A Comparison of a Team Versus an Individual Approach to Learning in an Online Teacher Preparation Program

by

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ABSTRACT

This quasi-experimental study investigated the effect of a high-performance teaming approach on motivation and engagement as compared to an individual approach in an online alternative teacher preparation program. The study sample included 104 teachers from all grade levels and subject areas enrolled in the program. Five intact groups of participants in two reading courses were assigned to a control or treatment group. The participants in the control condition completed the course individually, while participants in the treatment condition worked in structured learning teams. Asynchronous course discussions were led by the instructor in the individual approach, and led by team members in the team approach. The courses, designed for learner motivation, were controlled in both conditions. The Johns Hopkins University Electronic Learning Community (ELC) provided a web-based platform for each course, enabling students in both conditions to access course materials and engage in asynchronous discussions with class members and instructors.

To evaluate the differences between the control and treatment groups, data on four dependent variables were collected: (a) motivation toward course interest, with four subcomponents of student motivation; (b) motivation toward instructional materials, with four subcomponents of student motivation; (c) frequency of participants' interactions; and (d) perceived quality of the interactions. Study findings indicated that there was significantly more motivation toward the course overall, and more confidence and satisfaction toward the course between participants working in teams than working individually. Also, there was significantly more satisfaction toward the instructional materials for participants in the team approach. Study findings also indicated that

students working in teams had higher engagement than students working individually based on a higher rate of posting and an increase in the reported quality of interaction over time in the team approach. Findings contribute to meeting a demonstrated need for an online model for teacher preparation and a configuration for structuring teams in an online environment.

DEDICATION

In memory of Dr. John Castellani

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CHAPTER I

Introduction

Increasingly, adult learners are seeking online learning opportunities to meet their professional development needs (Allen & Seeman, 2015). The benefits of offering online learning experiences for learners and higher education institutions were well documented in the literature across a range of disciplines. Online learning opportunities provide scheduling flexibility and increase access for students, including nontraditional students and students who live a wide geographical distance from the institutions (Bell & Federman, 2013). In addition to flexibility and accessibility, online learning prepares learners to use a range of technology, which is ideal for teachers in the 21st-century classroom (Ertmer & Ottenbreit-Leftwich, 2013).

Online learning also brings about some challenges. These include increasing workload for faculty to teach online courses, particularly as they strive to maintain learner engagement and meet learners' needs when they cannot meet face-to-face (Regan, Evmenova, & Baker, 2014).When their efforts to keep learners engaged fall short, learner attrition can arise (Kauffman, 2015; Mayne & Wu, 2011; Rovai & Downey, 2010) because students often need motivation to complete an online course (Keller, 2010).

From a more positive lens, online professional development has become a viable option for teachers to extend their professional learning, and these learning experiences vary (O'Dwyer, Masters, Dash, De Kramer, Humez, & Russell, 2010; Russell, Kleiman, Carey, & Douglas, 2009). There is a variety of research in online learning across disciplines about what elements of instructional design lead to positive learner outcomes. Typically, this research includes important areas, such as student-to-student interaction

(Bernard et al., 2009; Richardson & Swan, 2003; Wang, 2004; Wang & Kang 2006) and design for motivation (Keller, 2010). However, more research is needed to determine specific components associated with effective online models for teachers. This study will explore an approach to instructional design for motivation that incorporates a specific component, collaboration, to determine if the approach results in better course design and engagement for a preservice teacher audience.

Online Learning in Higher Education

Allen & Seeman (2015) identified learning into four different categories based on the amount of content delivered using web-based technologies. Figure 1 below provides a summary of these categories and descriptions.

Amount of Content Delivered Online	Type of Course	Description
0%	Traditional	A course that is delivered without the use of any technology.
1 to 29%	Web Facilitated	A course that uses web-based technology to support a face-to-face course. May use a learning management system (LMS) or web pages to post a syllabus and assignments.
30 to 79%	Blended/Hybrid	A course that has both online and face-to-face delivery, with a substantial portion of activities delivered in an online format. Has online communication tools such as discussion boards and a reduced number of face-to-face meetings.
80%+	Online	A course that typically has no face-to-face meetings; most or all of the content is delivered in an online format.

Figure 1. Online course types. Adapted from "Grade level: Tracking online education in the United States", by I.E. Allen & J. Seaman, 2015. Retrieved from

http://www.onlinelearningsurvey.com/reports/gradelevel.pdf. Copyright 2015 by Sloan Consortium. Adapted with permission.

Because of the rapid development of online instruction, much of the research in this area has focused on the delivery of content rather than what processes affect learning (Bernard, Abrami, Lou, Borokhovski, Wade, Tamim, Surkes, & Bethel, 2009; Bernard et al., 2004; Larson & Lockee, 2009). Researchers categorized online learning into distinct generations based on technology available and, in some cases, instructional practices implemented. Researchers claimed that the first generation involved posting content on the Internet for students to access (Connolly and Stansfield, 2007; Rubens, Kaplan, and Okamoto, 2014). These researchers also stated that the second generation incorporated discussion and other social aspects as learners were able to access communication tools, rich streaming media, and support services. There is disagreement on the characteristics and timing of the third generation. Connelly and Stansfield (2007) purported that we are now part of the third generation which includes increased socialization, collaboration, and reflective practices. Conversely, Rubens, Kaplan, and Okamoto (2014) argued that the third generation is not yet upon us and that it will include improved data mining and use as well as artificial intelligence technology. In Anderson and Dron's (2011) generational characterizations of instructional design pedagogies are based on epistemological views of the time periods when technology was available. These researchers state that all three generations -- Cognitive-Behaviorist, Social-Cognitivist, and Connectivist – should be used effectively to meet the needs of learners today.

While a wide range of technologies was available to support creative and engaging courses, to meet the growing demand for online learning, instructional

curriculum designers have too often fell upon traditional, face-to-face instructional design models for developing approaches to online learning. These approaches were neither collaborative nor highly interactive among participants (Jarvis, 2006, 2007; Shearer, 2003). Also, these models rely on learner motivation for successful completion (Keller, 1987; Russell et al., 2009).

Pathways for Teacher Preparation

Alternative preparation programs are designed to recruit talented individuals to teach in large cities and rural areas that struggle with teacher shortages (National Educational Association, 2015). These programs are preferable for many, particularly those with considerable life experience, as well as those who want to change careers. According to the National Education Association (2015), nearly every state had alternative pathways for teacher preparation. Alternative pathways typically get teachers into the classroom quickly, providing a brief preparation period followed by an immersive in-service teaching experience while taking coursework along the way. This pathway is vastly different than traditional certification programs that include one-to-two years of teacher preparation training with field experiences and achieving certification before entering the classroom full-time as an in-service teacher. A well-known alternative certification program is Teach for America (TFA). The TFA website describes how top candidates are recruited to participate and that, while in the program, candidates are assigned to schools in low-income communities while completing coursework through the partner universities (http://teachforamerica.org). Research on the TFA program yielded mixed results in the first two years of teaching. Moreover, studies showed no

significant difference in teacher effectiveness by the third year of teaching (Darling-Hammond, 2015).

Effectively Preparing Preservice Teachers in an Online Education Model

It is evident there is a gap in the research literature on preparing preservice teachers in an online format, particularly through a fast-track, alternative teacher preparation pathway (Downing & Dyment, 2013). Consistent with Downing and Dyment's (2013) research, studies found in a literature search focused on the integration of specific technology tools in teacher preparation programs to support teaching pedagogical and educational technology knowledge, encourage reflective practice, or prepare someone to teach in K-12 virtual schools.

While we can glean insight from effective instructional strategies, transforming teaching practice when learning online also demands further research. Further, McQuiggan (2007) argues that adjusting to teaching online might result in a shift in teaching practice as teachers move from a teacher-centered environment to a student-centered one. A literature search revealed most of the information on online teacher preparation programs centers around the need to prepare teachers to teach in online K-12 settings (Kennedy & Archambault, 2012; O'Brien, 2015) and general technology integration (Mouza & Karchmer-Klein, 2014).

Structuring Collaboration in an Online Learning Environment

The concepts of collaboration and promoting high levels of interaction are prevalent in the research literature for K-12 learners, educators, and online students. Well-supported in the K-12 literature, a high-performance team approach describes a method for structured teaming that has characteristics beyond a cooperative group

(Johnson & Johnson, 1994; Mainzer, 2010; Slavin, 1990). While the definition of collaborative learning varies, the Barkley and Cross (2014) suggests it has these essential features:

- intentional design of structured learning activities;
- all participants in the group are engaging actively to meet the stated objectives and making equal contributions; and
- meaningful learning takes place.

With this approach, instructors are dedicating class time for teams to participate in team building, team learning, and team evaluation activities in addition to the regular content-related activities. However, there is limited rigorous quantitative research to support a similar teaming structure for adult learners and in an online setting. The empirical research on online learning teams provides strategies and considerations that provide insight into new online instructional models, but call for further testing, particularly for preservice teachers (An, Kim, & Kim, 2008; Lightner, Bober, & Willi, 2007; Liu & Burn, 2007; Smith, 2008).

The research on online learner collaboration is promising for implementation with an educational audience. National standards for high-quality professional development and related research require collaboration and communication among teachers with the intention of teachers transferring their learning to the classroom environment (Learning Forward, 2011). Additionally, the research literature on online learner engagement reveals a critical consideration of promoting high levels of quality interaction in an online environment (Bernard et al., 2009; Richardson & Swan, 2003; Wang, 2004; Wang & Kang 2006). If frequency, quality, and satisfaction of interactions are important to

learners online, perhaps the individual instructional approaches are not the best option. Predictably, the use of a collaborative approach with structured teams in online learning may promote learning while increasing engagement and motivation among learners.

Online Course Design for Motivation and Engagement

Studies have shown that any lack of motivation by participants or low levels of learner engagement contribute to the high attrition levels common in online courses and negatively affect learner outcomes (Dennen & Wieland, 2007; Muilenburg & Berge, 2005; Richardson & Swan, 2003; Wang, 2004; Wang & Kang 2006). Kember (2016) synthesized theories of motivation that describe motivation as multi-faceted, dynamic, and largely influenced by the context of the learning. Additionally, Kember presented a framework supported by multiple motivation theories that included motivation from both personal targets (e.g., a course grade) and social benefits from having interpersonal connections with other learners in the class.

According to Hrastinski (2008), the most frequently used indicator for measuring participation in an online course is frequency of interaction. He also proposed a more complex definition that included learners' feelings about their participation. For purposes of this study, engagement will include the frequency of interaction and the quality of their interactions. Studies showed that participants' high frequency of interaction in an online environment resulted in more effective communication and collaboration, deeper academic levels of discourse, and a higher perception of learning (Bernard et al., 2009; Richardson & Swan, 2003; Wang, 2004; Wang & Kang 2006).

Theoretical Framework

To improve student motivation, Keller (1983) developed the ARCS model of motivation based on a synthesis of research on human motivation. For decades, Keller's model has been applied and tested in a variety of instructional settings around the world (Chang & Chen, 2015; Keller, 2010), as it was designed to inform how to arrange resources and procedures to bring about change in motivation. Also, the model was widely implemented by other researchers with adult learners and in online settings (Keller, 2010). The ARCS model contains four categories that represent the components of motivation, as shown in Figure 1.1.

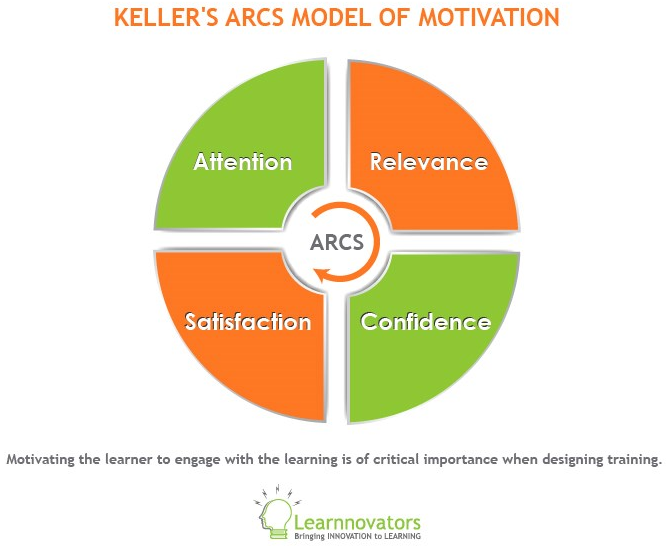

Figure 2. Keller's ARCS Model of Motivation. Reprinted from Resources, In *Learnnovators,* n.d., Retrieved from http://learnnovators.com/resources/#. Copyright 2014 by Learnnovators. Reprinted with permission.

Attention involves arousing and sustaining a learner's interest. Relevance refers to maintaining learner stimulation by linking to learners' needs, interest, and motives. Confidence involves helping learners feel a sense of accomplishment by being

appropriately challenged. Satisfaction relates to learners being rewarded extrinsically and intrinsically for their efforts. Figure 2 identifies these four motivational factors as well as the subcomponents of each (Keller, 2010).

Attention	Relevance	Confidence	Satisfaction
• Perceptual arousal • Inquiry arousal • Variability	• Goal orientation • Motive matching • Familiarity	• Learning requirements • Success opportunities • Personal control	• Intrinsic reinforcement • Extrinsic rewards • Equity

Figure 3. ARCS Model Motivational Factors and Categories

Keller's model contains a motivational design process that involves connecting instruction to learning goals, stimulating and appropriately challenging learners, and influencing how learners will feel after they have met the goals or did not succeed (Keller, 2010). Keller also developed and validated two instruments based on the ARCS model that measure course interest and the motivation of the courses' instructional materials. In this study, Keller's instruments will be used to determine motivation levels of online learners.

In addition to Keller's theory of motivation, Lev Vygotsky's theory of social constructivism may have an important role in the online courses. In his theory, Vygotsky postulated that learning is socially influenced, knowledge is socially constructed, and the community around us affects the way we see the world (Merriam, Caffarella, & Baumgartner, 2012). Constructivism holds that learning is built upon knowledge, and people construct meaning through experience (Merriam & Bierema, 2013). Additionally, building on Vygotsky's theory, along with theories of Dewey and Piaget, constructivists suggest that learning is more effective when it takes place in a social context, and when a

learner is actively engaged rather than passively learning content. This theory supports the concept of social presence which is the ability to project one's self, seeming like a *real* person in the online environment, and establish personal and purposeful relationships (Akyol, 2008; Gunawardena and Zittle, 1997). Studies showed that social presence had an important relationship to learner satisfaction and perceived learning in an online course (Cobb, 2011; Gunawardena and Zittle, 1997; Richardson & Swan, 2003). In summary, Keller's ARC theory of motivation and Vygotsky's social constructivism theory help to inform the effective design of online courses. When incorporating interaction and collaboration in an online course, the social constructivist theory supports learners being able to create new knowledge and be more engaged.

Statement of the Problem

The literature review suggested that a variety of instructional design models were used in the design of online courses, and much of the design decisions were made based on technology available or the understanding of what works in a face-to-face environment. There is a gap in knowledge of preparing preservice teachers using online learning experiences, particularly as part of an alternative teacher preparation program. Teacher professional standards emphasize the importance of collaboration in professional development. There are substantial contributions to the field from seminal researchers around collaboration for children. The research literature, including application of Keller's model to online learning experiences, contributed to the knowledge of what works in online learning to promote motivation and engagement. Through this understanding as well as how to structure collaboration to benefit teachers as learners, it is reasonable to infer that an instructional design model that incorporates tested

motivational design features for adult audiences and collaborative features will be effective for a preservice teacher audience.

Purpose of the Study

By studying the variables of interest of motivation, frequency of interaction, and perceived value of interaction, this quantitative study sought to determine if educators are more motivated and engaged, exhibiting a higher level of interaction with satisfaction when working collaboratively in teams versus individually in an online course for preservice teachers. Participants were recruited from the TFA program at a large private university in the Mid-Atlantic region. Participants were part of intact groups enrolled in seven sections of three different courses. Elements of Keller's ARCS design for motivation were applied to the courses, and course sections were assigned to control and treatment groups. The location of the study was online in a secure, web-based learning management system.

Primary Research Questions

The purpose of this study was to answer the research questions:

1. *Does a high-performance teaming approach in an online teacher preparation program as compared to an individual approach affect student motivation as defined by Keller's ARCS model toward course interest and/or the instructional materials?*

    1.2. *Does a high-performance teaming approach for teachers in an online teacher preparation program as compared to an individual approach affect any subcomponents of student motivation, Attention, Relevance, Confidence, and Satisfaction, as defined by Keller's ARCS model toward course interest and/or the instructional materials?*

2. *Does a high-performance teaming approach in an online teacher preparation program as compared to an individual approach affect learner engagement as measured by frequency of participation?*
3. *Does a high-performance teaming approach in an online teacher preparation program as compared to an individual approach affect learner engagement over time as measured by learners' perceived quality of interaction?*

Significance of the Study

In an online course, higher levels of engagement lead to higher satisfaction and positive learning outcomes. The results from this study will provide more insight into how to design an effective online course for preservice teachers. Because the study population consists of preservice teachers that are actively teaching in the classroom, the results of this study can inform online learning experiences for preservice and in-service educators in higher education and perhaps professional development settings. Because collaboration and motivational design features may contribute to engagement and positive outcomes for learners, results may help to support instructional designers across other disciplines.

Assumptions

The following research hypotheses draw on and contribute to a growing body of knowledge of training teachers using online technologies and appropriate instructional design strategies. The research will help the higher education and teacher professional development communities make better decisions about how to design online instruction for an educator population. This research was based on the following assumptions:

1. Online course participants who are motivated and engaged in the learning experiences are satisfied in the course.
2. Learners who are engaged online frequently participate and find the interaction valuable.
3. Teacher collaboration strengthens teacher effectiveness.

Hypotheses

The hypotheses of the study are below:

1. *There will be a significant difference in the variable set of Attention, Relevance, Confidence, and Satisfaction composite scores towards the course between participants who experience working in high-performance teams and participants who work individually in an online teacher preparation course.*
2. *There will be a significant difference in the variable set of Attention, Relevance, Confidence, and Satisfaction composite scores towards the instructional materials between participants who experience working in high-performance teams and participants who work individually in an online teacher preparation course.*
3. *Participants working in teams will demonstrate a higher level of engagement than participants working individually in an online teacher preparation course, as measured by the variable frequency of posting and quality of interactions.*
   3.1 Participants working in teams will have a higher rate of posting than participants working individually in an online teacher education course.
   3.2 Participants working in teams will report a higher level of quality in their peer-to-peer interactions over time in an online teacher education course.

Definition of Terms

Terms, as they were defined in this study, are listed below.

- Engagement - The frequency of interaction and those interactions having high quality.
- Interaction - A contribution, or post, in online discussions.
- Learning Management System (LMS) - A secure, web-based platform that supports online learning. Features include content posted, discussion boards, and a news or announcements page.

Summary

Individuals are increasingly accessing formal learning opportunities through distance learning. Alternative teacher preparation programs, including the TFA program, provide formal instruction while preservice teachers are working in the classroom. While some research provides insight into the effectiveness of these programs, there is a gap in the literature about online models for preparing teachers. National and state professional development standards recognize collaboration as a key component of teacher professional development, as teachers are required to collaborate regularly in their professional settings. The majority of research focused on collaboration, or cooperative learning targeted K-12 learners rather than adult learners with unique learning needs. Also, research has suggested that engagement leads to positive learner outcomes. Additional research will help to determine how an educational audience, working collaboratively online, can reach high levels of engagement.

