THE RELATIONSHIP OF PERSONALITY TRAITS TO TEACHER CANDIDATE PERCEPTIONS OF TEACHING CONFIDENCE AND TEACHING EXPERIENCE IN A SIMULATED CLASSROOM ENVIRONMENT

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CHAPTER 1

INTRODUCTION

The National Education Technology Plan published in 2010 outlines five major goals set in conjunction with the U.S. Department of Education. In reference to the third major goal, Teaching: Prepare and Connect, the plan states the following:

> The best way to prepare teachers for connected teaching is to have them experience it. All institutions involved in preparing educators should provide technology-supported learning experiences that promote and enable the use of technology to improve learning, assessment, and instructional practices. This will require colleges of education and postsecondary institutions generally to draw from advances in learning science and technology to change what and how they teach when they prepare teachers, keeping in mind that everything we know about how people learn applies to new teachers as well. (p.44).

This dissertation study presents research on the preparation of preservice teachers in a simulated classroom environment, addresses learning theories that connects teaching, and analyzes the outcomes of the simulation to equip teaching candidates to be effective teachers in the near future. Chapter 1 introduces the topic, presents the research questions, and describes the hypothesis and conceptual framework. Current literature is reviewed in Chapter 2, and Chapter 3 states the research methods used in this study. The results of the findings are explored in Chapter 4, and Chapter 5 presents a discussion of the findings and conclusions.

Background

Darling-Hammond (2010) suggests that effective teachers engage students in active learning, create intellectually ambitious tasks, and use a variety of teaching strategies. Not only do effective teachers help students learn (Cruickshank, Jenkins, & Metcalf, 2003) they also know how and why their students learn (Darling-Hammond, 1997; Darling-Hammond & Youngs, 2002; Rice, 2003; Hyslop-Margison & Sears, 2010). For this dissertation, effective teaching is

composed of preservice teachers' self-reported measures of teaching confidence and teaching experience. Studies of preservice, beginning, and experienced teachers (Grossman et al., 2009) have shown learning differences between expert and novice teachers. Research shows that students entering teacher education programs come with preconceived beliefs about education based on their own school experiences. Changing those beliefs has been shown to be difficult (Alger & Kopcha, 2009; Knobloch & Hoop, 2005; Richardson, 2003) and can have negative impacts in teacher-student interactions such as impeding student learning (Cook-Sather & Youens, 2007; Stillman, 2011). Preservice teachers can identify fewer instructional strategies (Graham, Buroyne, & Borup, 2010; Sato, Akita, & Iwakawa, 1993) and their lesson plans are more factual but less flexible than more experienced teachers (So & Watkins, 2005). Expert teachers are more aware of learning differences, student interactions, and types of task activities. They can identify problems more quickly, spend more time on analysis, and produce better solutions (Elliott, Stemler, Sternberg, Grigorenko, & Hoffman, 2011; Ropo, 2004). Beginning teachers face many challenges such as establishing routines, managing the classroom, hierarchical planning linked to the overall curriculum, and attention to longer-term learning goals (Alger & Kopcha 2009; Liston, Whitcomb, & Borko, 2006; Sardo-Brown, 1996; Shoham, Penso, & Shiloah, 2003).

When beginning teachers step into the classroom, their preparation to effectively teach is related to their teacher self-efficacy (Darling-Hammond, Chung, & Frelow, 2002). Self-efficacy is one's belief in their ability to succeed in a particular situation (Bandura, 1994). A teacher's sense of self-efficacy affects their attitudes and feelings towards the educational process and instructional practices (Woolfolk & Hoy, 1990). Self-efficacy in preservice teachers affects their

attitudes and beliefs in their teaching knowledge and their ability to apply teaching skills to impact student learning in the near future (Rockoff & Speroni, 2011).

Individual differences in teachers such as personality traits may also impact teacher performance (Teven, 2007; Tok & Morali 2009) and be predictors of future teacher efficacy (Rockoff & Speroni, 2011). The Big Five-factor model (McCrae & Costa, 1996) is a framework to measure human personality and includes these traits: openness, conscientiousness, extraversion, agreeableness, and neuroticism. In a meta-analysis, Poropat, (2009) reported that personality is an important component in a student's willingness to perform. Identification of preservice teachers' personality traits can provide valuable information about traits that may be associated with effective teaching. During preservice teachers' training educators can identify areas of teaching weaknesses and provide direction. For example, a teaching candidate who may be low in extraversion may have difficulty talking in front of an audience. If this skill is essential for effective teachers, then while the teaching candidate is in training, attention to presentation skills can be addressed.

To foster effective teachers, preparation programs should provide preservice educators with interactive teaching experiences in both real and virtual settings that will allow peers and instructors to provide feedback concerning the development and deployment of teaching knowledge and skills (Gibson, 2012). One virtual, interactive tool created to enable teachers to gain practice in teaching knowledge and skills is simSchool, an internet-based classroom simulation program that has the potential to change how preservice teachers are trained.

Statement of Problem

Teachers in training need opportunities to practice knowledge building to create curriculum materials, assess strategies, organize group work, and plan student inquiries (Darling-

Hammond, 2010). Institutions that prepare educators should provide technology-supported learning experiences that promote and enable the use of technology to improve learning, assessment, and instructional practices (U.S. Department of Education, 2010) and develop confidence in preservice teachers' abilities. Individual personality traits of preservice teachers may have a significant influence on their confidence in teaching. Confidence in teaching does not always align with the experience of preservice teachers (Hopper, Knezek, & Christensen, 2013).

Significance of Study

Preservice teachers can increase their levels of instructional self-efficacy through the use of simSchool (Christensen, Knezek, Tyler-Wood, & Gibson, 2011) and improve their confidence and experience in teaching. A study by Hopper, Knezek, and Christensen (2013) suggests that a simulated teaching environment can enhance preservice teachers' experience levels and improve teaching skills. Personality traits associated with high self-efficacy ratings can be identified through exploration of the relationship between preservice teacher personality traits and teaching confidence and experience. These associations may predict future effective teachers. Low task performance may be related to personality attributes; training can be provided to develop and improve teaching confidence and experience. Candidates with personality traits that do not align with effective teaching and have high self-efficacy ratings can grow stronger through perseverance by overcoming obstacles (Bandura, 1994).

Purpose of the Study

The purpose of this dissertation is to explore the relationship of preservice teacher's self-reported measures of teaching confidence, teaching experience, and the association with the Big

Five factors of personality: openness, conscientiousness, extraversion, agreeableness, and neuroticism-in simSchool.

Research Questions

This dissertation study is divided into two parts. The first part of the study examines preservice teachers' self-reported measures of teaching confidence and teaching experience in simSchool and answers the question:

1) Is there a difference between treatment and comparison groups on educator's gains in a) confidence, and b) experience?

The second part of the study explores the relationship of personality traits of preservice teachers and teaching effectiveness. Teaching effectiveness is composed of teaching confidence and teaching experience; therefore, the following three questions are investigated:

2) Is there a relationship between personality type and perceived teaching effectiveness?
3) Is there a relationship between personality attributes and preservice educator ratings of teaching experience in a simulated teaching environment?
4) Is there a relationship between personality attributes and preservice educator ratings of teaching confidence in a simulated teaching environment?

Findings of the research questions are presented in Chapter 4, while Chapter 5 discusses the findings and presents conclusions of the research.

Hypotheses

The first hypothesis presents the proposed finding for the first part of the study that examines how preservice teachers' use of simSchool impacts their self-reported measures of teaching confidence and teaching experience.

Null Hypothesis 1: Use of simSchool for six training hours will not result in increased ratings of experience or confidence in preservice teacher candidates.

Alternative Hypothesis 1a: Use of simSchool for six training hours will result in increased ratings of experience in preservice teacher candidates.

Alternative Hypothesis 1b: Use of simSchool for six training hours will result in increased ratings of confidence in preservice teacher candidates.

Rationale: Previous studies have found increased ratings of experience and confidence in preservice teachers who have used simSchool (Hopper et al., 2013) and have also found increased ratings of self-efficacy (Christensen et al, 2011; McPherson, Tyler-Wood, McEnturff, & Peak, 2011). The treatment group should demonstrate higher gains in confidence and experience than the comparison group.

The next five hypotheses are associated with the second part of the dissertation that explores the relationship of personality traits to teaching confidence and teaching experience. The five-factor model of personality (McCrae & Costa, 1996) includes conscientiousness, openness, extraversion, agreeableness, and neuroticism; and a proposed finding for each personality trait is presented. Personality trait studies have been performed to determine individual differences in job performance and individual differences in academic achievement. The relationships between personality traits have similarities in academic and work settings (Poropat, 2009). In the formulation of the hypotheses, personality trait research in the workplace and in academic settings was reviewed considering the sample population is preservice teachers.

Null Hypothesis 2: No relationship exists between conscientiousness and confidence or experience.

Alternate Hypothesis 2a: Conscientiousness is more prevalent in preservice teachers who

report a high rating in confidence.

Alternate Hypothesis 2b: Conscientiousness is more prevalent in preservice teachers who report a high rating in experience.

Rationale: Conscientiousness is the strongest trait that correlates with academic achievement (Digman, 1989) and job performance (Mount & Barrick, 1998). High performing individuals are dependable, persistent, goal directed and organized; whereas low performers tend to be careless, irresponsible, and impulsive (Mount & Barrick, 1998). Teacher candidates who rate high in confidence or experience most likely would be high performing individuals that are conscientious.

Null Hypothesis 3: No relationship exists between openness and confidence or experience.

Alternate Hypothesis 3a: Openness is more prevalent in preservice teachers who report a high rating in confidence.

Alternate Hypothesis 3b: Openness is more prevalent in preservice teachers who report a high rating in experience.

Rationale: Openness to experience and academic success have been found to be positively correlated (Chamorro-Premuzic & Furnham, 2008; Chamorro-Premuzic & Furnham, 2004) as open individuals are more likely to engage in stimulating activities. In the workplace, openness to experience was a predictor of training ability in many jobs (Mount & Barrick, 1998). High openness to experience for preservice teachers would indicate a willingness to try new methods of teaching and be open to new ideas. Openness to experience should be prevalent in preservice teachers who rate high in confidence and experience.

Null Hypothesis 4: No relationship exists between extraversion and confidence or

experience.

Alternate Hypothesis 4a: Extraversion is more prevalent in preservice teachers who report a high rating in confidence.

Alternate Hypothesis 4b: Extraversion is more prevalent in preservice teachers who report a high rating in experience.

Rationale: Extraversion has been found to be negatively related to academic achievement (Busato, Prins, Elshout, & Hamaker, 2000; Furnham & Chamorro-Premuzic, 2004; Furnham, Chamorro-Premuzic & McDougall, 2002) in many studies. Alternatively, in the workplace, individuals with high levels of extraversion have shown successful performance in jobs that require interaction with others and were a valid predictor of training proficiency (Mount & Barrick, 1998). Preservice teachers who rate high in confidence and experience may be more extraverted which will assist them in necessary interactions with children, peers, administration and parents.

Null Hypothesis 5: Emotional stability (neuroticism construct) will not be associated with preservice teachers who report a high rating in confidence, or experience.

Alternate Hypothesis 5a: Emotional stability (neuroticism) will be associated with preservice teachers' self-reported ratings in teaching confidence.

Alternate Hypothesis 5b: Emotional stability (neuroticism) will be associated with preservice teachers' self-reported ratings in teaching experience.

Rationale: People who are low in emotional stability or high in neuroticism pay more attention to self-talk, focus on their emotional condition (De Raad & Schouwenburg, 1996), and are characterized by high levels of anxiety. High levels of emotional stability are associated with self-efficacy and that in turn correlates with academic performance (Robbins et al., 2004).

In the workplace, emotionally stable individuals are successful in positions that involve interpersonal interactions (Mount, Barrick, & Stewart, 1998). Preservice teachers with a higher level of emotional stability or low neuroticism will be associated with higher ratings of confidence and experience.

Null Hypothesis 6: Agreeableness will not be associated with preservice teachers' ratings in confidence or experience.

Alternate Hypothesis 6a: Agreeableness will be associated with preservice teachers' self-reported ratings in teaching confidence.

Alternate Hypothesis 6b: Agreeableness will be associated with preservice teachers' self-reported ratings in teaching experience.

Rationale: Agreeableness is an important trait in teamwork interaction and on the job success (Mount & Barrick, 1998). An agreeable person demonstrates courtesy, flexibility, trust, cooperation, and tolerance (Barrick & Mount, 1991). Individuals who are argumentative, inflexible, uncooperative, and uncaring tend to be low in agreeableness. Some characteristics of good teachers include being caring, supportive, and concerned about the welfare of their students, and the ability to get along with parents (Cruickshank et al., 2003). A correlation should exist between agreeable preservice teachers who rate high in confidence and experience.

Further research on personality traits will be presented in the literature review in Chapter 2. The research results reported in Chapter 4 will address findings of each of the hypotheses.

Conceptual Framework

This dissertation study explores preservice teachers' perceptions of teaching confidence and teaching experience and is based on Bandura's social cognitive theory and Argyris and

Schon's theory of action. To understand how confidence and experience are defined in this study, each variable is examined before moving forward to the discussion of the theories.

Teaching Confidence

Teaching confidence can be defined as the faith or belief that one will act in a right, proper, or effective way (Merriam-Webster, n.d.) To measure confidence (Gibson, Riedel & Halverson, 2006) in this study, preservice teachers complete a self-report pre-test/post-test and participate in a simSchool training intervention. When preservice teachers complete the pre-test, they rate their own ability to perform a particular teaching skill. This rating translates to the preservice teachers' perception of how they would perform in the future based on their present skills before taking most of their methods courses or student teaching. Typically, preservice teachers tend to rate their confidence levels very high prior to the training intervention and may overstate their confidence. This phenomenon can be explained to some degree by the theory of action, described towards the end of this section.

Teaching Experience

Experience can be defined as the direct observation of or participation in events as a basis of knowledge and the length of such participation is important (Merriam-Webster, n.d.). Each preservice teacher comes to a teacher preparation program with different degrees of experience and their ratings are based on their own perceptions of teaching experience. Examples of experience can be babysitting, working in an after-school program, teaching Sunday school or vacation Bible school, or recollections of their own experience as a student in K-12 classrooms. These experiences vary considerably as to the breadth and depth of knowledge a student realizes based on the type and length of the experience.

Effective Teaching

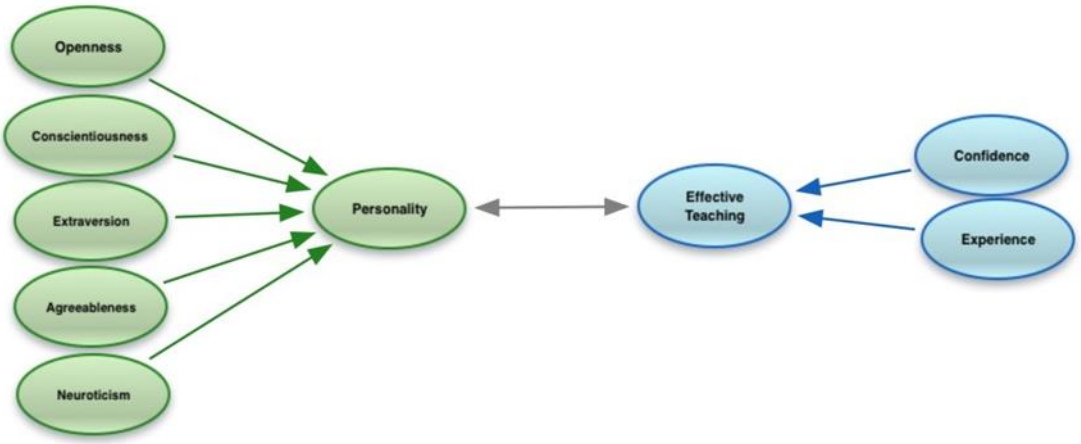


Figure 3. Relationship of personality traits and effective teaching.

One purpose of this dissertation is to measure the self-reported ratings of teaching confidence and teaching experience in the simSchool environment. The second purpose is to explore the relationship of personality traits and the self-reported ratings of teaching confidence and teaching experience, which measured together, are called effective teaching. Figure 1 illustrates the relationship of the proposed model between personality traits and effective teaching. In addition, the measures of confidence and experience that are referred to as effective teaching are similar to the concept of self-efficacy. Bandura's social cognitive theory describes self-efficacy as a determinant of how people think, motivate themselves, behave, and feel (Bandura, 1994). Self-efficacy is the belief in one's ability to produce levels of performance. Confidence in one's competence is another way to describe self-efficacy (Christensen et al., 2011). Competence can be increased through experience and observation of or participation in events as a basis of knowledge.

Bandura Social Cognitive Theory

Self-efficacy begins to develop in early childhood and continues to grow and change throughout life as individuals interact with others, learn skills, experience new situations, and acquire deeper understandings. Bandura defines four main sources that influence individuals to gain a stronger sense of self-efficacy:

The first and most effective source is to master an experience by successful repetition of a task. Oftentimes, tasks can be performed if the concept is easy to master; however, with more difficult tasks or when obstacles present themselves, perseverance is required for success. If an individual believes that they have what it takes to succeed, they can grow stronger during adversity (Bandura, 1994). Social modeling through the observation of others completing a task is the second way to gain self-efficacy. When others succeed through sustained effort, confidence in one's own ability to succeed increases with the idea that 'if you can do it, so can I.' In contrast, if competent others fail at a task, than one's own self-efficacy could be negatively influenced (Bandura, 1994). The third way to strengthen self-efficacy is through social persuasion by competent others instilling confidence with encouragement to succeed. For example, "I know you can do it because you have what it takes to be an effective teacher." Comments such as these encourage others to believe in their own ability to be successful; therefore, they may try harder when faced with obstacles. In addition to conveying positive comments, the fourth way to strengthen self-efficacy is to provide situations for others to succeed through self-improvement (Bandura, 1994). Psychological responses such as mood, stress, and fatigue, and physical states affect self-efficacy. How one perceives and interprets their emotional and physical states is more likely to impact performance (Bandura, 1994).

People with high ratings of self-efficacy view difficult tasks as challenges to be mastered

as opposed to threats to be avoided. They are goal-setters and maintain strong levels from commitment to task completion (Bandura, 1994). Teacher self-efficacy levels impact teaching performance, pedagogical beliefs, instructional practices, motivational styles, and effort, thereby affecting student achievement and motivational outcomes (Duffin, French, & Patrick, 2012). Talented teachers with high levels of self-efficacy create classroom atmospheres that provide students with environments conducive to learning (Bandura, 1993). Research shows that teachers with a high sense of self-efficacy devote more time to academic learning, support struggling students with the help they need to succeed, and praise student accomplishments. In contrast, teachers with a low level of self-efficacy spend less time on academic learning, give up more quickly on struggling students, and criticize student failures (Gibson & Dembo, 1984).

Theory of Action

Regarding the preservice teachers who may overrate their confidence with little experience in teaching, the theory of action can help explain this behavior. Human beings design action to achieve specific consequences and monitor themselves to learn. To make sense of their environment, they construct meaning to their intentions through concepts, schemas, and strategies. These constructions guide their action and are referred to as the theory of action. Argyris and Schon (1974) propose two kinds of theories of action - the espoused theory and the theory-in-use.

The espoused theory is how people would like to behave based on their personal values. This is the theory that individuals claim to follow and this would be the theory preservice teachers may acclaim in their teacher education programs. The theory-in-use is how individuals actually behave in spite of their personal values and can be inferred from action. What individuals do is different from what they espouse and few individuals are aware of the

difference. Even fewer individuals are aware of the actual theories they do use (Argyris, 1980). Individuals want others to see how competent they are regardless of how they actually perform or feel about their performance. For example, preservice teachers may record responses to a pre-test based on what they envision they can do instead of their actual ability, resulting in a disparity between espoused and actual performance. This could contribute to inflated confidence ratings.

