entire learning experience for the students. It made sense that Jamie would struggle with the rigid structure provided by the Structured Instructional Strategy Project and with incorporating active learning activities in his lecture section during the life of this study. Interestingly, Catherine had a different experience to Jamie.

Structured Instructional Strategy Project as a gateway to active learning. Catherine admitted that initially the rigidity of Structured Instructional Strategy Project allowed her to be more comfortable with facilitating active learning activities. However, as her comfort level with facilitating active learning activities increased, the rigidity of Structured Instructional Strategy Project became more difficult for both her and the students to "buy-in." So instead, Catherine began modifying some of the activities to best suit the content, the objectives, the student population, and her teaching approach. Furthermore, Catherine was encouraged by the increased level of student interaction with the use of active learning activities, but she did acknowledge that planning for the

activities was not easy and took time both in and outside of the classroom. Despite the time commitment, Catherine was devoted to "trying to make these lesson plans and make them to where they matter, where they're effective" (Exit interview, October 28, 2015) because she noticed that active learning was helping her students. Her learning from her experiences in incorporating Structured Instructional Strategy activities was impactful and valuable. With those experiences Catherine became more confident in the effectiveness of active learning exercises (as evidenced in higher student grades and a decrease in student dropout rate), in her abilities to facilitate a class, and in her comfort with taking risks. This seemed to transfer into the present study, too, and her comfort level with facilitating self-designed active learning activities was evident during my observations of her classes. Despite her comfort with facilitating small group activities, like Jamie, Catherine also struggled at times with the prescriptive nature of the Structured Instructional Strategies Project.

Frustrations with structure and rigidity. Both faculty colleagues expressed frustrations in regard to the highly structured and rigidity of Structured Instructional Strategy Project. For example, Catherine became frustrated with activities when sometimes "it doesn't fit the goals of learning in that particular class" or that the "[student roles] being so structured that students sometimes are like, 'I don't really even see how that role that I'm supposed to be doing fits this assignment' and it doesn't always" (Consultation session #3, September 16, 2017). Jamie disclosed that the Structured Instructional Strategy activities were "either poorly worded or that's not the phrase that I'd use or that's not the word that I use. Or sometimes it is things like on the

last page of the extension questions. It is not appropriate to do it now, I talk about it later" (Pre-observation interview, May 15, 2015). However, Catherine acknowledged that incorporating Structured Instructional Strategy into her course had allowed her to become more familiar and more comfortable with facilitating small group activities. In contrast, Jamie confessed that "I'm a controlling person and I think that makes it harder for me. Sometimes I kind of have to explain away why we are not going to do that. Sometimes by me explaining something away, the students are like then, 'Why are we doing this?" (Pre-observation interview, May 15, 2015). Since both faculty participants expressed frustrations and reticence with the Structured Instructional Strategy Project, we decided that I would not observe the course where they incorporated Structured Instructional Strategy Project activities due to its highly prescriptive nature and compliance with the NSF Grant application. Nonetheless, Structured Instructional Strategy Project had made an impact on both of their teaching practices across all of their courses and came up often during the consultation sessions.

Even though both faculty colleagues were incorporating the Structured Instructional Strategy Project and their experiences drove teaching decisions and influenced teaching practices, their experiences were different. Catherine's initial experience with Structured Instructional Strategy Project's scripted exercises was positive in the sense that it helped her to become more comfortable with facilitating small group exercises. However, as Catherine became more comfortable with facilitating active learning activities, her experience began to mirror Jamie's. She began to struggle with the rigidity of Structured Instructional Strategy and the frustrations that the

restrictiveness of the practice caused. Meanwhile, Jamie's frustration with Structured Instructional Strategy continued, which led to his decision not to continue to use it after the grant three-year life cycle.

Both Catherine and Jamie's experiences with the Structured Instructional Strategy Project provided me with insight into how and when a highly prescriptive approach could be used. Their experiences also demonstrated the importance of getting to know each faculty colleague and understanding how to incorporate new ideas into their ongoing systems of practice (Kennedy, 2016), which are critical elements to my instructional consultation process.

Comfort Level, Expectations, and Readiness – Factors in One's Capacity to be Transformative

Aside from faculty participants' perceptions of control, the data strongly suggested that comfort level with the content, teaching practices, and resources along with faculty participants' expectations of teaching and learning matters also impacted their capacity to be transformative.

Comfort Level and Expectations for Students

Out of the four faculty participants, Christian was the most comfortable with using digital technologies, therefore, he consistently experimented with how to use them in his lessons. Christian's overall expectation for his lesson planning was to include opportunities for the students to be actively participating in their learning either independently or with others. For example, prior to participating in this study, Christian wanted to increase collaboration opportunities for his students so I recommended Google

Drive tools to him. After some experimenting, Christian introduced Google Drive to the students by having them work on a healthy food option "wiki" created in a Google Doc. He reported that since he usually projects the document onto the screen, the students were intrigued and excited since they were able to view their own and each other's work simultaneously and in real-time either with iPads or personal laptops. Christian said that with this experience the students were not only actively participating in their learning process, they were also creating content. They were participating in conversations around the given topic and became more comfortable with being resources for each other. Not only did Christian require students to use Google Drive for collaborative assignments and presentations, he also used Google Drive to create multiple course resources, including syllabi, presentations, and assignments. Another benefit of this activity was that since Google Drive is a cloud-based service, users could access the content anywhere as long as they had access to the Internet. Christian used technology to extend teaching and learning opportunities beyond physical classroom settings. Marcus was more conservative and cautious with the role of digital technologies in teaching and learning.

Marcus had a somewhat more defined and bounded view of how digital technologies and digital resources could be used in the classroom. Findings suggest that Marcus used digital technologies and/or resources to extend his *bandwidth*. Marcus used the term *bandwidth* as a catch-all word that took into account his time, accessibility, and availability. Marcus remarked that one of the benefits of using Blackboard was that it would allow students to access content and resources "24/7." In addition, he found that Blackboard afforded a space for all students to participate, especially the students who

were not as comfortable participating in the face-to-face sessions. Despite acknowledging the benefits of using Blackboard, Marcus admitted that for the two courses that I observed, the use of Blackboard was essentially nonexistent because he was severely limited by his lack of bandwidth. Marcus really struggled with this conundrum throughout the study. He indicated a desire to work with me to develop resources and discussion spaces in Blackboard for all of his courses, yet well after the conclusion of the study, we have still not met this goal.

Like Jamie, Marcus limited his active learning activities outside of lecture sections. Marcus admitted that prior to participating in the study, he focused on skills and drills with no opportunities for students to collaborate or to participate in group activities except during labs. Since participating in the study, Marcus had somewhat changed how he approached some lecture sections. He focused "on outcomes and relevance/real-life applicability of concepts while at the same time checking for understanding, not just using quizzes, tests and assignments but also using paired activities and small group activities" (Self-report, February 18, 2016). Overall, he said that the consultation sessions helped him to become a better teacher (Self-report, February 18, 2016).

Unmet Expectations Led to Desire to Shift Teaching Practice

During the pre-observation interviews, faculty participants conveyed their goals of helping students to get a better understanding of and to achieve higher retention of content. At that time, faculty participants also expressed their frustrations with the students' struggles with understanding and retention of content. The students struggled

despite each faculty colleague's consistent efforts in revising their content presentations with different images, with videos, with examples, and providing different problems for demonstration purposes. Meanwhile, faculty participants noted that they had expected the students to enter college better prepared and as independent learners who had the ability to assess their own level of understanding. Faculty participants were discouraged by their experience and assessment that students needed a lot of hand-holding to meet academic standards. Consequently, they wanted to create learning opportunities to increase student participation and accountability in their learning in hopes of helping students become more aware of what they needed to be successful academically.

Faculty Participant Readiness

My analysis showed that faculty participant *readiness* is a strong determinant in their capacity to be transformative in their teaching practices. Readiness refers to a faculty member's openness to peer and self-critiques, willingness to consider and try new teaching strategies and digital technologies, and preparedness to shift their teaching practices from a more lecture-centric approach to a more active learning approach. Their level of readiness affected the magnitude of shift in their teaching practices. I will discuss this in detail later in this chapter.

Distinct Types of Courses Leading to Distinct Teaching Practices

STEM educators' learning goals for students were different for lecture sections, laboratories, and recitations (if applicable), which led to different teaching practices. STEM educators were presented with an opportunity that supported student learning yet complicated their teaching decisions and teaching practices. Unlike other disciplines,

STEM educators, especially in the science fields, needed to consider laboratory sections. Very often the teaching and learning experiences between lecture-lab were disjointed. It might have been due to an inconsistency in instructor assignment such as a full-time instructor being assigned to the lecture section and an adjunct faculty being assigned to the lab section. However, misalignment between content and lab activity also occurred when the same instructor was assigned to both the lecture and lab sections. For example, an instructor lectured about a particular topic but either there was no lab activity supplementing it or the lab activity would be out of sequence. The differences in faculty members' approaches and goals for lecture and lab sections also contributed to content and activity alignment, which muddied their teaching decisions. Continued work was needed to bring better alignment of content and activity so as to provide deeper learning opportunities and experiences for the students. At times, faculty participants looked to using digital technologies to help with students develop into independent learners in their courses.

The distinct type of courses (lecture sections, laboratories, and recitations) led to different teaching decisions and teaching practices for the faculty participants. All faculty participants saw a distinction between lecture and laboratory classes. They viewed the lab setting as a context in which students had the opportunity to develop many of the desired 21st century skills, which was not always the case in lecture settings. Faculty participants described that during labs, students typically worked in groups on an experiment or an activity. The students completed the work referring to a set of instructions provided by the faculty colleague. Faculty participants explained that the

students were self-directed throughout the lab while the instructor would go from group to group to answer any questions or clarify any confusion among the students. And yet they were functioning as facilitators and seemed to enjoy the reprieve of relinquishing control. For instance, Jamie said, "lab from my point of view is the best because I take a step back and they are active" (Pre-observation interview, May 15, 2015). When I asked why they approached lecture and lab so differently, the faculty participants explained that they taught differently in lecture and lab because the goals and objectives for the courses were different.