Scientifically-based research in online teaming should be conducted to identify optimal team configurations that are effective for adult learners. If these team

configurations prove to be positive for educators in online professional development, perhaps their learning can transfer into the K-12 classroom and increase teacher collaboration. Moreover, understanding the elements that contribute to or act as barriers to engagement of online adult learners will help institutions and school districts better plan for high-quality learning experiences, particularly for the preservice teacher population. Once the factors of learning and teaching online are better understood, investigation of technology tools to support the high level of collaboration interactions will be needed to maximize educators' learning and engagement.

This chapter reviewed the challenges of preparing teachers online, structuring collaboration online while maintaining high levels of motivation and engagement. This research study introduced an intervention of an instructional design approach that used the ARCS model and structured collaboration solution to address these needs. Based on the assumptions that engagement and interaction are linked to course satisfaction, and that teacher collaboration strengthens teacher effectiveness, three hypotheses were identified. These hypotheses addressed the impact of collaboration on the course interest and motivation by participants— as well as the frequency and quality of their interactions—when a teacher preparation course contains design features from the ARCS model.

CHAPTER II

Review of Literature

Introduction

Literature related to effective instructional practices for online learning that can help improve student satisfaction and promote effective online collaboration are presented in this chapter. The literature review centers on the following major themes: (a) online instructional design; (b) online course design for adult learner motivation; (c) online teacher education (d) collaboration online among educators; and (d) online learner engagement.

Online Instructional Design

Instructional design is a process of generating instruction in an education setting. At its most basic level, it typically involves a consideration of the learner, the organization of content, instructional strategies, and evaluation (Zheng & Smaldino, 2009). Over recent years, instructional design principles and practices have expanded, particularly with the integration of technology, to include understanding learners and learning context, designing learning outcomes, analyzing synthesizing and sequencing subject matter content, engaging learners in the content through well-designed instructional activities; promoting socialization; selecting appropriate media; assessing learning outcomes and providing feedback; and evaluating the teaching and learning process (Naidu, 2013; Russell, 2005). Further, learners can keep engaged in tasks through cooperative learning (Slavin, 1990, 1994).

Online courses have been defined as those courses in which at least 80% of the course content is delivered online (Allen & Seaman, 2015) and there are typically no

face-to-face meetings. Online learning, for the purpose of this study, is characterized by using the Internet to conduct classes in a fully-online format (i.e., without face-to-face contact).

Instructional design processes for online courses were built upon face-to-face approaches to course design. Further research is needed to determine the approaches and strategies that best promote learning in an online mode of delivery (Bernard et. al, 2009; Jarvis, 2006, 2007; Larson & Lockee, 2009). Koble and Bunker (1997) determined that only 17% of the articles published in the *American Journal of Distance Education* in its first eight years of publication were focused on learners and learning. In more recent literature, the research methodologies used in studies to assess student achievement in online learning were poorly reported and difficult to compare as different approaches, terms, technologies and content delivery methods were used (Bernard et al., 2009; Bernard et al., 2004). Additionally, the practice of instructional design was conducted by individuals and entities with a widely varying range of knowledge and experience regarding the theoretical and practical aspects of instructional design (Larson & Lockee, 2009). An analysis of ten national organizations with distance education standards found that only one suggested that instructional designers use a theoretical basis for online course development (Lockee & Burton, 2010). With this demonstrated lack of research, it is not surprising that there is no theoretical framework guiding this field.

The generational evolution of online learning. A notable theme in the research literature around online learning is its categorization into distinct generations. These generations are distinguished based on various classifications, but most commonly on the technology used that spanned these time periods. It is reasonable that the availability of a

particular technology will impact the type of learning experience or learning model that can be developed, rather than the pedagogical considerations coming first. Similarly, many online course approaches are driven by the learning management system, or technology platform for learning, that is available (Anderson & Dron, 2011). It is also worth noting that the online learning experiences in a previous generation do not disappear; rather, a broader range of learning experiences were increasingly appearing. This was evident throughout the extensive review of the literature, as online learning experiences included a wide range of instructional practices such as: individualized models/self-paced or non-facilitated; online learning communities; collaborative models; and synchronous versusasynchronous models.

Rubens, Kaplan, and Okamoto (2014) described the evolution of online learning. These authors described the first generation of online learning as focused on viewing content online. Learning content was organized into modules or courses, and may have been supported by quizzes, tests, and discussions. The second generation mirrored the new social capabilities of the Internet by incorporating more socialor collaborative activities within teaching and learning activities. Interestingly, the authors predict that the next generation, E-Learning 3.0, will involve better use of the vast data being produced on the web and incorporate artificial intelligence technology to support learning.

These generations are fairly consistent with those identified by Connolly and Stansfield (2007). However, these authors defined three generations of e-learning that reflect both technology use and changes in instructional practice. The first generation, according to these authors, was from 1994 to 1999. In this generation, traditional course materials were simply repurposed for an online format and posted on the Internet. In the

second generation, from 2000 to 2003, involved a transition to higher bandwidths; rich streaming media, more online resources available, and a move to virtual learning environments with access to learning content, communication tools, and related student support services. The third generation that began in 2004 involved greater collaboration, project-based learning, increased socialization, and reflective practices. Tools available in the third generation skyrocketed with the advent of Web 2.0 technologies, such as wikis, blogs, and social networking tools.

Anderson and Dron (2011) presented a different, pedagogically-based view of the generational evolution of online learning. This view encompassed three distinct generations that arose in chronological order, and they are consistent with learning theory grounded in epistemology of these time periods as well as technologies available. The authors purported that all three generations should be used effectively to address the full spectrum of needs of learners today.

The first generation, the Cognitive-Behaviorist Pedagogy of Distance Education, was grounded in theoretical ideas of major theorists such as B.F. Skinner, John Thorndike, and Edward Watson. Instructional design was organized into a series of linear stages that include: gaining learner attention; establishing objectives; creating learning opportunities that activate prior knowledge; providing learner guidance and feedback; and assessing learning. This approach is also a foundation of the Keller Plan (Keller & Sherman, 1978), the beginning of Keller's multi-decade work and research in instructional design models. These approaches to online instructional design created large-scale access to learning, with learners achieving clear learning objectives. However, Anderson and Dron (2011) argue that these approaches did not consider the importance

of social context in the learning experiences and the complexities of human beings with varied knowledge and experiences (Anderson & Dron, 2011). Online experiences from this generation are still common today. Common and cost-efficient models still involve self-directed online learning where students work independently at their own pace (Anderson & Dron, 2007; Keller, 2008). Researchers agreed that these models were not proven to promote high levels of interaction or address learner motivation, as they required students to take initiative to seek understanding and complete coursework (Keller, 1987; Russell et al., 2009).

The second generation identified by Anderson & Dron (2011), the Social-Constructivist Pedagogy of Distance Education originated in theories by Piaget, Vygotsky, and Dewey, and was further developed by theorists such as Moore who studied interaction in distance education. These instructional design models vary, but have common themes that include: (1) learning as an active process rather than a passive one; (2) knowledge construction; (3) a learner-centered learning environment that incorporates multiple learner perspectives; and (4) the use of metacognition and evaluation activities to measure and assess one's one learning. In this case, the instructor becomes more of a guide that designs the structure in which the learning takes place. This generation was able to come about because of the discussion thread technologies and more connective abilities of the internet that became more readily available. Social interaction is a key feature of this generation, and as addressed later in this chapter, is considered to be a critical component of quality distance education (Garrison, 1997). While the social interaction is a strength of constructivist distance education pedagogies, the cost and scalability is a concern to maintain these models, causing them to ironically

fall back to more passive learning models seen in the previous generation (Anderson and Dron, 2011).

Similarly, Garrison and Cleveland (2010) stated, "online learning represents a range of practices based on the Internet that provides synchronous and asynchronous communication in a personal and group environment" (p. 19). Online learning is more than just reading materials found in a website, it entails interaction with peers and instructors as well as a place to submit assignments and participate in class discussions. "The post-industrial era of distance education is adopting many of the educational assumptions associated with interactive and collaborative learning" (Garrison & Cleveland, 2010, p. 20). High social interaction may be accomplished with low student/teacher ratios, but budget constraints, system wide goals, and instructional design considerations have prevented systems and institutions from effectively implementing this structure (Pittenger & Doering, 2010).

The third online learning generation identified by Anderson and Dron (2007) is the Connectivist Pedagogy of Distance Education, and it is based on defining work of Canadians George Siemens (2007), and Steven Downes (2007). Connectivist learning focuses on using existing and new networks to solve problems and involves learners finding and applying new knowledge to complete learning tasks. Connectivist learning also goes beyond the constraints of a learning management system and includes both consumption and production of educational content. Like previous generations, this pedagogical practice requires specific technology tools. In this case, it is social networking tools, publishing tools, and searching technologies. Challenges with these practices include the need for technology skills and comfort level in ever-changing

technologies, and learners often finding the need for a more structured learning experience. Connectivism is hard to translate into ways to teach and to learn. Additionally, the expertise a person seeks from an individual or group might not be as accurate or worthy after all (Anderson & Dron, 2007).

Other issues complicate the design of online courses. For instance, it has been speculated that the approaches to designing online learning experiences should differ depending on the audience and context of the learning (Bernard et al., 2009; Gibson, 2003). It can be argued that the development of web technologies do not by themselves influence how learners process information and develop understanding. Rather, the learning outcome is based on the careful design of the learning experiences that incorporate both collaborative and independent learning activities and may be self-directed or directed by others (Anderson & Dron, 2011; Naidu, 2013; Rubens et al, 2014).

Online learning for educators. In education, online learning has become a viable option for teacher professional development. Researchers found evidence that participation in online professional development had positive effects on teachers' instructional practices, content knowledge, and their students' learning; however more rigorous qualitative research is needed to explore the online instructional approach that works best for this audience (O'Dwyer et al., 2010; Russell et al., 2009). In a review of literature on professional learning communities, Ravenna, Foster, and Bishop (2012) concluded that creating an effective professional learning community involved careful planning, the use of digital tools, and extensive face-to-face social interaction. Teachers respond positively when given opportunities for interaction, building learning networks

to foster professional growth and applying newly acquired skills in the K-12 classroom (Lowry, 2007). Additionally, many tools have been introduced in order to support teachers in their own professional development as well as for professional use. The tools introduced by the Web 2.0 concept which include Blogs, and Wikis are meant to create community. These tools are valuable in online learning because they enable the use of collaborative learning in group activities or projects, hence creating community and allowing the students to apply what was learned in the course (Carling & Winter, 2010).

Online Course Design for Adult Learner Motivation

In a comprehensive guide of adult learning theory and research, Merriam and Bierema (2013) concluded that adults bring unique needs to the learning environment. They theorized that the configuration of the learner, context, and learning process together distinguish learning in adulthood from learning in childhood. In his theory of transformative learning, Mezirow (1997) purported that only adults can raise questions about their assumptions and arrive at reflective judgment, and there is a central role of the construct of making meaning in adult education. Additionally, motivation is a distinguishing characteristic of adult learners. Knowles, in his theory of andragogy, describes adults as goal-oriented (Knowles, Holton, & Swanson, 2014). Further, when put into learning teams, adults are most motivated when they believe they can learn the material and the learning will help them to solve a problem or perform a task, and that what they are learning is important.

The ARCS Motivation Model. Keller (1987, 1999) asserted that a critical and most often overlooked aspect of designing online instruction is designing for learner motivation. Motivational design, in the context of online learning, attracts learners'

attention and maintains their engagement. After a comprehensive review of motivational literature, Keller (1979) concluded that motivated students (a) have their curiosity aroused and sustained, (b) expect that the instruction they receive is relevant to their values or accomplishing their goals, (c) have the conviction to succeed, and (d) expect that the consequences of the learning experience must connect with their personal incentives for participation. From these conclusions, Keller developed a theory which is represented by his ARCS model based on an acronym resulting from key words describing these conditions, A for attention, R for relevance, C for confidence, and S for satisfaction.

Attention involves gaining the initial interest of the learner as well as maintaining that interest throughout the learning experience (Keller, 1987a). In the ARCS model, Attention is related to extrinsic motivation and a balance of a learner's value and expectations for success. Strategies for Attention are those which stimulate the learner through external means, such as providing engaging visuals, using varied instructional strategies, or creating an interesting task (Keller, 1987b). In a team-based approach to online learning, learners can look forward to periodic new challenges and assuming different roles as they work collaboratively throughout a course.

Relevance refers to what learners are motivated to learn and what learners will continue to pay attention two once they have become stimulated. A key component of Relevance is the ability to use the best means to deliver instructional content based on learners' preferences (Keller, 1987b). For example, learners who do not prefer to work in groups might not find Relevance in the instructional experience. When using group work in an online course, it is important that learners have opportunities to engage in diverse

activities. Additionally, a helpful Relevance strategy will be to require learners to set and evaluate progress in meeting targeted goals.

Confidence relates to the motivation concept of self-efficacy. This refers to learners' feelings of self-worth and accomplishment. In a course designed to promote Confidence, expectations for performance requirements and assessment scales are clearly communicated to the learners and learners assume personal responsibility (Keller, 1987b). To support Confidence, a team-based learning approach will allow learners to have control over their environment, receive timely peer feedback, and participate in activities with increasing levels of challenge.

Finally, *Satisfaction* concerns learners' feelings of personal effort and accomplishment. This is related to both intrinsic and extrinsic motivations for learning, including enjoyment and recognition of completion through feedback or course grades (Keller, 1987b). By nature, team-based learning can support Satisfaction through collaborative problem-solving of real-world situations. Working in teams, individuals may receive more frequent and quality feedback from peers. It is, however, important that learners feel that their work in teams is assessed fairly and that rewards or consequences are applied consistently.

Keller (2010) developed two measurement tools used in conjunction with the ARCS model. The first, the Course Interest Survey (CIS) was designed to measure students' reactions to instruction that is instructor-led. The second, the Instructional Materials Motivation Survey (IMMS), measures students' reactions to self-directed instructional materials. In online professional development, participants can interact with an instructor for assignment feedback and to guide discussions. Also, all instructional

materials are presented in text and media formats, participants must be able to locate and interact with course content with ease. Keller (2008, 2010) illustrates the validity and reliability of these instruments and the validity of the ARCS model in various distance learning contexts.

The ARCS model has been applied to various types of learning environments including classroom instruction and distance learning. Numerous reports and studies described and confirmed the validity of the model and the measurement tools, as well as their uses in graduate, undergraduate, and non-collegiate settings. Results from studies that have used the ARCS model in online courses demonstrated a positive impact on student satisfaction and completion rates (Pittenger & Doering, 2010; Small, Zakaria, & El-Figuigui, 2004). Pittenger and Doering (2010) analyzed four college courses that were delivered in a self-paced online format to identify features of the ARCS model. These researchers sought to determine if the design of the courses contributed to the high satisfaction of the students and high completion rates. Results indicated that the ARCS model of motivational design had a positive impact on satisfaction and course completion. They identified educational scaffolding as the factor having the most significant impact on the high completion rates. Pittenger and Doering also noted that these courses did not incorporate any student interaction, which they concluded was needed to increase student motivation to complete the courses. A limitation of this study is that only 15% of students participated in the study, and all study participants earned a letter grade of an A or B in the course (Pittenger & Doering, 2010). Small, Zakaria, and El-Figuigui (2004) explored ARCS model components in information literacy skills instruction across community colleges. They found that the majority of instructional

strategies used were to gain students' attention, concluding that a broader range of strategies needed to be incorporated for deeper learning experiences

Online Teacher Education

In 2015, nearly every state had alternative pathways for teacher preparation (National Education Association, 2015). The traditional path to teacher certification involves prospective teachers completing an undergraduate or graduate teacher education program before becoming certified to teach (Dangel & Guyton, 2005). Typically, this pathway requires a one-to-two-years of preparation prior to teaching full time. A faster alternative to teacher certification is characterized by a four- to eight-week focused preparation period followed by full-time teaching and part-time coursework (Johnson, Birkeland, & Peske, 2005). Alternative preparation programs are designed to address a shortage of teachers in large cities and rural areas, with content knowledge in needed areas of special education, mathematics, and science (National Education Association, 2015). These programs are preferable for many, particularly those with considerable life experience, as well as those who want to change careers. Kee (2012) also identified a third certification route that is a blend of the two pathways, providing more preparation prior to entering the classroom, part time work while studying, and more in-depth mentoring. She also noted that programs differ greatly in terms of what features they offer, which makes it difficult to compare them.

Teach for America. A well-known alternative route is Teach for America (Raymond & Fletcher, 2002). Teach for America (TFA) recruits teacher candidates from top universities and colleges. The TFA website describes that, while in the program, teachers are assigned to schools in low-income communities while completing

coursework through the universities (http://teachforamerica.org). According to Darling-Hammond (2015), results on the effectiveness of TFA programs have been mixed. Some studies found teachers performing as effective as traditionally-certified teachers (or even more effective in teaching mathematics), while others performed less effective, especially in the elementary level and in the teaching of reading. By the third year of teaching, studies showed no significant difference in the effectiveness of teachers (Darling-Hammond, 2015). Similarly, Kee (2012) found that first year teachers felt more prepared for teaching when they had adequate pedagogical training, including coursework and field experiences, prior to teaching.

Technology and Teacher Preparation. Despite significant growth in online learning, researchers agree that research is needed in online preparation for preservice teachers (Downing & Dyment, 2013). With teaching online, teachers have the potential to revisit their teaching strategies as they move from a teacher-centered environment to a student-centered one (McQuiggan, 2007). Downing & Dyment (2013) suggested that transforming teaching practice when teaching online demands further research. They asked faculty about what they missed in the online environment, as compared to a face-to-face one. The majority of faculty's responses involved their interactions with students.

In a database search for research articles around online teacher preparation, the concentration of the resulting studies were twofold. First, a significant number of studies focused on the preparation of both pre-service and in-service teachers to use technology in the classroom through traditional or web-facilitated courses. Studies focused on the integration of specific technology tools in teacher preparation programs to support teaching pedagogical and educational technology knowledge, encourage reflective

practice, or prepare someone to teach in virtual K-12 schools (Downing & Dyment, 2013).Although many of these studies do not reflect online instruction, a relevant take-away from one study's findings is that the integration of technology into content courses (rather than taking a separate technology course) better prepared new teachers to transfer that knowledge into the classroom (Mouza & Karchmer-Klein, 2014).

The second concentration of research was on preparing teachers to teach in online K-12 environments, or virtual schools (Downing & Dyment, 2013). While online and blended learning opportunities for grades K-12 expand, Kennedy and Archambault (2012) and O'Brien (2015) called for preservice teacher education programs to prepare teachers to be skilled in teaching online K-12 learners. In their review of the literature on this topic, Eaton, Dressler, Gereluk, and Becker (2015) reported that teachers trained in an online format may be better suited to teach in virtual schools. They also stated that having adequate technical skills and support for technology is important as well as having opportunities for face-to-face, classroom-based field experiences in schools. In blended (online and face-to-face combination) preservice programs, they argue, provide a better sense of community and fewer teachers feel isolated when there are opportunities for discussion and reflection in the online environment. Further, in a qualitative study, Jones and Ryan (2014) analyzed reflections posted in both structured and unstructured online discussion spaces in a teacher preparation program. While they found greater participation in the unstructured forums, the researchers concluded that higher-level reflection was rarely present and further research was needed to explore ways to promote better reflective practice. In another study, through interviews and an online questionnaire to preservice teachers in a Canadian university program, researchers found

that online interactions supported ongoing reflection and increased cognitive engagements when that interaction took place in groups (Depover, Komis, & Karsenti, 2013).