Summary

In the Conceptual Framework, preservice teachers' perceptions were explored. Results indicated that preservice teachers may overrate their confidence in teaching skills at the pre-test time; however, their ratings at post-time may not be influenced in the same way. In this study, a treatment group and a comparison group participated in the pre- and post-tests and the treatment group received six hours of simSchool training. In Chapter 4 findings will be presented to compare the results of the treatment and comparison groups. What will be of particular interest is how simSchool impacts the treatment group and their ratings of confidence and experience in contrast to the comparison group. How will their perceptions vary and what role will personality traits play in teaching effectiveness? These are important questions because how one perceives and interprets their emotional and physical states is more likely to impact performance (Bandura, 1994).

Limitations and Delimitations

The current study was limited by the sample population. The sample size was sufficient for the analysis of the data; however, a larger sample size would yield more reliable results. Other limitations included gender which was primarily female (91%). The treatment group participated in the simSchool intervention as part of their course curriculum and surveys were voluntary. The comparison group participated in the surveys for extra credit. The results of the

surveys were based on self-reported data and are limited to this study; therefore, they are not generalizable to all preservice teachers. The delimitation in this study was that only one university participated in the research because it was a convenience sample.

Definitions of Terms

Agreeableness - a tendency to be compassionate and cooperative rather than suspicious and antagonistic towards others.

Big five personality traits - five broad domains or dimensions of personality that are used to describe human personality.

Canonical correlation – measure of the strength of the overall relationships between the linear composites (canonical variates) for the independent and dependent variables. In effect, it represents the bivariate correlation between the two canonical variates (Hair, J., Anderson, R., & Black, T., 1998).

Confidence - faith or belief that one will act in a right, proper, or effective way (Merriam-Webster, n.d.).

Conscientiousness - A tendency to show self-discipline, act dutifully, and aim for achievement.

Experience - direct observation of or participation in events as a basis of knowledge, and the length of such participation is of particular importance (Merriam-Webster, n.d.).

Extraversion - Energy, surgency, and the tendency to seek stimulation and the company of others.

Knowledge worker - Anyone who works for a living at the tasks of developing or using knowledge.

Neuroticism - A tendency to easily experience unpleasant emotions such as anger, anxiety, depression, or vulnerability.

Openness to experience - Appreciation for art, emotion, adventure, unusual ideas; imagination and curiosity.

Pedagogical balance - the alignment of confidence in teaching with experience in teaching. The measure is calculated from the differences in gain scores of confidence minus experience.

Preservice teacher - student teachers enrolled in a teacher education program.

Self-efficacy - the belief in one's ability to produce levels of performance (Bandura, 1994). It can also be defined as the competence in one's confidence.

Simulation - a simulation models reality in an authentic environment with authentic tasks to imitate an authentic system that can be internalized by the learner and includes interactions between the learner and the simulated model. It provides rules to reflect reality being taught and convey feedback from the system to indicate success (Warren, Jones, Dolliver, & Stein, 2012).

Teaching effectiveness - suggests that effective teachers engage students in active learning, create intellectually ambitious tasks, and use a variety of teaching strategies (Darling-Hammond, 2010). Effective teaching as a variable in this dissertation is comprised of preservice teachers' self-reported measures of teaching confidence and teaching experience.

Summary Chapter 1

The topic of the dissertation study was introduced and background information was provided. The purpose of this dissertation is to explore the relationship of preservice teachers' self-reported measures of teaching confidence and teaching experience and the Big Five factors of personality--openness, conscientiousness, extraversion, agreeableness, and neuroticism—in a

simulated teaching environment. A presentation of the statement of the problem, significance of the study, research questions, hypotheses, and conceptual framework has laid the foundation for further analysis. In Chapter 2, the literature is reviewed and in Chapter 3 research methods are described. Results of findings are presented in Chapter 4 and a discussion about the findings in Chapter 5 concludes the dissertation.

CHAPTER 2

LITERATURE REVIEW

Beginning and experienced teachers must learn to effectively balance content, pedagogy, and technology in unique contexts of a variety of educational situations (Mishra & Koehler, 2006) such as learner psychological characteristics, cultural and family backgrounds, content requirements, school routines, and state and national policies (Gibson, Kruse, Knezek, Tyler-Wood, Christensen, & Hopper, 2013). Additionally, teachers must meet the needs of all students through differentiated learning (Tomlinson, 1995), explore assorted pedagogical approaches to improve teaching, and develop the ability to assess and plan their own professional growth (Grossman, 2005). Typically, these types of skills are developed during teacher education experiences and student teaching (Gibson, et al., 2013). Skills are sharpened when preservice teachers begin to teach their own classroom and continue to teach in successive years.

Innovative Teacher Preparation

The development of highly skilled citizens in education and the workforce is critical due to the emergence of new technologies (Morgan & Spector, 2004). "An important change has occurred in the way new digital tools and collaborative environments have enhanced learning, moving from an emphasis on reproducing information to content creation and sharing in virtual environments" (Resta, Searson, Patru, Knezek, & Voogt, 2011). These skills that include technological literacy, information and communication technology (ICT) literacy, and information literacy are referred to as digital literacy (Resta et al., 2011). Digital literacy is one of the eight essential skills for lifelong learning (Resta et al., 2011) and is needed to compete in the global knowledge economy.

The Partnership for 21st Century Learning encourages teachers to integrate critical thinking, communication, collaboration, and creativity skills in conjunction with core content areas. Today's learners must be able to decipher information to critically judge which parts are trustworthy (Christensen & Knezek, 2013). "Today's citizens must be active critical thinkers in order to compare evidence, evaluate competing claims, and make sensible decisions" (Partnership for 21st Century Learning (P21), 2007, p. 13). To be effective problem solvers requires citizens to work creatively with technology, interpret information, and interact with other people (P21, 2007). As preservice teachers prepare to teach in the classroom, they need authentic opportunities to develop and demonstrate these skills (Rutherford, 2013).

The role of educators has evolved into that of a lifelong learner transforming professional practices to include effective teachers as role models, learning guides, and process instructors (Jukes, McCain, & Crockett, 2010). Teachers need to see themselves as members of a learning organization that develop, adapt, and transform the needs of the people with whom they connect (Jukes et al., 2010) and demonstrate competency in digital literacy. New skills need to be developed in future teachers as a result of technology integration in education. Gibson and Knezek (2012) provide a framework for 21st century teacher educators to consider based on Thomas Freidman's "The World is Flat." Examples of four suggested ideas from their article "Game Changers" include:

- "Develop teachers as knowledge workers who are trained to develop learning environments for assisting the development of other knowledge workers." (p. 9)
- "Develop teachers as designers of new types of instructional experiences that leverage emerging learning technologies, such as communal bookmarking, wiki coauthoring, interoperable data systems; mash-up authoring systems (media appropriation) as part of new media literacy." (p 9)
- "Develop teachers who know how to assemble, assess, and validate ePortfolios that are out on the open web, and can mine "the Web footprint" of a learner across time." (p. 9)

- "Develop teachers as coaches, with the habits and expectations of being only one stop in the chain of expertise students learn to use in every inquiry and expressive learning opportunity." (p. 9)

The International Society of Technology Education (ISTE) developed the National Education Technology Standards (NETS) that have been adopted by most U.S. states and many countries. The standards are used for evaluating the skills and knowledge educators need to teach, work, and learn in an increasingly connected global and digital society. "These standards define information technology (IT) skills and higher order skills necessary to use Information and Communication Technology (ICT) and learning technologies to improve learning, teacher, and school leadership" (Thomas & Knezek, p. 334). The skills include:

- Inspire student learning and creativity: By modeling innovative teaching and observing innovative teaching methods, preservice teachers can develop skills to inspire student learning and creativity using their knowledge of subject matter (ISTE, 2008). Since the mid-nineteenth century, educators have realized value from the learning by doing approach (Cruickshank & Armaline, 1986; Hixon & So, 2009) with students engaged in real-world issues solving authentic problems. Reflective and collaborative tools allow students to conceptualize their thinking and planning in creative processes. Preservice teachers need to learn to take part in learning with students, colleagues, and supervisors in face-to-face and virtual environments (ISTE, 2008).
- Design and develop digital age learning experiences and assessments: Preservice teachers need to be able to incorporate tools and resources to adapt relevant learning experiences and become active participants to set their own educational goals, manage their own learning, and assess their progress (ISTE, 2008).

- Model digital age work and learning: Today's global digital society requires that preservice teachers exhibit skills of an innovative professional to communicate ideas effectively and collaborate with students, peers, and teachers. (ISTE, 2008). Using technology tools to provide collaborative sessions between preservice teachers, their peers, and classroom teachers allows for increased observation and communication. Preservice teachers need to model digital-age learning themselves as well as observe others teaching digital-age instruction.
- Promote and model digital citizenship and responsibility: Cultural understanding and global awareness are skills preservice teachers need to develop with the use of digital communication and collaboration tools (ISTE, 2008). The diverse needs of all learners need to be addressed by using learner-centered strategies and teachers should advocate, model, and teach safe practices of digital information and technology (ISTE, 2008).
- Engage in professional growth and leadership: Preservice teachers need to model lifelong learning and continually strive to improve their practice. Professional growth and participation in learning communities allow teachers to advance in their own development, reflect on current research, and contribute to the self-renewal of the teaching profession to improve student learning (ISTE, 2008). Learning communities and mentoring are some of the ways that preservice teachers can strive to improve their practice.

Law (2008) suggests that the role of future teachers should center on knowledge building that requires preservice teachers to develop metacognition as independent learners. Future teachers need to be able to identify problems and knowledge gaps, monitor and review their own

learning, and achieve targeted goals (Law, 2008). Preservice teachers can foster a new professionalism through knowledge building in eight ways:

- promote deep cognitive learning,
- learn to teach in ways they were not taught,
- commit to continuous professional learning,
- work and learn in collegial teams,
- treat parents as partners in learning,
- develop and draw on collective intelligence,
- build a capacity for change and risk, and
- foster trust in processes (Hargreaves 2003, p. 24).

Knowledge building is not something that happens effortlessly and requires shared work from members of the community (Scardamalia & Bereiter, 2003). Teachers need the socio-metacognitive and the socio-emotional capacity to contribute to knowledge building and engage in change (Oshima et al., 2003). As knowledge workers, teachers will need to be creative and critical thinkers, and have good communication and self-regulation skills (Spector, 2012).

Five knowledge domains or big ideas for teaching are suggested by Goodwin (2010) to support integrated, inquiry-based, and holistic teacher learning that focus on achieving quality education through teacher preparation. They include:

1. Personal knowledge/autobiography and philosophy of teaching - describes learning to teach as a *positioning point*."That is, teacher preparation is a *transition* between what one has been in the past and will be in the future. Thus, prospective teachers' experiences and autobiographies become the foundation upon which teaching practice is built" (Goodwin, 2010 p. 24).

2. Contextual knowledge/understanding children, schools, and society – Contextual knowledge begins in the classroom and historically educators cannot teach preservice teachers everything they need to know for all situations in the classroom. What teacher educators can teach preservice teachers is problem-solving skills, information gathering skills, and strategies for naming problems and invoking solutions. In addition to acquiring local contextual understanding, preservice teachers need preparation in global contextual meaning. "Technology, international exchanges, and studying abroad all hold promise–and have evidenced success–as avenues towards greater intercultural knowledge and internationalization" (Goodwin, 2010, p. 24).

3. Pedagogical knowledge/content, theories, methods of teaching, and curriculum development: "Habits of mind are developed as student teachers are challenged to thoughtfully integrate disciplinary expertise and pedagogical content knowledge with prior experience and current student teaching practice" (Goodwin, 2010, p. 25).

4. Sociological knowledge/diversity, cultural relevance, and social justice - In our global society teachers and curriculum need to respect diversity. Sociological changes are resulting in transnational communities (Goodwin, 2010) of children and adults of multiple national associations. These changes impact our schools and what it means to teach well. Our world has always been diverse; however, globalization and technology has brought the world closer together. Goodwin explains that, "New teachers will need to confront their fears, prejudices, and misconceptions if they are to teach children of all races and ethnicities, children who have disabilities, children who are immigrants, migrants, refugees, (English) language learners, gay and lesbian, poor, academically apathetic, homeless, children who are different from them as well those who mirror them…"(Goodwin, 2010, p. 26).

5. Social knowledge/cooperative, democratic group process, and conflict Resolution (Goodwin, 2010). “Teachers who choose to participate in cooperative groups have the opportunity to exert leadership in the field. Teacher empowerment suggests that teachers have a say in shaping the profession. If teachers participate in the formation of school goals and policies, they must develop expertise in democratic group processes and decision making. These skills can transfer to the classroom where they incorporate fairness, cooperation and equality with their students” (Goodwin, 2010, p. 22).

In this section the literature addressed the role of teachers and the skills needed to be an innovative, effective teacher in the 21st century. How teacher preparation programs are addressing technological changes in education vary. Traditional teacher education research does not devote much attention to technology integration research and technology integration researchers pay little attention to teacher education research (Kirschner, Wubbels, & Brekelmans, 2008). Innovative solutions that bridge technology with 21st century skills and create effective teachers prepared to teach in a digitally connected world are needed.

This dissertation explores the relationship of preservice teachers’ teaching confidence and teaching experience in a simulated environment. In the simulated environment of simSchool, preservice teachers use the simulator to explore instructional strategies, create students and tasks, model classroom experiences, collaborate with peers, think critically, reflect on teaching, and develop confidence that will translate into effective teaching.

SimSchool

Digital games and simulations can help prepare preservice teachers in virtual learning environments. Teacher educators have seen a dramatic increase and growing appreciation of the potential for games and simulation-based learning in teacher preparation programs (Aldrich,

2004; Foreman et al., 2004; Prensky, 2001). Simulations can provide learning characteristics that include repeatability, automated analysis, reflective examination, and transfer of skills to the real classroom (Mayrath, Clarke-Midura, & Robinson, 2012). Two goals for the use of simulations in teacher education consist of: 1) producing better teachers, and 2) building operational models of physical, emotional, cognitive, social, and organizational theories concerned with teaching and learning (Brave & Nass, 2003). The National Research Council's report on "How People Learn" (HPL) framework (Bransford, Brown, & Cocking, 2000) outlines four broad areas of learning theory that are necessary in a simulation designed to improve teaching. These characteristics are a systems perspective of how people learn, supported by cognitive science and teaching and learning research. Gibson (2007) describes the four areas of HPL framework.

> The HPL framework suggests that a game about teaching needs to be personalized and adapted for maximum effectiveness with many different kinds of prospective teachers. It needs to reflect how experienced teachers work with their own and students' existing knowledge, and how students develop new knowledge through modeling and experimentation. The game needs to be contextualized within real situations and embedded in real communities of peers and experts who communicate and shape one's thinking. Finally, the game needs to be laced with ample, timely, accurate, expert feedback to guide one's development of knowledge-in-action. (p. 3)

The New Media Consortium (NMC) *Horizon Report* (Johnson, Adams, & Cummins, 2012) states that "game-based learning reflects a number of important skills higher education institutions strive for their students to acquire: collaboration, problem solving, communication, critical thinking, and digital literacy" (p. 19). The report specifically names simSchool as a "simulator that provides challenging teaching scenarios that develop knowledge and skills needed for classroom success" (p. 20).

SimSchool is an online simulation that can model different types of students, and provide practice sessions for teachers to assign tasks and interact with students (Zibit & Gibson, 2005). A simulation is part of a learning module with specific lesson objectives that can involve any

number of students from 1 to 18. Teachers begin by reading student reports that detail student personalities, learning preferences, and academic records. Tasks or groups of tasks, based on hierarchical thinking skills similar to Bloom's taxonomy (Krathwohl, Bloom & Masia, 1964) include recall, skills and concepts, strategic thinking or extended thinking activities. Students respond differently to assorted tasks through body language and comments that represent various states of attention. Teachers interact with students by negotiating power and affiliation using the interpersonal circumplex.

Physical, psychological and cognitive features of classroom learning make up the simStudent personality and are modeled in the simSchool environment. Learning theories and instructional practices such as zone of proximal development (Vygotsky, 1979), mastery and performance goals (Elliot, 1999), multiple intelligences (Gardner, 1993), differentiation of instruction (Tomlinson, 1995) and culturally responsive teaching (Gay, 2000) are reinforced from time in the simulator. Visual, auditory, and kinesthetic perceptual preferences are connected to learning styles theory (Silver et al., 2000; Lemire, 2002) and are the physical dimensions of simStudents. The psychological characteristics of simStudents are known as the OCEAN model (McCrae & Costa, 1996) based on the five factor model of personality. (Digman, 1990). OCEAN provides an acronym for the five factors as described in Table 2 (Howard & Howard, 2000; Gibson, 2007). Each of the factors has a high and a low end on a continuum. For example the "E" stands for extraversion or the degree to which a person can tolerate sensory stimulation from people and situations. On the high end of the continuum a person prefers to be around other people and involved in many activities. On the low end of the continuum a person prefers to work alone and is more serious, skeptical, quiet, and private. SimStudents fall in to a range from -1 to +1, with 0 at the center for each of the personality traits. The psychological

characteristics are presented to the simSchool players in the form of a narrative that divides the characteristics into one of five positions. For example, with extraversion, a simStudent could be described as extraverted or introverted, moderately extraverted or moderately introverted, or balanced in extraversion. Further research on the OCEAN model is reviewed in the next section. The psychological characteristics of the OCEAN traits, adapted from Howard and Howard (2000) are outlined detailing both ends of the spectrum for each trait (Gibson, 2007).

- *O = Openness:* The degree to which we are open to new experiences/new ways of doing things. Highly open people tend to have a variety of interests and like cutting-edge technology as well as strategic ideas. Those who are low in originality tend to possess expert knowledge about a job, topic, or subject while possessing a down-to-earth, here-and-now view of the present.

- *C = Conscientiousness:* Conscientiousness refers to the degree to which we push toward goals at work. Highly conscientious people tend to work towards goals in an industrious, disciplined, and dependable fashion. Low consolidation people tend to approach goals in a relaxed, spontaneous, and open- ended fashion, and are usually capable of multi-tasking and being involved in many projects and goals at the same time.

- *E = Extraversion:* Extraversion refers to the degree to which a person can tolerate sensory stimulation from people and situations. Those who score high on extraversion are characterized by their preference of being around other people and involved in many activities. Introversion at the other end of the scale is characterized by one's preference to work alone and is typically described as serious, skeptical, quiet, and a private person.

- *A = Agreeableness*: Accommodation refers to the degree to which we defer to others. Agreeable people tend to relate to others by being tolerant, agreeable, and accepting of others. Low accommodation or disagreeable people tend to relate to others by being tough, guarded, persistent, competitive, or aggressive.

- *N = Emotional stability:* At one extreme of the need for stability continuum, highly reactive people experience more negative emotions than most people and report less satisfaction with life than most people. At the other extreme, highly stable people do not get emotionally involved with others and may seem aloof or stoic.

The operational definitions of each personality characteristic will be detailed in a later section of this chapter.

The cognitive variables consist of academic performance capability and language capability. Together, combinations of these ten variables (visual, auditory, kinesthetic, openness, conscientiousness, extraversion, agreeableness, neuroticism, academic performance, and language capability) comprise simStudent personalities.