To the faculty participants, the primary goal of lecturing was to deliver content whereas the primary goal of a lab was for the students to be hands-on and apply the theory and/or concept that was addressed in lectures and/or readings. Consequently, faculty participants acknowledged that during labs they tended to take on the role of facilitator and allow the students to take the lead in their learning process. The way faculty participants approached and taught lab sections was more in alignment with their goals to develop independent learners who could self-assess their level of knowledge. In addition to the desire to increase opportunities for students to develop 21st century skills, faculty participants had voiced a desire for students to become independent learners. Jamie approached recitations with the same mindset. It was a space for the students to get a deeper understanding of the previously presented concepts and to ask questions.

At the study institution, recitations served as a space for students to seek additional support about a particular subject matter. Students were not required to attend recitation, as it was not a credit course. In addition, due to the large number of students

enrolled in Chemistry 1 lectures, each recitation section was divided into two 45-minute sections. High enrollment and short meeting sessions limited the ability for Jamie to reach out to struggling students, students who learned better in more intimate settings, and/or students who needed more time to process information. This was an area of frustration for Jamie as he realized and acknowledged the benefits of recitation sections. Jamie did not consider reflections in his teaching practices to be a priority at this point in his career due to his non-tenured status, current recitation structure, a deficient math prerequisite, and positive feedback from the students and administrators regarding his teaching effectiveness. Both recitations and lab sections presented as spaces for faculty participants to *apply* the previously learned concepts or theories and provide opportunities for students to ask questions. As such, I recommended to the faculty participants that they start considering lecture sections, labs, and recitations as a continuum instead of as distinct entities to create a more seamless learning experience for the students. But to support and to foster shifts in teaching practices, I needed to go beyond an understanding of the challenges within the context in which faculty participants teach and to examine what I refer to below as each participant's apparent position.

Importance of Understanding a Faculty Participant's Position within the Instructional Consulting Process

An understanding of *who* each faculty participant was as a teacher also influenced how I approached each consultation session within the life of this study. Hattie (2012) emphasized that "the teacher's view of his or her role is critical. It is the specific mind

frames that teachers have about their role - and most critically a mind frame within which they ask themselves about the effect that they are having on student learning" (p.18). To gain an understanding of who each faculty participant was as individuals in terms of their pedagogy, during the pre-observation interviews, we discussed and examined each faculty participant's definition of teaching and learning, determination of the role of a teacher and the role of a student, perception of experiences as a teacher and a student, and consideration of professional learning goals. To examine if there were any shifts in mindset, the faculty participants and I revisited the same set of questions. In the next section, I discuss each faculty participant's position in teaching and learning matters before and after the study.

Shifts in Mindset - Letting Go of Control and Increasing the Level of Comfort

Faculty members' capacity to be transformative in their teaching practices is dependent on many factors. Shifts in mindset, such as increasing a faculty member's level of comfort to incorporate active learning practices, are major influences on one's capacity to shift teaching practices. As part of the journey to understanding shifts in teaching practices, I began the study with conversations with each faculty participant in order to understand who they were as teachers. In addition, the faculty colleagues also explicitly determined and declared their own goal(s) for participating in the study. The information provided me with some guidance to best support each faculty participant. During the pre-observation interviews, all four faculty participants used the terms "to impart" or "to transmit" knowledge when I asked them to define the role of a teacher (interviews: Catherine, May 8, 2015; Christian, May 19, 2015; Jamie, May 15, 2015;

Marcus, September 17, 2015). With the role of teaching defined as such, it supported the faculty participants' practice of spending much of their lecture sessions presenting content through lecturing. Interestingly, while there were shifts in the way each faculty participant approached teaching, all but Catherine's definition of the role of a teacher remained relatively the same, which I will discuss in the following section.

Redefining the Role of the Teacher

At the start of the study, Catherine described the role of a teacher as being to "support the students and their grasp of the material and to impart knowledge to them" (Pre-observation interview, May 8, 2015). But by the end of the study, Catherine revised her definition to "my role as a teacher is sort of changing to help facilitate [the students] to acquire these [team work, communication, processing] skills" (Post-study interview, October 28, 2015). Catherine's redefinition of the role of a teacher was an unanticipated result of the study as she was the only faculty participant who had been systematically implementing active learning activities in her biochemistry course for the past couple of years. Catherine was one of the authors and recipients of a National Science Foundation Grant in 2013. The grant funded three faculty colleagues from the Biology and Chemistry departments to incorporate the Structured Instructional Strategy Project in their classes (discussed previously). Despite facilitating Structured Instructional Strategy project activities daily for the past few years, Catherine admitted that lecture was still her preferred method of teaching (Pre-observation interview, May 8, 2015). This was most likely due to the previously discussed frustrations that Catherine felt regarding the rigidity of the program throughout the duration of the National Science Foundation

Grant. Despite her preference for lecturing, as the study progressed, I noticed that Catherine began to consider teaching differently, which culminated in the realization that teaching was far more complex than just content presentation. Instead, Catherine came to the realization that teachers consider content, learning objectives, skills development, learning experiences, and many other factors when designing lessons. In fact, during the exit interview (October 28, 2015), Catherine stated that her thoughts on the role of a teacher were changing and evolving. Catherine reflected that:

> I think of myself as an educator, I hope it is for the good I'm evolving. And I think the reason I and others should evolve is, I think our world is evolving. So, I think I may have in the past thought teaching was much more content, whereas now I think it really needs to be not content only but it should [still] have content, but much more…. how can I critically think about the content that's presented to me? So, I think my job is both to present content to, to give skills or at least hopefully foster skills of critical thinking. I think that is to try and to provide lessons that bring content so that the students can gain knowledge of materials but hopefully also give them skills or at least foster skills to allow for them to critically think about the materials and maybe take those skills outside of my class. (Exit interview, 10/28/2015).

It was no surprise to me that with the change in Catherine's definition of the role of a teacher, her shift in teaching practices was easily noticeable. Specifically, I had the opportunity to observe Catherine's DNA/RNA translation and transcription lesson during two separate semesters. Her approach to each lesson during each semester was vastly

different. During the first observation, for the duration of the three-hour class Catherine spent most of the time lecturing. Whereas during the second observation, Catherine spent less than one-third of the time lecturing and used a newly designed active learning activity to provide opportunities to get an understanding and examination of the concepts. For me, as an instructional consultant, what I learned from this was the importance of consistent access to the faculty member and the value of follow-up, specifically having the opportunity to see the same lesson multiple times.

Defining the Role of the Student

Similar to defining the role of the teacher, the faculty members' explanations of the role of the student also impacted their teaching practices. To prepare for a deeper understanding of how each faculty participant defined the role of the student, I specifically asked them during the pre-observation interview to distinguish between a student and a learner. I asked for the distinction in order to try and understand whether or not the faculty participants had preconceived biases regarding the students with whom they worked. All of the faculty participants were surprised and were thoughtful in their responses (Reflective Journal: May 15, 2015; September 17, 2015). During the pre-observation interview (September 17, 2015) Marcus stated, "A student could be anyone. It could be an active learner, a passive learner, or just someone who occupies a seat. So, a student is someone who just registers for the class.... while a learner takes an active role in his learning, responsibility in his learning, reaches out when either inside or outside the classroom." Essentially, Marcus delineated the role of the student and the role of the learner with specific responsibilities and behaviors aligned with their

respective definitions. This matched the other three participants' explications of a student and a learner. When faculty participants were pushed to distinguish between a student and a learner, the distinction they provided was that a student was someone who registered, paid, and was a number in the class since they did not necessarily participate, whereas a learner was one who registered, paid, attended, and met the requirements of the classes. Interestingly, it appeared that faculty participants seemed to use an underachieving individual to describe a student and an achieving student to describe a learner. These patterns suggest that the consultation process necessarily includes attending to how the faculty members construct their student's role because it may impact a faculty member's teaching approach.

Students as thinkers. Faculty participants also clearly expected the students/learners to be "thinkers." Specifically, the expectations were that the students should be always thinking about what they knew *and* what they did not know. Underlying the expectation of students as thinkers was the assumption that through self-assessment, the students would be able to ask questions regarding a given content. Furthermore, Christian believed that the thinking process manifested itself as questions. He explained that, "you [students] should always be asking questions to make sure you understand. I think that's really important because sometimes you just get blank faces. You don't know whether they are getting it or not. Once they're asking questions, you know they have started to think" (Exit interview, November 9, 2015). Faculty participants emphasized the importance of questions from the students. Student questions inform faculty participants regarding students' prior knowledge of a particular concept,

students' understanding of the concepts, and lesson pacing. With student and learner responsibilities firmly defined and delineated, none of the faculty participants changed their definitions for a student and a learner.

Disconnect Between Practice and Learning Goals

Throughout the consultation sessions, it was apparent that faculty participants often experienced a disconnect between teaching practices and learning goals. More specifically, faculty participants wanted to help students develop various skills, such as self-assessment, yet they favored lecture as their primary mode of practice, especially during lecture sections. As previously mentioned, faculty participants asserted that the primary goal of lecture sections was to deliver content; therefore, during lecture sections they spent a significant amount of time *presenting* content. Curiously, this proved to be a source of frustration for the faculty participants in the sense that despite the amount of time and preparation they put into their lessons, including PowerPoint presentations, handouts, and use of digital technologies, plus attending to students during office hours or via emails, many students were still not successful academically. This frustration might have been due to an assumption that students would automatically understand the content because the information had been shared. Unfortunately, that assumption "does not acknowledge the underlying challenges that make it difficult for some students to absorb and apply the facts they hear or read" (Bailey, Jaggars, & Jenkins, 2015, p. 86). In other words, it was not enough for the students to grasp the content by just reading and/or hearing about it. This source of frustration was one of the reasons that led to faculty participants to consider incorporating active learning practices in their classes.