Collaboration Online Among Educators

Collaborative learning is a highly researched topic in K-12 education. According to seminal theorists, Johnson and Johnson (1994), teachers who implement collaborative learning at the K-12 level should strive to promote the highest level of team development among their students through high-performance teams. Differing from traditional group work, high-performance teams have been characterized in the literature by clear group goals and a common purpose, group and individual accountability, continuous improvement, a high level of commitment, equal contributions by team members, and high quality work beyond reasonable expectations (Johnson & Johnson, 1994; Mainzer, 2010; Slavin, 1990). Similarly, Smith (1996, pp. 74-76) lists five elements that he considers to be essential in cooperative learning groups:

- Positive Interdependence: The success of the individuals is tied to the success of the group. This provides a motivation to the group to achieve the group goals.
- Promotive Interaction: Participants actively support one another by sharing resources, support, and encouragement.
- Individual and group accountability: The group is accountable for achieving its goals. Individuals are also accountable for contributing to the group's work.
- Development of teamwork skills: Participants gain interpersonal and small-group skills from working in teams in addition to meeting the academic learning outcomes.

- Group processing: Students periodically evaluate their group's productivity, celebrate successes, and make decisions about improvements needed.

While the definition of collaborative learning varies, the literature suggests the following essential features: (1) intentional design of structured learning activities; (2) all participants in the group are engaging actively to meet the stated objectives and making equal contributions; and (3) meaningful learning takes place (Barkley & Cross, 2014).

Collaboration in teacher professional development. The concept of educator collaboration is promoted in professional development standards and related research. The national Standards for Professional Learning were developed through a collaboration of 40 professional associations and educational institutions to address the challenge of designing high quality instructional experiences for the teacher population (Learning Forward, 2011). These standards, built upon research and best practices of professional development, highlight learners as active participants in the learning process as well as describe the conditions present in professional learning experiences for educators. The *Learning Communities* Standard emphasizes collaboration, communication, and relationship building skills in the context of learning communities to support student learning:

> Professional learning that increases educator effectiveness and results for all students occurs within learning communities committed to continuous improvement, collective responsibility, and goal alignment. (Learning Forward, 2011, Learning Communities section, para.1)

Collective responsibility is described as fostering peer-to-peer support for learning. Additionally, this standard is achieved through collective participation and a cycle of

continuous improvement to engage in "inquiry, action research, data analysis, planning, implementation, reflection, and evaluation" (Learning Forward, 2011, Learning Communities section, para.3).

Studies and syntheses by Lieberman and Miller (2008), Saunders, Goldenberg, and Gallimore (2009), and others support the development of collaborative learning communities in teacher professional development to promote a collective responsibility. In 2010, the Stanford Center for Opportunity Policy in Education produced a technical report of teacher professional development in the United States and abroad. The report described common professional development formats, such as workshops and conferences, as being ineffective in changing practice and improving learning outcomes for children. Instead, the report identifies key factors in the high quality professional development. Engaging teachers in active learning, collaborative activities as part of learning communities and learning teams are included in the report's recommendations. Similarly, Siemon (2009) found that teachers who worked interactively and collaboratively were able to identify their learning needs, and this increased the likelihood of improving learning outcomes for children.

Inherent in the goal of high quality professional development for teachers is the expectation that teachers' learning should transfer to the classroom setting (Learning Forward, 2011). A benefit of teachers engaging in collaborative learning communities in professional development is that these skills can be applied to the K-12 classroom. In K-12 settings, = educational researchers found that structured collaborative learning has been shown to promote practices and outcomes that benefit the education of students by providing opportunities for support and feedback, resource sharing, critical assessment

and reflection, and cultivation of higher level reasoning and creative thinking (Johnson & Johnson, 1994; Mainzer, 2010; Slavin, 1990). Teachers who engage in these team-based learning communities online may have the same positive results. However, Barkley and Cross (2014) stated that, in most cases, collaborative learning is not a replacement for traditional methods of instruction, but rather a helpful companion.

Collaboration among educators online. While collaboration has been thoroughly studied and supported for K-12 learners, it is surprising that few scientifically-based studies focused on the development of high-performance teams of educators in the context of high-quality professional development. Studies of graduate students in higher education and nursing courses provided some insight into structuring teams of adult learners in an online environment (An et al., 2008; Gregory, 2010; Gruenbaum, 2010; Ku, Tseng, and Akarasriworn, 2013; Lightner et al., 2007; Liu & Burn, 2007; Smith, 2008). These approaches included establishing formal learning groups to accomplish a complex task and maintaining stable group membership throughout the learning experience.

In dissertation research of a teacher professional development experience, Lowry (2007) found no significant difference in concept attainment in an online team-based learning community than in a face-to-face setting. The integration of elements of high-quality professional development, core adult learning principles, and structures to promote high-performance teaming led to significant positive effects for both virtual and face-to-face teams. In this study, teachers responded positively when given opportunities for interaction, building learning networks to foster professional growth and applying newly acquired skills in the K-12 classroom.

A study conducted by Ku, Tseng, and Akarasriworn (2013) examined three years' worth of online courses with collaborative components. Using a survey to collect collaborative experiences from students in the educational technology and school library courses, researchers found that the factors of team dynamics (trust, open communication, and cohesion), team acquaintance (opportunities to get to know one another), and instructor support (prompt response to student questions) had moderate to high degrees of correlation with teamwork satisfaction (Ku et al., 2013). Notably, in this study, 70% of the participants were female. These results are consistent with Ritke-Jones and Merys' (2010) qualitative research study of online learners' sense of community wherein female and male composition students collaborating on class projects showed differences in survey responses. Of the six students analyzed across two learning groups, the female students valued student and instructor interaction more highly than male students.

The literature around social networks suggest that interactions both within and between groups of participants are important because they differ (Anderson, 2010). This approach would support the use of whole class discussions along with learning teams in an online course. With multiple levels of interaction and collaboration, teachers may be more likely to influence each other's pedagogical beliefs and teaching practices (Penuel, Wiliam, Frank & Krause, 2010).

In a qualitative study conducted by Tseng and Yeh (2013), researchers found that students who enjoyed working in groups had trust and camaraderie with their team members. Conversely, students with poor teaming experiences indicated negative factors that included lack of communication. To facilitate team acquaintance – team formation and camaraderie – at the beginning of an online course, team members should engage in

teambuilding activities to initiate working relationships and establish social presence. Teambuilding was accomplished through posting introductions, creating team charters or protocols for working collaboratively effectively, and identifying roles such as selecting a leader (Akyol, 2008; Palloff & Pratt, 1999; Turmel, 2010). As teams collaborate over a course, pausing to engage in team reflection and evaluation activities support recognizing team and member achievements and accountability, group processing activities that support learner engagement, conflict resolution, and group interdependence, and informal exchange and trust-building (An et al., 2008; Gregory, 2010; Gruenbaum, 2010). Finally, research indicated a benefit of having a shared space to collaborate (Johnson & Johnson, 1994; Van den Hooff, Elving, & Meeuwsen, 2010). In an online environment, teams can use a discussion board or other web-based tool to facilitate collaborative exchange.

Online Learner Engagement

What is learner engagement? Many different theories and research findings have argued this point (Hrastinski, 2008). More recently, with the online movement, engagement has taken on a different set of issues. In a face-to-face class, adult learner engagement can be observed as they interact in collaborative activities. Also, learners have a presence in the classroom by physically attending. Conversely, in an online forum, learners show they are engaged by establishing social presence and contributing online posts. In the context of online learning, social presence, or the ability to project one's self and establish personal and purposeful relationships, has been characterized in the research literature by frequent, effective communication (e.g., through discussion posts), open communication and group cohesion (Akyol, 2008). Gunawardena and Zittle (1997) defined social presence as the degree that makes someone “real” in an online

environment. Their early groundbreaking research established social presence as a predictor of satisfaction in a text-based medium. Since that time, studies had similar results, showing a strong relationship between social presence and course satisfaction, as well as a strong relationship between social presence and perceived learning (Cobb, 2011; Horzum, 2015; Richardson & Swan, 2003). Shen, Hiltz, and Bieber (2006) analyzed data from 485 students involved in virtual teaming field experiences that incorporated online examinations. Shen et al. presented results showing significantly higher levels of perceived learning and student satisfaction, linked to enhanced interactions and a sense of online community. The design of these learning experiences were unique to other studies in that they involved anonymous students conferencing with anonymous instructors to get support and clarification of the exam design, requirements, and grades.

In 2011, Cobb studied social presence in online nursing courses. Results from a survey analysis indicated a strong relationship between social presence in the course and satisfaction by the students. Findings also indicated that it was less important what medium of communication was used in the course; the students found the experiences with relationships, feeling a sense of community, and feeling comfortable in the online course to be more important and relevant to their course satisfaction (Cobb, 2011).

Interaction in online learning. Moore (1989) was among the first researchers to study interaction as an important component for promoting positive learner outcomes in distance learning. He identified three types of interaction in distance education: learner-to-content, learner-to-instructor, and learner-to-learner. For twenty-years, a large body of research in distance learning has built upon Moore's research (Anderson, 2010). For a

professional development experience to be most effective, learners should establish social presence, engaging in frequent and continuous interaction, particularly in learner-to-learner and learner-to-instructor exchange (Bernard et al., 2009). In her review of research literature on teacher education programs, Ravenna, Foster, and Bishop (2012) cited a body of research that identifies student to student interaction as an essential component to online learning. Also, they found that a high level of interactivity correlates with high student satisfaction and performance in the course.

Interaction is also related to attrition in an online environment, and the numbers of students dropping out of online courses are high. In an analysis of distance learning studies, Kauffman (2015) found attrition rates still remain high compared to face-to-face instruction, ranging from 10 to 50% higher. Also, excitement in having easy access to high quality educational resources online led to the creation of Massive Open Online Courses (MOOC). Despite this opportunity, universities are seeing staggering rates of attrition. For example, Duke University's Fall 2012 Bioelectricity course, with 12,175 participants, only 64% only took the first quiz and just 313 participants passed with a certificate (Belanger, 2012). It was reported that the general dropout rate of MOOCs is 91% to 93% (Yang, Sinha, Adamson, & Rose; 2013). Researchers agree that students are at a higher risk of withdrawing from an online course when they feel isolated from a lack of social interaction and/or collaboration with peers (Kauffman, 2015; Mayne & Wu, 2011; Rovai & Downey, 2010).

In a review of educational research literature, Hrastinski (2008) discovered that the frequency of interaction in the online environment was the most commonly used indicator for evaluating online learner participation. For example, instructors may require

students to contribute a specified number of initial postings and follow-up responses to the course discussion board to meet participation requirements. Several distance learning studies that operationally defined participation as the frequency of interaction, he reports, have demonstrated positive outcomes for learners. Multiple studies found that participants' high frequency of interaction, in the context of distance learning, resulted in more effective communication and collaboration, deeper academic levels of discourse, and a higher perception of learning (Bernard et al., 2009; Richardson & Swan, 2003; Wang, 2004; Wang & Kang 2006). A qualitative discourse analysis of 28 faculty members and 20 students in online business courses also showed that collaboration played a key role in facilitating high levels of interaction and perceived learner engagement (Liu, Magjuka, Bonk, & Lee, 2007).

In addition to the frequency of participation, Hrastinski (2008) discovered more complex indicators of online learner participation, and proposed a definition that included learners' feelings about their participation. He further identified units of analysis reflecting participation from the study designs, in addition to frequency and quality of posts, such as learner perceptions measured through surveys and interviews, system logins, and number of messages read. Other studies have focused on the quality of interaction to promote learner engagement, citing that a learner may contribute several discussion posts over a course a time, but the posts might not be substantive (Horzum, 2015; Jaggars & Xu, 2016). Illustrated in this example, engaged learners contribute high quality posts.

A unique, more comprehensive view of learner engagement was created by Munns and Martin (2005). They developed a conceptual framework based on existing

frameworks in sociology and psychology to link learner engagement and motivation. Focused on school and classroom-based relationships and face-to-face settings, The MeE framework combined the Martin psychological perspective on motivation and the sociological research from the 2004 Fair Go Project on student engagement. This framework, designed to guide planning for learner engagement and evaluation, promotes a multifaceted approach to encourage motivation and engagement. The ways that individuals are supported and encouraged are important elements of the framework that contribute to motivation. Additionally, the relationships that occur within the teaching and learning context impact engagement. Multiple levels of online learner participation are considered including frequency of participation and feelings of self-efficacy. Further, collaboration among learners is supported through the Relational level of the framework. The conceptual framework is depicted in Figure 4.

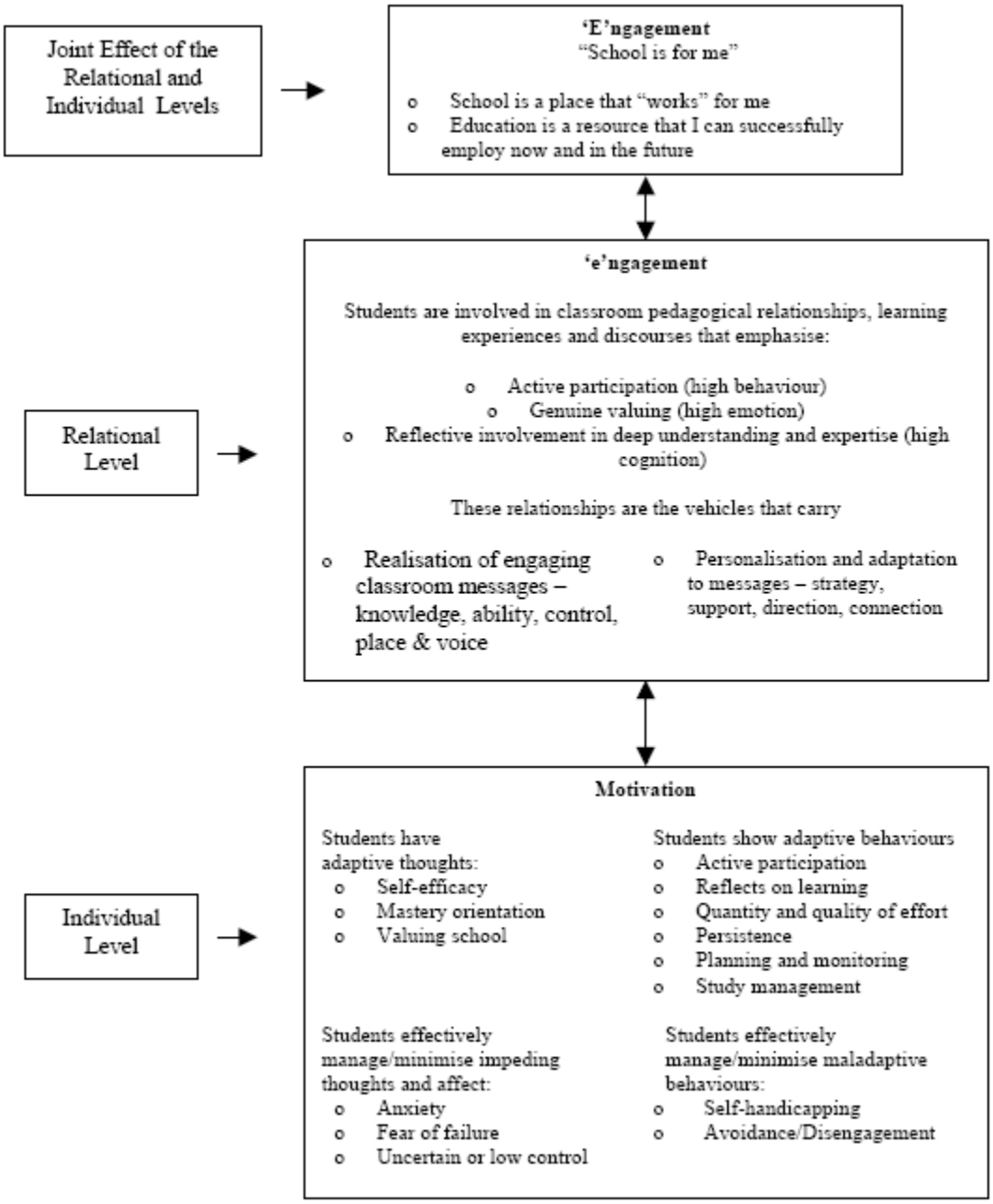

Figure 4. The MeE Framework of Motivation and Engagement. Reprinted from "It's All About MeE: A Motivation and Engagement Framework", by G. Munns and A. Martin, 2005. Paper presented at Australian Association for Research in Education Annual

Conference, Sydney, December. Copyright 2014 by G. Munns and A. Martin. Reprinted with permission.

Studies showed that learning outcomes improved when participants were engaged in the process of learning by establishing their own goals, exploring appropriate resources, and working with others in groups (Dennen & Wieland, 2007; Wang & Kang, 2006). In a technology-enhanced learning environment designed to promote social learning among adult learners, researchers observed quality participant engagement evidenced by collaborative problem-solving, constructing mental models and social maturation (Lightner et al., 2007). For the purposes of this study, engagement will be viewed by both the frequency of interactions as well as learners' self-ratings of the quality of their interactions with classmates and contributions of group members. If an engaged online learner is one who interacts with others at a high frequency, collaboration can be required among participants to promote higher levels of interaction.

Research Problem

The literature review presented historical and current research in the field of online learning and teacher preparation, including the need for further research in instructional design methodologies that promote learning as well as effective design strategies that motivate and engage an educational audience. Additionally, if collaboration and high levels of interaction are important themes in the research literature, how are collaborative learning experiences best structured in an online environment to maximize teacher learning? While there is limited rigorous quantitative research for a model of team-based learning experiences, K-12 research on high-performance teaming and empirical research of online learning teams provide strategies

for implementation that warrant consideration and further testing in the online learning environment.

Research and theory in adult learning recognized factors that distinguish adult learners from children. For adult learners and particularly in online learning settings, the concept of motivation is relevant. Keller's (1979) theory of motivation recognizes four areas of motivation that apply to technology-supported instruction: Attention, Relevance, Confidence, and Satisfaction. After analysis of these areas, a structured, team-based approach to online instruction may provide strategies that motivate learners in an online course.

Additionally, a team-based approach may prove to increase learner engagement in an online environment. The literature review explores definitions of engagement, operationally defining engagement as the frequency and quality of participant interaction. If an engaged online learner is one who interacts with others at a high frequency, collaboration should be required among participants to promote higher levels of interaction. However, if engagement is a complex endeavor that incorporates behavior, emotion, and cognition, then the instructional design and structure of collaboration in an online environment becomes a more relevant issue.

The purpose of this literature review is to address the problem: Will preservice teachers be more satisfied in the course and in the course design, and will they be more engaged, exhibiting a higher level of interaction with satisfaction, when working collaboratively in teams versus individually in an online course? The purpose of this study it is to compare a team (collaborative) versus an individual model of online instruction designed for motivation to determine if learners will be more satisfied,

motivated, and engaged in the collaborative model of learning used within an alternative online teacher preparation program.