SimSchool has the capacity to develop heuristic knowledge in preservice teachers (Christensen et al., 2011) through experience in the simulator. Heuristics is a Greek word that means "to know," " to find," or " to discover" and is a technique to find feasible solutions using previous knowledge (Russell & Norvig, 1995) such as creating an educated guess, rule of thumb, or intuitive judgment (Gibson & Kruse, 2012). "People who practice with a simulator develop heuristic knowledge of the underlying theories because the immersive multimedia experience tap into physical, emotional, and cognitive pathways, heightening the sense of importance of the experience" (Gibson & Kruse, 2012, p. 1145).

One advantage of a simulation like simSchool is that teaching candidates can develop skills and confidence to be an effective teacher without the ill impacts of practicing on real students (Gibson, 2007). In addition modules are repeatable so preservice teachers can adjust variables to experiment with changes in academic performance and student outcomes. "Teacher decisions can be thought of as independent variables in an ongoing experiment in their own classrooms that builds expertise over time" (Gibson, 2007, p. 3). Documented outcomes of simulations such as simSchool experiences include improvement in general teaching skills, more confidence in using technology, and an increased belief that the teacher has the skills and ability to make a difference in a child's life (Girod & Girod, 2006; Girod et al., 2008; Ferry & Kervin, 2007; Cheong & Kim, 2009, Knezek & Vandersall, 2007). Other benefits include improvement in preservice teachers' performance in teacher-preparation courses, attitudes toward inclusion of

special needs students, significant, positive impact on the mastery of deeper learning capacities that comprise the readiness to teach, and increased "staying power" on the path to the field of teaching acquired through rapid development of strong self-efficacy and resilience (Christensen et al., 2011; McPherson et al., 2011). Three findings have emerged from field trials of simSchool in teacher preparation programs (Kim, Gibson, & Baek, 2007; Knezek & Vandersall, 2007; Zibit & Gibson, 2005). First, those who use simSchool may develop a readiness to teach that could be contributed to the development of a teacher's self-efficacy. Second, attitudes about the use of games and simulations in education are strengthened. Third, simSchool provides a non-biased platform to practice different kinds of teaching knowledge and skills that engages and develops procedural knowledge (Gibson, 2012). In these ways, simSchool enables transformational experiences for teacher candidates to help them become more effective teachers in their classrooms and learning communities.

Five-Factor Model of Personality

The foundation of a simStudent's personality is The five-factor model of personality (McCrae & Costa, 1996) or the OCEAN model. The five-factor model of personality is strengthened by its long history of empirical evidence (Goldberg, 1981; Conley, 1985; Costa & McCrae, 1988; Lorr & Youniss, 1973; McCrae & Costa, 1985; McCrae & Costa, 1989; Digman & Inouye, 1986; Digman & Takemoto-Chock, 1981; Fiske, 1949). Research supports links between personality traits and work performance (Barrick & Mount, 1991; Funder, 2001, Hough, 2001, Poropat, 2009). A universal model of personality, the big-five factor represents biologically rooted (Costa & McCrae, 2008; Corker, Oswald & Donnellan, 2012), individual differences that can impact teacher temperament (Teven, 2007) and academic performance (Poropat, 2009).

Personality traits are universal across languages and cultures (Allik & McCrae, 2004; Rossier, Dahourou, & McCrae, 2005) and among age groups (Donnellan & Lucas, 2008; McCrae, Costa & Martin, 2005; Soto, John, Gosling, & Potter, 2011). Cross-cultural studies of the Big-Five factor model support universality in 50 societies and across six continents (McCrae & Allik, 2002; McCrae & Terracciano, 2005; Schmitt, Allik, McCrae, & Benet-Martinez, 2007) despite history, economy, social life, and ideology. Cross-national studies in 26 countries found that perceived personality profiles were typical of adolescents, adults, and seniors (Donnellan & Lucas, 2008; McCrae et al., 2005; Soto, et al, 2011).

Many five factor instruments exist to measure personality traits such as the revised NEO personality inventory (NEO-PI-R, Costa & McCrae, 1992c) and the big five markers (Goldberg, 1992). Two types of reports are used in completing a survey: a self-report and an observer report. Self-report measures are completed by the self-rater who considers external and internal trait expressions. Observer surveys are completed by work colleagues and measure external traits (Funder, 1995). Studies have shown that observers' ratings of personality traits may predict performance behaviors better than self-ratings. (Connelly & Hulsheger, 2012)

The five-factor model is divided into five broad factors or domains that include openness, conscientiousness, extraversion, agreeableness, and neuroticism and each trait is discussed in the next sections.

Openness

Students with openness are imaginative, broadminded, and intellectually curious (Costa & McCrae, 1992). They are flexible in their thinking, more creative and adventurous (Lee-Baggley, Preece, & DeLongis, 2005), and open students reflect the ideal student (DeRaad & Schouwenberg, 1996). They value change, actively seek new experiences (McCrae & Costa,

1980; McCrae & Costa, 1997), tend to be foresighted, resourceful, and have a positive association to learning (Bergeman et al., 1993; Vermetten, Lodewijks, & Vermunt, 2001). Those with high levels of openness have more varied life experiences (Luedtke, Roberts, Trautwien, & Nagy, 2011) and are more willing to seek out a range of life events (Lilgendahl & McAdams, 2011). In contrast, those who have a low level of openness seek familiar environments and avoid new experiences (Lilgendahl & McAdams 2011). Research has shown that openness could be a factor that explains the difference in how individuals process difficult life events (Weiss, King, & Figuredo, 2000; Manners & Durkin, 2000). Although some studies have found that correlations between openness to experience and academic achievement were found to be very low (r = .06) discounting the interaction between openness to experience and academic performance (O'Connor & Paunonen, 2007); other studies show that individuals who rate high in openness to experience have a more positive attitude toward learning experiences (Barrick & Mount, 1991). "This dimension has been shown to have the highest correlation of any of the personality dimensions with measures of cognitive ability (McCrae & Costa, 1987). Therefore, it is possible that openness to experience is actually measuring ability to learn as well as motivation to learn (Barrick & Mount, 1991, p. 20)."

Conscientiousness

Conscientiousness is a tendency to demonstrate a strong will to achieve (Digman, 1989), and is associated with academic performance through sustained effort (Barrick, Mount, & Strauss, 1993; McAdams & Walden, 2010). A conscientious student has the tendency to organize, be task and goal oriented, and can delay gratification. This type of personality has self-control, plans well, and is intrinsically motivated for high achievement (Costa, McCrae, & Dye, 1991). The strongest predictor of academic success is conscientiousness as it has been found to

be a positive and significant predictor of academic achievement in most studies (Chamorro-Premuzic & Furnham, 2004; 2008; W, Matyja & Huber, 2008; Wagerman & Funder, 2007).

Extraversion

Extraverted students place importance on interpersonal relationships, like to engage in e social interactions and are active and outgoing (Watson & Clark, 1997). Generally, those with a high level of extraversion tend to be positive and happy (Francis, 1998), and optimistic (Costa & McCrae, 1992). Some researchers suggest that extraverted students perform better academically because they have higher energy levels which leads to positive attitudes which leads to a greater desire to learn (DeRaad & Schouwenberg, 1996). Other researchers propose that students who are highly extraverted socialize more and pursue activities outside of studying which could lead to lower performance levels (Eysenck, 1992).

Agreeableness

The trait of agreeableness is characterized by cooperation and friendliness towards others with warm, kind, gentle, and trustworthy attributes. Agreeableness is linked to compliance of teacher instructions, effort and focus on learning tasks, and facilitating cooperation in the learning process (De Raad & Schouwenburg, 1996). Some studies show that agreeableness has been found to be positively related to academic achievement (Tok & Morali, 2009; Gray & Watson, 2002; Farsides & Woodfield, 2003), whereas other studies have found no significant correlations between agreeableness and academic achievement (Conard, 2006; Duff, Boyle, Dunleavy, & Ferguson, 2004).

Neuroticism (Emotional Stability)

Emotional Stability (neuroticism) pertains to the ability to control stress and is characterized by low confidence, a tendency to experience anxiety, and a higher level of arousal

(Somer, Korkmaz, & Tatar, 2004). Neuroticism reduces academic performance due to increased learning anxiety and focus on emotional states (De Raad & Schouwenburg, 1996). Neuroticism has been found to be negatively associated with academic achievement (Chamorro-Premuzic & Furnham, 2003a; 2003b); however, in a meta-analysis by O'Connor and Paunonen (2007) an extremely low correlation coefficient (r = -3) was found between neuroticism and academic performance that suggests neuroticism may be a very low determinant of individual differences and overall academic achievement.

Summary Chapter 2

The relationship of the OCEAN variables to preservice teachers' perceptions of teaching confidence and teaching experience in simSchool were explored. Together, teaching confidence and teaching experience compose teaching effectiveness. This literature review accomplished the following:

- examined the role of teachers and the necessary skills to be an effective teacher in the 21st century;
- presented literature on the learning theories;
- presented literature on the research findings of simSchool; and
- reported recent literature of the five-factor model of personality.

Chapters 3 and 4 will address the methods and results of this study. Findings on teachers' personality traits can provide valuable information that may be associated with effective teaching. SimSchool training may impact teaching confidence and teaching experience in preservice teachers and increase their self-efficacy. Chapter 5 discusses these findings and how they impact teacher training in the 21st century.

CHAPTER 3

METHODS

Research Design

This study executed a quasi-experimental design to understand the personality traits of preservice teachers and how their perceptions of teaching confidence and teaching experience were related to preservice teachers' performance in simSchool. Quantitative research methods were used to measure and examine two key constructs of personality and teaching effectiveness between two groups of preservice teachers. Figure 2 illustrates the research design.

Group	Research Design		
Treatment	X1	O	X2
Comparison	X1		X2

Figure 4. Research designs for treatment and comparison groups.

SPSS Version 21 was used to analyze data in several ways.

- Descriptive statistics provided a context for the data.
- Cronbach's alpha and factor analysis were used to check reliability and validity of the OCEAN instrument.
- Pearson's r correlation was used to measure the strength of the relationship between personality traits, confidence, and experience.
- Repeated measures multi-variate analysis of variance was used to analyze pre-post changes.
- Multiple regression was used to analyze the associations between confidence, experience, and the personality traits.

- Canonical correlation analysis and multiple regression techniques were used to assess the relationship of personality traits to pedagogical experience and confidence. "The primary goal of Canonical correlation analysis is to evaluate the degree that two variable sets are related to each other and then determine how the specific variables function in this multivariate relationship" (Nimon, Henson, Gates, 2010, p. 703).

The treatment group consisted of 37 preservice teachers enrolled in a technology integration course and the comparison group included 117 preservice teachers enrolled in a required preservice teacher course on the educational aspects of exceptional learners. The treatment participants completed a pre-test and a personality survey at the beginning of the fall semester, six hours of simSchool modules, and a post-test. The comparison group completed a pre-test, a personality survey, and a post-test, but did not participate in the simSchool modules.

Population and Sample

The target population for this study was preservice teachers enrolled in a teacher preparation undergraduate program at the University of North Texas. This population was chosen to continue to explore how simSchool can prepare preservice teachers for the classroom and to examine the relationship of preservice teachers' personality traits to their perceptions of teaching confidence and teaching experience.

The treatment group was preservice teachers enrolled in a technology integration course and participated in the treatment of simSchool as part of the course curriculum. Participants in the comparison group were enrolled in a required education course on teaching exceptional learners. The comparison group completed the Survey of Teaching Skills pre/post-tests and the OCEAN survey as an extra credit assignment. Both the treatment and the comparison group participants (n = 152) who completed the pre-test and the OCEAN survey served in the sample

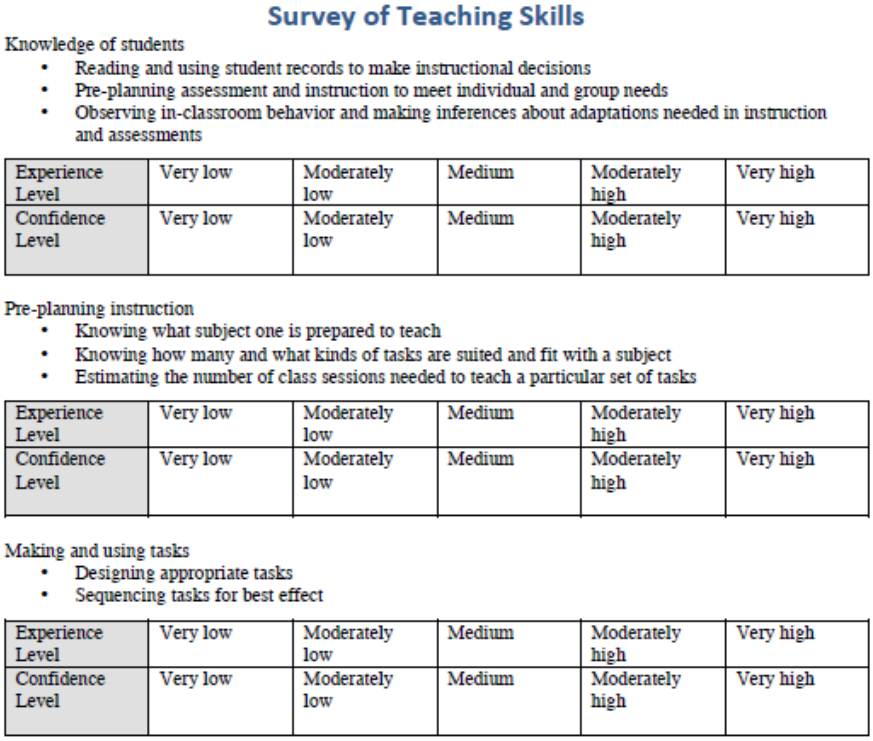
for the canonical analysis which requires approximately 10 cases per variable for the researcher to expect a stable solution (Hair, Anderson, & Black; 1998). The study examines seven variables, requires at least 70 cases, and meets more than twice the sample-size requirements. The matched pre-post participants (n = 116) consisted of a subset of the larger sample and was used for the repeated measures analysis of variance.

Instrumentation

Two instruments were administered during the study. The Survey of Teaching Skills was given to participants as a pre-test and post-test. The OCEAN Survey was administered one time to all participants to measure their personality traits of openness, conscientiousness, extraversion, agreeableness and neuroticism.

Survey of Teaching Skills

The Survey of Teaching Skills (Gibson, Riedel, & Halverson, 2006) functions as two scales in one instrument to measure teaching self-efficacy in eight areas in simSchool. In each of the eight teaching areas, participants rated their experience level and confidence level using a five-item scale which includes measurements of very low, moderately low, medium, moderately high, and very high. Cronbach's alpha for Experience Level = .93, and Confidence Level = .93. According to the guideline by DeVellis (1991), both Cronbach's Alpha scores were excellent, indicating high internal consistency reliability for each measurement index. The Survey of Teaching Skills was used in the pilot study and Cronbach's alpha was Experience Level = .96, and Confidence Level = .94. Figure 3 shows an example of three survey questions. The entire survey can be viewed in Appendix A1.



Survey of Teaching Skills

Knowledge of students

- Reading and using student records to make instructional decisions
- Pre-planning assessment and instruction to meet individual and group needs
- Observing in-classroom behavior and making inferences about adaptations needed in instruction and assessments

Experience Level	Very low	Moderately low	Medium	Moderately high	Very high
Confidence Level	Very low	Moderately low	Medium	Moderately high	Very high

Pre-planning instruction

- Knowing what subject one is prepared to teach
- Knowing how many and what kinds of tasks are suited and fit with a subject
- Estimating the number of class sessions needed to teach a particular set of tasks

Experience Level	Very low	Moderately low	Medium	Moderately high	Very high
Confidence Level	Very low	Moderately low	Medium	Moderately high	Very high

Making and using tasks

- Designing appropriate tasks
- Sequencing tasks for best effect

Experience Level	Very low	Moderately low	Medium	Moderately high	Very high
Confidence Level	Very low	Moderately low	Medium	Moderately high	Very high

Figure 5. Example of questions from the Survey of Teaching Skills.

Ocean Survey

The OCEAN survey functions as a self-report measure of one's openness, conscientiousness, extraversion, agreeableness, and neuroticism. It is a 30-item instrument created by Gibson (2011) using the International Personality Item Pool (http://ipip.ori.org/) that is an online, public domain scientific collaboratory of resources that measure individual differences. "A collaboratory is a computer-supported system that allows scientists to work with each other, facilities, and data bases without regard to geographical location" (Lederberg & Uncapher, 1989, p. 6.; Finholt & Olson, 1997). Reliability and validity for the International Personality Item Pool has been established by researchers (Goldberg et al., 2006) and is often used in personality measurement.

The OCEAN survey measures the five personality traits based on how much of the trait is present in one's personality. Participants rate their personality traits using a five-item scale ranging from strongly disagree to strongly agree. The responses are weighted numerically with strongly disagree as a one and strongly agree as a five. The survey includes six questions in each of the five constructs. The range of scores in each construct varies from 6 – 30. Reverse coding was used to measure each construct in a positive direction. For example, neuroticism was recoded to measure emotional stability rather than stress or anxiety levels. Figure 4 shows an example of six questions from the OCEAN survey. The entire survey can be viewed in Appendix A2 and the OCEAN survey key can be viewed in Appendix A3.

	SD – D – N – A – SA (Strongly Disagree – Disagree – Neutral – Agree – Strongly Agree)	
1.	I waste a lot of time before settling down to work	SD – D – N – A - SA
2.	I tend to assume the best about people	SD – D – N – A – SA
3.	Poetry has no effect on me	SD – D – N – A – SA
4.	I like to be where the action is	SD – D – N – A – SA
5.	I often feel helpless and want someone to rescue me	SD – D – N – A – SA
6.	I'm highly productive and usually get everything done	SD – D – N – A – SA

Figure 6. Example of questions from the OCEAN survey.

Data Collection

Prior to data collection, an IRB was submitted to the university and approval was given to conduct the research study with two preservice, undergraduate courses. The treatment group will include participants from a technology integration course designed for preservice teachers. The comparison group will include participants from a course about teaching exceptional learners.

Treatment Group

Data collection occurred at three separate times throughout the one-month study and varied for the treatment and comparison groups. The 37 student participants were from three different sections of the learning technology course with three different instructors, and the training was performed by the same trainer for all three sections. The treatment consisted of two, three-hour sessions on simSchool incorporating activities that had been previously established as effective through the Fund for the Improvement of Postsecondary Education (FIPSE), Gates/EDUCAUSE, and National Science Foundation grants secured by Drs. Christensen, Knezek, and Tyler-Wood at UNT (U.S. Dept. of Education Fund for the Improvement of Postsecondary Education Grant #P116B060398; U.S. National Science Foundation Research and Disabilities Education (RDE) Grant #0726670; EDUCAUSE Modules Project). Sessions were conducted approximately two weeks apart. Each is described step-by-step in this section.

Session 1

1. The 16-item pre-test (Appendix A.1) was administered to students online during simSchool registration on their own computer. Participants had access to a "how to register for simSchool" video (Appendix B.1) with instructions in the video to complete the survey.

2. SimSchool Introduction (30 minutes) – The trainer presented a Prezi overview (Appendix B3) of simSchool introducing students to the science behind simSchool and the simSchool classroom.

3. Everly's Bad Day (30 minutes) – Participants worked in teams of two at computers with a navigator and a driver. The navigator was responsible for reading through the materials while the driver piloted the computer in simSchool. During the simulation, participants taught pre-determined tasks (Appendix B4) to Everly (Hettler, Gibson, Christensen, & Zibit, 2008). Upon completion of the lesson, they received a report that tracked Everly's learning and their teaching effectiveness. Participants analyzed the results and adjusted tasks to improve Everly's academic performance.

4. Everly's Better Day (30 minutes) – Participants switched roles as navigator and driver and chose tasks and comments to interact with Everly. After reports of the lesson were created, participants compared and contrasted the changes in Everly's performance (Appendix B5) and came together as a larger group to discuss their classroom decision making in the simulation.