Learning goal – Developing Students into Independent Learners

From our conversations, it was apparent that while the faculty participants were familiar with active learning practices, they were less accustomed to incorporating active learning into their lecture sections. Despite faculty participants' narrow view of lectures as content delivery, their expectations of what the students should do with that knowledge went well beyond receiving content. In fact, they wanted the students to be independent learners. In the pre-observation interview, Christian argued that the students needed to become independent learners and part of that process was to be able to apply that knowledge in a given situation or scenario. Other faculty participants went on to explain that "students do have a responsibility in that once the knowledge had been imparted, it was up to them to practice and to engage in active learning and to become part of their own learning" (Catherine, May 8, 2015) as well as "to actually take what has been learned and apply it outside, whether that's on an exam or in the real world or in other classes" (Jamie, October 20, 2015). However, because of the dominance of lecture as the preferred teaching practice, faculty participants were not consistently providing the students the opportunity to self-assess and recognize which concepts were challenging or unclear to them. Moreover, despite having full control of content presentation, all faculty participants expressed the frustration that the students did not necessarily know what questions to ask beyond superficial questions involving the definition of terms. Even more, students did not seem to know what they knew *or* what they did not know and that lack of understanding was evident in exam grades. This was further complicated by their assumptions and expectations about students' prior knowledge and preparedness.

Learning Goal – Increasing Student Preparedness

Faculty participants' perceptions of student's under- and unpreparedness exacerbated their need for control. Faculty participants had an expectation that the students would enter their courses with at least minimal prior knowledge of the course content. However, that expectation was not necessarily met. Instead, they found that the students often attended classes underprepared and/or unprepared to either contribute or to learn. The faculty participants presumed the students' under-preparedness was either that they had not read the assigned readings or had insufficient grasp of content from prerequisite courses, leading the faculty participants to increase their efforts in content delivery through lecture. However, as discussed in the previous section, increasing the content amount, breaking down content, revising PowerPoint presentations, and/or providing supplemental resources had not helped with student preparedness. Their hope was that increasing required student participation during the lecture sections and changing the expectations of the role and responsibilities of students would prompt them to be more prepared so they could contribute during lecture sections.

Acknowledging and Considering Student Efforts toward Academic Success

Besides struggling with the issue of control, faculty participants also acknowledged their students' own sense of frustration with their academic success despite their reported deliberate efforts to learn. During our first consultation session, Catherine revealed some of her students' frustrations about continuing to not perform well on assessments despite their concerted efforts to study for the exams (Consultation session #1, May 25, 2015). Catherine explained that she had students who regularly

attended her classes, asked questions, and studied for exams beyond just re-reading the textbooks and notes, such as using additional study tools like flashcards, but still did not perform well on exams. It was during this particular conversation that I brought up the lack of opportunities in her lectures for the students to pause and reflect on what had just been taught. I pointed out that the students might need guidance to begin assessing their own understanding, or essentially to develop *metacognitive skills*. Metacognitive skills are "the ability to perceive their own weaknesses and apply strategies to overcome those weaknesses" (Bailey, Jaggars, & Jenkins, 2015, p. 82). To foster metacognitive skills, the students needed opportunities to "reflect on, organize, and improve their own thinking and learning" (Bailey, Jaggars, & Jenkins, 2015, p. 84) both inside and outside the classroom. Besides Catherine, the other faculty participants were also concerned about the students' lack of proficiency to assess their level of understanding for the course content. Faculty participants hoped to address their concerns and goals for the development of 21st century skills and independent learning with increased student preparedness and opportunities to participate through active learning activities. Unexpectedly and without any prompting, students' ability to self-assess became the central focus for all faculty participants. This was also evident in their attempts to cultivate a learning environment that encouraged student participation. Despite the faculty participants' affinity and reliance on using lecture, they seemed to somewhat gravitate to a social view of learning in which the students learned in a participatory learning environment. It was apparent in our conversations and during classroom observations that the faculty participants made a concerted effort to diversify their

teaching practices and to provide opportunities for student participation, such as soliciting student questions and answers, facilitating concept reviews, and solving problems. However, the success of attempting to include the students in their own learning varied.

Providing Opportunities for Students to be Part of the Learning Process

The faculty participants provided opportunities for students to think about and practice a problem-solving process. Catherine and Christian wanted to also give students time to reflect and to practice. For example, during the first classroom observation of Catherine's microbiology class, she demonstrated how to use the genetic code dictionary to go through the DNA → mRNA process. She then gave the students a few minutes to work independently, and then completed the chart as a class. Catherine attempted to have students volunteer to give the answers. Unfortunately, only a handful of students provided her with answers. Christian approached concept review sessions in a similar fashion. Christian would ask questions, the same few students or Christian would provide the answers to the questions. After consultation sessions and agreeing with my recommendations, Catherine and Christian separately developed packets for students to work on together in small groups and then go over as a class. Both noted an increase in student participation with the revised approach.

Like the other three faculty participants, Marcus also had the pedagogical structure of providing problems or problem sets in lecture sections, but just needed to allow the students to participate in the problem-solving process in order to arrive at something recognizably "active." In addition, Marcus also had two distinct activities, Eureka Moments and Engineering Reflections, which had the potential to support active

participation and self-assessment from the students. For Marcus, Eureka Moments were episodes when a student would make a connection, such as a particular theory to its application. Engineering Reflections was the place where students reflected on the problem that they had solved to make sure the numbers and solutions were correct and made sense. However, Marcus actually led and directed both activities instead of letting the students reflect, think, and talk through the process. As we worked through the disconnect between Marcus' learning goals and teaching practices, Marcus appreciated and understood the disconnect between his intention of providing opportunities to the students to develop into independent learners and his actions as a teacher. He asserted that he was going to work towards fostering a learning environment that supported active participation and self-assessment. But by the end of the study, Marcus was still not quite ready to allow the students to be fully independent in solving problems, explaining Eureka Moments, and evaluating Engineering Reflections. Regardless of the results, Marcus was now aware of his cognitive dissonance and reluctance to explore and experiment with various teaching practices during his lecture sections but not during his lab sections. Despite the faculty participants' realization of, understanding, and acknowledgement of the benefits of implementing my recommendations, often they did not implement them. That was difficult and discouraging for me.

Shifts in Practice- Letting Go of Control, Increasing the Level of Comfort, and Readiness

As previously discussed, the shifts in teaching practices varied widely due to faculty perception of control and readiness being either major determinants or at times,

deterrents to the process. However, a faculty colleague's level of comfort and experience with active learning practices, incorporating new strategies, and working with me seemed to mitigate the effects of control and readiness. As part of the instructional consultation process, I worked to increase faculty colleagues' level of comfort through sharing personal and peer experiences, by providing recommendations that were within context and in small bites. The recommended changes were minor, small, and worked seamlessly with a faculty colleague's existing teaching practices. Classroom observations and subsequent conversations regarding the lesson using the field notes played significant roles in providing recommendations in relevant context thus providing opportunities for feedback and reflection that led to shifts in mindset and/or practice.

Finding a Balance between Content Presentation and Offering Opportunities for Active Participation

The faculty participants acknowledged that the main purpose for them to assign problems during lecture sections was to make sure students understood the concept and were able to follow a problem-solving process. They wanted the students to be able to assess themselves on what they understood and what they did not understand. Simply providing and demonstrating how to solve the problems did not allow self-assessment to happen. Therefore, during the consultations we discussed why solving the problems for the students did not meet their purposes for student participation and self-assessment. Instead, faculty participants were only mimicking that practice during lecture while the students were ultimately just passive information recipients with little opportunity to reflect on and to practice what they had just learned or to allow self-assessment to occur.

All faculty participants were committed to providing students more opportunities to go through the problem-solving process. With the revised problem-solving presentation, Catherine, Christian, and Jamie reported increased student participation and more targeted questions from the students since shifting some of the responsibility of problem solving and answering questions to the students. Catherine succinctly summarized during one of the consultation sessions that:

> ...each instructor makes assumptions that the students should know something, but they actually don't. And if they were in a strict lecture environment, you'd probably never...that question never comes up...nobody says anything because they are not being prompted with certain questions to even get to that question (Consultation session #4, September 16, 2015)

Catherine was ready to *expand* her teaching practices.

Readiness to Expand One's Teaching Practices

Catherine's main concern as a teacher was that the students would *learn*. It was this concern that initially led her to research and explore active learning practices in 2013. Catherine believed that it was not only her responsibility to impart knowledge but she also needed to provide opportunities for the students to practice and to participate in their own learning. It was the student's responsibility to participate, to inquire, and to gain skills such as communication and critical thinking. In the two-plus years of incorporating active learning in her lessons, Catherine found that active learning was beneficial to both the students and herself. She reported seeing an increase in student participation and questions. Catherine also reported a broadened perspective on teaching-

learning and a diversification in her teaching practices. Furthermore, some student behavior changes and summative assessment results further reinforced her belief in the benefits of active learning in regard to student participation, student learning, and content retention.