CHAPTER III

Method

Introduction

This quasi-experimental, quantitative study tested the effects of a collaborative online learning model for teachers compared to an individual learning experience. In the control group, students worked individually on coursework, only using a whole group discussion forum for interacting with class members. In the treatment group, students worked in learning teams throughout the course, interacting with team members in team discussion forums. The study design and methodology are described in this chapter in the following seven sections: (a) recruitment and selection of the participants, (b) the setting in which the study was conducted, (c) independent variables that were investigated and instruments used, (d) dependent variables that were measured, (e) procedures for conducting the study, (f) research design, and (g) the statistical analyses that were used to test the hypotheses.

Participants

Online participants. One hundred and four teachers in the university's Teach for America (TFA) in Maryland were recruited to participate. To be eligible for in the study, participants must (1) be enrolled in the university's online graduate TFA alternative teacher preparation program; (2) enrolled in one of five sections of the two spring semester reading courses that are included in the study, Teaching Reading Across the Content Areas, or Assessment for Reading Instruction, and (3) have reliable Internet access. Participants self-enrolled through the university's online registration system.

Online instructors. Five instructors were recruited to participate in the study. Each instructor taught one section of the course. The participating instructors in this study were highly qualified and experienced in the field of education. All of the instructors served as a K-12 teachers and higher education instructors throughout their careers. Additionally, the instructors received training to teach online through the university and had prior experience teaching in online settings for adult learners.

Setting

The online environment for the study was the Johns Hopkins University School of Education Center for Technology in Education's Electronic Learning Community (ELC), a secure web-based course platform. The ELC contained interactive content, announcements, discussion board, calendar, and file storage capabilities. Participants were able to access the ELC from anywhere at any time using a web browser and a secure login and password. Discussion boards provided a forum for participants to post messages in their own time and read and respond to those previously posted by other course participants or the instructor. These discussions were threaded, showing an ordered graphical display of postings and replies.

In the ELC, materials were organized in a particular way for instructional delivery. Resources and activities were organized into sessions that course participants complete over a designated period of time. Each instructional session contained: introductory content; a video presentation of content and/or assigned articles and textbook readings; an activity that may include a requirement to post in an online discussion forum; an assessment; and a wrap up activity. Each session also had a

checklist that contained a summary of the required session components and due dates. All of the content and directions for the sessions were accessible through the ELC navigation.

An "Open Forum" discussion board was created for each course. In addition, team discussion boards were created in the course platform for students in the treatment group. Students in the team group also had access to a whole group "Open Forum" discussion board. These discussion boards were linked throughout the sessions to encourage discussion and collaboration among all participants. Assignments were submitted by students individually in the ELC Gradebook tool and then graded by the instructor. All course grades were private, visible only to the instructor and individual students.

Instruments/Dependent Variables

Four variables were evaluated to assess the potential differences between the control and treatment conditions: (a) motivation toward course interest, with four subcomponents of student motivation measured by Keller's ARCS Motivation Model; (b) motivation toward instructional materials, with four subcomponents of student motivation measured by Keller's ARCS Motivation Model; (c) frequency of participants' interactions, as measured by usage statistics for participation; (d) perceived quality of the interactions as measured by participants' responses to a survey question at three points in time.

Motivation toward course interest. Keller's ARCS Motivation Model is an approach to designing learning environments that increases students' motivation to learn. Originating in 1983 by Keller, this approach focuses on four categories, or components of motivation based on the research in this area: Attention, Relevance, Confidence, and Satisfaction. The instructional design process implemented to enhance these courses

considered the motivational characteristics of the learners and promoted the development of learning experiences that were appropriate for them. Because the categories are supported by different psychological constructs, data analyses looked at each separately.

All study participants completed Keller's (2010) ARCS Measurement Survey, the Course Interest Survey (CIS) (see Appendix A for the complete instrument). Designed for instructor-led settings, this validated instrument estimated learners' motivational attitudes towards the courses. This 34-item questionnaire prompted students to provide a rating for each statement on a five-point Likert scale (1 = Not true, 2 = Slightly true, 3 = Moderately true, 4 = Mostly true, 5 = Very true).

Numerous reports and studies have described and confirmed the validity of the model and this measurement tool, as well as its use in graduate, undergraduate, and non-collegiate settings (Chang & Chen, 2015; Keller, 2010; Kim & Keller, 2011; Park & Choi, 2009). After two pilots with 45 and 65 undergraduate students, Keller administered the CIS with 200 undergraduate and graduate education students in a Southeastern university. Internal consistency estimates based on Cronbach's alpha were satisfactory (Table 1).

Table 1

Keller's (2010) CIS Internal Consistency Estimates

Scale	Reliability Estimate α
Attention	0.84
Relevance	0.84
Confidence	0.81
Satisfaction	0.88
Total Scale	0.95

Additionally, scores on each instrument subsection were correlated at a significance of $p < .05$ with students' course grades, but were not significantly correlated with grade point averages.

Motivation toward the instructional materials. All study participants completed Keller's (2010) ARCS Measurement Survey, the Instructional Materials Motivation Survey (IMMS) (see Appendix B for the complete instrument). This instrument, validated by Keller (2010) contained 36 Likert-scale statements that measures the four individual ARCS components and was used to determine participant reactions to the online instructional materials. Numerous studies also described and confirmed the validity of this instrument (Keller, 2010; Loorbach, Peters, Karreman, & Steehouder, 2015; Yacob, Yusoff, & Saman, 2013). Keller (2010) administered the IMMS to 90 undergraduate students of preservice teachers at a large Southern university. Internal consistency estimates based on Cronbach's alpha were satisfactory (Table 2).

Table 2

Keller's (2010) IMMS Internal Consistency Estimates

Scale	Reliability Estimate α
Attention	0.89
Relevance	0.81
Confidence	0.90
Satisfaction	0.92
Total Scale	0.96

This survey was validated through an experimental study of two treatment groups, with one having traditional, non-enhanced instructional materials and the second having enhanced materials. Both lessons had the same objectives and technical content. Scores for the enhanced lesson were significantly higher than those on the non-enhanced lesson.

Frequency of interaction. Engagement was measured by participants' frequency of interaction in the course, as determined through usage statistics. Usage statistics captured the total number of postings by participants in the study throughout the course. Postings in both team (team condition only) and whole group (individual and team condition) discussion forums were included. Discussion postings for the instructors were not included in the total count.

Quality of interaction. A self-report question using a 4-point Likert scale was administered at three points in the course (at the beginning after the first week, at the midpoint, and at the end of the course) to determine the perceived quality of the interaction among participants in the course. The rating included the indicators from high quality interaction to limited interaction (see Appendix C for the Quality of Interaction

Rubric). Engagement ratings were captured at the three points in time to compare by control (students working individually) and treatment (students working in teams) group.

Demographic survey. By the end of the first week of each course, participants completed a demographic survey (see Appendix D). This survey was originally designed by the university's distance education unit and used over 20 times for online professional development initiatives. The survey was modified for this research study to provide additional information about participants' prior experience with online learning.

Data security. All surveys were put online in a secure Survey Monkey tool. Participants were given a number code that corresponds to the last four digits of their cellular phone numbers. This code was used by the student investigator to ensure survey completion among all participants while maintaining privacy as survey results were not personally identifiable. Only the student investigator had access to the survey data via a private account. Participants were assigned a code once consent forms were signed. These codes were kept separate from participant names in a password-protected file on the student's computer.

Independent Variable

Two experimental conditions were compared during this study: (a) two four-week facilitated online reading courses with a team-based approach, and (b) two four-week facilitated online reading courses with an individual approach. The first reading course, Teaching Reading in the Content Areas, had students divided into three sections. The second reading course Assessment for Reading Instruction (Elementary) had students divided into two sections. To control for variance in the course facilitation, the five course instructors were trained to use a fidelity checklist (see Appendix E). Across

courses, both conditions applied the same instructional design approach for motivation and activities to engage participants. Also, participants worked through the curriculum at the same pace in the ELC.

Reading course 1: Assessment for Reading Instruction. The first course, Assessment for Reading Instruction, was designed for novice elementary school teachers. Course topics included: analyzing issues regarding reading assessment; communicating with key stakeholders around literacy assessment; selecting and implementing diagnostic, formative, and summative reading assessments; and analyzing reading assessment results. Learners were assessed through a communication planner activity, mini-case study activity, and the development of action steps based on assessment results.

In the teaming approach to course delivery, students formed small learning teams to engage with throughout the course. Students were prompted and encouraged to have team-led course discussions around content and activities with their assigned team members in designated team spaces. A space for whole class discussions was available for students to engage in discussion with the instructor and other class members outside of the team. In the individual approach to course delivery, students were encouraged to participate in class discussions around the same content and activities. However, they were expected to complete and turn in assignments independently. Students in all course groups had to participate a minimum number of times to the discussions, regardless if they were in the team or individual approach.

Reading course 2: Teaching Reading in the Content Areas. Designed for novice middle and high school math, science, and social studies teachers, topics of Teaching Reading in the Content Areas included: effective practices for literacy

instructional planning and assessing literacy; selecting and reviewing content literacy materials; reading strategies; and intervention strategies for diverse learners. Course assessments included administering a literacy assessment, analyzing classroom literacy materials, and developing and implementing a literacy lesson plan.

This course had the same format and scope of requirements as the Assessment for Reading Instruction course. In the teaming approach, students formed small learning teams and were prompted and encouraged to collaborate each week with their teams in designated team spaces. Also, a whole group discussion space was available for students to have discussions with the instructor and other students outside of the team. The only requirement for a whole group discussion was a getting-to-know you discussion prompt in the beginning of the course. In the individual approach, students received the same encouragement to participate in class discussions in open discussion forums but completed assignments independently. Similar to the other reading course, students in all course groups had to contribute a set minimum number of times to the discussions.

Before the study began, both courses were designed for motivation based on Keller's (1987) ARCS Motivation Model. For example, participants were provided activities that they can apply directly in their classrooms in an attempt to both attract and maintain *Attention* (A) through *Relevance* (R). Also, the course was designed for participants to achieve Confidence (C) through progressively more challenging tasks throughout the course. In addition, participants will earn university graduate credit for successful completion of the course that can be applied to their degree-bearing program which supports *Satisfaction* (S). Appendix F contains a more detailed list of course modifications based on the ARCS Motivation Model.

Procedure

Before beginning this study, permission to conduct research was obtained by the Homewood institutional review board of Johns Hopkins University (see Appendix H for approval and informed consent forms). The investigator conducted meetings to discuss the proposed research with the university's Director of Distance Education unit and the education program's supervisor. Through these discussions, the courses of most immediate need for improvement were identified and a process for implementation was agreed upon. The plan for revising the course curriculum was based on feedback from students in the program and effective practices recommended by the online learning team at the Johns Hopkins University's School of Education Center for Technology in Education (CTE), developers of the ELC.

Upon approval from the institutional review board, the following steps were implemented to complete the study. First, a recruitment plan was developed and implemented with the support of the program leadership and CTE. Materials about the study were sent to all of the students enrolled in the selected courses as well as the instructors contracted to teach these course sections. Instructors participated in an online training session prior to the start of the course to receive an overview of the initiative, consent to participate, and learn to use the fidelity checklist. All of the subjects were invited by email to come together online at the start of the course for a thirty-minute session to receive an overview of the initiative, sign informed consent letters, and complete the initial demographic survey (see Appendix G for IRB letters of consent).

Five intact groups of participants enrolled in the two courses were assigned to one of two experimental groups and numbered as illustrated in Figure 5.

	Control Group *Individual Approach*	Treatment Group *Team Approach*
Assessment for Reading Instruction (ARI)	Section 1	Section 2
Teaching Reading Across the Content Areas (TRC)	Section 1 Section 2	Section 3

Figure 5. Overview of Experimental Groups. This figure shows the number of sections assigned to each experimental group by course.

Participants self-enrolled in one of two course sections of the Assessment for Reading Instruction course or one of three course sections in the Reading across the Content Areas course. Course sections were first randomly assigned to the control group that had an individualized learning approach, and treatment group that had a team learning approach. As shown in Figure 5, three sections of the courses were assigned to the control group, and two sections were assigned to the treatment group. Then, sections were numbered for reference in the study (e.g., ARI Section 1).

In the treatment group, participants were randomly assigned to four- or five-member teams within their group using a random number table. Within these teams, participants collaborated within their assigned group as they advanced through the curriculum. Open team spaces were available in the ELC for groups of students to work collaboratively on activities. The team spaces had discussion boards and file storage capabilities that were the same as those used by all participants in the ELC, but the spaces were designated and labeled for teams. They followed team-based procedures as they

completed activities in a team space and created work products with their assigned team members. Team members also had access to the whole class for support via an "Open Forum" asynchronous discussion forum. Likewise, participants in the control group (working individually) had access to the whole class for support via the "Open Forum" asynchronous discussion forum. However, in the individual learning approach, participants did not belong to teams and completed all activities independently.

In the individual approach, instructors facilitated the whole group discussions. In the team approach, teams facilitated their small group discussions. Instructors did not have a presence in the team discussion forums. For both experimental groups, the instructors monitored learner participation for their individual sections throughout the course by periodically reviewing learning products and posting instructional tips, reminders, and feedback to the whole class via the ELC announcements and community (Open Forum) discussion board. The instructors followed a fidelity checklist to ensure the same instructional support was applied to all groups.

The content of the courses was organized into three sessions, Week 1, Week 2, and Weeks 3/4. The combining of the last two weeks of the course was due to the large assignments that took place those weeks. The team approach required participants to complete activities in teams each session, as well as complete additional teambuilding activities in Week 1. First, participants were notified of their membership to four- or five-member teams at the start of the courses as well as the expectation that they will be required to work in their teams to complete team activities. These activities included asynchronous course discussions as well as providing support for team members to

complete course assignments. In the first week, participants engaged in a series of teambuilding activities listed below:

- **A getting to know you activity**: Teams discussed commonalities among members.
- **Forming a team identity**: Based on team member commonalities, each team developed a team name. This name will be shown on the team's designated discussion forum.
- **Developing operating standards**: After reviewing characteristics of a high-performing team, teams were guided to develop standards for how they will be expected to perform as a group throughout the course.
- **Assigning team roles**: Each team reviewed roles assigned to individual team members for various course activities. These roles, defined as Facilitator, Coach, Resource Manager, Reporter, and Wildcard (for five-member teams only) with assigned specific job descriptions, rotated each week so that individuals shared the workload equally (See Appendix I for teambuilding directions and team roles).

At the midpoint of the course, teams were prompted to think about the effectiveness of their teams and evaluate the extent that they were engaged in their team discussions. This information was not used in the study analysis, but the prompt assisted team members to reflect upon how their teams were operating as well as their individual contributions to the teams.

In every subsequent session, all participants were asked to indicate what they like about the course so far (select all that apply): Overall content of the course; Course

materials; Opportunities to interact and share my learning with others through discussion forums; Support and feedback that I have received from the facilitator and others; Use of the cycle of instruction; Electronic Learning Community (ELC) course environment; and Other (Please specify.) Also, they were asked to identify any challenges they encountered in the course and areas they needed assistance. These responses were shared in broad class summary format (with no possible personally identifiable information) with instructors so they would be able to address any outstanding issues with the whole class. A summary of the activities and differences in the control and treatment groups are presented in Figure 6.

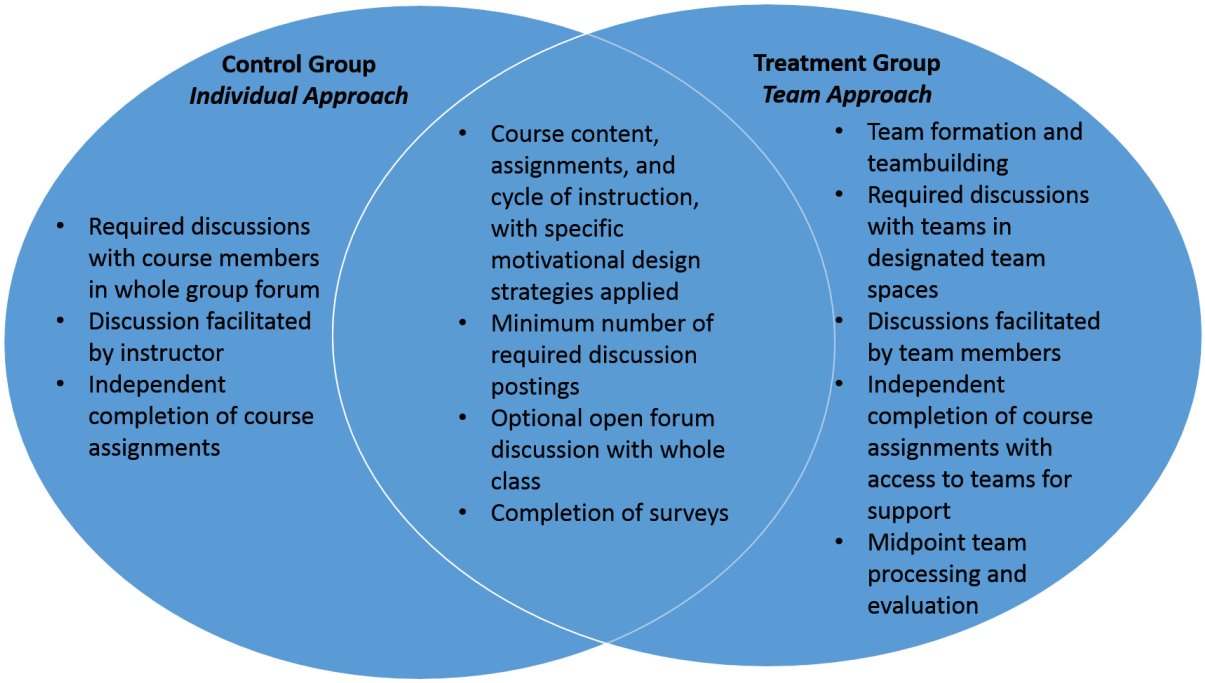

Figure 6. Similarities and differences between individual and team approaches. This Venn diagram shows similarities and differences with regard to the control and treatment group, with the treatment group having structured team activities applied.

Research Design

This quasi-experimental, quantitative study analyzed posttest only data from three questionnaires and usage statistics from two four-week online graduate teacher preparation courses that incorporate high-performance teaming compared to ones that incorporate individual activities. This study sought to determine if participants are more motivated and engaged in the teaming condition as compared to the individual condition based on the variables of Attention, Relevance, Confidence, and Satisfaction, engagement, and perceived value of the interaction.

Statistical Analysis

An experimental, posttest only, control group design was used to answer the research questions. Intact groups of participants were purposely assigned to one of two course conditions.

Hypothesis 1: Motivation toward course interest. It was predicted that teachers in the treatment group will have higher motivation and interest toward the course than teachers in the control group. Mean values were calculated for the administration of the Keller's (2010) ARCS CIS for both groups. Comparison of the analysis of the means were performed to determine if any differences are present between the control and treatment groups. A one-way analysis of variance (ANOVA) was used to compare the CIS overall score means for both the control and treatment groups to determine significance. Also, a one-way analysis of variance (ANOVA) was used to compare each of the ARCS subcomponent score means for both the control and treatment groups to determine significance. This test determined significance for the ARCS subcomponents of motivation, Attention, Relevance, Confidence, and Satisfaction.

Hypothesis 2: Motivation toward the instructional materials. It was predicted that teachers in the treatment group will have higher motivation toward the content and learning materials than teachers in the control group. Mean values were calculated for the administration of the Keller's (2010) ARCS IMMS for both groups. Comparison of the analysis of the means were performed to determine if any differences were present between the control and treatment groups. Also, a one-way analysis of variance (ANOVA) was used to compare each of the ARCS subcomponent score means for both the control and treatment groups to determine significance. This test determined significance for the ARCS subcomponents of motivation, Attention, Relevance, Confidence, and Satisfaction.