5. SimStudent Personalities and OCEAN variables (30 minutes) – Participants completed the 30-item OCEAN survey online in Qualtrics. They calculated their personality traits for classroom use.

6. Creating Yourself (30 minutes) – Participants created a simStudent (Appendix B6 and B7) that reflected their personality traits and chose tasks to teach themselves. Participants reflected on themselves as a learner. An overview of how to use simSchool teacher talk was presented to participants (Appendix B11).

7. Reflection (30 minutes) – Participants self-reflected on the instructional strategies they used in simSchool, the activities they performed, and next steps. As a larger group, participants exchanged insights learned during the simulation.

Session 2

1. Bloom's Taxonomy (30 minutes) – The trainer presented the levels of Bloom's taxonomy (Krathwohl et al., 1964) to participants and discussed activities to teach preservice teachers how to incorporate skills that consisted of critical thinking, creativity, collaboration, and communication into lessons. The six levels of thinking in Bloom's taxonomy were compared to the four levels in simSchool as shown in Appendix B.11.

2. SimSchool and Bloom's Taxonomy Module (1.5 hours) – Participants worked in teams of two on a three-part module teaching a virtual class of three students using a collaborative wiki to record their results (Appendix B12). Preservice teachers taught recall lessons (Appendix B13), extended thinking lessons (Appendix B14), and then combined thinking levels (Appendix B.15) to compare, analyze, and adjust activities to improve learning for all simStudents.

3. Reflection (45 minutes) – Participants reflected in pairs and then presented to the class their findings and methods used in teaching (Appendix B16).

4. Post-Survey (15 minutes) – Participants completed the post-test online in Qualtrics.

Comparison Group

Data collection occurred at two separate times within the one-month study. The online pre-test and OCEAN survey was completed early in the semester by 117 student participants from five sections of the teaching exceptional learners course with five different instructors. The post-test was completed one month later online in Qualtrics and by 102 students. The students were offered extra credit to complete both the pre- and post-tests.

Summary Chapter 3

This chapter outlined the specifics of the research design used in the dissertation study. Methods of data collection, the population, sample, and instrumentation were described. The simSchool intervention used with the treatment group was detailed. Chapter 4 presents the results of the data analysis.

CHAPTER 4

RESULTS

The results of the analysis of the data will be explored to examine the relationship of personality traits to preservice teachers' perceptions of teaching confidence and teaching experience in simSchool. The presentation of descriptive statistics for the data, Pearson product-moment correlations, repeated measures analysis of variance, canonical correlation, and linear regression analysis will address each of the four research questions and the six hypotheses. The pilot study described in the following section provides a foundation for Research Question 1.

Pilot Study

The pilot study, "Assessing Alignment of Pedagogical Experience and Confidence in a Simulated Classroom Environment" (Hopper et al., 2013) consisted of 58 preservice teachers enrolled in a technology integration course at the University of North Texas. A treatment and comparison group participated in the study and both groups completed a pre- and post-test. The treatment group participated in eight hours of simSchool as part of their course curriculum. The comparison group continued to participate in previously established classroom activities to determine if simSchool is more effective at teaching a set of constructs as opposed to the current status quo curriculum.

The Survey of Teaching Skills was found to be a valid and reliable instrument in the pilot study and was used as the pre- and post-test instrument for the dissertation. The simSchool intervention was eight hours in the pilot study and was reduced to six hours in the dissertation. Findings from the pilot study indicated that simSchool training for preservice teachers provided experience that simulated a real classroom and offered alternative methods to practice and improve teaching skills. The pilot study indicated that a simulated teaching environment can

enhance preservice teaching-experience levels. One component of the dissertation study repeated the experiment from the pilot study and compared how a different group of preservice teachers performed with simSchool. The same quasi-experimental research design from the pilot study was used to answer the question: Are there differences between treatment and comparison groups on educator's gains in a) confidence and b) experience?

Overview

This study used quantitative statistical procedures from SPSS Version 21 to analyze the data. Fewer than 10% of responses were missing in the data and mean substitution was used to replace missing data. Figure 5 shows each research question and the data analysis technique used.

Research question	Method of data analysis
1) Is there a difference between treatment and comparison groups on preservice educators' gains in: a) confidence, and b) experience?	Repeated measures analysis of variance
2) Is there a relationship between personality type and perceived teaching effectiveness?	Canonical correlation analysis
3) Is there a relationship between personality attributes and preservice-educator ratings of teaching experience in a simulated teaching environment?	Canonical correlation analysis Pearson's r Multiple regression
4) Is there a relationship between personality attributes and preservice-educator ratings of teaching confidence in a simulated teaching environment?	Canonical correlation analysis Pearson's r Multiple regression

Figure 7. Quantitative analysis for research questions

Data Analysis of Descriptive Statistics

Undergraduate students from two different teaching preparation courses at the University of North Texas participated in this study. The sample size of 152 students consisted of 9.2% males and 90.8% females. Other demographic data are listed in Table 1.

Table 1

Demographics of Sample, n = 152

Demographic	Items	Count	Percentage
Gender	Male	14	9.2%
	Female	138	90.8%
Classification	Freshman	2	1.3%
	Sophomore	43	29.6%
	Junior	76	50.0%
	Senior	28	18.4%
	Post baccalaureate	2	1.3%
	Other	1	.7%
Age	18-20	75	49.7%
	21-23	48	31.1%
	24-29	18	11.9%
	30-40	8	5.3%
	Over 40	3	2.0%

The analysis subset returned from the larger sample consisted of 117 students who completed the Survey of Teaching Skills pre- and post-test. The mean differences pre- to post-test were examined using a paired sample t-test with n = 36 in the pre-treatment group and n = 37 in the post-treatment group. The pre-test comparison group was n = 80 while there were n = 77 in the post-test comparison group. As shown in Table 2 and Table 3, the treatment group gain in confidence was not statistically significant ($p < .05$); however, treatment experience ($p =$

.003) showed significant gains ($p < .05$) from pre- to post-test, before versus after the simSchool intervention. A large effect size ($d = .62$) in experience and a small/medium effect size ($d = .29$) in confidence were found for pre- to post- gains (Cohen, 1988). The comparison group did not demonstrate significant gains ($p < .05$) from pre- to post-test on either confidence or experience measures. The effect sizes for comparison group changes pre- to post-test were near to zero (0) as shown in Tables 2 and 3.

Table 2

Survey of Teaching Skills Experience of Pre- and Post-Matched Treatment and Comparison Descriptive Statistic

	Time 1			Time 2				
Variable	*n*	*M*	*SD*	*N*	*M*	*SD*	*p*	Cohen's *d*
Treatment Experience	36	2.88	.78	37	3.32	.64	.003	.62
Comparison Experience	80	2.60	.90	77	2.61	.83	.990	.01

Table 3

Survey of Teaching Skills Confidence of Pre- and Post-Matched Treatment and Comparison Descriptive Statistics

	Time 1			Time 2				
Variable	*n*	*M*	*SD*	*N*	*M*	*SD*	*p*	Cohen's *d*
Treatment Confidence	36	3.18	.64	37	3.36	.61	.164	.29
Comparison Confidence	80	2.90	.88	77	2.90	.83	.951	0

Descriptive analyses were used to explore the treatment data set in more detail before multivariate analyses were completed. Data were examined for the pre-treatment group with $n = 34$ cases with complete data and $n = 37$ cases representing all treatment subjects. The trends

were similar for the $n = 34$ and $n = 37$ findings so the three cases in question were retained in the data set, with mean substitutions utilized for missing data in the subsequent analyses reported in this document. This process allowed all treatment subjects to be included in the more complex multivariate analyses sensitive to loss of degrees of freedom due to subject attrition.

Descriptive statistics including mean and standard deviations for the OCEAN survey data were computed for each personality trait, with $n = 152$ subjects at pre-test time, as shown in Table 4. The means ranged from 2.85 to 3.94 on a scale from 1 to 5 with 5 showing a high level of the trait. For example, extraversion had a mean score of 3.94 indicating preservice teachers rated their level of extraversion fairly high (toward being extraverted), whereas, emotional stability (neuroticism after reverse-coding) had a mean score of 2.85, indicating a moderate score. Note that personality attributes were only assessed at pre-test time for all subjects in this study. The rationale for this decision was that personality traits are generally assumed to be fixed, or at least very slow to change (Costa & McCrae, 2008; Corker et al., 2012) – and therefore one measure should suffice.

Table 4

OCEAN Personality Trait Descriptive Statistics

Measurement	*n*	*M*	*SD*
Openness	152	3.50	.74
Conscientiousness	152	3.55	.79
Extraversion	152	3.94	.61
Agreeableness	152	3.93	.61
Neuroticism	152	2.85	.83

Research Questions

Research Question 1 and Hypothesis 1

Research Question 1: Is there a difference between treatment and comparison groups on educator's gains in a) confidence or b) experience?

Null Hypothesis 1: Use of simSchool for six training hours will not result in increased ratings of experience or confidence in preservice teacher candidates.

Alternative Hypothesis 1a: Use of simSchool for six training hours will result in increased ratings of experience in preservice teacher candidates.

Alternative Hypothesis 1b: Use of simSchool for six training hours will result in increased ratings of confidence in preservice teacher candidates.

Analysis of Hypothesis 1

To determine if changes in preservice teachers' confidence and experience could be attributed to the simSchool treatment, a MANOVA was used in which treatment and comparison functioned as the attribute variables. The MANOVA test allowed for examination of the effects of the two dependent variables and the significance of group differences. The independent variables were the attribute variables of treatment and control. The dependent variables were confidence and experience.

The MANOVA test results showed the pre to post gains for the treatment group to be higher than for the comparison group and the gains in experience were significantly ($p = .044$) higher. Paired t-test analysis indicated the changes from pre to post were significant for experience ($p = .003$) and the treatment effect sizes for experience ($d = .62$) and confidence ($d = .29$) approached or exceeded the $d = .3$ magnitude commonly considered to be educationally meaningful (Bialo & Sivin-Kachala, 1996). These findings suggest that six hours of simSchool

intervention increased the ratings of experience and possibly confidence in preservice teachers. The null hypothesis was rejected and the Alternative Hypothesis 1a was accepted. Further research is needed before conclusions can be drawn regarding Alternative Hypothesis 1b.

Summary of Research Question 1

A summary of the MANOVA findings are reported in Table 5 and graphically illustrated in Figures 6 and 7. The treatment group gained more than the comparison group in the areas of experience and confidence, and the gains were significant ($p = .044$) for experience. The trends in confidence and experience found in the MANOVA were consistent with the confidence and experience gain scores in the paired *t*-tests introduced in Table 2 and 3 and described in detail in Tables 5 and 6. No significant ($p < .05$) gain was found for the treatment group in confidence ($p = .164$) while for experience ($p = .003$) there was significant ($p < .05$) gain. The confidence effect size ($d = .29$) was small/medium and experience was found to have a moderate/ large effect size ($d = .62$) according to guidelines of .2 = small, .5 = moderate, and .8 = large established by Cohen (1988). Based on these results the treatment group was concluded to have higher gain scores than the comparison group in the area of teaching experience, indicating that the simSchool intervention increased preservice teachers' perceptions of teaching experience, a major component of effective teaching as currently defined. Trends in the data indicate probable positive gains in both teaching experience and confidence. Conjectured relationships between experience and confidence will be explored in more detail in Chapter 5.

Table 5

MANOVA Tests of Within Subjects

Source	Variable	Type III Sum of Squares	*df*	*MS*	*F*	*p*
Time	Confidence	.427	1	.427	.851	.358
	Experience	1.857	1	1.857	3.502	.064
Time * Group	Confidence	.114	1	.114	.228	.634
	Experience	2.210	1	2.210	4.168	.044

Table 6

Paired Samples t-Test for Experience of Treatment and Comparison Groups

	Paired Difference						
				95% *CI*			
Group	*M*	*SD*	*SEM*	*LL*	*UL*	*df*	*p*
Treatment	-.41	.75	.127	-.67	-.15	34	.003*
Comparison	.001	1.13	.130	-.26	.26	75	.990

*$p < .05$ significant

Table 7

Paired Samples t-Test for Confidence of Treatment and Comparison Groups

	Paired Difference						
				95% *CI*			
Group	*M*	*SD*	*SEM*	*LL*	*UL*	*df*	*p*
Treatment	-.14	.59	.100	-.35	.06	34	.164
Comparison	.008	1.17	.134	-.26	.28	75	.951

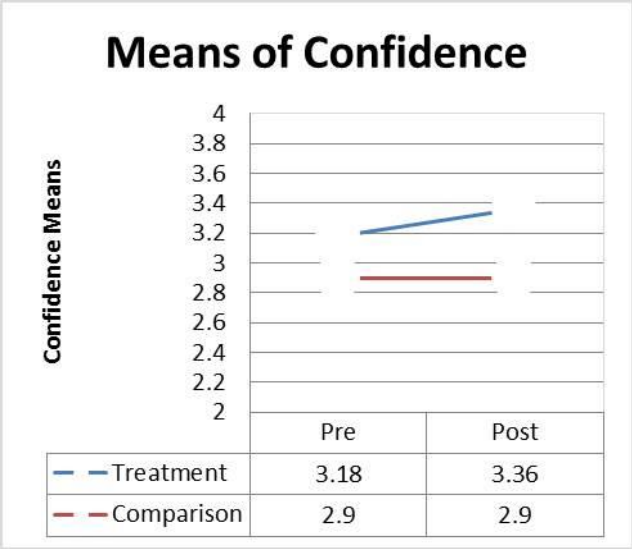


Figure 8. Pre- to post-gains in confidence for the treatment and comparison groups increased at varied rates (not statistically significant, p =.63).

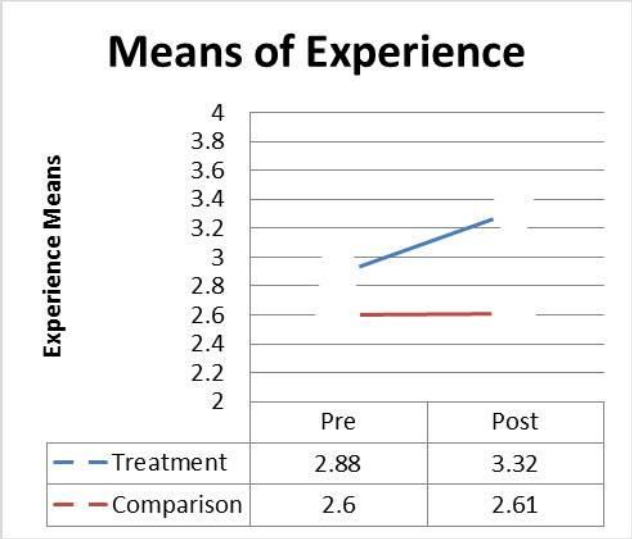


Figure 9. Pre- to post-gains in experience for the simSchool treatment group increased at a greater rate than the comparison group (statistically significant, p = .044).

Research Question 2

Research Question 2: Is there a relationship between personality type and perceived teaching effectiveness?

A canonical correlation analysis was performed using a composite personality variable synthesized from the five personality traits of openness, conscientiousness, extraversion, agreeableness and neuroticism, then correlated with a combination of the two effective teaching variables of confidence and experience. The purpose was to evaluate the multivariate relationship between personality and effective teaching. The analysis was conducted with the pre-test total sample (n = 152) including the treatment and comparison subjects. Personality and effective teaching were the two synthetic variables created from combining the variables in the linear equation. The analysis resulted in two functions with squared canonical correlations (R_c^2) of .09 and .06 as shown in Table 8. The overall model across all functions was statistically significant using Wilks's λ = .86, criterion $F(10, 288.00) = 2.29$, p = .013. The effect size for the overall model was 1 – λ, yielding a .14 effect size, which indicates that in this model *personality* explained 14% of the variance in effective teaching.

Table 8

Canonical Correlation between Personality and Teaching Effectiveness for Combined Treatment and Comparison Groups

Function	Eigenvalue	Variance explained (Percent)	Canonical correlation	Squared canonical correlation
1	.10	60%	.30	.09
2	.06	40%	.25	.06

Function 1 accounted for 60% of the explained variance and Function 2 explained 40% of the remaining marginal variance. The first function was statistically significant (p = .013) and the second function contributed but was insignificant (p = .059) at the p < .05 level. Additional analysis will be included only for the first function which accounted for 9% of the variance in teaching effectiveness (R_c = .30 x .30 = .09).

The canonical correlation between personality traits and effective teaching was found to be R_c = .30, a medium effect size according to guidelines provided by (Cohen, 1988) of .1 = small, .3= moderate, and .5 = large. The strengths of the contributions of experience and confidence to the teaching effectiveness synthetic variable for canonical Function 1 are listed in Table 9 while the strengths of contributions of the personality variables conscientiousness, openness, extraversion, neuroticism, and agreeableness to the synthetic variable personality are listed in Table 10. Both experience (r = .71) and confidence (r = -.70) are strong contributors to teaching effectiveness, based on guidelines by Cohen. The personality variables of extraversion (r = .85) and openness (r = -.50) are strong contributors to personality.

Table 9

Contributions of Confidence and Experience to Teaching Effectiveness in Canonical Function 1 for Combined Treatment and Comparison Groups

Variable	Function 1 – Teaching Effectiveness
Confidence	-.70
Experience	.71

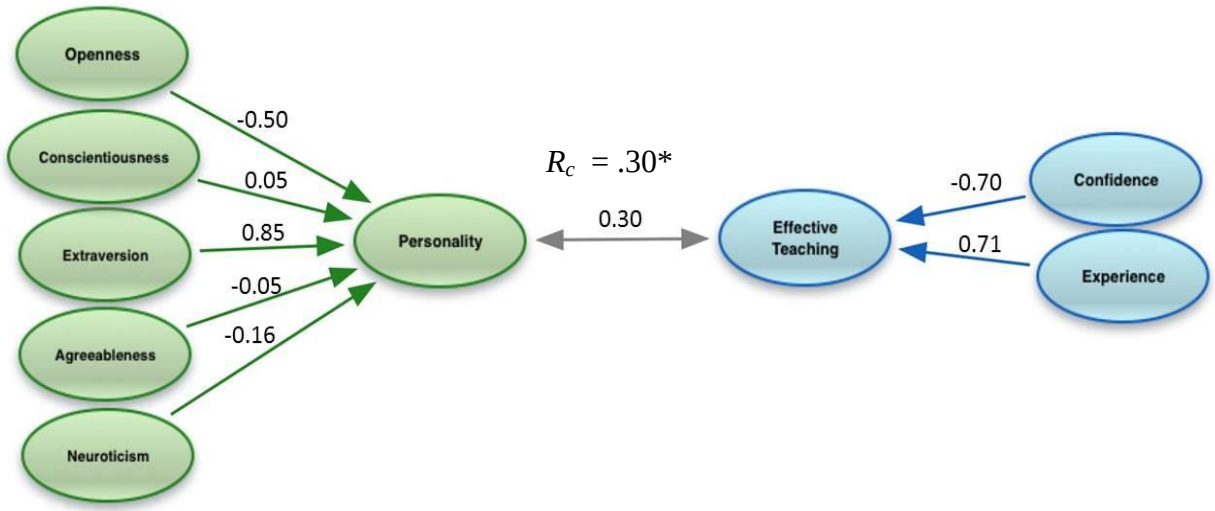
Table 10

Contributions of Five Personality Attributes to Personality in Canonical Function 1 (Independence) for Combined Treatment and Comparison Groups

Variable	Function 1 - Personality
Conscientiousness	.05
Openness	-.50
Extraversion	.85
Neuroticism	-.16
Agreeableness	-.04

Collectively, the Function 1 model indicates that preservice teachers who perceived high levels of experience reported higher extraversion and lower openness. In addition, low levels of perceived confidence exhibited higher extraversion and lower openness. The canonical correlation model for the first function is given in *p < .05, **p < .001

Figure 10.