Catherine disclosed a list of examples of either student behavioral changes or student success in assessments while participating in active learning activities. She noticed no drop in grades when she converted a three-hour lecture to a 45-minute jigsaw activity on bacteria (Consultation session #2, May 28, 2015). Catherine observed an increase in levels of student participation during the lecture sections with incorporation of active learning and an overall improvement in her students' work (Consultation session #5, October 12, 2015). The overall improvement in student work included better exam grades, specifically in Biochemistry and an increase in student understanding of concepts as measured by various types of assessments, such as high-stakes exams and papers (Consultation session #5, October 12, 2015). The most noticeable change for Catherine was not just the increase in the number of questions, but the depth of questions posed by the students. She summed up her experience and confidence in active learning as beneficial to the students because:

> …the students actively doing something engaging somehow allows for them to better retain it. So just my personal observation, I think they were more engaged. From what I noticed, I tell you this, just not from this particular -- well, even that one, even that particular lesson. I'm noticing that students are asking more questions than they ever have. And that too says, for example, in that particular

> lecture [Observation #3, October 5, 2015] when they got into groups and discussed the process. And one of the groups had a question they couldn't resolve. I don't think that would have happened. I don't think that would have happened had I said, 'Do you have any questions.' So, I think that is helping. And I think what's – what I am noticing is that the students maybe in the past didn't even know enough to ask a question, whereas now, they know enough to form questions (Consultation session #5, October 12, 2015).

Although Catherine began her experience with active learning practices with a lot of hesitation, the combination of increased student participation, increased number of questions, noted difference in the quality of questions, and better success in assessments now had given her more confidence in using active learning practices in lieu of solely relying on lecture. What was more pertinent to Catherine was that she noticed the students seemed to have a higher sense of responsibility in their learning and that was especially evident when they were immersed in the active learning activities. Catherine revealed the inordinate amount of time she committed to improving in active learning and student participation in her classes. But encouraged by the level of student participation and success, Catherine found the work rewarding despite the amount of time and creative energy that it took to design and prepare for active learning activities. In fact, she expected that she would continue to put in the effort and do more in the future. During the exit interview, Catherine reflected:

> I think my teaching is evolving. And what I would like for my teaching to include is a majority of it to be active learning. And I think if there is a digital

> technology that supports that active learning, I will use it, and probably use it in the long term (Exit Interview, October 28, 2016).

Jamie's comfort level and readiness to use active learning practices in his lecture sections was much less further along than Catherine's. Jamie was ready to *tinker* with his teaching practices.

Readiness to Tinker with One's Teaching Practices

Jamie's goal for participating in this study was to learn how to engage students more through better presentation. After several classroom observations, it was evident that Jamie was a dynamic lecturer often using visuals and everyday examples to help the students gain better understanding of abstract concepts in chemistry. He was also very detailed when modeling how a problem should be solved. For example, when demonstrating how dimensional analysis should be done, Jamie used the same process with different color markers to highlight each step several times during a lecture section. To help meet Jamie's goal to present content more effectively, I focused on his content delivery, PowerPoint slide content and organization during classroom observations, to include opportunities for students to check for their own understanding after a new concept. Two areas stood out: organization of PowerPoint slides and lack of "wait time." After the consultation sessions, Jamie took the time to rearrange his PowerPoint presentations to include a concept summary slide with either a problem or questions for the students to consider or solve. For example, during the second Chemistry 1 classroom lecture, after each micro-lecture, or short lecture about one specific topic, Jamie concluded the micro-lecture with a specific problem that addressed the topic that was just

covered. This was a new practice for Jamie. Prior to our consultation session, Jamie acknowledged that the majority of the concept summary slides and/or problems were at the very end of the PowerPoint presentation. With the reorganization, the problem sets acted as a "check for understanding" summary exercise immediately after the introduction of a concept instead of all at the end of the lecture section. Moreover, Jamie was more cognizant of wait time.

During our last consultation session, we discussed the fourth classroom observation in which I observed a Chemistry 1 lecture section for a second time. Jamie reflected that during the lecture section, he was covering another substantially difficult topic and he remembered reminding himself throughout the lecture that "this is what students don't understand, this is where ---these are the pitfalls, any questions, and I actually kind of thought to myself, give another minute, even though no one is really saying much give it another minute" (Consultation session #4, October 14, 2015). He continued on to say that he also began to pose explicit questions to the students as he solved problems on the board. Even though he was still solving the problems, newly posed questions such as "Why did I do that? Why didn't I do this? Should I have done this?" *did* encourage more student responses. Jamie explained that these questions were meant for the students to think about the problem-solving process instead of just copying down the process. The increase in wait time led to better and more efficient pacing of his lessons. Jamie no longer relied on student visual cues (head nodding, head shaking) and lack of response to indicate to him whether or not he should move on to the next topic. Instead, Jamie persisted by asking for clarification or giving probing questions to

try and engage the students more. The students responded to his efforts with increased participation during lectures by answering and/or asking questions, which encouraged Jamie to continue to tinker with his teaching practices. Christian did not seem to experience the same hesitations that Catherine and Jamie had in regard to incorporating active learning activities in his classes.

Readiness to Deepen One's Teaching Practice

Christian had been using self-designed active learning activities in all of his courses for the past few years. Unlike the other faculty participants, Christian was open and enthusiastic about incorporating active learning activities in his classes. This difference might be attributed to Christian's early exposure to various teaching practices. As previously mentioned, Christian began working with me during his second semester of teaching while he was an adjunct faculty member. On the other hand, what hindered Christian was his need to constantly make sure that he was current and complete in his content knowledge. Christian acknowledged that he spent a tremendous amount of time reading multiple textbooks, industry journals, and reliable websites to ensure that he was indeed giving the students current and accurate content information. He seemed to be more confident regarding his teaching practices. In fact, Christian was ready to deepen his active learning practices. Christian was ready to redesign his courses to incorporate more active learning activities to meet learning objectives in the face-to-face and online environment. Christian was self-aware and very critical of himself which contributed to his growth as an educator. He admitted that:

I was not confident and had no idea how to be an educator my first semester of

> teaching. I can see myself throughout the semesters growing, experimenting, and seeking out help when I was unsure. My creativity also grew tremendously, which made the classroom experience and learning better for the students. I would have to say that I was all content and no education in the beginning, but grew tremendously with help (Self-report, February 3, 2016).

Due to Christian's own reflective practices and our conversations, we noted several changes in the way he facilitated his classes during the study. The change that he found to be most beneficial was in the way he had conducted content review at the beginning of his classes. Prior to the study, during the review session Christian was the main provider of the content with the same two or three students who periodically participated by answering questions. After we discussed the first classroom observation, Christian immediately implemented my recommendation of allowing the students to be the primary participants in the review process. To do so, Christian created a review packet designed for the students to work in small groups to complete the packet within a specified time.

By allowing the students to be the primary participants in the review process, the students learned to assess their personal level of understanding, to collaborate with peers, and to have the opportunity to teach and learn from each other. Fostering the students' ability to self-assess and creating opportunities for the students to teach each other were both goals for Christian to implement in his courses. He found this new practice to be valuable for the students. Christian said, "This [review activity] makes them do it. They take it seriously." (Consulting session #3, October 6, 2015). He also asked the students for their opinions regarding the change in the review process. Christian stated that the

students liked the review activity and asked that he continue the activity for the remainder of the semester. He also noted that the student participation level was much higher. The students were taking notes, discussing the concepts, and asking questions. Christian also asserted that the students seemed more confident in their grasp of the material and were more willing to participate in the larger classroom discussions. In addition to the revised review activity, Christian also looked to revise his content presentation and facilitate more active learning activities during class.

After the multiple classroom observations and consultations, Christian felt more comfortable with how he presented content. Overall, he said that the consultation sessions helped him to present the content more effectively. He went on to say, "I understand how to implement some materials better. I was able to design my PowerPoint more effectively especially when implementing an animation. I learned how to place and lead up to it more effectively" (Self-report, February 3, 2016). With the revisions to his PowerPoint presentations, he enhanced content delivery and understanding and provided more opportunities for the students to think, to participate, and to ask questions. Christian also felt that he understood how to implement some of his materials better through the use of jigsaw. Although he had used a form of jigsaw in his online course, he had never incorporated it in his face-to-face courses. Furthermore, Christian did not realize that jigsaw was an active learning activity and did not know the actual reasoning and technique behind it. With some explanation and examples during the consultation, he felt much more comfortable in designing a jigsaw activity for his upcoming lesson on hormones. These subtle changes led to increased student participation and student

understanding of the concepts. Similar to Christian, Marcus realized that a slight change to how he facilitated the Eureka Moments and Engineer Reflections would provide students with opportunities to self-assess and be active participants in their learning.

Readiness to Think about One's Teaching Practices

At this point in his teaching career, Marcus was not ready to take actions in order to add more active learning activities throughout his lecture sections. Instead, he was *thinking* about how active learning practices may benefit the students and also how to work with what he called his already limited bandwidth. Although Marcus stated that he would like to include active learning activities in his lecture sections, he admitted that it might not be realistic at the time. Marcus acknowledged time constraints, as one of the main factors that prevented him from revising current practices or trying new practices or digital technologies. Marcus and I focused on how we could extend his bandwidth -- time, availability, and accessibility, one of which was a revision of his current use or the lack of use of Blackboard. As previously discussed, Marcus realized that he was underusing Blackboard, especially when using it might alleviate some of his bandwidth concerns. Currently, he viewed using Blackboard as a repository for course content and resources instead of a space where interactions, clarifications, and learning could occur. With carefully selected or self-created digital resources available in Blackboard, Marcus should have been able to expand his bandwidth by spending less time reviewing the same problems to multiple students at different times in order to be able to focus on fostering the culture of shared responsibility in learning and teaching that he desired. As it was

with incorporating active learning activities, considerations for the use of digital technologies were dependent on the needs of individual faculty participants.