Hypothesis 3: Engagement in the online course. It was predicted that teachers in the treatment group will be more engaged than teachers in the control group. Engagement in the online course was measured by the frequency of participants' interaction and the quality of their interaction in the courses.

Hypothesis 3.1: Frequency of interaction. It was predicted that teachers in the treatment group will interact more online than teachers in the control group. Data were collected from all participants through the number of discussion posts captured through the course usage statistics. Each course required the same minimum number of posts. The total number of discussion posts compared included the number of total combined whole group (control and treatment) and team (treatment only) discussion postings for each course section. To control for the course, Z-scores were computed for raw scores. Because each section had a different number of participants, the computed Z-score was

then divided by class size to determine the rate of posts per course. The rate of posts for courses in the control group was compared to the treatment group.

Hypothesis 3.2: Quality of interaction. It was predicted that teachers in the treatment group will report a higher rating of the quality of interaction over time than the teachers in the control group. Descriptive statistics were reviewed to determine whether interaction ratings were positive for control and treatment groups, and if there were any patterns or changes these ratings over time as the course progressed.

Summary

One-hundred and four teachers enrolled in an online teacher preparation program and five instructors were recruited to participate in this study. Two independent variables were compared. Five intact groups of participants in two courses were assigned to a control or treatment group. The participants in the control condition completed the course individually, while participants in the treatment condition worked in structured learning teams. To evaluate the differences between the control and treatment groups, data on four dependent variables were collected: (a) motivation toward course interest, with four subcomponents of student motivation; (b) motivation toward instructional materials, with four subcomponents of student motivation; (c) frequency of participants' interactions; and (d) perceived quality of the interactions. A quasi-experimental, posttest only, control group design was used to answer the research questions. Outcome data for the first two variables was compared using a one-way ANOVA. The third variable was analyzed through the computation of a rate of post score and comparison of this rate by group. The fourth variable was analyzed using descriptive analyses.

CHAPTER IV

Results

Three hypotheses were tested to assess the effects of teaming in an online teacher education course on motivation and engagement, as compared to an online teacher education course where students worked individually. In order to test these hypotheses, motivation toward course interest was assessed through the Course Interest Survey (CIS), and motivation toward the instructional materials was assessed through the Instructional Materials Motivation Survey (IMMS). In addition, learner engagement was assessed through the frequency of participation as well as participants' ratings of the quality of their interactions at three points in the courses. This chapter begins with a description of the participants followed by the results of the study, arranged in order of the stated hypotheses.

Characteristics of Participants

One hundred and four preservice teachers from a Teach for America program enrolled in a large private university in the mid-Atlantic region participated in this study. Teachers were registered in one of two online reading courses, Assessment for Reading Instruction (ARI) and Teaching Reading Across the Content Areas (TRC). ARI had two sections of students, and TRC had three sections of students. These intact groups were randomly assigned to control (participants working individually) and treatment (participants working in teams) groups. Fifty-seven students were assigned to the control group, and 47 students were assigned to the treatment group. The number of students per section is shown in Table 3.

Table 3

Participants by Course Section and Condition

Course/Section	Control *n (%)*	Treatment *n (%)*	Total *n (%)*
ARI			
Section 1	24 (23.1%)	0 (0%)	24 (23.1%)
Section 2	0 (0%)	27 (26.0%)	27 (26.0%)
Total	24 (23.1%)	27 (26.0%)	51 (49.1%)
TRC			
Section 1	10 (9.6%)	0 (0%)	10 (9.6%)
Section 2	23 (22.1%)	0 (0%)	23 (22.1%)
Section 3	0 (0%)	20 (19.2%)	20 (19.2%)
Total	33 (31.7%)	20 (19.2%)	53 (50.9%)

The following demographic data were collected for all participants: gender, grade level taught (elementary/K-8 or secondary/9-12), education level, and online course experience. To determine online course experience, participants were asked to identify the number of online courses taken. Table 4 presents the characteristics of participants by experimental group.

Table 4

Characteristics of Participants by Condition

Demographic Variable	Control *n (%)*	Treatment *n (%)*	Total *n (%)*
Gender			
Female	43 41.3%)	38 (36.5%)	81 (77.9%)
Male	13 12.5%)	9 (8.7%)	22 (21.2%)
Other	1 (1.0%)	0 (0%)	1 (1.0%)
Grade Level			
Pre-K/Elementary	30 (28.8%)	34 (26.0%)	57 (54.8%)
Secondary	27 (26.0%)	13 (12.5%)*	47 (45.2%)
Education Level			
Bachelors	54 (51.9%)	45 (43.3%)	99 (95.2%)
Masters	2 (1.9%)	2 (1.9%)	4 (3.8%)
Doctorate	1 (1.0%)	0 (0%)	1 (1.0%)
Online Course			
Experience	5 (4.8%)	1 (1.0%)	6 (5.8%)
Novice	49 (47.1%)	38 (36.5%)	87 (83.7%)
Experienced	3 (2.9%)	8 (7.7%)	11 (10.6%)
Highly Experienced			

Note. Analyses revealed a statistical significance in the number of participants in each group by grade level. A significantly higher number ($p < .05$) of secondary educators were in the control group than the treatment group. There was no statistically significant difference ($p > .05$) for the other demographic variables.

The demographic variable of online courses taken appeared to be evenly distributed across the control and treatment groups. To test the distribution of this variable, three levels of experience were defined: (a) "novice" participants who have never taken an online course; (b) "experienced" participants who have taken one to seven online courses; and (c) "highly experienced" participants who have taken eight or more online courses. The range of experiences in taking online courses from novice or new to highly experienced was documented in the literature (Muilenburg & Berge, 2005).

A chi-square goodness of fit test was conducted to assess whether there was a significant difference in any of the demographic variables by the experimental condition. There was no significant difference ($p > .05$) between the treatment and control groups for the variables of gender and education level. There were statistically significant differences in the number of secondary educators that participated in the study ($\chi^2(N = 104, df = 1) = 4.228\ p < .05$).

Additionally, participants were asked if they completed the online courses they took. In the study sample, three participants (2.9%) in the study indicated they did not complete all of the online classes they took. One of the participants (1.0%) was in the control group, and two of the participants (1.9%) were in the treatment group. There was no statistically significant difference ($p>.05$) for this demographic variable.

Because social media are technologies that facilitate informal learning and social interaction (Bryer & Zavatarro, 2011), participants were asked to rate their level of activity in using social media using a scale from one (not at all active) to four (very active). A chi-square analysis showed no significant difference between the treatment and control groups for the variable of social media activity (see Figure 7).

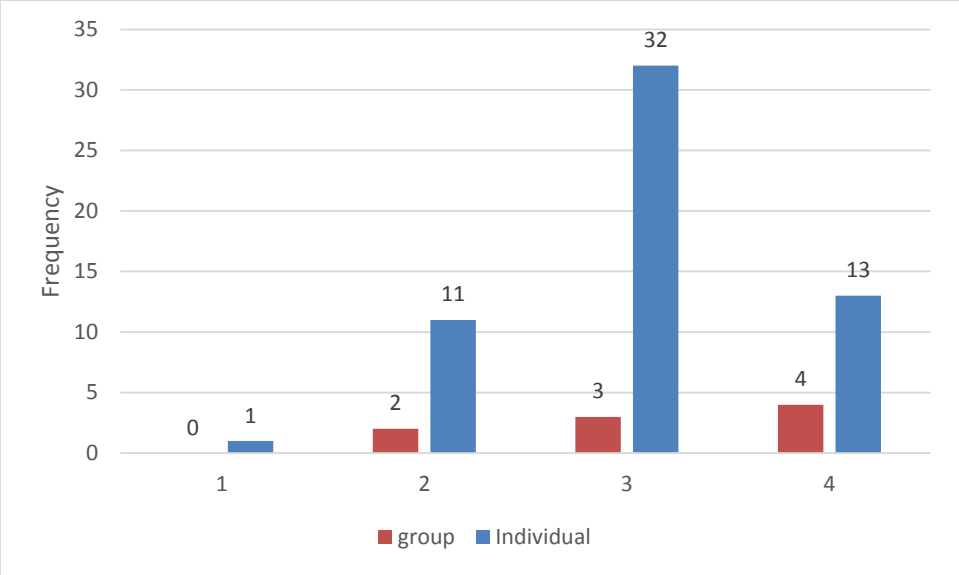

Figure 7. Frequency of social media activity. This figure illustrates the frequency of participants' social media activity by experimental condition from one (not at all active) to four (very active).

Hypothesis 1: Motivation toward Course Interest

Hypothesis 1 stated that will be a significant difference in the motivation variable set of Attention, Relevance, Confidence, and Satisfaction composite scores between participants who experience working in high-performance teams and participants who work individually in an online teacher education course. This hypothesis examined the differences between the learning approaches on the composite CIS (questions 1-34). There were 104 participants who responded to all of the items on the CIS questionnaire, 57 in the individual approach and 47 in the team approach. Descriptive statistics are in Table 5.

Table 5

Descriptive Statistics for the CIS (Full Scale)

Group	*N*	*M*	*SD*
Individual	57	3.14	.69
Team	47	3.43	.65
Total	104	3.27	.68

The CIS had a high level of internal consistency, as determined by a Cronbach's alpha of 0.941. There were no outliers in the data, as assessed by inspection of a boxplot for values greater than 1.5 box-lengths from the edge of the box. The CIS score was normally distributed for the individual and team groups, as assessed by Shapiro-Wilk's test ($p > .05$). A one-way ANOVA was conducted to determine if there was a difference in means between the treatment and control groups. The analysis revealed that there was a statistically significant difference between the control and treatment groups in the motivation toward the courses (CIS score), with students in the treatment group reporting significantly higher motivation toward course interest ($n = 47$, $M = 3.4$, $SD = 0.7$) than students in the control group ($n = 57$, $M = 3.1$, $SD = 0.7$) in the online teacher education courses [F (1, 102) = 4.86 $p < .05$]. Based on the significantly higher score of motivation toward course interest in the treatment group, hypothesis 1 was accepted.

Subcomponents of motivation toward the course. The CIS questionnaire contained questions related to the four subcomponents of motivation: Attention (eight questions); Relevance (nine questions); Confidence (eight questions); and Satisfaction

(nine questions). Descriptive statistics for scores on the CIS subcomponents are in Table 6.

Table 6

Descriptive Statistics for the CIS (ARCS Subcomponents)

Group	*N*	*Mean*	*SD*
Attention			
Individual	57	2.82	.79
Team	47	2.91	.71
Total	104	2.86	.75
Relevance			
Individual	57	3.44	.79
Team	47	3.66	.69
Total	104	3.54	.75
Confidence			
Individual	57	3.41	.69
Team	47	3.90	.74
Total	104	3.63	.75
Satisfaction			
Individual	57	2.87	.82
Team	47	3.24	.82
Total	104	3.04	.84

A one-way ANOVA was conducted to determine if there was a difference in means between the treatment and control groups for the Attention, Relevance, Confidence, and Satisfaction sub scores of motivation toward the course. There were no outliers and the data were normally distributed for each group, as assessed by boxplot and Shapiro-Wilk test ($p < .05$), respectively.

Findings indicated a statistically significant difference between the control and treatment groups for Confidence and Satisfaction. Students in the treatment group reporting significantly higher Confidence ($n = 47$, $M = 3.9$, $SD = 0.7$) than students in the control group ($n = 57$, $M = 3.4$, $SD = 0.7$) [$F(1, 102) = 11.920$, $p = .001$]. Students in the treatment group also reported significantly higher Satisfaction toward the course ($M = 3.2$, $SD = 0.8$) than students in the control group ($M = 2.9$, $SD = 0.8$) [$F(1, 102) = 5.436$, $p < .05$]. There were no other significant findings.

The subhypotheses were accepted for Confidence and Satisfaction.

Hypothesis 2: Motivation toward the Instructional Materials

Hypothesis 2 stated that will be a significant difference in the motivation variable set of Attention, Relevance, Confidence, and Satisfaction composite scores towards the instructional materials between participants who experience working in high-performance teams and participants who work individually in an online teacher education course. This hypothesis examined the differences between the learning approaches on the composite IMMS (questions 1-35). There were 104 participants who responded to all of the items on the IMMS questionnaire, 57 in the individual approach and 47 in the team approach. Descriptive statistics are presented in Table 7.

Table 7

Descriptive Statistics for the IMMS (Full Scale)

Group	*N*	*Mean*	*SD*
Individual	57	3.26	.64
Team	47	3.44	.65
Total	104	3.34	.65

The IMMS had a high level of internal consistency, as determined by a Cronbach's alpha of 0.938. An exploratory analysis was conducted using a boxplot (see Figure 5). There were outliers in the data, as assessed by inspection of a boxplot for values greater than 1.5 box-lengths from the edge of the box. There were three points in the control group, labeled 4.92, 4.93, and 1.64 and one point in the treatment group labeled 1.64 (IMMS mean scores) in Figure 8 that met this criterion.

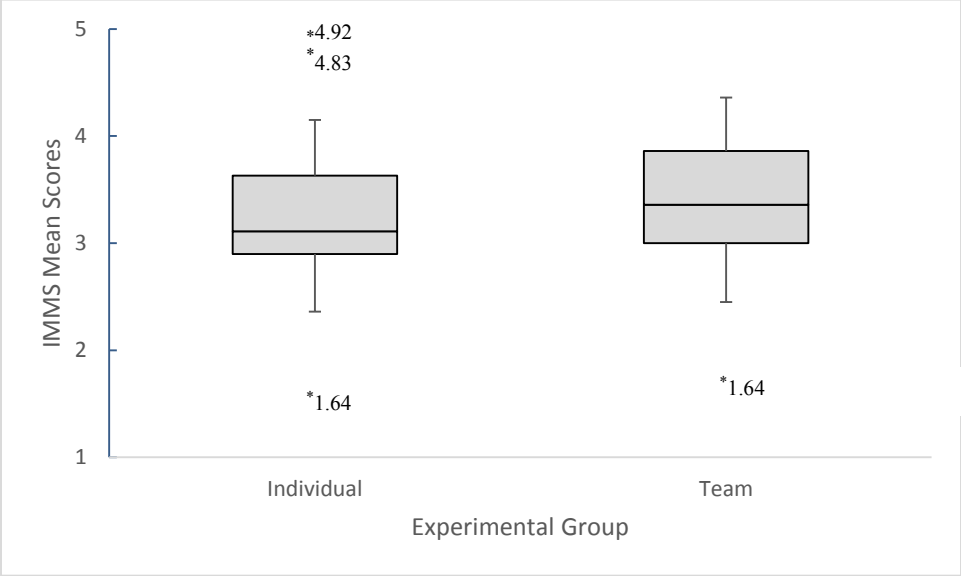

Figure 8. Boxplot of IMMS Mean Scores for Control and Treatment Groups

* Denotes outliers.

The IMMS score was normally distributed for the individual and team groups, as assessed by Shapiro-Wilk's test ($p > .05$). A one-way ANOVA was conducted to determine if there was a difference in means between the treatment and control groups. The analysis revealed that there was not a statistically significant difference between the control and treatment groups in the motivation toward the instructional materials (IMMS score). The mean of the IMMS scores in the individual group ($n = 57$, $M = 3.3$, $SD = 0.6$) is similar to the mean of the treatment group ($n = 47$, $M = 3.4$, $SD = 0.7$) in the online teacher education courses [$F(1, 102) = 2.117$, $p > .05$]. Hypothesis 2 was rejected.

Subcomponents of motivation toward the instructional materials. The IMMS questionnaire contained questions related to the four subcomponents of motivation: Attention (twelve questions); Relevance (nine questions); Confidence (nine questions); and Satisfaction (six questions). Descriptive statistics are in Table 8.

Table 8

Descriptive Statistics for the IMMS (ARCS Subcomponents)

Group	*N*	*Mean*	*SD*
Attention			
Individual	57	3.15	.69
Team	47	3.27	.75
Total	104	3.21	.72
Relevance			
Individual	57	3.38	.76
Team	47	3.58	.65
Total	104	3.48	.72
Confidence			
Individual	57	3.56	.56
Team	47	3.71	.71
Total	104	3.63	.63
Satisfaction			
Individual	57	2.82	.97
Team	47	3.18	.90
Total	104	2.98	.95

A one-way ANOVA was conducted to determine if there was a difference in means between the treatment and control groups for the Attention, Relevance, Confidence, and Satisfactions sub scores of motivation toward the instructional materials.

The data were normally distributed for each group, as assessed by Shapiro-Wilk test ($p < .05$). There was homogeneity of variances, as assessed by Levene's test for equality of variances (Attention, $p = .54$; Relevance, $p = .62$; and Satisfaction, $p = .67$). For Confidence, the assumption of homogeneity of variances was violated, as assessed by Levene's test for equality of variances ($p = .03$). The instructional materials motivation sub score of Attention was not statistically significantly different between the control and treatment groups [$F(1, 102) = 0.691$, $p > .05$]. There was little difference between the means of the individual group ($n = 57$, $M = 3.2$, $SD = 0.7$) and team group ($n = 47$, $M = 3.3$, $SD = 0.7$).

Also, the analysis revealed that there was not a statistically significant difference between the control and treatment groups in the motivation sub score of Relevance toward the instructional materials, with students in the treatment group reporting slightly higher Relevance ($n = 47$, $M = 3.6$, $SD = 0.7$) than students in the control group ($n = 57$, $M = 3.4$, $SD = 0.8$) in the online teacher education courses [$F(1, 102) = 1.882$, $p > .05$].

The instructional materials motivation sub score of Confidence was not statistically significantly different between the control and treatment groups [$F(1, 102) = 1.442$, $p > .05$]. There was little difference between the means of the individual group ($n = 57$, $M = 3.6$, $SD = 0.6$) and team group ($n = 47$, $M = 3.7$, SD = 0.7). The analysis also revealed that there was a statistically significant difference between the control and treatment groups in the motivation sub score of Satisfaction toward the instructional materials. Students in the treatment group reported significantly higher Satisfaction ($n = 47$, $M = 3.2$, $SD = 0.9$) than students in the control group ($n = 57$, $M = 2.8$, $SD = 1.0$) [$F(1, 102) = 3.754$, $p = .05$].

The subhypotheses were accepted for Satisfaction.

Hypothesis 3: Engagement in the Online Course

Hypothesis 3 stated that there will be a significant difference between the engagement for participants in teams than participants working individually in an online teacher education course. Because engagement was measured through the frequency and quality of discussion postings, Hypothesis 3 stated that the frequency (Hypothesis 3.1) and quality (Hypothesis 3.2) of interaction for the treatment group would be greater than that of the control group.

Hypothesis 3.1: Frequency of Interaction. In order to test Hypothesis 3, data were collected from all participants through the number of discussion posts captured through the course usage statistics. Each course required the same minimum number of posts. To control for course, Z-scores (Z Sum Posts) were computed for raw scores in the frequency of interaction data set, which included the number of total combined whole group (control and treatment) and team (treatment only) discussion postings for each course section. Instructor posts were not included in these totals. The Z Sum Posts variable was then divided by class size to determine the rate of posts per course. The rate of posts per class are presented in Table 9.

Table 9

Rate of Posts by Course

Course/Section	Experimental Group	Rate of Posts Score
ARI		
Section 1	Individual	-0.01
Section 2	Team	0.01
TRC		
Section 1	Individual	-0.09
Section 2	Individual	-0.00
Section 3	Team	0.06

The rate of posts were graphed on a bar chart in order to compare them. Figure 9 shows the comparison of the rate of posts by course and by experimental condition.