*p < .05, **p < .001

Figure 10. *Canonical correlation model for Function 1 in the relationship of personality to teaching effectiveness for combined treatment and comparison group, n = 152.*

A relationship between personality type and perceived teaching effectiveness exists with a medium correlation found to be *r* = .30. Nine percent (9%) (.3 x .3 = .09) of the variance in effective teaching can be explained by knowing personality. According to the results of this study preservice teacher's personality traits have an overall impact on effective teaching.

Research Questions 3 through 4 and Hypotheses 2 through 6

Research Question 3: Is there a relationship between personality attributes and preservice educator ratings of teaching experience in a simulated teaching environment?

Research Question 4: Is there a relationship between personality attributes and preservice educator ratings of teaching confidence in a simulated teaching environment?

A relationship between personality traits and teaching effectiveness has been established in Research Question 2. Research Questions 3 and 4 encompass Hypotheses 2 through 6.

Hypothesis 2

Null Hypothesis 2: No relationship exists between conscientiousness and confidence or experience.

Alternate Hypothesis 2a: Conscientiousness is more prevalent in preservice teachers who report a high rating in confidence.

Alternate Hypothesis 2b: Conscientiousness is more prevalent in preservice teachers who report a high rating in experience.

Analysis of Hypothesis 2

Two sets of Pearson product-moment correlation coefficients were computed to assess the relationship between conscientiousness and experience, and conscientiousness and confidence. No significant ($p < .05$) correlations were found between conscientiousness and experience or confidence at the pre-test; no significant ($p < .05$) relationships were found for post-test data on these attributes. A negative correlation between conscientiousness and the change in confidence from pre-treatment to post-treatment ($r = -.421$, $n = 34$, $p = .013$) was found. A higher level of conscientiousness was associated with higher gains in confidence pre to post treatment for preservice teachers. This finding is reason to reject the null hypothesis and accept alternate Hypothesis 2a noting that there is a relationship between conscientiousness and confidence. Preservice teachers who were more conscientious became less confident at the pre to post change time.

Hypothesis 3

Null Hypothesis 3: No relationship exists between openness and confidence or experience.

Alternate Hypothesis 3a: Openness is more prevalent in preservice teachers who report a high rating in confidence.

Alternate Hypothesis 3b: Openness is more prevalent in preservice teachers who report a high rating in experience.

Analysis of Hypothesis 3

Two sets of Pearson product-moment correlation analysis between openness and confidence, and openness and experience were conducted. Significant associations ($p < .05$) were found between openness at the pre-test time and change in level of reported experience from pre to post-test. No significant ($p < .05$) correlations were found between openness and experience or openness and confidence at the post-test time. At the pre-test time a negative correlation between openness and experience ($r = -.419$, $n = 35$, $p = .012$) and a negative correlation between openness and confidence ($r = -.399$, $n = 35$, $p = .017$) were found. These findings indicate that preservice teachers with higher levels of openness were associated with lower levels of experience and confidence at the pre-test time. When openness was correlated with the change in experience and confidence from pre to post the opposite direction of association was found. Preservice teachers with higher levels of openness increased in experience ($r = .360$, $n = 34$, $p = .036$) and in confidence ($r = .391$, $n = 34$, $p = .022$) during the timeframe of the simSchool activity. Openness was associated with confidence and experience; therefore, the null hypothesis was rejected and Alternate Hypotheses 3a and 3b were accepted.

Hypothesis 4

Null Hypothesis 4: No relationship exists between extraversion and confidence or experience.

Alternate Hypothesis 4a: Extraversion is more prevalent in preservice teachers who report a high rating in confidence.

Alternate Hypothesis 4b: Extraversion is more prevalent in preservice teachers who report a high rating in experience.

Analysis of Hypothesis 4

Two sets of Pearson product-moment correlation coefficients were computed to assess the relationship between extraversion and experience, and extraversion and confidence. No significant ($p < .05$) correlations were found between extraversion and experience nor for extraversion with confidence at the post-test and the change in experience and confidence from pre- to post-test. A correlation between extraversion and experience ($r = .393$, $n = 35$, $p = .019$) and extraversion and confidence ($r = .346$, $n = 35$, $p = .042$) was found at the pre-test time. A higher level of extraversion was associated with higher levels of experience and confidence for preservice teachers before the simSchool treatment. These relationships are reasons to reject the null hypothesis and accept the Alternate Hypotheses 4a and 4b.

Hypothesis 5

Null Hypothesis 5: Emotional stability (reverse coding of neuroticism construct) will not be associated with preservice teachers who report a high rating in confidence, or experience.

Alternate Hypothesis 5a: Emotional stability (reverse coding of neuroticism) will be associated with preservice teachers' self-reported ratings in teaching confidence.

Alternate Hypothesis 5b: Emotional stability (reverse coding of neuroticism) will be associated with preservice teachers' self- reported ratings in teaching experience.

Analysis of Hypothesis 5

Two sets of Pearson product-moment correlation analyses, between emotional stability and confidence as well as experience, were conducted. Greater confidence was found to be associated with higher emotional stability at the post-test time (r = .358, n = 37, p = .032). No significant ($p < .05$) correlations were found between emotional stability and experience. No significant ($p < .05$) relationships were found for emotional stability with confidence at the pre-test nor for the change in experience and confidence from pre to post-test. These findings indicate that at post-test those preservice teachers with higher levels of emotional stability also tended to have higher levels of confidence. Emotional stability was associated with confidence; therefore, the null hypothesis was rejected and the Alternate Hypothesis 5a was accepted.

Hypothesis 6

Null Hypothesis 6: Agreeableness will not be associated with preservice teachers' ratings in confidence or experience.

Alternate Hypothesis 6a: Agreeableness will be associated with preservice teachers' self-reported ratings in teaching confidence.

Alternate Hypothesis 6b: Agreeableness will be associated with preservice teachers' self-reported ratings in teaching experience.

Analysis of Hypothesis 6

Two sets of Pearson product-moment correlation coefficients were produced to assess the relationship between agreeableness and experience, and agreeableness and confidence. No

significant associations were found in the agreeableness trait; therefore the null hypothesis was accepted. These findings indicate that agreeableness is not associated with preservice teachers' ratings of confidence or experience.

Summary of Hypothesis 2 through 6

Three sets of correlational analysis were conducted for pre-test (Table11), post-test data (Table 12), and gain data from pre to post (Table 13) in order to assess the relationships between individual personality traits, confidence, and experience. These tests were run using the treatment group data because research questions 3 and 4 are framed in a simulated classroom environment.

Table 11

Significant ($p < .05$) Pearson Correlations at Pre-test for Treatment Group Participants

Variable	Experience	Confidence
Conscientiousness		
Openness	-.419*	-.399*
Extraversion	.393*	.346*
Neuroticism (Stability)		
Agreeableness		

*Correlation is significant at $p < .05$

Table 12

Significant ($p < .05$) Pearson Correlations at Post-test for Treatment Group Participants

Variable	Experience	Confidence
Conscientiousness		
Openness		
Extraversion		
Neuroticism (Stability)		.358*
Agreeableness		

*Correlation is significant at $p < .05$

Table 13

Significant ($p < .05$) Pearson Correlations for Experience and Confidence Gain Scores from Pre-test to Post-test with Personality Attributes for Treatment Group Participants

Variable	Experience	Confidence
Conscientiousness		-.421*
Openness	.360*	.391*
Extraversion		
Neuroticism (Stability)		
Agreeableness		

*Correlation is significant at $p < .05$

Summary of Research Questions 2, 3, and 4

Associations between confidence or experience (or both) and personality traits were found for four of the five personality traits being studied. High conscientiousness was found to be associated with a decline in confidence from pre-treatment to post-treatment. The findings regarding openness showed negative associations with experience and confidence at the pre-test time; however, positive associations with experience and confidence were found in the change from pre-treatment to post-treatment. This indicates those high in openness were initially low in their self appraisals of experience and confidence, but apparently gained experience and

confidence through the simSchool treatment. Extraversion was found to be associated with confidence and experience in preservice teachers at the pre-test time only. The lack of significant associations after the simSchool treatment, at post-test time, implies that working in simSchool may have ameliorated an initial tendency for extraverts to rate their teaching and experience confidence levels high. Emotional stability was found to be positively correlated with confidence at the post-test time only. This implies that perserving through challenging simSchool activities that are sometimes cognitively disruptive, may have an especially positive impact on the teaching confidence of preservice candidates with high emotional stability (low neurotocism). Note that it is also possible that the opposite ends of the emotional stability data and other indices previously reported could account for the significant correlations. That is, those with especially low emotional stability may have come out of the simSchool exercises with consistently low levels of confidence. Further research would be needed to determine which portion(s) of the treatment group were actually influenced.

No significant ($p < .05$) relationships were found between teaching experience or confidence and the personality attribute of agreeableness. However, based on the collective conclusions reached regarding null and alternate hypotheses addressing the five major areas of personality attributes, several relationships between personality attributes and preservice educators' ratings of teaching experience and teaching confidence in a simulated teaching environment were found.

At this point a relationship between personality traits and teaching effectiveness (Question 2), a relationship between experience and personality traits (Question 3), and a relationship between confidence and personality traits (Question 4) have been shown in this study. To examine the impact of personality types on experience and confidence two multiple

regression analyses were run to predict experience and confidence from personality traits. The variables of conscientiousness, openness, extraversion, neuroticism and agreeableness statistically significantly predicted experience, $F(5, 29) = 2.834$, $p < .033$, adj. $R^2 = .33$ at the pre-test time. The variable of openness added statistically significantly to the prediction, $p < .05$. A multiple regression analysis was run using the five personality traits and the variables were near statistically significantly predicting confidence, $F(5, 29) = 2.42$, $p = .06$, adj $R^2 = .173$ at the pre-test time. To test further for significance, the trait of agreeableness was deleted due to a low beta ($\beta = .043$) and the lack of usefulness of the agreeableness trait in the correlation analysis. The four variables of conscientiousness, openness, extraversion and neuroticism were able to predict confidence ($F(4, 30) = 2.98$, $p < .05$, adj $R^2 = .19$) at the pre-test time. The variable of openness added statistically significantly to the prediction, $p < .05$. Regression coefficients and standard errors can be found for pre-test in Table 14, post-test in Table 15 and change from pre- to post- in Table 16.

Table 14

Treatment Pre-test Experience and Confidence Coefficients

	Experience			Confidence		
Variable	B	SE B	β	B	SE B	β
Conscientiousness	.089	.172	.081	.055	.118	.072
Openness	-.400	.172	-.380*	-.293	.138	-.348*
Extraversion	.311	.266	.214	.243	.208	.195
Neuroticism	.209	.158	.212	.166	.106	.250
Agreeableness	.134	.213	.109	-	-	-

*$p < .05$

Table 15

Treatment Post-test Experience and Confidence Coefficients

	Experience			Confidence		
Variable	B	SE B	β	B	SE B	β
Conscientiousness	-.102	.162	-.110	-.129	.123	-.171
Openness	-.017	.150	-.020	.069	.132	.088
Extraversion	.028	.252	.023	.203	.211	.163
Neuroticism	.233	.138	.295	.207	.105	.327
Agreeableness	.118	.200	.118	-	-	-

*$p < .05$

Table 16

Treatment of the Relationship between Personality Traits and the Change in Experience and Confidence from Pre-treatment to Post-treatment

	Experience			Confidence		
Variable	B	SE B	β	B	SE B	β
Conscientiousness	-.254	.185	-.236	-.232	.117	-.319
Openness	.288	.181	.283	.272	.135	.338*
Extraversion	-.246	.285	-.174	-.035	.205	-.029
Neuroticism	.069	.165	.073	.065	.104	.104
Agreeableness	-.098	.226	-.083	-	-	-

*$p < .05$

Summary Chapter 4

In this chapter, results from the analysis of data were presented. Findings addressed each of the research questions and hypotheses. Two major outcomes were discovered in the data. The first outcome was related to Research Question 1 and suggested that preservice teachers who used simSchool had greater pre to post-test gains in experience than the comparison group. The second outcome was related to Research Questions 2, 3, and 4 and confirmed relationships between personality traits and teaching effectiveness. In Chapter 5, these findings are further discussed.

CHAPTER 5

DISCUSSION OF FINDINGS AND CONCLUSIONS

Two major outcomes were reported in Chapter 4 that impacts preservice teachers' preparation training and fosters effective teaching. First, findings presented indicated that the simSchool treatment group increased its perceptions of experience with significant gains in contrast to the comparison group. Secondly, relationships between personality traits and teaching effectiveness were identified through canonical correlation analysis and through examination of the individual traits of openness, conscientiousness, extraversion, agreeableness, and neuroticism as predictors of confidence and experienc. These findings are discussed at greater length in this chapter, as are conclusions and future research.

simSchool Effectiveness

The first research question addressed the effectiveness of simSchool training for the treatment group and found that preservice teachers trained in six hours of simSchool showed higher pre- to post-test gains in teaching experience than those without the training. The findings are consistent with the results of the pilot study (Hopper et al., 2013). A review of Research Question 1 and Hypothesis 1 is listed in Figure 9.

simSchool Research and Hypothesis	
Research Question	Is there a difference between treatment and comparison groups on educator's gains in: a) confidence b) experience?
Null Hypothesis	Use of simSchool for six training hours will not result in increased ratings of experience and confidence in preservice teacher candidates.

Figure 11. Research question 1 and the null hypothesis.

Results reported in Chapter 4 and 5 support the use of simSchool for preservice teachers. Significant differences have been found between the treatment and comparison groups in experience. The null hypothesis was rejected and Alternate Hypothesis 1a was accepted.

- Alternative Hypothesis 1a: Use of simSchool for six training hours will result in increased ratings of experience in preservice teacher candidates.

Personality Traits

A primary goal of this dissertation was examine the relationship of personality traits to teaching confidence and teaching experience, for preservice teachers using simSchool. The second major outcome in this dissertation study was the link found between personality traits and teaching effectiveness. Through the use of canonical correlation analysis, the traits of openness, conscientiousness, extraversion, agreeableness, and neuroticism were linked by structure coefficients that create the synthetic variable of personality. The synthetic variable was found to be correlated with effective teaching. The canonical correlation between personality traits and effective teaching was found to be R_c = .30, a medium effect size (Cohen, 1988). The overall model accounts for 14% of the variance in effective teaching and Function 1 accounts for 9% of the variance. Further investigation using multiple regression analysis provides additional

information regarding personality traits as predictors of teaching confidence and experience.

It is important to note that the canonical correlation analyses were computed at the pre-test time. At the pre-test, all participants were grouped together and the results were based on their personalities alone as the treatment was not yet administered. The treatment group received training on instructional strategies and higher-order thinking skills. They practiced teaching, adjusted tasks, made classroom decisions, analyzed academic performance, and reflected on their actions. In the treatment group, preservice teachers with specific personality traits were affected by the simSchool training. Their ratings of confidence and experience were significant at the post- test time and regarding change from pre- to post-test. Personality traits did not change from pre- to post-test; the personality traits in those preservice teachers whose confidence and experience changed, emerged. To explore how each trait is associated with teaching confidence and teaching experience, a review of the findings of the relationships of each personality trait with confidence and experience will be discussed.

Conscientiousness

Three sets of Pearson product-moment correlation coefficients were computed to assess the relationships between conscientiousness and confidence at the pre-test, post-test and the change in confidence from pre-treatment to post-treatment. No significant relationships were found at the pre-test (r = .136, p = .435) or post- test (r = -.187, p = .275) times; however, the change in confidence from pre-treatment to post-treatment was found to have a significant negative correlation (r = -.421, n = 37, p = .013). Those preservice teachers higher in conscientiousness decreased in confidence as shown in Figures 10, 11, and 12. Based on the espoused theory those teachers may have overrated their confidence at the pre-test time and after

the simSchool treatment, preservice teachers realized they did not know as much as they had originally espoused.

Three sets of Pearson product-moment correlation coefficients were computed to assess the relationship between conscientiousness and experience at the pre-test (r = .107, p = .543), post-test (r = -.094, p = .584), and for the change in experience (r = -.247, p = .16) from pre-treatment to post-treatment. No significant associations were found, however, trends indicated that those preservice teachers higher in conscientiousness, may have increased in experience from pre-treatment to post-treatment. The scatterplots that illustrate the relationship between conscientiousness and experience are shown in Figures 13, 14, and 15.

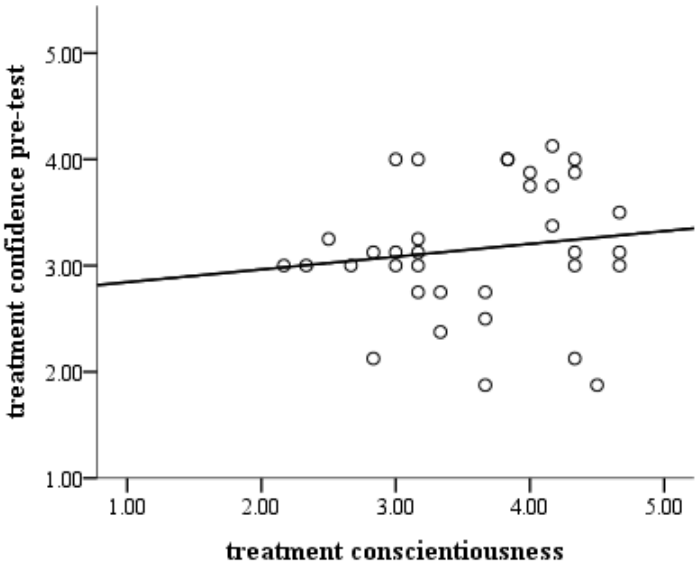


Figure 12. Relationship between conscientiousness and confidence of the treatment group at pre-test *(r = .136 , *p = .435).*

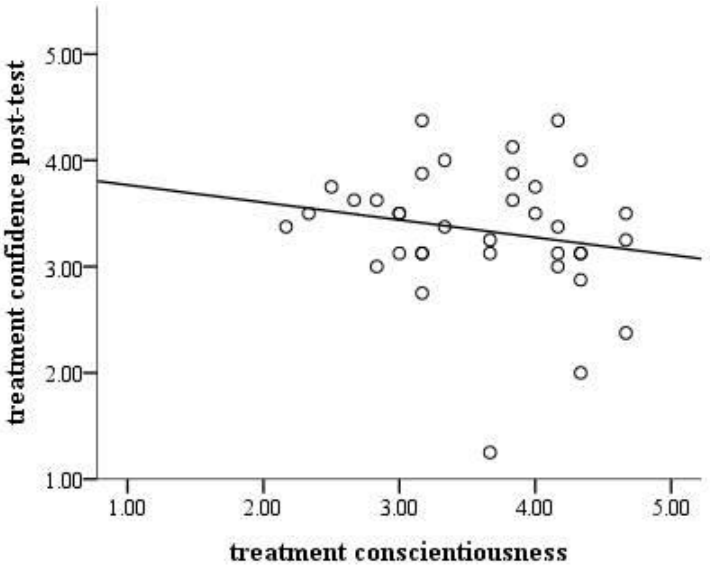


Figure 13. Relationship between conscientiousness and confidence of the treatment group at post-test (r = -.187 , *p = .275).