Shifts in Teaching Practices are Inconsistent and Complex

By the end of the study, some faculty participants demonstrated shifts in practices while others may have shifted their views but not their practices. While all the faculty participants were open to suggestions and acknowledged the benefits of the shifts in teaching practices to include more opportunities for student participation, the actual change in teaching practices was inconsistent among the faculty participants. One impediment was due to institutional structure. Often institutional structure "demands far too much time, energy, and skills—especially so when given onerous workplace conditions they already faced: large classes, tightly packed schedules, scrambling for instructional materials, and lack of support staff" (Cuban, 2013, p. 162). Beyond the time, energy, skills, and support limitations, faculty participants' teaching decisions and practices were influenced also by who they were as educators and their personal teaching and learning experiences. For example, Catherine and Christian were already using various active learning activities but wanted to add more to their lessons. We focused most of our consultation sessions collaborating on decisions as to when it would be appropriate to include an active learning activity and then designing the activity. Jamie's goal was to enhance his presentations during lecture sections. Jamie's lectures were about 50% content presentation and 50% problem solving and he really did not want to deviate from that format. So, we focused on reorganizing his lectures so that the problems became active learning activities after each concept or topic. Previously,

Jamie's presentations tended to have problems either after multiple concepts or at the end of the content presentation and the students often were not given either the opportunity or enough time to try and solve the problems. With the presentation reorganization and longer wait time, the students were given the opportunity to assess their level of understanding and the ability to solve given problems. Marcus was significantly different than the other faculty participants.

Our discussions throughout the study tended to be more philosophical in nature; we would discuss different approaches to teaching, various learning theories, and how teachers' personal experiences could influence their teaching decisions and practices. It was apparent from our conversations that Marcus understood the importance for his engineering students to be able to understand the theory, to apply the theory, and then to reflect on the application. Yet, he was not providing students the opportunity to be participants in the learning process despite naming his activities, such as Eureka Moments and Engineer's Reflections, to insinuate some type of action from the students. That was because he was not quite ready to let go of "control" just yet. With all the differences in mind, throughout the study, I reminded myself that "not all teachers might experience the readiness to learn at the same time" (Terehoff, 2002, p. 68-69) and that professional learning should be focused on each faculty participant's expectations and goals. Essentially, the faculty participants are learners. Therefore, their learning experiences with me should have "a sense of personal freedom to learn, a choice of learning, and the relevance of experiences during learning" (Terehoff, 2002, p. 67). Throughout the study, I facilitated reflections regarding the lessons I observed to help

make sense of the experiences during this period of learning.

Conclusion

The four faculty colleagues and I worked towards shifting their teaching practices from a more lecture-centric approach to a more active learning approach with the use of instructional consultation. At the start of the study, we had honest conversations regarding our positionalities on teaching and learning as well as reflections on our current practices. The conversations and reflections were important in that they helped establish the participants' existing mindset or practices. Unexpectedly, at some point during the study, all four faculty participants discussed control, whether it was control of content, control of classroom environment, or control of student participation. The degree to which each faculty participant relinquished control varied, yet all faculty members did have some change in their teaching practices by the end of the study. Subsequently, they seemed to have become more reflective and more aware of their own thoughts and actions which led to some shifts in the way they thought about teaching and learning.

As my findings suggest, a faculty member's capacity to be transformative may be influenced by external factors, such as institutional expectations, and internal factors, such as one's readiness to change. It is worthwhile for faculty developers to keep in mind the influences of institutional structure and practices, along with considerations for a faculty member's perception of control, comfort level to try new teaching strategies and digital technologies, expectations of the students, and readiness to change when designing professional learning activities.

Chapter 6: Conclusion –

Possibilities and Challenges of the Instructional Consultation Process

This study was designed to use the instructional consultation process to collaborate with faculty colleagues to help shift their teaching practices from a lecture-focused format to a more active learning approach during their lecture sections. There were two foci to this action research study. One was to look at the possible roles that instructional consulting and digital technologies seemed to play in shaping four full-time community college STEM faculty participants' teaching practices. Part of the study was to investigate which and how digital technologies were being used by faculty participants as well as attending to how active learning may be incorporated with and without digital technology. The second focus was to examine *my* role and practices as an instructional consultant in order to better understand how I might best support individual faculty colleagues. The research question, "How can the instructional consultation process at a community college shape faculty members' teaching practices with and without the use of digital technologies?" attended to both foci of the study.

In this concluding chapter, I summarize and discuss what I have learned from this action research study regarding the factors that influenced shifts in the four faculty participants' mindset and teaching practices. I also discuss what I learned about my instructional consultation process and the role it played in transformative teaching. In this study, I also examined the role of digital technologies and digital resources in teaching. My analysis showed that the use of digital technologies was not an essential factor in shifting mindset and/or teaching practices; instead, digital technologies were

used to enhance the teaching process and learning experiences. This information can be used to develop targeted interventions at the institutional level, such as consideration for changes in current classroom observation practices, and in the instructional consultation process, such as systematically including follow-ups with faculty colleagues throughout the process. A natural progression of this work would be to analyze whether a shift in a teaching practice does change the students' learning experience and increase their academic success.

Factors that Influenced Shifts in Mindsets and Practices - What did I Learn?

It may be a challenging task for faculty members to shift their mindset and/or teaching practices. Various factors act as facilitators, moderators, or impediments to a faculty member's capacity to be transformative. It can also be challenging for an instructional consultant to influence faculty colleagues' teaching in positive ways; therefore, it is important to reflect on how the instructional consultation is "working." In an attempt to identify and understand the influences of the various factors, I designed and conducted this action research study to examine the role of instructional consulting and digital technology in shifting a STEM faculty member's teaching practices. My decision to focus on shifting teaching practices from a lecture-centric to a more active learning approach was to meet the expectation that higher education institutions should promote workforce skills such as critical thinking, problem solving, communication, and collaboration across all content areas (Alvarez, Taylor, Rauseao, 2015; Kong & Song, 2013; McLaughlan & Kirkpatrick, 2004; New Media Consortium, 2016; O'Flaherty & Phillips, 2015; U. S. Department of Education, 2010). As discussed in previous chapters,

my analysis found that the influential factors with respect to shifts in mindset and/or teaching practices were extremely complex. They encompassed external factors such as institutional practices and internal factors such as a faculty participant's perception of control. Institutional practices such as tenure and using classroom observations for high stakes evaluation purposes can severely restrict a faculty member's willingness to try a new teaching practice. Furthermore, at the study institution it was common practice for faculty colleagues to have an overload schedule of at least one course beyond the full credit load of 15 credits per semester. This practice not only limited each faculty colleague's capacity to explore new teaching practices, it also created challenges for them to find a comfortable work-life balance because of time constraints.

Other factors were internal, such as the perception of control and the value a faculty participant placed on it. Readiness to shift teaching practices seemed to be determined by: comfort level with change, with trying new teaching strategies, with digital technologies, with perceived responsibilities at the study institution, and with expectations of student preparedness and readiness. Additionally, there was a noticeable disconnect among all of the faculty participants' teaching practices and their desired learning outcomes for the students. At times, a faculty participant attempted to use digital technologies to mitigate the disconnect, such as when Jamie used the Periodic Table app to provide the students with opportunities to work together and perform deeper dives in order to understand the trends and applications of the periodic table. However, my analysis suggests that while digital technologies and digital resources can help faculty members provide active learning opportunities to the students during lecture sections,

they are not necessary, instead digital technologies and resources were used to enhance the course content or to increase student participation. Moreover, to maximize effective incorporation of digital technologies and digital resources, they should be used purposefully to meet a specific learning objective. Currently, there is little sustained research work in higher education regarding learning and the use of digital technologies with pedagogical considerations. Attaining an understanding of these influential factors helped guide and focus the instructional consultation sessions.

My Instructional Consultation Process – What Did I Learn?

My analysis, even though based on one site and a small set of participants, suggests that instructional consultation is complex. I found I used what could be described as a coaching model in a deliberate attempt to provide more opportunities for faculty colleagues to "enact new ideas within their own ongoing systems of practice" (Kennedy, 2016, p. 955). Through coaching, I facilitated this enactment using what Kennedy termed *insight*. Insight typically occurs as a result of self-generated "aha moments," but also can be created through thought-provoking questions that force educators to reflect on their rationale, decisions, and practices (Kennedy, 2016). Through the coaching model of instructional consultation, faculty participants reflected on their perceived impediments, readiness to change, teaching decisions, and teaching practices. Each faculty participant embarked on a unique journey of either thinking, tinkering, expanding, or deepening teaching practices with active learning. Consequently, many elements affected how I, the instructional consultant, fostered the working environment, posed questions, and made recommendations.

Despite the many challenges that the faculty participants and I encountered throughout the instructional consultation process, we were mostly successful in meeting our goals. As previously discussed in Chapter 3, I had three goals as an instructional consultant for this action research study:

1. Collaborate with faculty colleagues to increase student participation in their classrooms by incorporating active learning activities
2. Collaborate with faculty colleagues to design activities using digital technologies to increase student participation in their own learning process
3. Involve faculty colleagues in reflective practices that examined the decision-making and experiences of their teaching

As the findings suggested, all four faculty participants were involved in a guided reflective activity in all of the instructional consultation sessions throughout the duration of the study. When faculty participants and I met after a classroom observation, I would inquire about their perception of the class, for example, "What were your learning objectives? Did you accomplish them?" And, I would always follow-up with "How do you know?" The follow-up question forced the faculty participants to reflect on the lesson and provide evidence to support their perceptions. Very often our conversations led them to rethink a specific aspect of their teaching practices. For instance, after participating in the study, Marcus stated, "Through Shelley's consultancy, I have refocused my energies on identifying ways to encourage my students to collaborate and be independent learners. Pursuing my learning outcome has now become a team effort: myself + my students + digital resources" (Self-report, April 18, 2016). Overall, the data

analysis indicated that all four faculty participants had shifted in either their mindset and/or teaching practices in about three to four months' time, which in itself is an accomplishment. With this in mind, I propose that institutions thinking about shifting faculty teaching practices should seriously consider allotting adequate resources (funds, personnel, time, and faculty evaluation practices) to support instructional consultation opportunities to their faculty members.