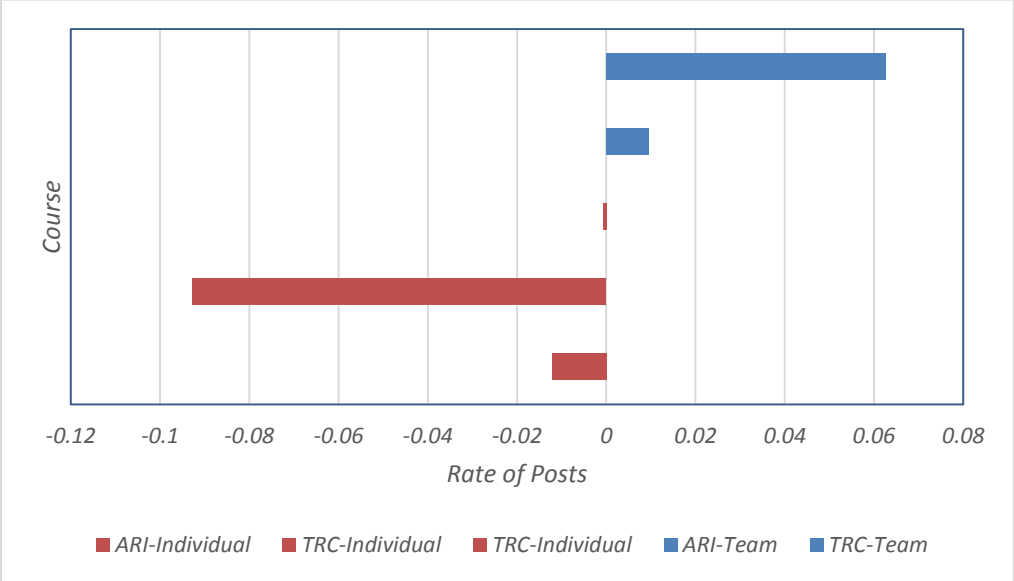

Figure 9. Rate of posts per course and experimental condition. This figure illustrates the rate of posts for the course sections in the individual group (shown in red) and the team group (shown in blue).

As evident in Figure 9, for courses with the teaming condition, the rate of posts was positive. For courses with the individual condition, the rate of posts was negative. Students working in teams produced a higher rate of posts than students working individually. Hypothesis 3.1 was accepted.

Hypothesis 3.2: Quality of Interaction. Participants were asked to rate the quality of their peer-to-peer interactions on a scale from one (no quality interaction) to four (multiple interactions of quality) at three points in the four-week course: after the first week (beginning), at the midpoint of the course, and at the end of the course (endpoint). Descriptive statistics are in Table 10.

Table 10

Descriptive Statistics for the Quality of Interaction Ratings by Group

	Group			
	Individual		Team	
	N	*%*	*N*	*%*
Beginning Interaction				
1	5	8.8%	9	19.1%
2	31	54.4%	19	40.4%
3	18	31.6%	16	34.0%
4	3	5.3%	3	6.4%
Midpoint Interaction				
1	7	12.3%	10	21.3%
2	26	45.6%	20	42.6%
3	19	33.3%	14	29.8%
4	5	8.8%	3	6.4%
Endpoint Interaction				
1	7	12.3%	2	4.3%
2	28	49.1%	16	34.0%
3	19	33.3%	29	61.7%
4	3	5.3%	0	0.0%

A rating of three or four was considered a positive rating for the quality of interactions. In the group of students working individually, the interaction ratings remained fairly

consistent, with 36.9% (n = 21) reporting a positive rating at the beginning interaction point, 42.1% (n = 24) reporting a positive rating at the midpoint of the course, and 38% (n = 22) reporting a positive rating at the end of the course. There was little variation for the control group in perceived quality of interaction. For students working in teams, 40.4% (n = 19) provided positive ratings at the beginning of the course. Positive ratings declined slightly to 36.2% (n = 17) at the midpoint but then increased to 61.7% (n = 29) by the end of the course. Over time, students working in teams rated the quality of their interactions higher. Students in the treatment group reported higher engagement through the quality of their interactions over time than students in the control group. Hypothesis 3.2 was accepted.

Summary

This study assessed the effects of teaming in an online teacher education course on motivation and engagement as compared to one where students worked individually. Data were collected from 104 course TFA students enrolled in five sections of two online reading courses. Data analysis consisted of descriptive statistics and quantitative analysis. One significant finding was in the motivation toward the course ($p < .05$) based on mean scores on the Course Interest Survey. Students working in teams reported significantly higher mean scores in the Keller ARCS Motivation Model categories of Confidence ($p < .05$) and Satisfaction ($p < .001$) than students working individually in the online courses. Also, students working in teams had a higher engagement than students working individually based on a higher rate of posting and an increase in the reported quality of interaction over time in the team condition.

A one-way ANOVA revealed that students working in teams reported a significantly higher motivation toward the course than students working independently. Further, students working in teams reported significantly higher Confidence and Satisfaction toward the course than students working individually. There was not a significant difference in Keller's ARCS subcomponents of Attention and Relevance between the control and treatment groups.

A one-way ANOVA revealed no significant difference in motivation toward the instructional materials between the control and treatment groups based on an analysis of the total mean scores of the Instructional Materials Motivation Survey. However, there was a statistically significant difference between the control and treatment groups in the motivation sub score of Satisfaction toward the instructional materials. Students in the treatment group reported significantly higher Satisfaction toward the instructional materials than students in the control group. There was no difference in the other ARCS subcomponents of Attention, Relevance, or Confidence.

Engagement in the online courses was assessed through the frequency of participation as well as asking participants to rate their quality of interaction over time. It was predicted that students working in teams would be more engaged than students working individually. This was evident through the frequency of participation, as it was observed that students in the treatment group had a higher rate of posting compared to students in the control group. Also, the quality of interactions had observable differences in the control and treatment groups. Students working in teams reported an increase in engagement through the quality of their interactions from the midpoint to the end of the

course. Conversely, the engagement of students working in teams did not change over the course period.

The content of Chapter 5 includes a summary and interpretation of the findings, implications for practice, and recommendations for further research. Limitations of the study are also addressed.

CHAPTER V

Discussion

This final chapter is divided into five sections. The first section presents the major conclusions from the study. The second section presents a discussion of findings and interpretation of results. Implications for theory and practice is provided in the third section, followed by limitations of the study in the fourth section. The concluding fifth section presents recommendations for further study.

Major Conclusions

The purpose of this study was to compare a team (collaborative) versus an individual model of online instruction, designed for motivation, to determine if learners will be more motivated and engaged in the collaborative model of learning used within an online alternative teacher preparation program. The dependent variables examined were motivation toward the course and motivation toward the instructional materials, based on Keller's ARCS Motivation Model. For each, Attention, Relevance, Confidence, and Satisfaction subcomponents of motivation were also examined. Two dependent variables related to the engagement of students in the courses were also measured: (1) the frequency of posting, as determined through total course usage statistics; and (2) the quality of interactions, as determined by ratings on a four-point scale at three points in time in the course.

Study results indicated there was significantly more motivation toward the course for students working in teams than students working individually, and that the difference was significant in students' confidence and satisfaction in the course. Also, results indicated that although there was no statistical significance in students' motivation

toward the instructional materials as a whole, there was significantly more satisfaction toward the instructional materials for students working in teams than students working individually.

Students working in teams were more engaged in the course. Findings indicated that students working in teams had a higher rate of posting in the class discussions than students working individually. Additionally, the quality of interactions for teams improved through the course, while the quality remained the same for students working individually.

Findings and Interpretation of the Results

In this section, findings from the results are presented along with their evaluation and interpretation based on data collected and support from the literature. The three hypotheses are used to organize the discussion.

Hypothesis 1: Motivation toward course interest. The first hypothesis predicted a significant difference in the motivation variable set of Attention, Relevance, Confidence, and Satisfaction (ARCS) composite scores between participants who experience working in high-performance teams and participants who work individually in an online teacher education course. A one-way ANOVA indicated a statistically significant difference between the control and treatment groups. Students working in teams reported significantly higher motivation toward course interest than students working individually. Because study results indicated the teaming treatment condition significantly increased motivation toward course interest, this hypothesis was supported.

Subcomponents of motivation toward the course. A one-way ANOVA conducted for each ARCS motivation subscale indicated a statistically significant difference

between the control and treatment groups for Confidence and Satisfaction. Students working in teams reported significantly higher Confidence and Satisfaction than students working individually. There were no other significant findings. Therefore, the subhypotheses were supported for Confidence and Satisfaction.

Hypothesis 2: Motivation toward the instructional materials. The second hypothesis predicted a significant difference in the motivation variable set of Attention, Relevance, Confidence, and Satisfaction (ARCS) composite scores toward the instructional materials between participants who experience working in high-performance teams and participants who work individually in an online teacher education course. A one-way ANOVA demonstrated no statistically significant difference between the control and treatment groups. Therefore, this hypothesis was not supported.

Subcomponents of motivation toward the instructional materials. A one-way ANOVA conducted for each ARCS motivation subscale indicated a statistically significant difference between the control and treatment groups in Satisfaction. While the mean scores were higher for Attention, Relevance, and Confidence in the treatment group, there were no significant findings for these subscales. Therefore, the subhypotheses was supported for Satisfaction.

Hypothesis 3: Engagement in the online course. Hypothesis 3 stated that there will be a significant difference between engagement in the online teacher education course for participants working in teams as compared to participants working individually. Because engagement was measured through the frequency and quality of discussion postings, Hypothesis 3 stated that the frequency (Hypothesis 3.1) and quality

(Hypothesis 3.2) of interaction for the treatment group would be greater than that of the control group.

Hypothesis 3.1: Frequency of interaction. The third hypothesis predicted a difference in the frequency of interaction among participants working in teams as compared to participants working individually in the online course. For this analysis, the rate of posts were computed for each course and then compared. For courses with the teaming condition, the rate of posts was positive. For courses with the individual condition, the rate of posts was negative. Students working in teams had higher engagement by producing a higher rate of posts than students working individually. Therefore, this hypothesis was supported.

Hypothesis 3.2: Quality of interaction. The third hypothesis also predicted a difference in the quality of interaction among participants working in teams as compared to participants working individually in the online course. A comparison of mean interaction ratings over time revealed little variation for the control group in students' perceived quality of interaction. Students working in teams rated their interactions higher between the midpoint and end of the course. Students in the treatment group reported higher engagement through the quality of their interactions over time than students in the control group. This hypothesis was supported.

Interpretation of the results. Based on the review of the findings, four distinct themes emerged. First, study results indicated there was significantly more motivation toward the course for students working in teams than students working individually, and that the difference was significant in students' confidence and satisfaction in the course. Second, while the students' motivation toward the instructional materials was not overall

significantly different for groups, students working in teams had significantly more satisfaction toward the instructional materials than students working individually. Third, students working in teams were more engaged in the course, having a higher rate of posting in the class discussions than students working individually. And fourth, the quality of interactions for teams improved over time while the quality remained the same for students working individually.

Motivation toward the course. Participants working in teams were significantly more motivated in the course than participants working individually, and the areas of motivation that were significant were students' confidence and satisfaction in the course. According to Keller (2010), a course that promotes confidence is designed to help students succeed and believe they can control this success. Also, confident students feel a sense of self-worth and accomplishment. As stated earlier, expectations for performance requirements and success on assessments were clearly communicated to the students, and students took responsibility for their learning (Keller, 1987b).

In the courses, all students were given clear expectations for assignments as well as rubrics for how they will be evaluated. An explanation for the higher confidence in the team-based learning approach is that the teams felt more confident in their abilities to succeed in the course because of the support they received as part of the team. Students in teams received peer feedback on assignments and were able to tackle challenges with more support than students working individually. Peer support may have led to team members feeling more control over their learning. Further, individuals might have better understood the instructional goal because they had team members to clarify and discuss steps for meeting course expectations. In the teaming approach, it was easier to reach out

for support from class members because students were encouraged by written assignment directions to connect with teams, and there were designated spaces to collaborate in the online courses (Johnson & Johnson, 1994; Van den Hooff, Elving, & Meeuwsen, 2010).

Another explanation for the high confidence rating in the teaming approach is that each class began with a teambuilding activity that prompted team members to introduce themselves. The activity also included directions to identify rotating team roles, such as selecting a Facilitator for each week. Identifying team roles contributed to the confidence of students in teams because they knew their expectation each week (Akyol, 2008; Palloff & Pratt, 1999; Turmel, 2010). Also, this team formation activity acted as an ice breaker and sought to ease anxieties for students who were nervous or uncomfortable when they began (Keller, 2010).

The satisfaction from a course, according to Keller (1978b), concerns learners' feelings of personal effort and accomplishment. Courses designed with motivation for satisfaction helps students feel good about the learning experience and brings forth their desire to continue learning (Keller, 2010). To achieve high levels of satisfaction, important aspects of an online course include learner feedback and a fair assessment of work. During the first two weeks of each course, students were prompted to participate in discussions around a particular topic. Students were given the same number of required minimum posts per discussion (three) in each course. During the second half of the course, students were encouraged to engage in discussion either through the team forum (teaming approach only) or the whole group "Open Forum" (individual and teaming approach), particularly if they needed assistance or feedback on course assignments.

An explanation for higher confidence ratings in the team approach was that students were able to to receive more feedback in teams than in the individual approach. The team structure provided a boundless built-in support system for answering questions and engaging in collaborative problem-solving. The resulting feelings of mutual concern and personal success likely led to high levels of satisfaction in the course for students working in teams. Additionally, learners who mastered a task had direct opportunities to help others. Students working individually, on the other hand, were limited to interactions with the whole class. They may not have been as comfortable reaching out to the class for peer feedback, and may have relied on the instructor for sole support. Providing detailed feedback and meetings learners' needs in an online course is a consistently documented challenge that instructors face (Regan, Evmenova, & Baker, 2014). Unmet expectations and lack of peer feedback may have led to lower satisfaction in the course by students working individually.

Studies found that social presence led to higher levels of satisfaction in online courses (Cobb, 2011; Shen et al., 2006). Through teambuilding, team members established social presence early on in the course as well as a team identity that served them throughout the course. Forming relationships with team members, feeling a strong sense of community, and feeling comfortable collaborating with others were important factors that led to higher satisfaction for students working in teams (Cobb, 2011; Ku et al., 2013. Richardson and Swan's (2003). Research also showed a strong relationship between social presence and perceived learning, which an important part of satisfaction (Keller, 2010). And just as teams can collaborate and share ideas, they can share in their triumphs.

Motivation toward the instructional materials. While participants working in teams were more motivated in the course than participants working individually, there was no significant difference in participants' overall motivation toward the instructional materials. The area of motivation that was significant, however, was students' satisfaction. The survey focused on the design of the course, including the materials, content, and activities, and was typically used for courses that were not instructor-led or collaborative (Keller, 1987b). It was reasonable to expect that participants in both team and individual learning approaches responded similarly to the design of the course materials. Where the groups may have differed in this area, however, is how they interacted with the materials and each other. This explanation may account for students in the team approach having significantly more satisfaction toward the course materials that students in the individual approach.

Survey questions that assessed participants' satisfaction toward the instructional materials focused on a feeling of accomplishment, course enjoyment, and reward through how feedback was provided. The feeling of accomplishment is consistent with Knowles' theory of andragogy which describes adults as goal-oriented and motivated when they feel they can solve a problem or successfully perform a task (Knowles, Holton, & Swanson, 2014). Similar to the explanation provided earlier for motivation toward the course, it is likely that opportunities for peer feedback led to course satisfaction. In the teaming approach, students received more personal attention while working on course activities and assignments rather than relying solely on the instructor for feedback and engagement (Regan, Evmenova, & Baker, 2014).

Engagement through the frequency of interaction. Participants working in teams had a higher rate of posting than participants working individually in the online courses. A calculation involving the number of students in each course and the total number of posts in discussion forums determined the rate of posting. For students in the individual learning approach, a whole group discussion forum was available each week in the course for completion of the required discussions as well as to post any course-related questions or comments as desired. In the team approach, students were directed to complete required discussions in their teams but could post any course-related questions or comments in the team forums or an available whole group forum. In both courses that had the teaming approach, students posted in both the team and whole group forum, which contributed to the higher rate of posts.

From the high satisfaction ratings, it seemed as if students in the teaming approach enjoyed communicating within their teams throughout the course, but also found value in communicating with the other members of the class. Similarly, Depover et al. (2013) found a high level of participation in the open forum, unstructured discussions among teachers. The literature on social networks support interactions within teams and across teams and suggest both are important because they differ (Anderson, 2010). There is evidence from the literature that interaction is key to online learning, and that a frequency of interaction and course satisfaction are linked (Ku et al., 2013; Liu et al., 2007; Ravenna et al., 2010). The results of this study are consistent with these findings.

It is important to note that instructors did not have any involvement in the team discussions. The instructor was able to view the team spaces and the discourse within, but the instructor was asked only to post in the whole group discussion forums. At first

glance, it would seem as if the lack of instructor involvement would reduce the frequency of interaction within teams because individuals were not accountable to the instructor for posting. However, perhaps an intrinsic motivator was in effect, as students in teams needed to rely on each other to respond. And perhaps without the instructor present, team members were able to establish an environment of trust to engage in more relaxed or informal discussion to achieve their desired results (An et al., 2008; Gregory, 2010; Gruenbaum, 2010). Additionally, if students were accustomed to posting in whole group discussions, they likely will have continued participating in those exchanges in addition to the team discussions.

Engagement through the quality of interactions. Students working in teams reported a higher quality of interactions than students working individually in the course. Students rated the quality of their interactions after the first week of the course, at the midpoint of the course, and at the end of the course. In the individual approach, the interaction ratings remained fairly consistent over time. In the team approach, the interactions ratings declined slightly between the beginning and midpoint ratings, and then increased at the endpoint rating. The quality of interactions over time increased for students working in teams.

An explanation for this difference is that teams were high performing, becoming more adept over time at working together effectively toward a common goal and perhaps enjoying the experience (Smith, 1996; Tseng & Yeh, 2013). The deepening of these interactions suggested that the teams were exhibiting characteristics of high-performing teams including group and individual accountability, continuous improvement, a high commitment level, and equal contributions by all team members (Johnson & Johnson,

1994; Mainzer, 2010; Slavin, 1990). Deeper levels of discourse may also have signaled positive interdependence, where groups were motivated to achieve group goals and find success as individuals and as a group (Smith, 1996).

Over time, team members may have felt accountable to respond to each other in the team. In the individual learning approach, student questions were posed to the whole class where other students would not likely feel obligated to respond. In this case, the interactions around sharing ideas and feedback, for the most part, were between the students and the instructor. Peer-to-peer interactions mainly took place during the required whole group discussions. In the team approach, however, peer-to-peer interactions took place in the latter half of the course around support for completing course assignments.

Implications for Theory and Practice

This section discusses the theoretical implications of the results of this study and provides considerations for practice. On a theoretical basis, findings suggest that collaboration can lead to higher motivation and engagement for students in online teacher education courses. For consideration of practice, four design strategies are described to strengthen online programs for teacher educators: (1) design for motivation and learning, (2) design for learner engagement, (3) design for collaboration, (4) design for effective online teaching. These strategies have implications for the design of instructional content and activities, facilitation strategies, and the organization of the learning environment.