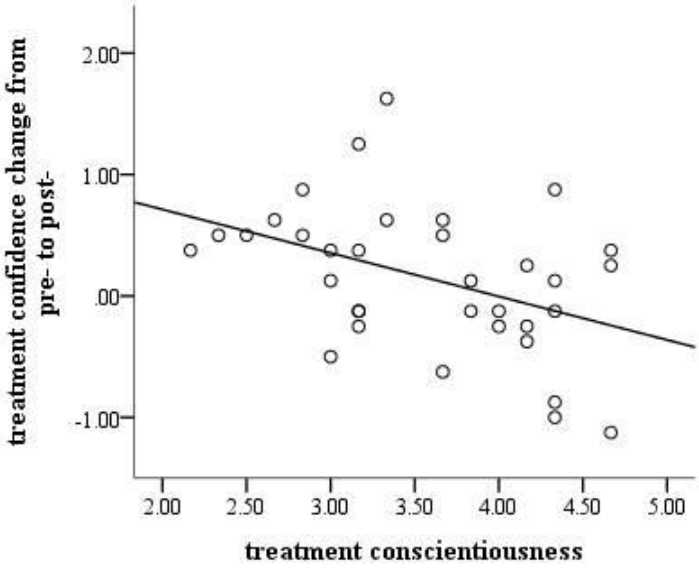


Figure 14. The relationship between conscientiousness and the decline in confidence from pre- to post-test of the treatment group (r = -.421, *p = .013).

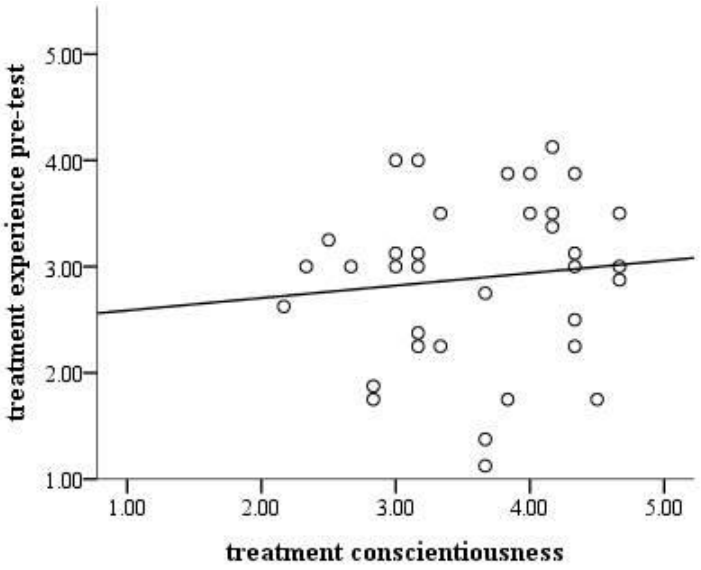


Figure 15. Relationship between conscientiousness and experience of the treatment group at pre-test (r = .107 , *p = .543).

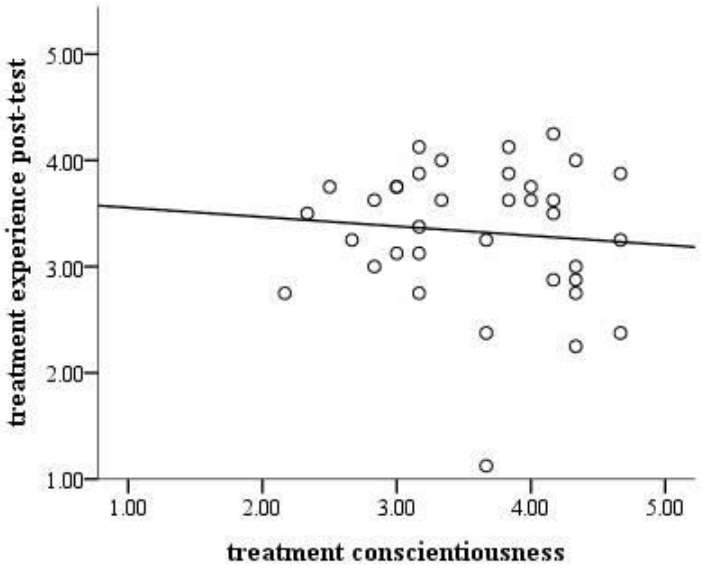


*Figure 16. Relationship between conscientiousness and experience of the treatment group at post-test (r = -.094 , *p = .584).*

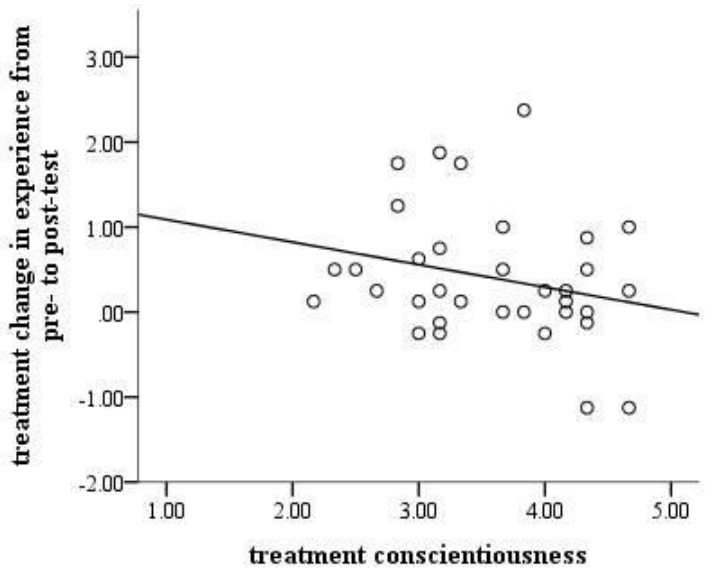


*Figure 17. The r*elationship between conscientiousness and the change in experience from pre-treatment to post-treatment (r = -.247 , *p = .16).

Openness

Openness was found to be an important contributor to the synthetic variable of *personality* in the canonical correlation analysis (r = -.50, p < .05). Three Pearson product-moment correlation coefficients were computed to assess the relationships between openness and confidence at the pre-test, post-test, and the change in confidence from pre-treatment to post-treatment. There was a significant negative correlation between openness and confidence at the pre-test (r = -.399, n = 37, p < .05) and a significant positive correlation in the change from pre-treatment to post-treatment (r = .391, n = 34, p = .022). No significant relationships were found at the post-test (r = .061, p = .724) time. The scatterplots shown in Figures 16, 17 and 18 summarize the data for the relationships of openness and confidence. Three Pearson product-moment correlation coefficients were computed to assess the relationship between openness and experience at the pre-test, post-test, and the change in experience from pre-treatment to post-

treatment. There was a significant negative correlation between openness and experience at the pre-test (r = -.419, n = 35, p < .05) and a significant positive correlation for the change from pre-treatment to post-treatment (r = .360, n = 35, p < .05), whereas no significant relationships were found at the post-test (r = -.003, p = .985) time. Openness was found to be a positive contributor to an increase in experience from pre-treatment to post-treatment in simSchool as illustrated in the scatterplots in Figures 19, 20, and 21. Preservice teachers reported a gain in their experience levels after simSchool use.

At the pre-test time those preservice teachers who reported more openness tended to report less confidence and experience, whereas, the preservice teachers who reported less openness tended to report more confidence and experience. Once they completed the simSchool training, the more open students may have increased in their levels of confidence and experience and the less open students may have decreased in their levels of confidence and experience. Because openness to experience measures a student's ability to learn as well as motivation to learn (Barrick & Mount, 1991, p. 20), those open preservice teachers may have been more willing to learn during the simSchool treatment. At the post-test the less open students reported a decrease in confidence and experience which could indicate that after the simSchool treatment the less open students realized they were not as confident or experienced as they espoused. Based on the espoused theory or how people would like to behave based on their personal values, those teachers may have overrated their confidence at the pre-test time. After the simSchool treatment, using the theory-in-use or how individuals actually behave in spite of their personal values and can be inferred from action, their confidence ratings changed because they realized they did not know as much as they thought they knew after the simSchool treatment.

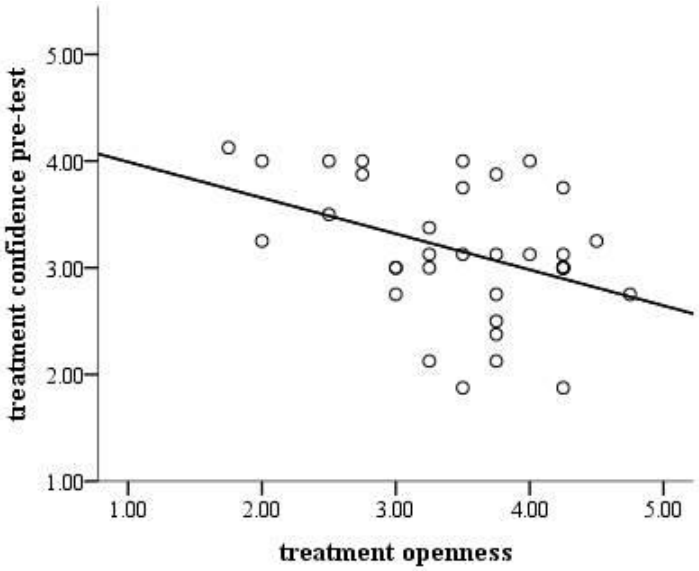


Figure 18. Relationship between openness and confidence of the treatment group at pre-test (*r* = -.399, *$p < .05$).

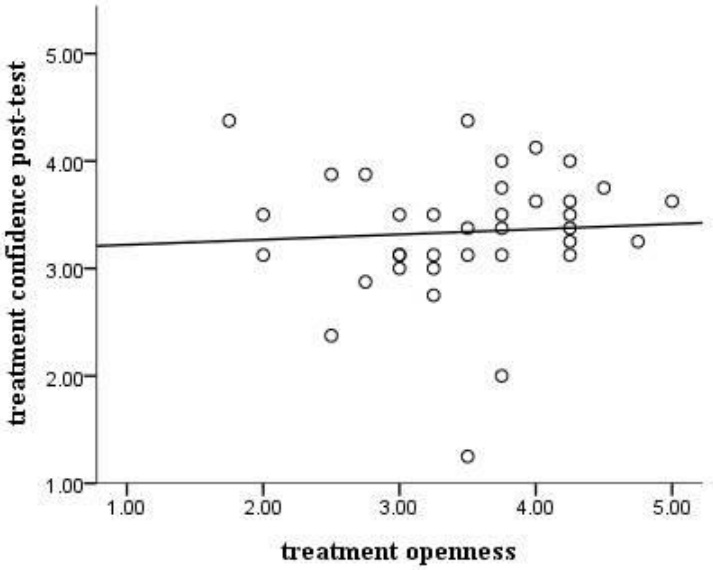


Figure 19. Relationship between openness and confidence of the treatment group at post-test (r = .061, *p = .724).

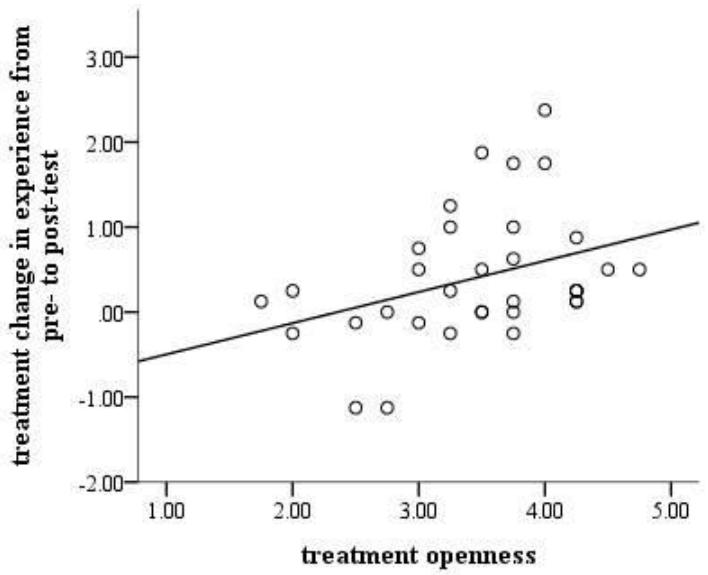


Figure 20. The relationship between openness and the gain in confidence from pre- to post-test of the treatment group (r = .391,*p = .022).

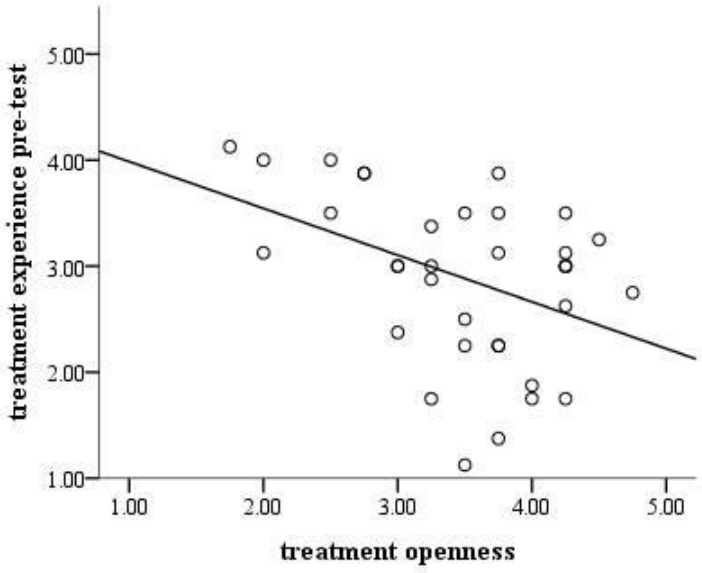


Figure 21. Relationship between openness and experience of the treatment group at pre-test (r = -.419, *p = .012).

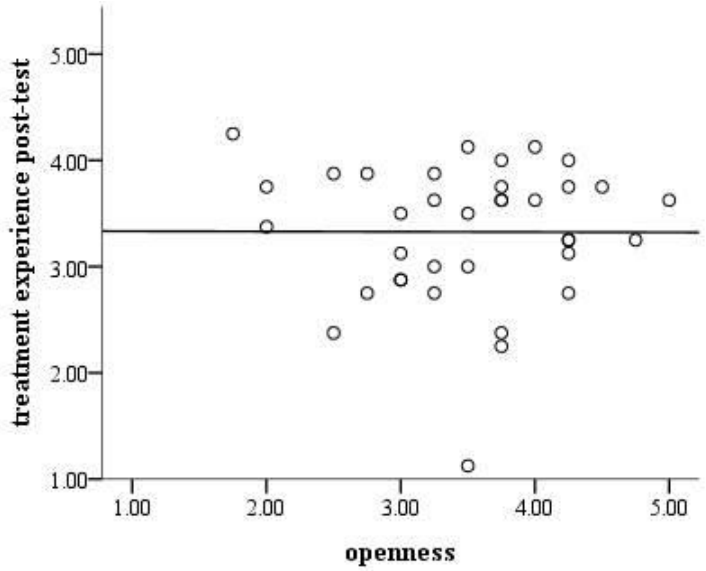


Figure 22. Relationship between openness and experience of the treatment group at post-test (r = -.003, *p = .985).

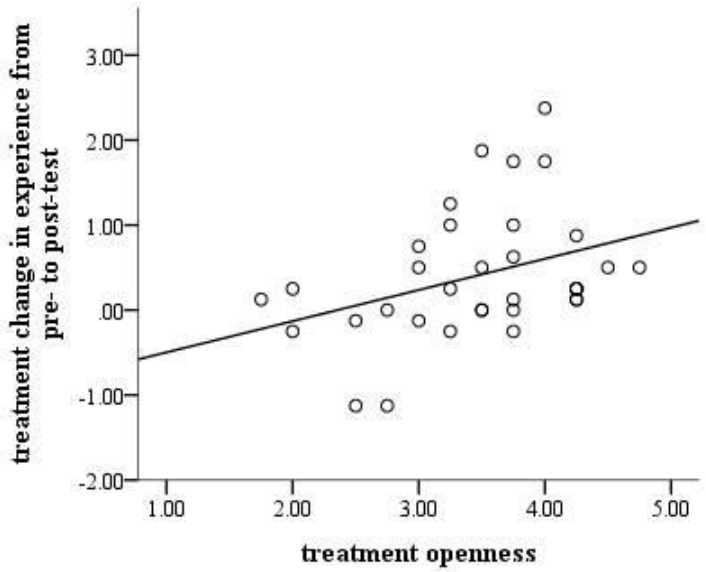


Figure 23. The relationship between openness and the gain in experience from pre- to post-test of the treatment group (r = .360, *p = .036).

Extraversion

Extraversion (r = .85) was found to be the strongest contributor of the five personality traits to the synthetic variable *personality* in the canonical correlation analysis. Three Pearson product-moment correlation coefficients were computed to assess the relationships between extraversion and confidence at the pre-test, post-test, and the change in confidence from pre-treatment to post-treatment. There was a significant, positive correlation between extraversion and confidence at the pre-test time (r = .346, p = .042). No significant relationships were found at the post-test (r = .218, p = .201) or the change in confidence (r = -.071, p = .692).

Three Pearson product-moment correlation coefficients were computed to assess the relationship between extraversion and experience at the pre-test, post-test, and the change in extraversion and experience from pre-treatment to post-treatment. A significant positive correlation at the pre-test (r = .393, p < .019) was found between extraversion and experience. Findings showed an insignificant positive correlation at the post-test (r = .138, p = .421) and an insignificant negative correlation in the change in experience (r = -.246, p = .160) from pre-treatment to post-treatment. Self-reported measures of confidence and experience increased from pre- to post-test in those preservice teachers that were higher in extraversion as shown in Figures 22-27. Those preservice teachers that were more extraverted became more confident after the simSchool treatment and reported increased levels of teaching experience. In previous research studies, extraversion has been negatively related to academic achievement (Busato et al., 2000; Furnham & Chamorro- Premuzic, 2004; Furnham et al., 2002) as students that are highly extraverted socialize more and pursue activities outside of studying (Eysenck, 1992). Typically, students with a high level of extraversion tend to be positive and happy (Francis, 1998), active and outgoing, and place importance on interpersonal relationships (Watson & Clark, 1997).

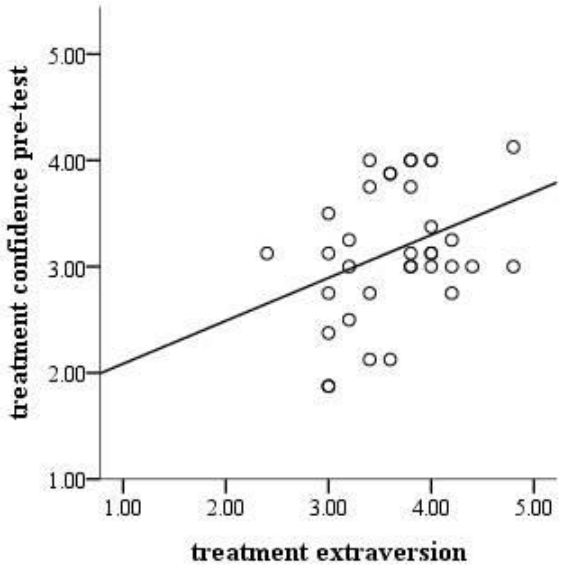


*Figure 24. Relationship between extraversion and confidence of the treatment group at pre-test (r = .346, *p =.042).*

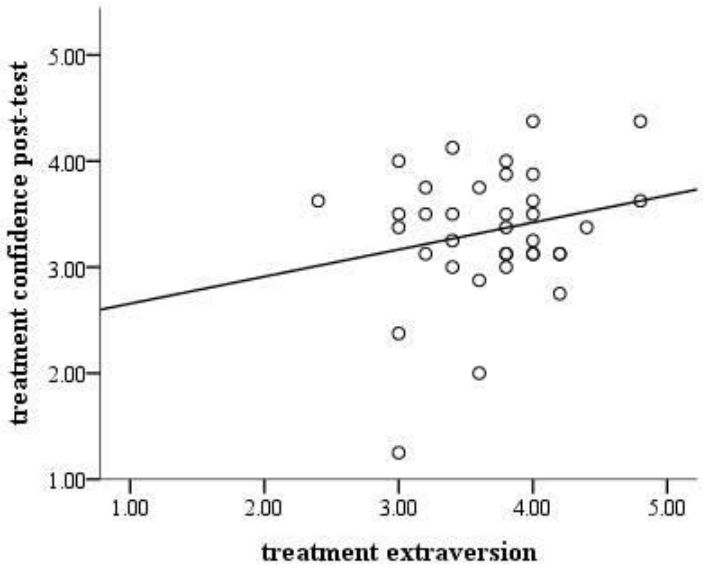


Figure 25. Relationship between extraversion and confidence of the treatment group at post-test (*r* = .218, **p* = .201).