I also reflected on my practices and my experiences as an instructional consultant throughout the study. Through this action research study, I have a much better understanding of why I intuitively use a coaching model when working with faculty colleagues as it aligns with my theoretical framework, a social view of learning, and my affinity towards a humanistic approach to learning. As I systematically analyzed my practices, multiple factors (as discussed in Chapter 4) were influential and informed how I worked with each faculty participant.

As I worked with faculty colleagues throughout the study I found that despite the uniqueness, needs, and goals of each faculty colleague, there was an overall structure that emerged during the instructional consultation process. Below is a visual representation (see Figure 7) of my instructional consultation process that depicts the elements that were part of that process: conversations, observations, questions, recommendations, actions, and follow-up. The elements did not occur linearly nor did they occur in a vacuum. Instead, each element collectively informed and guided me throughout the consultation sessions.

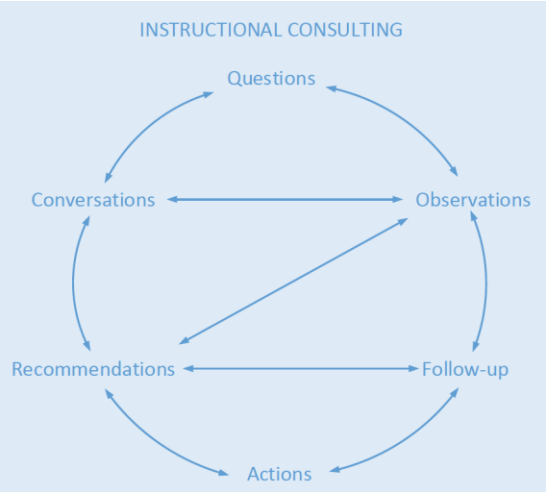


Figure 7. My Instructional Consulting Process during this Study

With a better understanding of my instructional consultation shift, I was able to stay more focused on the goals and needs of the faculty participants. Prior to the study, at times I was overly enthusiastic about a digital technology or a practice, such as active learning, and inadvertently subscribed to a more "top-down" approach. Interestingly, since the findings indicated that the faculty participants were open to my recommendations and found the various data sources, such as the classroom observation field notes, valuable (see for example, consultation sessions: Catherine, October 12, 2015; Christian, October 6, 2015; End-of-study interviews: Jamie, October 20, 2015; Marcus, December 14, 2015) I find I am now more confident in regard to working with faculty colleagues. Even with the shifts in the four faculty participants' and my mindset and practices, there are many other factors to consider in order to help increase faculty members' capacity to be transformative in their teaching and to foster an institutional environment where transformative teaching is encouraged.

Implications for Future Research Work

The study forced me to reflect on and methodically document my instructional consultation process. While I did achieve fostering a co-learning environment with the faculty participants through applying a social learning theory to my approach, which is based on "the premise that our understanding of content is socially constructed through conversations about that content through grounded interactions, especially with others, around problems or actions" (Brown & Adler, 2008, p. 18), there were limitations in my instructional consultation process. The two critical limitations were length of time and as a result, not enough follow-up.

All four faculty participants acknowledged the benefits of working with me through the instructional consulting process and that they would continue to reflect on their teaching practices and student learning experiences. In fact, Marcus emailed me after the conclusion of the study indicating that despite my limited access to him during the study that "the ramifications of your dissertation reverberate in my teaching everyday" (April 25, 2016). I am uncertain, however, about whether the shifts will be sustainable. From the results of my data analysis, it seemed that for sustainable shifts in teaching practices, instructional consultation needs to be a long-term commitment beyond a few months in order to foster and support continued reflections and conversations. While I observed and faculty participants reported some changes in how they taught their classes, I am not certain how steadfast these changes were as I did not consistently conduct follow-up sessions to ascertain the reported changes.

Follow-up is a piece of my instructional consulting process that I have come to realize was really important as a result of this study. I did conduct some form of follow-up with each of the faculty participants. The most common follow-up was essentially a debriefing session, where the faculty colleagues and I discussed their thoughts on the lessons, my observations, and my recommendations. With the exception of Catherine, I found that I was not satisfied with the follow-up element of the instructional consulting process, however. I had an opportunity to complete a different kind of follow-up with Catherine. Since Catherine's course assignments allowed me to observe during two different semesters, (2015 summer session and 2015 fall session), I was able to observe the same lesson twice. The follow-up after the summer session lesson and the planning session several weeks prior to the actual lesson provided the opportunity for the two of us to really dissect the lecture, determine which content on which to focus, confirm lesson objectives, and then to collaborate on designing the activities. Follow-up was critical for me because it was the space for the faculty participant and me to discuss teaching practices and recommendations within the context of a particular lesson. Several factors contributed to not having enough follow-up during the study: time-commitment and scheduling issues. It is worthwhile to consider examining the impact of length of time and follow-up for any sustained shifts in teaching practices in future research work. Various factors, such as institutional traditions, cultures, and structures have a bearing on the instructional consultation process and more importantly on faculty members' capacity to be transformative in their teaching practices.

Influences of Institutional Traditions and Culture

In an earlier chapter, I discussed various higher education institutional practices (e.g., cafeteria-style structure, lecture as the signature pedagogy and tenure) and the culture at the study institution (i.e., classroom observations being part of the teaching effectiveness evaluation process, course structures and requirements) were identified as influential factors on faculty participants' capacity to be transformative in their teaching practices. Furthermore, the scope of my work with individual faculty colleagues was also inhibited by the distinct disunion of faculty and staff at the institution. That is, there was a perception that only faculty members should be in discussions and make decisions on all matters regarding teaching and learning (Reflection Journal Entry: April 28, 2015). Although not all faculty colleagues universally accepted and adopted that perception, it did predispose their perception of my role at the institution. Often, faculty colleagues who have never worked with me presume that my job responsibilities are limited to technology in the classroom and Blackboard training. While technology and Blackboard training are part of my responsibilities, the overall focus of my job at the Center for Teaching and Learning is teaching and learning. This brings the question, "How can a higher educational institution better promote its in-house faculty development opportunities?" And for me, the more important question is, "How can I continue to offer instructional consultation services without it being part of a study?" as it may be perceived that I stepped beyond my purview, specifically due to my classroom observations. As such, the same culture and traditions (as discussed in Chapter 4) that were impediments to the faculty participants' capacity to be transformative in their

teaching practices were also impediments to the instructional consultation process. Moreover, these traditions and cultures exacerbated the inherent tensions embedded within the instructional consultation process. However, an institution's approach and emphasis on professional learning can alleviate some of the impediments.

Interestingly, faculty participants did not report having experienced resistance or at least seemed to have experienced minimal resistance from their students when they incorporated active learning activities with or without digital technologies. Instead, they reported that the students participated in the active learning activities and seemed to welcome the change of pace. All of them also felt that they had sufficient support from the study institution and respective department chairpersons when exploring different teaching practices and incorporating digital technologies. As indicated previously, there were several institutional elements that may have been seen as impediments to their ability and capacity to be transformative in their teaching practices, such as course load and time restrictions.

Institutional Structure Demands and Impediments to Capacity for Change

Often institutional structure "demands far too much time, energy, and skills - especially given the onerous workplace conditions they already face: large classes, tightly packed schedules, scrambling for instructional materials, and lack of support staff" (Cuban, 2013, p. 162). Beyond the time, energy, skills, and support limitations, faculty participants' teaching decisions and practices were also influenced by how they view themselves as educators, and how their teaching and learning experiences have influenced their practices. During the fall 2015 semester, all of the faculty participants

had more than the 15-credit teaching load which is considered a full teaching load at the study institution. In fact, some of them had more than a 20-credit teaching load because it included lecture sections, recitation, and labs. Unfortunately, this heavy course load was typical and, according to the faculty participants, the heavy course loads were the norm in their respective departments. Along with the heavy course loads, faculty participants also experienced additional time commitments to the study institution in the form of committee work and advising responsibilities. This additional time commitment is consistent with what faculty members experience in other higher education institutions (Bickerstaff & Cormier, 2014). Faculty participants expressed that their teaching responsibilities and other commitments to the study institution resulted in a struggle to find a good and successful work-life balance. And the faculty participants admitted that their professional and personal responsibilities did not allow the time nor the mental capacity for them to always try new things in their classrooms. This was further complicated by other concerns regarding either institutional or departmental policies and/or procedures.

Concerns with prerequisites...or the lack thereof. Both Jamie and Christian expressed concerns about some course prerequisites. Jamie conveyed that the current math prerequisite for Chemistry 1 was not rigorous enough. Christian stated that while Chemistry 1 was not a prerequisite for Exercise Physiology, it should have been. Both cited that current prerequisites were contributors to the level of student lack of preparedness in their courses. Marcus recognized that even though his courses had the appropriate prerequisites in place, it did not necessarily mean that all of the students came

into his courses academically prepared. This presented difficulty in some students' ability to comprehend the course concepts thus leading to unsuccessful assessments. He admitted that to resolve this particular issue, there may need to be interdepartmental collaboration. He also indicated interest in continuing to do interdisciplinary work with peers whether for professional learning purposes or to work with other faculty colleagues for collaboration opportunities such as his capstone course project. However, those efforts proved to be difficult due to lack of common meeting times for both faculty members and students. There were other institutional practices that could be redesigned to help increase their capacity to be transformative in their teaching. One such practice was the reason for the inclusion of classroom observations.