Implications for Theory. This study found that motivation and engagement toward teacher education courses were higher for students working in teams than working individually. The design of the courses included motivational design strategies as well as

effective strategies for instructional design and course delivery. An important theoretical implication from this study is that collaboration improves online learning experiences for teachers. When motivational design strategies were in place, and the learning environment was well-structured, collaboration presented a viable solution to challenges of maintaining high levels of learner engagement and motivation.

The effectiveness of the teaming approach points to the application of principles of high-performance teaming from the research literature. These include structuring collaboration with team formation, teambuilding with an equal assignment of roles, and group processing and evaluation activities. The establishment of these high-performing teams led to the rewards of deeper dialogue, resource-sharing, and opportunities for peer feedback. Because these are positive outcomes for learners, study findings may lead to the development of a pedagogical model for online learning for a teacher audience that incorporates high-performance teaming and design for motivation. These findings also contribute new knowledge in the field of preparing preservice teachers in an online format, particularly through a fast-track, alternative teacher preparation pathway.

Implications for Practice. Study findings provide insight into how to approach the design of online courses for teachers, particularly for teachers enrolled in alternative teacher preparation programs. Keller (2010) described motivational design as being a part of instructional design, and together they are a part of learning environment design. Building on effective practices from the literature, the key themes presented below are important for the design of the online instruction as well as in the design of the learning environment itself.

Design for Motivation and Learning. Keller's (2010) ARCS Model of Motivation provides design strategies for online courses that focus on critical features of Attention, Relevance, Confidence, and Satisfaction. Rather than approaching course design by starting with the range of content to cover, it is recommended that instructional designers essentially flip the approach from one of *teaching* to one of *learning*. This practice entails a full consideration of the learner, including the learners' experiences, prior knowledge, and intrinsic and extrinsic motivators. It also entails consideration of the learning environment and how the learner engages with the content, the students, and the instructor. According to Keller (2010), the focus of motivational design is the processes, strategies, and tactics that are effective for helping adult learners achieve their goals. For learner success, motivational design works hand-in-hand with other influences on learning including instructional strategies, interaction, and collaboration. Designing for motivation includes: (1) capturing the interest of the learner and stimulating curiosity to learn (Attention), (2) meeting the personal goals of the learner (Relevance), (3) helping the learners feel they can succeed (Confidence), and (4) providing extrinsic and intrinsic rewards for the accomplishments (Satisfaction), all while ensuring the design meets instructional goals. (Keller, 2010).

The careful planning and design of the course environment provided a clear way for learners to find and interact with course content. Clusters of web pages, organized by week, presented weekly course objectives and provided detailed directions for completing readings, discussions and assignments. Each organizational "chunk" also had a direct link to the relevant whole group or team discussion board and a summary checklist of activities with due dates. The checklist served as a tool for individuals to

ensure they met all of the course requirements each week. Each weekly chunk also was structured the same way so that students had a predictable cycle of instruction each week in the course. A clear design of the learning environment may reduce instructor time spent on course support and allow students to focus on the learning rather than having learning impeded by the technology (Regan, Evmenova, & Baker, 2014).

Design for Engagement. Study findings support the research on social presence, the ability to project oneself in an online forum and establish personal and purposeful relationships (Akyol, 2008). Social presence has shown to be an important element of promoting engagement in an online course, particularly one that incorporates teaming. In this study, the use of collaboration in the course design allowed students to establish social presence, which in turn, created more opportunities for interaction and deeper interactions over time. Working in teams, engaged students felt confident and successful, and that the learning experience was rewarding.

The learning environment was designed to have a shared space to collaborate. Based on recommendations in the research, the whole group (individual and team learning approaches) and team (team learning approach only) forums were made available with features for students to both post replies to others in the class as well as start new discussion topics (Johnson & Johnson, 1994; Van den Hooff, Elving, & Meeuwsen, 2010). Because students interacted both within and across teams, it was important to design learning experiences that promote both types of interaction. The ability to share ideas and feedback on assignments in small groups provided learners more opportunities for meaningful engagement. In the online teacher education courses, opportunities to collect with the larger group allowed individuals to get a broader

perspective on particular topics, but also allowed teams to share their collaborative work for review and feedback from other teams.

Design for Collaboration. Specific processes and strategies for structuring collaboration were presented in the research literature, particularly in the K-12 classroom (Johnson & Johnson, 1996; Mainzer, 2010; Slavin, 1990). But as study findings suggest, they are also important to the success of a team of adult learners. At the beginning of the course, a teambuilding activity provided a means for students to introduce themselves and establish social presence in the course. The teambuilding activity also allowed learners to decide how they will work together and identify team roles that rotated each week (Akyol, 2008; Palloff & Pratt, 1999; Turmel, 2010). The periodic evaluation measures in the study prompted students to evaluate their team engagement. For future courses, a more in-depth group processing and evaluation activity will allow teams to reflect on their individual and collective efforts, refine their work moving forward, and contribute to positive interdependence (An et al., 2008; Gregory, 2010; Gruenbaum, 2010). These structured team formation and teambuilding activities at the beginning of the course, coupled with periodic team processing activities promote camaraderie among teams and a positive teaming experience, even for those students who had negative experiences working in teams in the past (Tseng & Yeh, 2013).

Design for Effective Online Teaching. In this study, the development of a learning environment included both the organization of the LMS as well as a supportive climate for learning that was fostered by the course instructor. The design of an effective, appealing, and efficient learning environment is challenging and complex (Keller, 2010). In this study, the course platform was designed for the instructor to build and nurture a

sense of community through announcements (for instructors to share news and feedback to the whole class) and whole group discussion boards (for instructors to communicate with class members).

Instructors who participated in this study taught online courses and had received training in this area before beginning teaching. Before the start of the study, instructors were trained to implement certain online teaching techniques consistently using a fidelity checklist. These techniques included strategies to build and maintain a sense of community in the class by posting announcements each week in the course, responding to students in whole group discussions, and providing timely and detailed feedback on assignments. As mentioned earlier, instructors were asked not to interact within the team discussions so as to let the teams evolve on their own. All of these effective strategies contributed to students' confidence and satisfaction in the course (Keller, 2010).

The design strategies noted in Figure 10 have the potential to strengthen online teacher preparation programs.

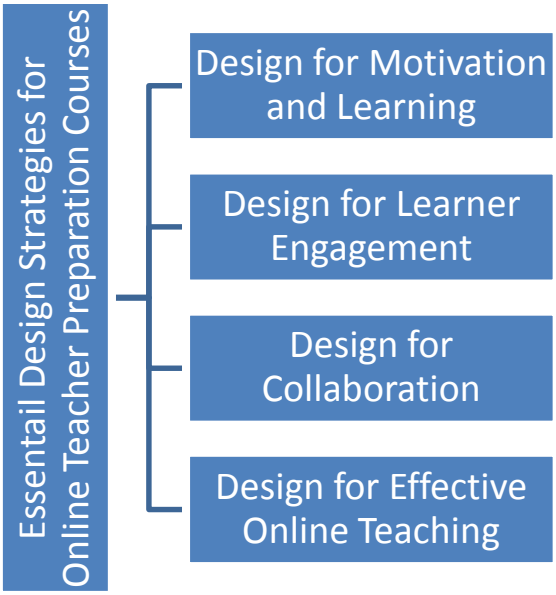

Figure 10. Essential Design Strategies for Online Teacher Preparation Courses.

Further, as study findings suggest, these essential elements in effect can improve the learning experience, deepen learner engagement, and foster learner motivation. Predictably, the benefits of structured collaboration can also increase teachers' collaboration skills which may ultimately transfer to the K-12 classroom.

Limitations of the Study

Limitations of the study relating to the study population, the use of intact groups with different courses and instructors, as well as the duration of the study may have impacted the study and the ability to generalize the results. The study population consisted of mostly female students. Also, they were all graduate students enrolled in a TFA program, a unique population of teachers. TFA programs recruit top college graduates to teach in K-12 classrooms while they receive training and work to earn certification. For this reason, the TFA population is notably different than students in other teacher preparation programs as well as certified teachers in the field.

Because students had already enrolled in their designated sections before the study, intact groups were used. Most of these students completed courses together in previous semesters, which suggests that they had a high comfort level with technology. However, the previous courses did not have the motivational design and structured collaboration features in place. Because many of the students completed courses in the past, it is reasonable to consider that their motivation toward this course may have been related to their success or motivation in the previous courses in the program.

With a limit on class size, five sections of two courses were used in the study to achieve a larger sample size. The study focused on the design of the courses and was intended to be generalizable to other courses in the online teacher preparation program. To this end, courses selected for the study were reading courses targeting both elementary and secondary teachers, with the same duration, cycle of instruction, number and scope of assignments, and minimum discussion-posting requirements.

Another limitation of the study is the use of five different course instructors. The styles and personalities of the instructors differed, and that may have impacted the motivational or engagement levels in the course. The genders of the instructors differed as well, with two males and one female instructor in the individual condition, and two female instructors in the team condition. The instructors that taught the courses were recruited by the university department and had completed the required university online teaching training. All of the instructors had previous experience teaching in the TFA program. Before the start of the courses, instructors received training on how to use a fidelity checklist that outlined effective online teaching strategies to be implemented throughout course delivery. At that time, instructors expressed differing levels of

enthusiasm for the course design changes. One instructor, assigned to the individual condition, was not favorable towards the changes made to the course design. She shared that she preferred the design that was in place before because she had become very comfortable teaching that version of the course. The instructors assigned to the team condition were very positive about the changes, with one instructor commenting that this new format was, "everything [she] hoped the course would be."

The duration of the study was another limitation. The course was four weeks in length. While study findings showed positive outcomes for motivation and engagement, a longer course duration would have provided more time for teams to develop. Also, it would have allowed for more in-depth team processing and evaluation activities. If course participants had not known each other before the start the course, they might not have achieved the same depth of engagement. Finally, because of the nature of collaboration in education for both teachers and K-12 students, these findings may not be able to be generalized more broadly.

Recommendations for Research

It is recommended that further research investigates an expanded study duration as well as the impact of teaming on learning and classroom teaching. With a limitation of study duration, it is suggested that the study is replicated with courses that take place over a longer period and with the addition of prompts for more in-depth team processing and evaluation. The study can also investigate how teams develop over time and their impact on teaming skills. Teaming skills are those interpersonal and small group skills that develop beyond meeting the academic learning outcomes (Johnson & Johnson, 1994; Mainzer, 2010; Slavin, 1990). The development of collaboration skills is recognized by

national standards for high-quality professional development as being important for teachers themselves and to transfer those skills to the classroom environment (Learning Forward, 2011). The recommended online course design strategies could be applied and tested in online teacher professional development settings as well.

The role of high-performance teams online and their ability to transform teaching practice is worthy of further investigation. It is recommended that courses with motivational design and structured collaboration be studied further to determine the impact on student learning. The study could investigate the effects of high-performance teaming on the quality of the learning product as well as implementation or a resulting change in practice. Further research on the effects of high-performance teaming for adult learners in online settings can lead to the development of grounded theory. This theory of social learning in online settings would undergird a pedagogical model for online delivery for this audience.

Summary

This chapter presented the major study findings and related implications for the design of online teacher preparation courses. The study investigated the impact of motivation toward the course and the instructional materials, as well as on learner engagement for students working in teams as compared to students working individually. The results revealed that there was significantly more motivation toward the course for students working in teams than students working individually, and that the difference was significant in students' confidence and satisfaction in the course. Also, there was significantly more satisfaction toward the instructional materials for students working in teams than students working individually. Finally, students working in teams were more

engaged in the course, demonstrating a higher rate of posting in the class discussions and positive change in the quality of interactions over time. Results contribute to meeting a demonstrated need for an online model for teacher preparation and a configuration for structuring teams in an online environment. These findings have implications for both theory and practice to inform the design of a rewarding, motivating, and engaging learning experience for teachers in their training, with opportunities for interpersonal connections, peer-to-peer support, and confidence-building at the critical beginning of a new teacher's career.

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APPENDIX A

Course Interest Survey

Directions: There are 34 statements in Part I of this questionnaire. Please think about each statement in relation to the class you have just taken and indicate how true it is. Give the answer that truly applies to you, and not what you would like to be true, or what you think others want to hear.

Think about each statement by itself and indicate how true it is. Do not be influenced by your answers to other statements.

Record your responses for each question and follow any additional instructions that may be provided in this survey.

Use the following values to indicate you response to each item below.
1 = Not true
2 = Slightly true
3 = Moderately true
4 = Mostly true
5 = Very true

1. The instructor knew how to make us feel enthusiastic about the subject matter of this course.
2. The things I learned in this course will be useful to me.
3. I felt confident that I did well in this course.
4. The class had very little in it that captured my attention.
5. The instructor made the subject matter of this course seem important.
6. You had to be lucky to get good grades in this course.
7. I had to work hard to succeed in this course.
8. I do NOT see how the content of this course relates to anything I already know.
9. Whether or not I succeeded in this course was up to me.
10. The instructor created suspense when building up to a point.
11. The subject matter of this course was just too difficult for me.
12. I felt that the course gave me a lot of satisfaction.
13. In this class, I tried to set and achieve high standards of excellence.
14. I felt that the grades or other recognition I received were fair compared to other students.
15. The students in this course seemed curious about the subject matter.
16. I enjoyed working for this course.
17. It was difficult to predict what grade the instructor will give to my assignments.
18. I was pleased with the instructor's evaluations of my work compared to how well I think I have done.
19. I felt satisfied with that I was getting from this course.
20. The content of this course related to my expectations and goals.
21. The instructor did unusual or surprising things that were interesting.

22. The students actively participated in this class.
23. To accomplish my goals, it was important that I do well in this course.
24. The instructor used an interesting variety of teaching techniques.
25. I do NOT think I will benefit much from this course.
26. I often daydreamed while working in this course.
27. As I was taking this class, I believed that I could succeed if I tried hard enough.
28. The personal benefits of this course were clearer to me.
29. My curiosity was often stimulated by the questions asked or the problems given on the subject matter in this class.
30. I found the challenge level in this course to be about right: neither too easy nor too hard.
31. I felt rather disappointed with this course.
32. I felt that I got enough recognition of my work in this course by means of grades, comments, or other feedback.
33. The amount of work I had to do is appropriate for this type of course.
34. I got enough feedback to know how well I was doing.

APPENDIX B

Instructional Materials Motivation Survey (IMMS)

There are 36 statements in this questionnaire. Please think about each statement in relation to the instructional materials you have just studied and indicate how true it is. Give the answer that truly applies to you, and not what you would like to be true, or what you think others want to hear.

Think about each statement by itself and indicate how true it is. Do not be influenced by your answers to other statements.

Record your responses for each question and follow any additional instructions that may be provided in this survey.

Use the following values to indicate you response to each item below.
1 = Not true
2 = Slightly true
3 = Moderately true
4 = Mostly true
5 = Very true

1. When I first looked at this course, I had the impression that it would be easy for me.
2. There was something interesting at the beginning of this course that got my attention.
3. This material was more difficult to understand than I would like for it to be.
4. After reading the introductory information, I felt confident that I knew what I was supposed to learn from this course.
5. Completing the exercised in this lesson gave me a satisfying feeling of accomplishment.
6. It is clear to me how the content of this material is related to things I already know.
7. Many of the pages had so much information that it was hard to pick out and remember the important points.
8. These materials are eye-catching.
9. There were stories, pictures, or examples that showed me how this material could be important to some people.
10. Completing this course successfully was important to me.
11. The quality of the writing helped to hold my attention.
12. This course is so abstract that it was hard to keep my attention on it.
13. As I worked on the course, I was confident that I could learn the content.
14. I enjoyed this course so much that I would like to know more about this topic.
15. The pages of this course look dry and unappealing.
16. The content of this material is relevant to my interests.
17. The way the information is arranged on the pages helped keep my attention.
18. There are explanations or examples of how people use the knowledge in this lesson.
19. The exercises in this course were too difficult.
20. This course has things that stimulated my curiosity.
21. I really enjoyed studying this course.

22. The amount of repetition in this course caused me to get bored sometimes.
23. The content and style of writing in this course convey the impression that its content is worth knowing.
24. I learned some things that were surprising or unexpected.
25. After working on this course for awhile, I was confident that I would be able to pass a test on it.
26. This course was not relevant to my needs because I already knew most of it.
27. The wording of feedback after the exercises, or of other comments in this course, helped me feel rewarded for my effort.
28. The variety of reading passages, exercises, illustrations, etc., helped keep my attention on the course.
29. The style of writing is boring.
30. I could relate to the content of this course to things I have seen, done, or thought about in my own life.
31. There are so many words on each page that it is irritating.
32. It felt good to successfully complete this course.
33. The content of this course will be useful to me.
34. I could not really understand quite a bit of the material in this course.
35. The good organization of the content helped me be confident that I would learn this material.
36. It was a pleasure to work on such a well-designed course.

APPENDIX C

QUALITY OF INTERACTION RUBRIC

At the midpoint and end of the course, teams were prompted to rate the levels of engagement of their team members on a Likert scale of one through four. Participants were asked the following question: *What is the level of interaction of this team member compared to the rest of the team?* The four-point scale had the following levels:

- 1= Limited interaction - I worked independently on coursework and have not interacted with others beyond the minimum discussion posting requirements
- 2= Moderate Interaction - I had some interactions with members of the class, such as posting two or more times in a discussion forum
- 3= Fairly High Interaction - I had some continuous, valuable interactions with members of the class such as engaging multiple times (at least three) in the discussion forum
- 4= High Interaction - I had many continuous, valuable interactions with members of the class, such as engaging regularly in the discussion forum (at least four times across the week)

APPENDIX D

Demographic Survey

Please note: The following demographic survey questions were available at the start of the course and were due to be completed by the end of Week 1.

1) What is your first name?

2) What is your last name?

3) What are the last four digits of your cellular phone number (used for future surveys instead of your name)?

4) Which course and section are you enrolled in?

- *Course sections with instructor names were listed as choices*

5) What is your gender?

- Female
- Male
- Other

6) Please indicate all of the grades that you work with regularly.

- Pre-K
- Kindergarten
- 1st
- 2nd
- 3rd
- 4th
- 5th
- 6th
- 7th
- 8th
- 9th
- 10th
- 11th
- 12th
- Other (please specify)

7) What is the highest level of education you have earned?

- Bachelor's Degree
- Master's Degree or Equivalent
- Advanced Graduate Specialist Certificate
- Doctoral Degree
- Other (please specify)

8) How active are you in use of social media (such as Facebook, Twitter, or LinkedIn)?

9) How many online courses have you taken in the past?

10) If you have taken at least one online course, how many of them did you successfully complete?

11) How satisfied have you been with previous TFA courses [at this institution]?

- Completely satisfied
- Moderately satisfied
- Minimally satisfied
- Not at all satisfied
- This is my first TFA course

12) How satisfied were you with your past online course experiences in general?

- Completely satisfied
- Moderately satisfied
- Minimally satisfied
- Not at all satisfied
- This is my first online course

13) What do you like most about the course so far?

- Overall content of the course
- Course materials
- Opportunities to interact and share my learning with others through online discussion forums
- Support and feedback I will receive from the instructor and others
- Electronic Learning Community (ELC) course environment
- Other (please specify)

14) What additional information or support do you need to be successful in this course?