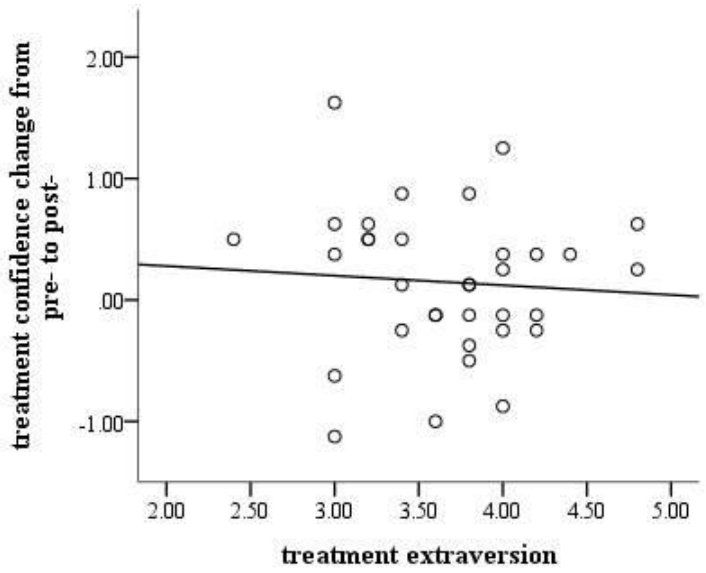


Figure 26. The relationship between extraversion and the gain in confidence from pre- to post-test of the treatment group (r = -.071, *p = .692).

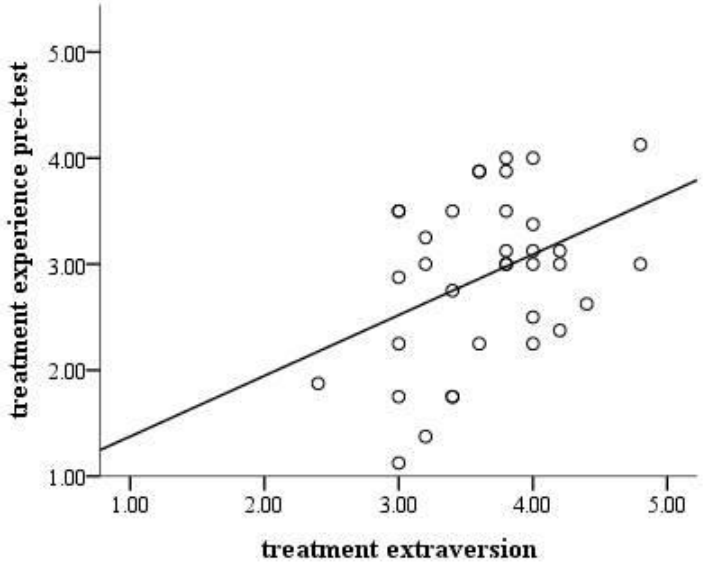


Figure 27. Relationship between extraversion and experience of the treatment group at pre-test (r = .393, *p = .019).

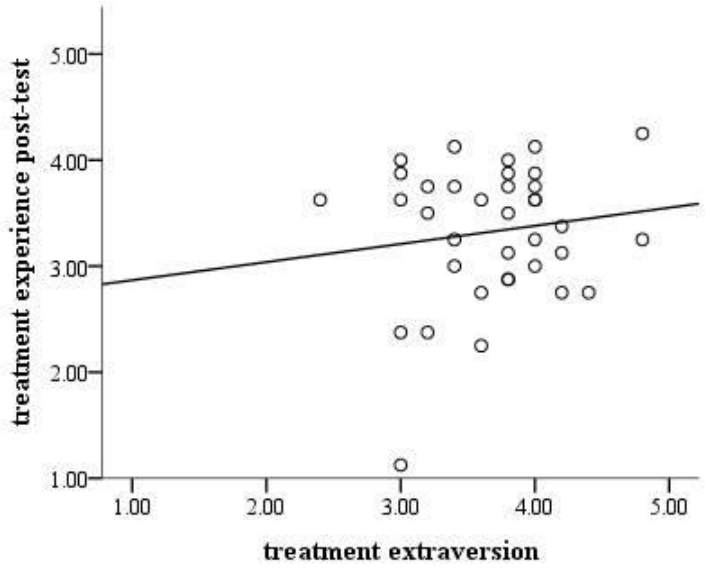


Figure 28. Relationship between extraversion and experience of the treatment group at post-test (r = .138, *p = .421).

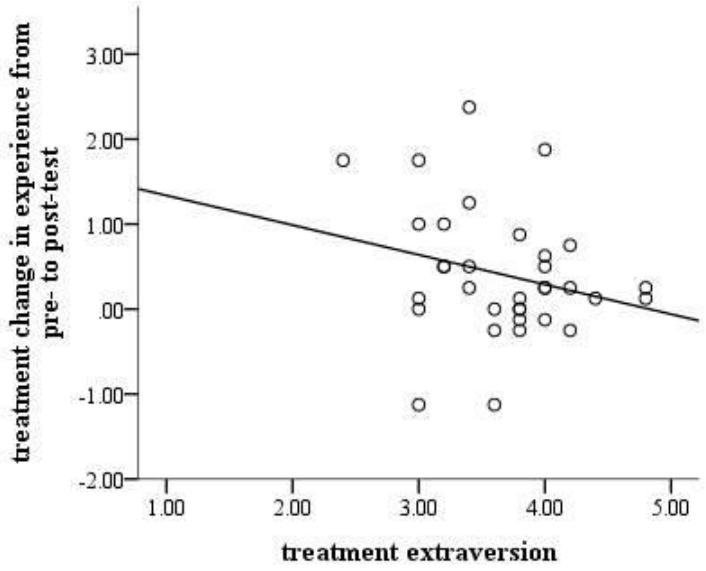


Figure 29. The relationship between extraversion and the change in experience from pre- to post-test of the treatment group (r = -.246, *p = .160).

Neuroticism

Three Pearson product-moment correlation coefficients were computed to assess the relationships between neuroticism (recoded as emotional stability) and confidence at the pre-test, post-test, and the change in confidence from pre-treatment to post-treatment. No significant

relationships were found at pre-test (r = .255, p = .140.) or in the change in confidence (r = .121, p = .494) from pre-treatment to post-treatment; however, a significant positive correlation was found at the post-test (r = .358. p < .05). Those preservice teachers that were high in emotional stability increased in confidence after the treatment of simSchool.

Three Pearson product-moment correlation coefficients were computed to assess the relationship between neuroticism and experience at the pre-test, post-test, and the change in extraversion and experience from pre-treatment to post-treatment. Findings showed insignificant positive correlations at the pre-test (r = .243, p = .160), post-test (r = .302, p = .074), and in the change in experience (r = .025, p =.890) from pre-treatment to post-treatment. Very slight increases in measurements of confidence or experience were found from pre-treatment to post-treatment as shown in Figures 28-33.

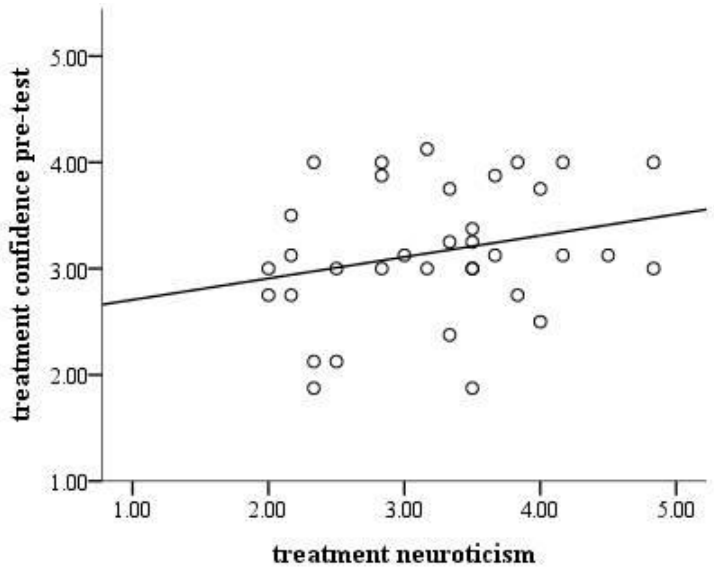


Figure 30. Relationship between neuroticism (coded as emotional stability) and confidence of the treatment group at pretest (r = .255, *p = .140).

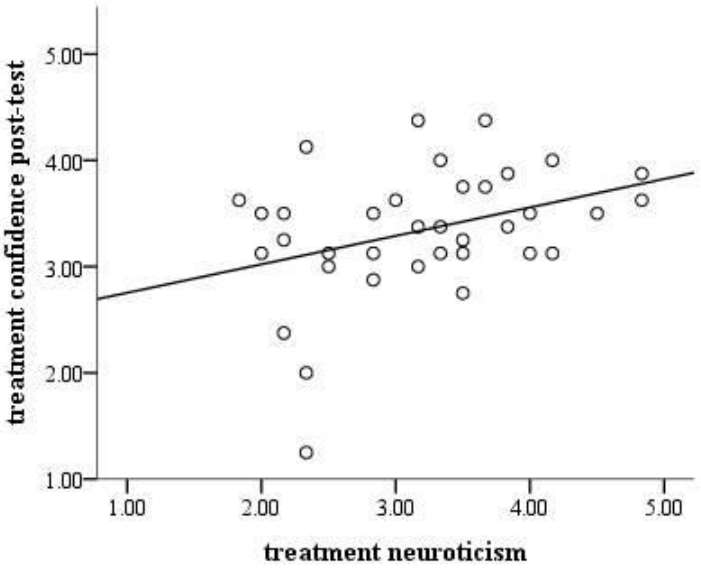


Figure 31. Relationship between neuroticism (coded as emotional stability) and confidence of the treatment group at post-test (r = .358. *p < .05).

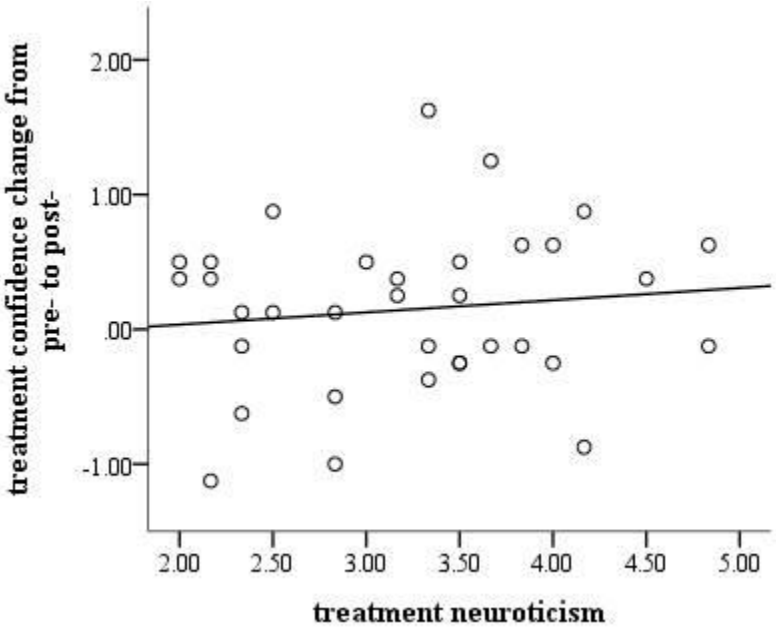


Figure 32. The relationship between neuroticism (coded as emotional stability) and the change in confidence from pre- to post-test of the treatment group (r = .121, *p = .494).

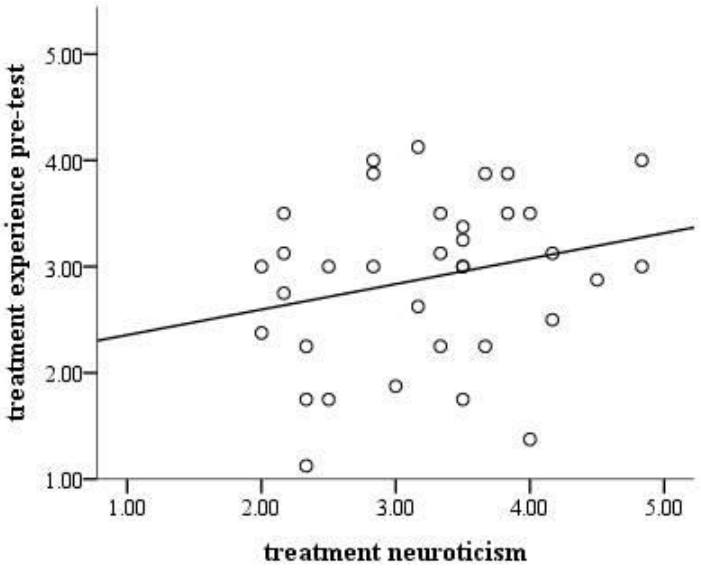


Figure 33. Relationship between neuroticism (coded as emotional stability) and experience of the treatment group at pre-test (r = .243, *p = .160).

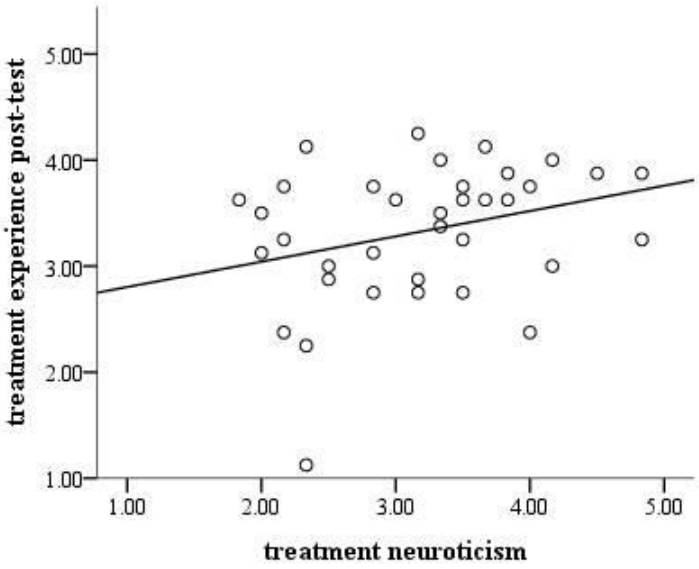


Figure 34. Relationship between neuroticism (coded as emotional stability) and experience of the treatment group at post-test (r = .302, *p = .074).

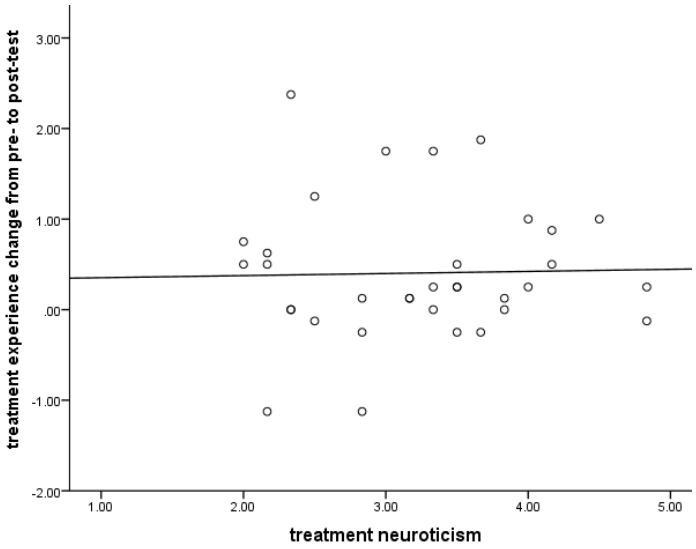


Figure 35. The relationship between neuroticism (coded as emotional stability) and the change (increase) in experience from pre- to post-test of the treatment group (r = .025, *p = .890).

Agreeableness

The trait agreeableness emerged with the fewest correlations of the five personality traits. Three Pearson product-moment correlation coefficients were computed to assess the relationships between agreeableness and confidence at the pre-test, post-test, and the change in confidence from pre-treatment to post-treatment. Insignificant positive relationships were found at pre-test (r = .158, p = .365), post-test (r = .256, p = .132), and in the change in confidence (r = .061, p = .731) from pre-treatment to post-treatment.

Three Pearson product-moment correlation coefficients were computed to assess the relationship between agreeableness and experience at the pre-test, post-test, and the change in agreeableness and experience from pre-treatment to post-treatment. Findings showed insignificant positive correlations at the pre-test (r = .227, p = .189), insignificant positive correlations at the post-test (r = .163, p = .341), and an insignificant negative correlation in thechange in experience (r = -.128, p = .471) from pre-treatment to post-treatment. Very slight

increases in measurements of confidence or experience were found from pre-treatment to post-treatment as shown in Figures 34-39.

These findings concur with other research studies where agreeableness has been found to not be an important predictor of job performance (Barrick & Mount, 1991) or academic achievement (Conard, 2006; Duff et al., 2004). However, other studies have found agreeableness to be positively related to academic achievement (Gray & Watson, 2002; Farsides & Woodfield, 2003; Tok & Morali, 2009) and an important trait in teamwork interactions and on-the-job success (Mount & Barrick, 1998). Those preservice teachers that were more agreeable may have increased in their level of experience. The students worked in pairs during the simSchool intervention which could possibly suggest that those students with higher levels of agreeableness might work better in collaborative activities.

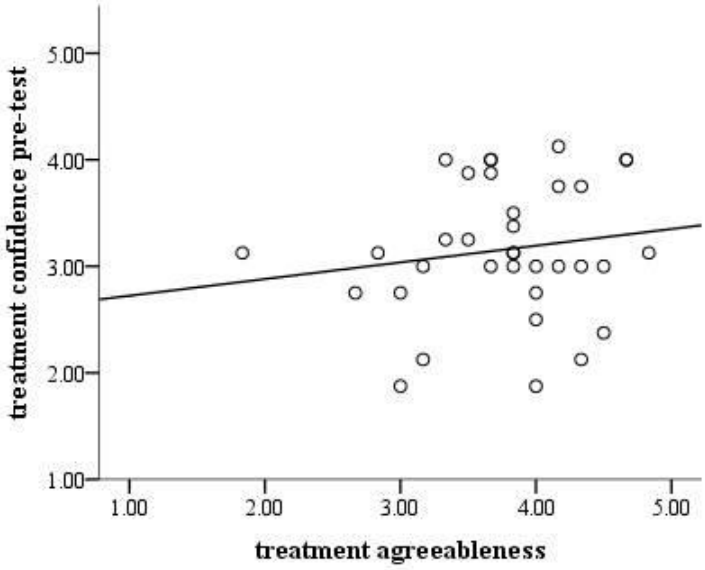


Figure 36. Relationship between agreeableness and confidence of the treatment group at pre-test(r = .158, *p = .365).