Classroom observations as high-stakes evaluative tool. The study institution's formal observations were evaluative tools used to assess a faculty member's competency in subject matter, teaching, and student interaction. In contrast, this study's classroom observations were used to look closely at a faculty participant's teaching practices and use it to inform possible changes to increase student participation opportunities. For example, during the first observation, I noted that Catherine had exclusively lectured for fifty-three minutes on DNA transcription and translation which was the primary focus of that particular lesson. During the consultation session after the classroom observation, we discussed how to break the fifty-three minutes of lecture into shorter content presentation sessions with active learning activities added to those sessions. I explained to Catherine that despite the study institution's sole evaluative purpose of formal observations, it was not unusual for formal observations to serve dual purposes:

evaluative and professional growth. In fact, for the first time in her career, Catherine asked an administrator to observe the same active learning lesson (the revised DNA and RNA transcription and translation processes) that I discussed previously. She was disappointed in her observation report; not in the results, but in the feedback. Catherine disclosed that while she received a very positive observation report reinforcing her mastery of the subject matter and statements of what practices she had used in the lesson; the report did not help her determine any areas for professional growth. Catherine believed that to help her to continue to grow as an educator, she needed critical feedback from her administrators similar to the feedback that I had provided to her throughout our consultation sessions. Beyond the institutional structures and policies, unintended results may have occurred when faculty members considered incorporating new or revised teaching practices, as was the case with the cognitive dissonance experienced by Catherine and Jamie.

Considerations when experimenting with different teaching practices.

During the consultation sessions with Catherine and Jamie, we discussed their involvement with the National Science Foundation Grant. The grant was to incorporate the Structured Instructional Strategy Project in the classroom to assess its impact on student learning and success. As discussed in previous chapters, Structured Instructional Strategy Project's activities are prescriptive and no revision is allowed and as a result, exasperated faculty participants' need to have control in their classes. Interestingly, Catherine explained how her research into Structured Instructional Strategy Project led her to examine active learning and the benefits of active learning for the students.

Furthermore, Catherine believed the key behind active learning was to prepare the students for the workforce. Even though Jamie had concerns regarding Structured Instructional Strategy Project prior to actual implementation, he did concur with Catherine in regard to the benefits of active learning. Despite Catherine and Jamie's cautious optimism about incorporating the Structured Instructional Strategy Project, its rigidity caused a cognitive dissonance for them regarding an active learning approach to teaching. Their experiences illustrated how the two different approaches to active learning practices led to some hesitation, reticence, and cynicism that faculty colleagues felt as they experimented with and implemented active learning activities. The cognitive dissonance stemmed from Catherine and Jamie incorporating the two diametrically different active learning approaches, Structured Instructional Strategy Project and self-designed approach, simultaneously. Fortunately, even though there were some challenges to shifting a faculty colleagues' teaching practices, shifts in mindset and practices occurred with thoughtful changes to existing practices, digital technology implementation, and reflective practices.

What Facilitated Shifts in Teaching Practices

As discussed in the previous chapter, my recommendations were given within and tailored to each faculty participant's particular context (course, classroom setting and specific concept.) The recommendations were similar in that the changes were minor with the focus of shifting student learning from passively listening to actively participating. During these conversations, faculty participants and I expanded considerations for context.

Broader considerations for context. As the faculty participants and I collaborated on incorporating active learning activities into their classrooms, we had discussions about how a course "fit." True to the cafeteria-style approach, individual courses often did not connect with other courses within a program and/or major (Bailey, Jaggars, and Jenkins, 2015). To create clearer alignment of courses, I asked the faculty participants to think about how each of their courses fit into the program or major, how it aligned with the institution's mission statement, how it would help the students meet their career goals, and how it would relate to life (see Figure 8). The four faculty participants reported that they frequently provided real-life applications and/or scenarios with content presentation. However, my questions pushed them to be more thoughtful when planning their lectures, activities, and assessments. That was an unintended consequence of this study, which led to changes in my own practices when working with faculty colleagues.

For example, about a year after the conclusion of the data collection phase of my study, I developed a visual representation of my consultation prompt questions (see Figure 8) which I now use whenever I work with faculty colleagues on course development, activity design and assessment creation. At this point, the feedback from numerous faculty colleagues has been positive.

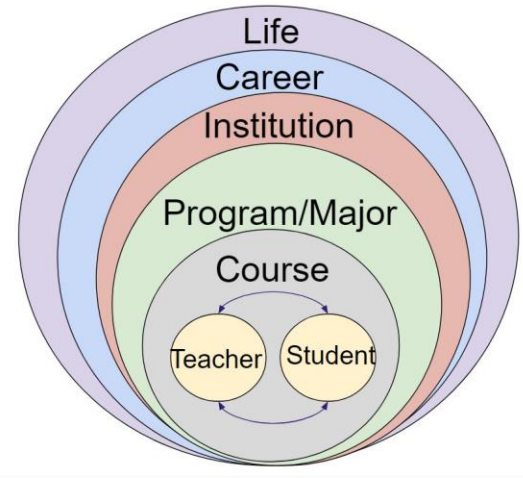


Figure 8. Broader Context - Considerations for Course Design

Struggling with perfect alignment between existing digital technologies and meeting faculty needs. Catherine summarized the instructional consulting experience succinctly stating that "what I like about the changes I'm making in my courses is I like the active learning process" (Exit interview, October 28, 2015). Unfortunately, at this point, she expressed disappointment that she has not found one total digital technology that meets all of her needs. Christian, Jamie, and Marcus expressed the same sentiment. Nonetheless, they firmly believe that digital technologies and digital resources do have a role as components in the classroom. Whether the role is to reinforce content or provide a simulation, it has a role in education. Moreover, all faculty participants confirmed that they will continue to use digital technologies and digital resources in their teaching in the future. The disappointment of not having one digital technology or digital resource that would meet all of their needs was not the only obstacle that faculty colleagues faced. My analysis suggests that as the faculty participants became more reflective and more open to change.

Reflection for Professional Learning

The process of reflection helps educators to reconstruct their teaching experiences and make sense of them (Blumberg, 2015.) They become aware of their current practices and the instructional decisions they make. In the immediate sense, I wanted them to reflect on particular strategies or processes and examine whether these strategies or processes hindered or enhanced their ability to achieve their learning goals for their students, essentially using Schön's (1987) reflection-*on*-action. Reflection-on-action occurs when faculty participants reflect on their thoughts and actions after the action has already occurred. But for the long term, I wanted faculty participant to use Schön's reflection-*for*-action, as this mode of reflection engages the faculty member to reflect in order to inform future teaching decisions and actions. Eventually, I want faculty participants to use reflective practices as a tool *in* practice and *on* practice. That is, reflection in the moment of teaching, Schön's reflection-*in*-action, and after teaching to help faculty members to become more self-aware, more mindful of their instructional decisions, and more self-directed in their professional learning needs. The larger goal would be to help faculty participants become more aware of their thoughts and actions and better equip them to expand and potentially transform their teaching practices. Even though reflection questions were used throughout the consultations, the practice of reflection did not become part of all of the faculty participants' teaching repertoire, with the exception of Christian. However, Christian was a reflective teacher prior to participating in the study.

Addressing my research question, "How can the instructional consultation process at a community college shape faculty members' teaching practices with and without the use of digital technologies?" my analysis suggests that the instructional consultation process definitely has strong potential in shaping a faculty member's teaching practices. However, the instructional consultation process is time intensive and resource draining. It also requires a high level of trust between the faculty member and instructional consultant that is developed overtime. There were many "off-the-record" comments and conversations throughout the study. Those conversations were honest, impactful, and at times led to potential resolutions or changes in perspectives. There were also multiple restrictive factors, such as institutional practices, that limited the faculty participants' capacity to be transformative in their teaching practices. As I reflect on my instructional consultation process and faculty participants' responses and feedback, I keep coming back to the potential for using classroom evaluations as a professional learning opportunity as opposed to a high-stakes evaluation. I am debating the benefits of using classroom observations solely for evaluation purposes, especially considering the rich conversations regarding teaching practices that stemmed from all of the classroom observations. Ultimately, this study shed some light on how the instructional consultation process can help facilitate a shift in teaching practices with and without digital technology. This study also highlighted some intrinsic factors that merit further consideration for researchers.

Recommendations for Future Research Work

The results of this study are important as they contribute to the conversation about how to support community college faculty members' capacity to be transformative in their teaching. As my analysis suggests, instructional consultation can help facilitate a faculty colleague's shift in mindset and/or shift in practices. Moreover, faculty participants also perceived that the shift benefited the students' learning experiences and increased academic success. Considerations should be given to designing a study that targets assessing whether shifting teaching practices does indeed change students' learning experiences and help with their academic success. This study also identified various inherent institutional and higher education elements that presented impediments to the faculty members' capacity to shift their teaching practices from a lecture-focused approach to a more active learning approach.

Future research on best practices for institutional policies and procedures may include looking at the optimal course load a full-time faculty member should carry taking into account other college commitments, such as research and committee work. It may also be worthwhile to examine alignment of content and learning goals for different course delivery options. For example, a lecture section-laboratory option may help us understand the grade disconnect that happens when a student receives a "D" in a lecture section but receives an "A" in the lab. Beyond examining the institutional process, considerations are needed to rethink the administration's role in supporting a faculty member's professional learning, specifically, how supervisors can use the highly evaluative process of classroom observations for professional learning opportunities. As

previously discussed, often classroom observations are used to evaluate a faculty member's content knowledge and teaching effectiveness which can lead to some high stakes decisions, such as tenure and promotion. However, another way is to use classroom observations to inform a faculty member's professional learning needs as I have done in this study. All four faculty participants valued the use of classroom observation field notes to inform and guide the conversations and recommendations for change. These considerations for future studies have the potential to help shape the restructuring and rethinking of the way higher institutions approach the teaching and learning experiences.