APPENDIX E

Fidelity Checklist for Instructors

Instructor Checklist for Online Faciliation	YES	NO	COMMENTS
Set Up – Prior to the start of the course			
Post a friendly starter announcement, welcoming students to the course			
Create new discussion threads for the two required discussions in the Open Forum discussion board.			
Post a starter discussion thread in the Open Forum for encouraging feedback and course questions.			
Facilitation			
Visit each discussion forum 3-5 times per week throughout the training period and respond to individuals, highlighting key points			
Post a summary/wrap up (via discussion forum or announcement) for the two required discussions that addresses outlying questions and provides clarifications as needed based on your review of the discussions.			
Post 2-3 announcements each week in the course.			
Communicate with a positive tone.			
Respond to student emails in a timely manner (24-36 hours).			
Feedback			
Provide timely and detailed feedback on all assignments. Because of the condensed format of			

the course, graded assignments with feedback should be returned to students within 4-5 days.			

APPENDIX F

ARCS Motivation Model Course Modifications

Before the study began, design modifications were made to the Assessment in Reading Instruction and Reading across the Content Areas courses. These modifications, presented below, were informed by Keller's (2010) ARCS Motivation Model.

Attention

- Revised overview of each session and, where appropriate, used a "hook" of interest to learners (e.g., posed a problem).
- Used videos and images in place of text or to enhance text, where appropriate, to spark interest.
- Reviewed assignments to ensure they were designed to maintain students' interest, and added description of the purpose and/or importance of the assignment.
- For each reading, included a summary of the reading and relevant look fors.
- Chunked session content and activities so that they were presented in a clear and digestible manner.
- Used white space on session pages to separate blocks of information.
- Ensured content on each session page varied so that learners were not viewing redundant information.
- Encouraged instructors to communicate with a positive and informal tone in the course announcements.

Relevance

- Ensured assignments were applicable to the classroom.
- Reviewed and edited discussions to ensure they had practical application.
- In session overviews, explained the relevance or importance of concepts outlined in the session objectives.
- Reviewed assignments to ensure there were statements describing what the learner would be able to do after finishing these instructional tasks.
- Reviewed assignments and activities to ensure they were related to the knowledge and skills of a classroom teacher.
- Ensured the course had activities and assignments that provided learners with choices in order to accomplish the goals.

Confidence

- Revised the cycle of instruction so that learners interact with the content and activities in a predictable manner; each session had a predictable sequence of readings, activities, discussions, and assignments.
- Reviewed the activities and assignments to ensure they were consistent with the session objectives, content, and examples provided.
- Utilized course checklists as "roadmaps" to assist with time management and tracking completion of individual session requirements.
- Encouraged students to use the Open Forum discussion to share ideas and ask questions.
- Re-organized the sequence of assignments so they increased in difficulty as the course progressed.
- Incorporated prompts within each session for learner reflection.
- Reviewed all content to ensure the overall challenge level was appropriate for this audience.
- (For the team approach only) Formed teams and supported collaboration through providing directions for using team spaces, an icebreaker activity for teambuilding, team evaluation prompts, and encouragement throughout the course sessions to collaborate.

Satisfaction

- Added session objectives so that learners know focus, purpose, and goals of each session.
- Prompted the instructor to provide recognition of learners' accomplishment and appreciation of effort via course announcements and timely course feedback each week of the course.
- Ensure learners have opportunities to practice newly acquired skills in the classroom setting.
- Provided opportunities through the Open Forum and Team Spaces (team approach only) for learners to help one another.
- Reviewed the final course projects to ensure their content and level of difficulty were appropriate and consistent with what students have learned in the course.

APPENDIX G

Approved Electronic Consent Form

Title: A Comparison of a Team versus an Individual Approach to Online Learning

Principal Investigator: Dr.]ohn Castellani, Associate Professor of Education, Johns Hopkins University

Dr. Jacqueline Nunn, Professor and Director of the Center for Technology in Education, Johns Hopkins University

Linda Z. Carling, Program Director for Online Teaching and Learning at the Center for Technology in Education, Johns Hopkins University

Dear Participant,

This research study involves completion of four surveys and a follow-up focus group to describe your experiences in the professional development course. The purpose of this research study is to explore the effects of learning as a team (vs. as an individual). Therefore, by the start of the course, participants will be assigned to one of two groups, controlling for these different pedagogical approaches. This means that participants will either work individually throughout the course or be assigned to work within a four or five-member team to complete course activities. Upon completion of the course, participants will be asked to complete surveys and participate in a follow-up online focus group to describe their experiences in the course. Additionally, I will analyze usage statistics to see how frequently participants post online as well as measure learning using a rubric. We anticipate that approximately 80 people will participate in this study.

There are no foreseeable risks for participating in this study and all survey data will be confidential and destroyed at the end of this study. Confidentiality will be maintained at all times by the principal investigators. The potential benefit from participating in this study is that you are gaining a relevant, high quality learning experience and are helping the field of education to explore ways to improve teacher professional development that is offered online. This study may benefit society by understanding the complex issues that surround online pedagogy and how to deliver engaging, relevant online professional development experiences.

Your participation in this study is entirely voluntary. You choose whether to participate. If you decide not to participate, there are no penalties, and you will not lose any benefits to which you would otherwise be entitled. If you choose to participate in the study, you can stop your participation at any time, without any penalty or loss of benefits. If you want to withdraw from the study, please notify me, Linda Carling, at carling@jhu.edu or 410-516-9842. If we learn any new information during the study that could affect whether you want to continue participating, we will discuss this information with you. Under certain circumstances we may decide to end your participation before you have completed the study. Specifically, we may stop your participation if the study is finished before the intended end date. There may also be other circumstances that would lead us to end your participation.

Any study records that identify you will be kept confidential to the extent possible by law. The records from your participation may be reviewed by people responsible for making sure that research is done properly, including members of the Johns Hopkins University Homewood Institutional Review Board and

Electronic Consent Form

officials from government agencies such as the National Institutes of Health and the Office for Human Research Protections. (All of these people are required to keep your identity confidential.) Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

You will not receive any payment or other compensation for participating in this study. Please feel free to ask any questions about research study now or at any time during the study by contacting me. If you have questions about your rights as a research participant or feel that you have not been treated fairly, please call the Homewood Institutional Review Board at Johns Hopkins University at 410-516-6580.

Please print a copy of this consent form for your records, if you so desire.

Your information will be collected below and stored by the researcher in a secure location. The last four digits of your cellular phone number will be used by you to identify yourself in surveys that you complete rather than using your name so that your responses remain confidential. The researcher will maintain the list of numbers in order to verify that you completed the surveys.

Please complete the fields below:

First Name: [Short Answer Box]

Last Name: [Short Answer Box]

Email Address: [Short Answer Box]

Last Four Digits of Your Cellular Phone Number: [Number Box]

I have read and understand the above consent form, I certify that I am 18 years old or older and, by clicking the submit button to enter the survey, I indicate my willingness voluntarily take part in the study.

[SUBMIT BUTTON]

Electronic Consent Form

APPENDIX H

Teambuilding Directions and Team Roles

Introduction to Teambuilding

Collaboration is critical to the success of teachers. Collaboration allows teachers to get ideas, ask questions, and share resources and strategies. You are assigned to team throughout this course. You are encouraged to use one another as a sounding board as you complete your assignments, and you will share what you learned with one another. You will still complete and submit your assignments independently, but your team can provide valuable insight and feedback to you as you need it. This will be important because of the scope of the course assignments and the condensed format of this course.

To facilitate easy communication with your team members, your team will have a designated Team Space in the ELC for discussions and file sharing (click on Team Spaces in the left navigation to access). You will be prompted throughout the weeks as to when you are expected to connect with your team (i.e., via a discussion). However, you can communicate with them in the Team Spaces as often as you'd like. Your Team Space will be completely driven and managed by your team members throughout the course, and you may organize your conversations and work however you please. It is expected that you make multiple and substantive contributions to your team so that you can create high quality work.

To assist you in getting started and being most successful throughout the course, follow the directions to first meet and greet your team members. You are asked to identify a team name, review team roles through the course, and develop one or more team operating standards that will help your team to become high performing. Team roles allow for team members to take turns taking the lead, thereby equally distributing work/leadership responsibilities throughout the course.

Team Roles

Below are the roles that are used for teams of four or five members in Johns Hopkins University School of Education online courses.

While you do not have team assignments to complete in this course, these roles can be helpful as you manage team discussions and support one another throughout the course. This is also a strategy for cooperative learning that you can use in the classroom with your students. This course gives you an opportunity to try rotating team roles yourself.

Facilitator: Post a starter thread for the team's discussion. Check in with teammates frequently to make sure everyone understands the assignment directions, completes course and teamwork tasks, and grows their knowledge and comprehension of the content.

Coach: Post positive, motivating comments as needed in the team space blog or discussion to promote active team participation. Strive to keep team spirit high. Encourage team members to maintain team operating standards.

Reporter: If directed by session activities, post summaries or team projects in the designated locations. Post to the team blog if needed.

Resource Manager: Locate online resources based on course topics to help increase team members' understanding of the content and ability to complete the activity. Seek to clarify and support ideas, as needed. Be responsible for the organization of ideas, conversations, and resources.

Wildcard: In the case that a team member in role needs assistance, this person can step into the role.

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EDUCATION

ED. D., 2016, Teacher Development and Leadership, Johns Hopkins University, Baltimore, Maryland, Research Focus: Online Learning and Collaboration.

M.S., 2002, Education/Technology for Educators, Johns Hopkins University, Baltimore, Maryland

B.S., 1999, Elementary Education/Science, University of Maryland, College Park, College Park, Maryland

Additional Coursework:

2004-2005, Graduate Certificate in Teaching the Adult Learner, Johns Hopkins University, Baltimore, Maryland

Scholarly Awards/Fellowships

Aileen and Gilbert Schiffman Fellowship, 2008 – 2009, 2010 -- 2011

Edward Franklin Buchner Fellowship in Education, 2008 – 2009

PROFESSIONAL EXPERIENCE

Program Director for Teaching and Learning Online, 2002-Present**,** School of Education, Center for Technology in Education (CTE), Johns Hopkins University (JHU), Columbia, Maryland

Adviser, **Graduate Certificate in Teaching the Adult Learner** 2007-Present, School of Education, JHU

Adjunct Instructor, 2002-Present, School of Education, JHU

Independent Consultant, 2001-2002**,** CTE JHU

Online Instructor, 2000-2002, eSylvan, Baltimore, Maryland

Math Curriculum Developer, 2000-2001, eSylvan, Baltimore, Maryland

Grade 4 Teacher, 1999-2000, Montgomery County Public Schools, Strathmore Elementary School, Silver Spring, Maryland

PROFESSIONAL ACTIVITIES

Classroom Instruction

Johns Hopkins University

Advanced Seminar in 21st Century Skills (893.701)

Designing and Delivering E-Learning Environments (893.645)

Foundation to Innovation: Adult Learning (610.610)

Graduate Project in Technology (893.830)

Instructional Strategies and Technologies for the Adult Learner (610.630)

Leader as Teacher: Influencing Communities and Individuals (705.710)

Multimedia Tools for Web-based Development & Training (893.646)

Web-Based Mentoring and Online Interactions (893.648)

SERVICE ACTIVITIES

University Service

Graduate Internship Mentor, Technology for Educators, JHU, 2002 to 2012

Site-Based Mentor, Graduate Certificate in Teaching the Adult Learner, JHU, 2008 to 2012

Professional Service

Reviewer, Teacher's College Record, 2013 to present

Conference Workshop Chairperson, Maryland Society for Educational Technology (formally the Maryland Instructional Computer Coordinators Association), 2008 to 2013

Institute of Higher Education Liaison, Maryland Society for Educational Technology (formally the Maryland Instructional Computer Coordinators Association), 2006 to 2013

Community Service

Volunteer, Very Special Arts Festival, Baltimore County Public Schools, 2014 to present

Volunteer, Special Olympics Maryland Athlete Congress, 2007 to 2014

Volunteer, Adolescent Therapeutic Group Home, Mosaic Community Services, Inc., 2008 to 2014

PROFESSIONAL ASSOCIATIONS

International Society for Technology in Education (2005-2016)

Maryland Society for Educational Technology (formally the Maryland Instructional Computer Coordinators Association) (2001-2016)

The E-Learning Guild (2003-2016)

RESEARCH

Doctoral Research: **A Comparison of a Team versus an Individual Approach to Learning in an Online Teacher Preparation Program**, Johns Hopkins University School of Education Center for Technology in Education, 2016 (research advisors: Dr. Deborah Carran, Dr. John Castellani)

Description: By studying the variables of interest of motivation, frequency of interaction, and perceived value of interaction, this study will determine if educators are more motivated and engaged, exhibiting a higher level of interaction with satisfaction, when working collaboratively in teams versus individually in an online teacher education course.

Early Childhood Comprehensive Assessment System: Formative Assessment Pilot Study, Johns Hopkins University School of Education Center for Technology in Education, 2014 (in collaboration with Dr. Jacqueline Nunn and Tamara Otto)

Description: This study aims to test traditional paper-based formative performance tasks with 3, 4, and 5 year olds for usability, feasibility, and validity.

Field Test of the Start Strong Early Childhood Comprehensive Assessment System: A Partnership to Promote School Readiness by the Maryland and Ohio Departments of Education, Johns Hopkins University School of Education Center for Technology in Education, 2013 (in collaboration with Dr. Jacqueline Nunn and Tamara Otto)

Description: The purpose of this field test is to examine the validity, reliability, and feasibility of the Kindergarten Readiness Assessment items for a sample of kindergarten students and teachers in Maryland and Ohio.

SELECTED GRANTS

Building Blocks Part B/619 (MSDE): Director of Teaching and Learning Online, 2014-2016, sponsored by the Maryland State Department of Education, MSDE via US Department of Education for leading professional development for state implementation of the Child Outcomes Summary for preschool special education.

Early Childhood Race to the Top CAS Grant: Early Childhood Grant (MSDE): Director of Professional Development**,** 2012 – 2016; sponsored by the Maryland State Department of Education, MSDE via US Department of Education for: 1.) leading the design of a comprehensive assessment system for children 36 months to Kindergarten to establish developmental trajectories with regard to Kindergarten readiness in Maryland and Ohio; 2.) Building an online gaming system to capture authentic developmental performance in combination with guided observation; and 3.) Scale-up the Maryland EXCELS QRIS and conduct validation study.

The Center for IDEA Early Childhood Data Systems (DaSy Center)/SRI International: Director of Teaching and Learning Online, 2013—2016; sponsored by the DaSy Center/SRI International via the US Department of Education Office of Special Education Programs (OSEP) for leading the design of online learning modules and digital assets to support IDEA early intervention and early childhood special education state programs in the development or enhancement of coordinated early childhood longitudinal data systems.

Strengthening Partnerships to Strengthen Education: Director of Teaching and Learning Online, 2003 to 2016; funded by the Maryland State Department of Education to research, advocate for, and disseminate effective policies and practices for: 1.) Consideration of assistive technology devices, services, and testing accommodations and promote their use across general and special education; 2.) Evidence-based, technology-supported, instructional strategies that foster collaboration between general and special educators, improve outcomes

for all students, and support students with disabilities as they progress in the general education curriculum. 3.) Fostering leadership at the school, district, state, and national levels that is informed by data, supportive of collaboration between general and special education, invested in technology integration, and committed to assuring that all children, including those with disabilities, are able to access and progress in the general education curriculum. Developed and delivered online professional development for targeted audiences including an online Early Intervention Leadership Academy for aspiring leaders in early intervention in Maryland. Developed an Early Childhood Gateway Web site with online modules and resources designed for teachers, providers, administrators, families, and community partners in early childhood to improve services for young children with disabilities and their families. Assist yearly in grant preparation and reporting.

STAR Schools Project: Maryland Digital Schools: Project Manager for Online Learning Initiatives, 2002 to 2006; funded by the U.S. Department of Education through Maryland Public Television to support the Maryland Star Schools Consortium in using digital broadcasting and other technologies to help teachers implement innovative teaching strategies to meet new educational standards that stress higher-level thinking skills and project-based collaborative learning.

School Safety Web-based Curriculum for Six Target Audiences: Project Manager, 2003 to 2004; funded by the U.S. Department of Justice, Office of Justice Programs to identify essential content and components of a strategic and comprehensive Web-based school safety curriculum for teachers, administrators, parents, students, police, school based officers, and concerned citizens. Developed a Web-based, menu driven environment for delivery of training and community building, and online courses for each targeted audience member.

PUBLICATIONS

Carling, L.Z., & Winter, K. (2011). Web 2.0 for teaching and learning [TAM fan]. Arlington, VA: Technology and Media Division (TAM) of the Council for Exceptional Children.

Carling, L.Z., & Winter, K. (2010). Enhancing the 21st century adult learning experience with web 2.0 tools. In Castellani, J., & Warger, C. (Eds.), Accessibility in action: Universal design for learning in postsecondary settings. Arlington, VA: Technology and Media Division (TAM) of the Council for Exceptional Children.

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Carling, L.Z., & Winter, K. (2011). Web 2.0 for teaching and learning [TAM fan]. Arlington, VA: Technology and Media Division (TAM) of the Council for Exceptional Children.

Carling, L.Z., & Winter, K. (2010). Enhancing the 21st century adult learning experience with web 2.0 tools. In Castellani, J., & Warger, C. (Eds.), Accessibility in action: Universal design for learning in postsecondary settings. Arlington, VA: Technology and Media Division (TAM) of the Council for Exceptional Children.

SELECTED LECTURES AND PROFESSIONAL PRESENTATIONS

Carling, L. (June 2015). *A parent's perspective on entry into preschool special education.* Maryland Preschool Special Education Child Outcomes Summary Statewide Professional Development, Columbia, MD.

Carling, L., Peloff, D. (October 2014). Ready *for Kindergarten: The Kindergarten Readiness Assessment*. Maryland State Board Meeting, Maryland State Department of Education, Baltimore, MD.

Carling, L., (April 2013). Ohio's Early Childhood Comprehensive Assessment System Updates. Ohio State Advisory Committee Meeting, Ohio Department of Education, Columbus, OH.

Carling, L. (2013, December). *Top 10 things to know about web-based professional development and communities of practice.* Webinar Series, Consortium for School Networking (CoSN), Online/Webinar.

Carling, L., Otto, T. (2012, November). *The CAS PD requirements gathering process for the OCCRA PD Network*. OCCRA Professional Development Network, Ohio Childcare Resource and Referral Network, Columbus, OH.

Carling, L. (2012, October). *The early childhood comprehensive assessment system. The professional development framework*. CCSSO Technical Advisory Committee Meeting, The Council of Chief State School Officers, Baltimore, MD.

Carling, L., Alexander, C. (September 2012). *The early childhood comprehensive assessment system needs in Maryland*. Maryland State Advisory Committee, Maryland State Department of Education, Columbia, MD.

Carling, L.Z. & Neimeyer, L.K. (2010, June) *Deeper learning with web 2.0: Increase the power of online courses.* Concurrent session presented at the annual meeting of the International Society for Technology in Education, Denver, CO.

Carling, L.Z., & Winter, K. (2010, March) *High quality adult learning: A model for online instructional design*. Concurrent webinar session presented at the annual International Online Conference for Teaching and Learning, Online.

Winter, K., and **Carling, L.Z.** (2010, March) *Web 2.0: Tested tools, new applications*. Virtual poster session presented at the annual International Online Conference for Teaching and Learning, Online.

Carling, L.Z. & Neimeyer, L.K. (2010, April) *Design on a dime: Graphic design and media production using free web tools.* Workshop presented at the annual meeting of the Maryland Society for Educational Technology, Baltimore, MD.