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Appendix A

Digital Technology Activity Planning and Reflection Table

Please use the table below to plan and reflect after *each* digital resource integration.
(Note: You may have multiple entries for one digital resource integration.) Below are explanations of what we would like to see for criteria.

1. **Date of Integration:** Please enter the date the digital resource was used in the class.
2. **Course:** Please enter the name and level (Higher Ed: 100-, 200-levels)
3. **Digital Resource Used:** Please enter the name of the digital resource and the platform (web-based or mobile, i.e., app)
4. **Student Learning Outcome:** Please enter the student learning outcome(s) for the digital resource integration.
5. **Activity:** Please provide a complete description of the activity for the digital resource integration.
6. **Results:** Please provide your reflection of the result of the activity, please include the following:
    a. Did it meet the student learning outcomes?
    b. What are the students' reactions/participation level/contribution?
    c. Would you use the digital resource again? Why or why not?
    d. How would you revise it if you used this digital resource again?

Date of Integration	Course	Digital Resource Used	Student Learning Outcome(s)	Activity	Results
Example: 11/21/12	HES212: Exercise Science	iMuscle App (iPad)	Identify various muscles and the exercises/stretches needed for an individual exercise prescription.	Pair work: Students work collaboratively to design a resistance training exercise prescription for a designated population (i.e., elderly, endurance athlete)	*Please answer all four questions and feel free to add any additional observations or comments.*

Appendix B

Pre-Observation Interview Questions

Research Q:

How can the instructional consultation process at a community college shape faculty members' teaching practice with and without the use of digital technologies?

Definitions:

For the purposes of this proposal, digital technology is defined as: digital tools, services and networks used by educators to involve learners in acquiring knowledge, the know-how, and the skills, analyze or critique in relation to a topic, issue or task, and applying that knowledge confidently in an authentic situation.

Digital resources in this sense include, but are not limited to, proprietary software, apps on mobile devices (such as iPads or smartphones), and *open* digital technologies (such as the blood-typing game from Nobel Prize Educational games or online videos and practice exercises from Khan Academy).

Questions:

Demographic:

1. How many years have you been teaching?

2. What is your definition of teaching?

    a. What is the role of the teacher?

3. What is your definition of learning?

    a. Is there a difference between student and learner?

    b. What is the role of the student?

    c. What is the role of the learner?

4. When was the first time you encountered technology for education use as an educator?

5. Current courses you are teaching:

Questions:

1. What got you into using digital technology?

2. How do you use digital technology in your teaching?

    a. Probe: how does that meet your goal?

    b. How does that work with what you think the role of a teacher?
        i. Role of the student?

    c. Give me an example:

3. How do your students interact with digital technology in your class? (Independently, collaboratively?)

    a. Tell me about some of the things you do in class with digital technology.

4. What is your process when determining what and how to use digital technology?

    a. Please provide example(s).

5. Tell me about all the different ways that you learn about using digital technology in your classes.
    a. Within your department?

    b. Within the college?

    c. Do you belong to any communities (OL, learning communities)?

    d. How did you get involved with them?

6. How do you envision using digital technologies in your classes long term?

7. What advice do you have for a teacher who would like to use digital technology in their classes?

8. What kind of support would you like the college to provide you in continuing to

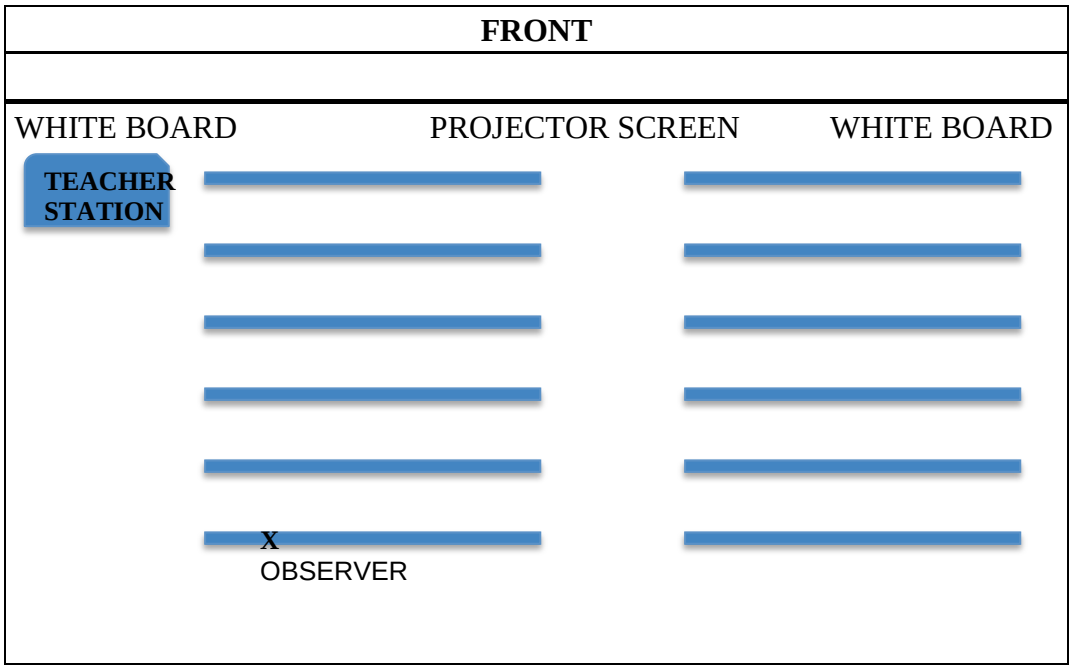
use digital technology in the class?

9. Would you like to elaborate on something that we spoke about?

10. Is there anything you would like to discuss that we did not have a chance to talk about?

Appendix C

Sample Classroom Observation Field Notes



Date: May 28, 2015

Setting: Larger classroom (6x2 + 1 rows with 6 seats per row)
Approx: 34 students

8:05-8:12 PPt & Board work Review

8:13-8:26 New materials (Bd work & PPt); a lot of references back to previous learning
Back to class a lot b/c bd work; a couple of students conversing for "clarification"

8:26 video clip/Pearson (demos what is on the bd)-explanation prior to showing video

8:29 pause & clarification & reference to prior learning

8:29-8:32 video cont'd

8:32 questions on the video? No questions. ***(short exercise - 3 minute review; teacher-initiated probing question?; student generate a test question? - higher level, not recall)***

8:32 continue lecture (PPt)

8:35-8:38 DNA gyrase animation/YouTube

8:36 clarification what is required

8:36-9:23 lecture (PPt & Bd work) transcription process for RNA and DNA - distinction (can the students figure it out first using images?) - multiple questions ***compare/contrast activity of transcription and translation processes in DNA, RNA, and eukaryotes***

genetic code table (will be on exam) - ***demo & student practice -- look at the Gene Link app***

9:23 summarizing video for transcription & translation (Pearson). ***(short exercise - 3 minute review; teacher-initiated probing questions?; student generated test questions? – higher level not recall)***

-maybe a check for understanding activity (transcription, translation, condon, etc. – be specific) prior to showing the video? Students self-check their work against the summary video & generate one question

9:30-9:42 BREAK

9:42-9:46 Review of prior lecture & look over/review skipped slides

9:46 lecture (PPt & some Bd work): regulation of protein synthesis and metabolism

10:10 Bd work (see picture: DNA dictionary use and go through process (DNA → mRNA) include transcription *(give the students a few minutes to work independently and then together)* → minimal responses

Using the genetic code dictionary

Appendix D

Consultation Session Questions

1. How did you think the class went? What were your learning objectives? Did you accomplish them? How do you know?

2. What do you think was the level of understanding for the students? How do you know?

3. What do you think students' retention of the materials will be? How do you know?

4. What are the typical grades for this specific topic that you covered today?

5. Would you change anything that you did today? If so, what and why?

Appendix E

End-of-Study Interview Questions

Research Q:

How can the instructional consultation process at a community college shape faculty members' teaching practice with and without the use of digital technologies?

Questions:

What is your definition of teaching?

a. What is the role of the teacher?

2. What is your definition of learning?

    a. Is there a difference between student and learner?

    b. What is the role of the student?

    c. What is the role of the learner?

Questions:

1. What is the role of digital technology for you?

2. How do you use digital technology in your teaching?

    a. Probe: how does that meet your goal?

    b. How does that work with what you think the role of a teacher?

        i. Role of the student?

    c. Give me an example:

3. How do your students interact with digital technology in your class? (Independently, collaboratively?)

    a. Tell me about some of the things you do in class with digital technology.

4. What is your process when determining what and how to use digital technology?

    a. Please provide example(s).

5. How do you envision using digital technologies in your classes long term?

6. What advice do you have for a teacher who would like to use digital technology in their classes?

7. What kind of support would you like the college to provide you in continuing to use digital technology in the class?

8. Would you please describe your experience when working with me throughout this process in thinking about your teaching practice?

    a. What did I do that was most helpful?

    b. What did I do that was the least helpful?

    c. How else could I have supported you in your teaching practice?

9. How can I best help you throughout your career at CCM?

10. Would you like to elaborate on something that we spoke about?

11. Is there anything you would like to discuss that we did not have a chance to talk about?

Appendix F

End-of-Study Self Report

1. How would you describe your teaching process/planning and teaching style/practice prior to working with me? (This proceeds the study, so it may be 5 years ago, etc.)
2. How would you describe your teaching process/planning and teaching style/practice since working with me?
3. What is the biggest difference you see in your teaching (process/planning, practice) after working with me during this study through the instructional consultation process?

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