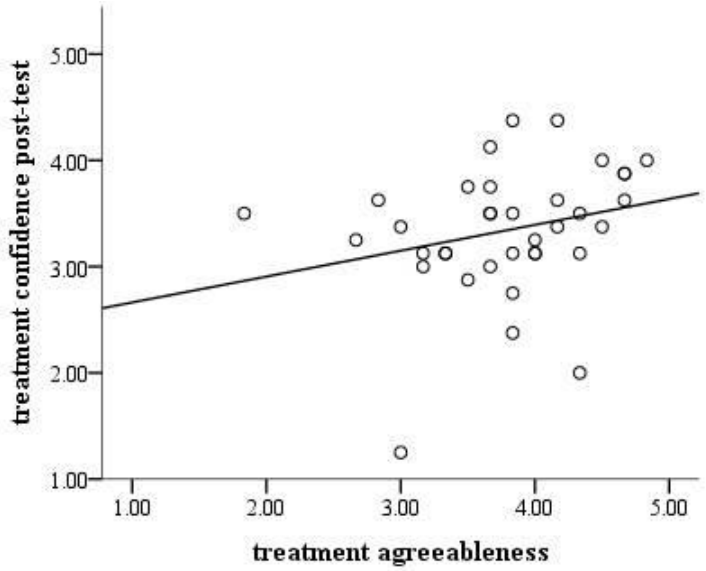


Figure 37. Relationship between agreeableness and confidence of the treatment group at post-test< (r = .256, *p = .132).

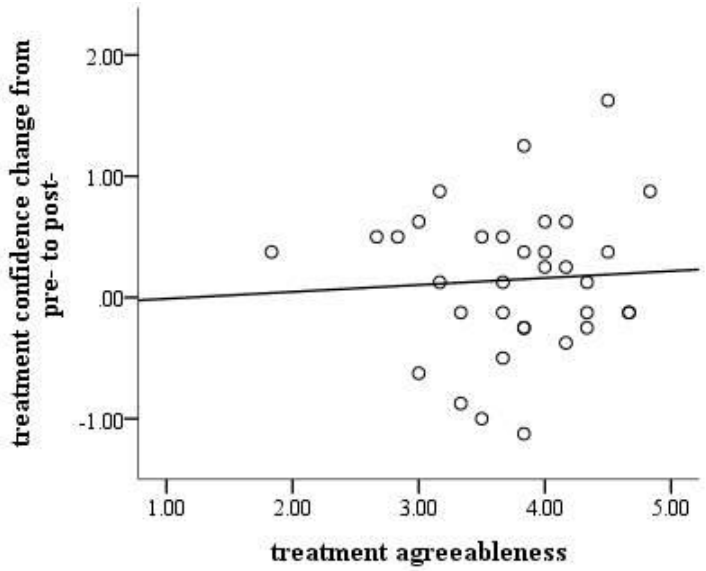


Figure 38. The relationship between agreeableness and the change in confidence from pre- to post-test of the treatment group (r = .061, *p = .731).

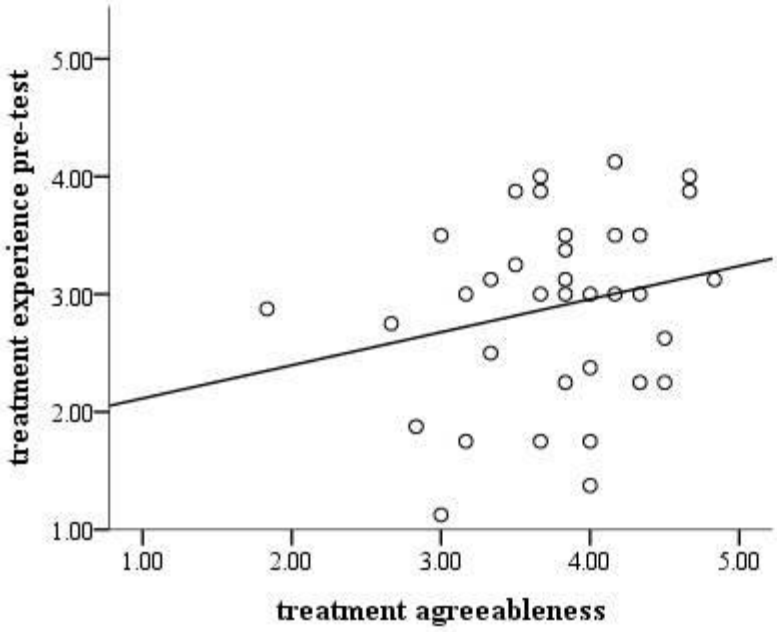


Figure 39. Relationship between agreeableness and experience of the treatment group at pre-test (r = .227, *p = .189).

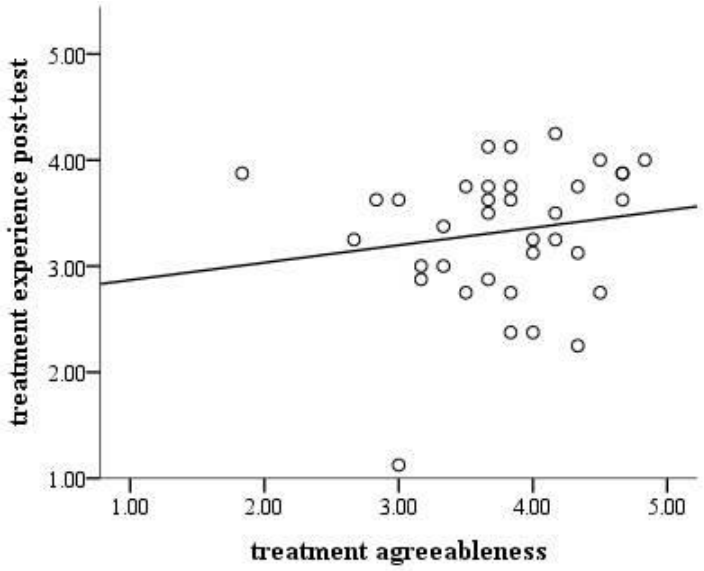


Figure 40. Relationship between agreeableness and experience of the treatment group at post-test (r = .163, *p = .341).

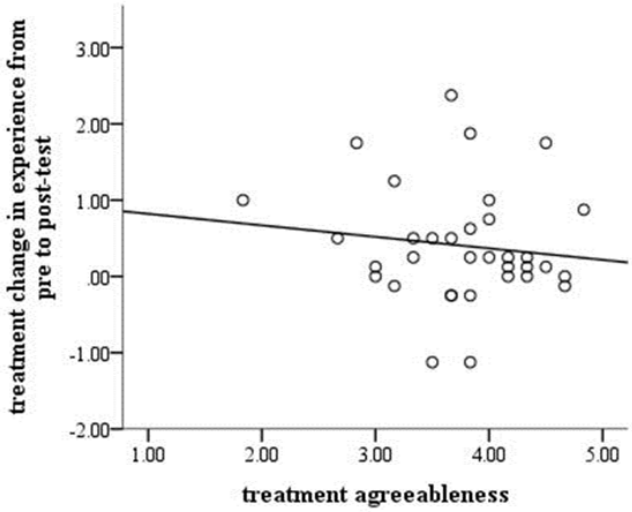


Figure 41. The relationship between agreeableness and the change (increase) in experience from pre- to post-test of the treatment group (r = -.128, *p = .471).

Personality Traits Summary

A review of Research Questions 2, 3, and 4 are listed in Figure 40 with findings from this study.

Research Question	Findings
2. Is there a relationship between personality and perceived teaching effectiveness?	A relationship between personality and perceived teaching effectiveness was found using canonical correlation analysis
3. Is there a relationship between personality attributes and preservice educator ratings of teaching experience in a simulated environment?	A relationship between extraversion, openness, and experience were found using regression analysis
4. Is there a relationship between personality attributes and preservice educator ratings of teaching confidence in a simulated teaching environment?	A relationship between conscientiousness, openness, extraversion, neuroticism, and confidence were found using regression analysis

*Figure 42. Findings from r*esearch question 2, 3, and 4.

The relationships between personality attributes and teaching experience and confidence produced interesting findings as shown in Figure 41.

Trait	Treatment effect
Conscientiousness	• Students with more conscientiousness were associated with decreases in confidence from pre-treatment to post-treatment
Openness	• Students with less openness were associated with higher levels of experience and confidence at the pre-test time
Extraversion	• Students with more extraversion were associated with higher levels of experience and confidence at the pre-test time
Neuroticism (Emotional Stability)	• Students with more emotional stability were associated with higher confidence after the treatment of simSchool at the post-test time
Agreeableness	• No findings

Figure 43. Findings of treatment group for predictors of experience and confidence.

Before any simSchool treatment, preservice teachers with higher levels of extraversion and lower levels of openness reported more confidence and experience in teaching. After simSchool treatment, preservice teachers with more emotional stability reported higher confidence in teaching. Personality traits that related to the change in confidence and/or experience from the pre-treatment to the post-treatment were conscientiousness and openness. Those preservice teachers with more conscientiousness decreased in confidence, while preservice teachers with more openness increased in confidence and experience.

Figure 42 lists the null hypothesis and the findings of experience and confidence. Relationships between experience or confidence were found in the personality traits of conscientiousness, openness, extraversion, and emotional stability; therefore, the null hypotheses for each of those traits were rejected and the alternate hypotheses were accepted. No relationship

was found between experience or confidence with the trait of agreeableness; therefore, the null hypothesis was accepted.

Null Hypothesis	Experience	Confidence
2: No relationship exists between conscientiousness and confidence or experience	-	X
3: No relationship exists between openness and confidence or experience	X	X
4: No relationship exists between extraversion and confidence or experience	X	X
5: Emotional Stability (neuroticism) will not be associated with teaching confidence and experience	-	X
6: Agreeableness will not be associated with preservice teachers who report a high rating of confidence or experience	-	-

Figure 44. Null hypotheses for questions 2, 3, 4, 5, and 6.

*Alternate Hypothesis 2a: Conscientiousness is more prevalent in preservice teachers who report a high rating in confidence.

Alternate Hypothesis 3a: Openness is more prevalent in preservice teachers who report high rating in confidence.

Alternate Hypothesis 3b: Openness is more prevalent in preservice teachers who report a high rating in experience.

Alternate Hypothesis 4a: Extraversion is more prevalent in preservice teachers who report

a high rating in confidence.

Alternate Hypothesis 5a: Emotional stability (neuroticism) will be associated with preservice teachers' self-reported ratings in teaching confidence.

Null Hypothesis 6: Agreeableness will not be associated with preservice teachers' ratings in confidence or experience.

*The null hypothesis for conscientiousness was rejected because a relationship was found to exist between conscientiousness and confidence. However, the relationship was in the opposite direction to the one hypothesized. There was a significant correlation (r = -.421, p = .013) between conscientiousness and the change in confidence from pre to post-test. Those with high conscientiousness declined in their teaching confidence from pre- to post-. Alternate Hypothesis 2a states that: conscientiousness is more prevalent in preservice teachers who report a high rating in confidence. This alternative hypothesis was also not confirmed.

Discussion

Findings suggest that personality traits affect the experience and confidence ratings of preservice teachers in a simulated classroom environment and that simSchool training may improve the development of teaching confidence and teaching experience. In addition, simSchool training may improve teaching self-efficacy and the balance between experience and confidence-both areas that impact teaching effectiveness.

Self-efficacy

Self-efficacy is more than competence; it is confidence in one's competence (Christensen et al., 2011). Preservice training is one of the most critical periods for developing perceived self-efficacy (Christensen et al., 2011; Hsien, 2007). Self-efficacy is not a new measure for simSchool. Previous studies using the Teacher Preparation Survey and simSchool as an

intervention for preservice teachers have resulted in large gains of self-efficacy. In a study of 32 preservice teacher candidates from a Reading/Language Arts methods course (Christensen et al., 2011) at a large southwestern university, students participated in nine hours of simSchool. Strong findings in the area of instructional self-efficacy resulted in pre-post gains for the treatment group (ES = .96). This was sufficiently greater than the gain for the comparison group (ES = .40). The effect of simSchool can be said to be educationally meaningful (Bialo & Sivin-Kachala, 1996).

Gains in self-efficacy were reported in a study of 104 preservice teachers who explored how to accommodate the learning needs of a simulated student with disabilities in an inclusion-classroom setting. The effect size was large for the treatment group (d = .68, p = .03); whereas, the comparison group made no significant gains in self-efficacy. Findings showed that simSchool activities resulted in gains in instructional self-efficacy (Christensen et al., 2011).

In the conceptual framework (Chapter 1) of Social Cognitive Theory, Bandura defines four main sources that influence individuals to gain a stronger sense of self-efficacy. Listed in Figure 43 are Bandura's sources to gain self-efficacy and activities performed in simSchool training directly corresponding with the self-efficacy sources.

Sources to Gain a Sense of Self-Efficacy	simSchool Training Skills
Successful repetition of task	Preservice teachers: • Repeat lessons • Make adjustments to teaching • Analyze findings
Social modeling through the observation of others completing a task	Preservice teachers observe: • Trainer modeling effective teaching • Peers modeling simSchool task completions
Social persuasion by competent others instilling confidence with encouragement to succeed	Preservice teachers are encouraged by: • Trainer feedback • Peer feedback • Simulation feedback
Situations for others to succeed through self-improvement	Preservice teachers can: • Make classroom decisions • Adjust mistakes • Repeat lessons • Practice on virtual students

Figure 45. Sources to gain a sense of self-efficacy and simSchool training skills.

Pedagogical Balance

Preservice teachers tend to have high ratings of confidence in their ability to teach; however, their ratings may be overstated in the pre-test. Evidence of inflated confidence ratings has been seen in the pilot and dissertation study suggesting that at pre-test time, preservice teachers rate confidence higher than their experience levels, which can be connected to the conceptual framework in Chapter 1. espoused theory (Argyris & Schon, 1974) addresses how people would like to behave based on their personal values. The theory-in-use concept from espoused theory explains how individuals actually behave in spite of their personal values and can be inferred from action (Argyris & Schon, 1974).

Pedagogical balance is a new measure created by the simSchool research team through grants awarded by the U.S. Dept. of Education Fund for the Improvement of Postsecondary Education (FIPSE), the Gates/EDUCAUSE Foundation, and the National Science Foundation to assess alignment of perceived confidence and experience. These awards spanning 2006-2012 were secured by Drs. Christensen, Knezek, and Tyler-Wood at UNT (U.S. Dept. of Education Fund for the Improvement of Postsecondary Education Grant #P116B060398; EDUCAUSE Modules Project; U.S. National Science Foundation Research and Disabilities Education (RDE) Grant #0726670). Pedagogical balance is defined as the difference between a person's average confidence rating for teaching and average experience rating for teaching. The lowest rating on the 16-item Survey of Teaching Skills (see Appendix A-1) used for examining pedagogical balance to date is 1.0 for each measure, while the highest is 5.0, so the greatest possible difference between confidence and experience is 4.0. The idea implied by the concepts underlying pedagogical balance is a difference score equal to 0.0 so that the confidence of a preservice teacher is aligned with his/her experience. Graphical illustrations of the results of repeated measures MANOVA found the comparison group became more out of balance (further away from 0); however, the simSchool treatment group improved pedagogical balance in both the dissertation and pilot studies (Appendix C).

Experience has been found to increase after simSchool training. Pedagogical balance has shown improvement as preservice teachers' experience increases and becomes more in balance with confidence (Hopper et al., 2013). Self-efficacy increases as preservice teachers' confidence grows in competence through experience and observation of or participation in events such as simSchool to gain a basis of knowledge.

Pedagogical balance is a difference score that measures confidence minus experience.

Conversely, examination of numerous prior studies led the author to propose that self-efficacy can be viewed as an operational definition as the summation of confidence and experience (Appendix C). The results of this study are proposed areas for future research and further study and support ideas that:

- Preservice teachers may overrate their confidence levels at pre-test time
- Preservice teachers gain teaching experience in simSchool
- Experience and confidence become more balanced after simSchool use
- Self-efficacy increases after simSchool use

Future Research

The identification of a relationship between personality traits and effective teaching is the major outcome of this study. Findings support the idea that traits of openness, emotional stability, extraversion, and conscientiousness are associated with confidence in teaching; whereas, openness and extraversion are associated with experience in teaching. Future experimental investigations are needed on the relationships of personality traits and effective teaching. In addition to personality trait research, further study can be investigated on the proposed model of effective teaching presented in Chapter 1 and reviewed in Chapter 4. Further researchers may consider a pre- and post-canonical correlation analysis to investigate the changes from pre- to post- in the comparison and treatment groups. The post-data analysis would most likely reveal valuable information about the role of experience and confidence in teaching effectiveness and the impact of the treatment.

Another outcome in this study points to the use of simSchool for teacher preparation. Studies at universities around the globe are an area of future research to compare findings from preservice teachers in other countries. simSchool can be accessed worldwide, wherever an

internet connection is available. Further research replicating the dissertation study of the relationship between personality traits and effective teaching in simSchool lends itself to global research as the personality traits are universal across languages and cultures (Allik & McCrae, 2004; Rossier et al., 2005) in 50 societies and across 6 continents (McCrae & Allik, 2002; McCrae & Terracciano, 2005; Schmitt et al, 2007).

simSchool Review

Four questions were asked to the 37 preservice teachers in the dissertation treatment group upon completion of simSchool. This section presents the questions with the student responses.

1) How engaging was simSchool?

Students had five choices ranging from very engaging to not very engaging. In the six hours that the preservice teachers used simSchool, 84% of the students found simSchool to be either sufficiently engaging or very engaging and 16% found simSchool to be somewhat engaging.

2) How difficult were the simSchool modules?

Students participated in three modules during the two sessions of simSchool. One of the modules was a simSchool-created module and the other two modules were created by the simSchool trainer. Five responses to the questions were offered ranging from easy to very difficult. Seventy-three percent of the students thought the modules were neutral, meaning not too easy or too difficult. Sixteen percent of the students thought the modules were easy and 11% responded that the modules were difficult.

3) Was simSchool worth the effort?

Ninety-seven percent of preservice teachers found simSchool to be worth the six hours of effort they put forth to complete the modules.

4) Would you recommend simSchool to a friend?

In addition, 97% of preservice teachers responded that they would recommend simSchool to a friend.

In this study, most of the preservice teachers found the simSchool modules to be engaging, not too easy or too difficult, worth the effort, and would recommend simSchool to a friend. A comment box was available for students to enter what they learned in the simSchool module. A few comments include:

- "We learned how different tasks affect different students. It was interesting how some students were being distracting and not participating, but they were actually learning, and vice versa."
- "Comments made to one student affects all the other students in the class. I also learned that every student learns differently and that the effectiveness of the teacher comments depended upon the students' personalities."
- "I learned how to adjust tasks to better fit individual needs."
- "I learned how to apply different ways of teaching students who have different personalities and different needs in a classroom."

These comments show new insights about teaching that these preservice teachers acquired during simSchool and may be evidence of the development of heuristic knowledge. As reviewed in the literature, heuristic knowledge is a technique to find feasible solutions using previous knowledge (Russell & Norvig, 1995) such as creating an educated guess, rule of thumb, or intuitive judgment (Gibson & Kruse, 2012). "People who practice with a simulator develop heuristic knowledge of the underlying theories because the immersive, multimedia experience

tap into physical, emotional, as well as cognitive pathways, heightening the sense of importance of the experience" (Gibson & Kruse, 2012, p. 1145).

Innovative Teacher Preparation

Heuristic knowledge is a 21st century skill that can develop educators into critical thinkers. Critical thinking together with activities that promote creativity, communication, and collaboration is the type of training that will create teachers as role models, learning guides, and process instructors (Jukes et al., 2010). The use of simSchool in-teacher-training has the capacity to prepare teacher candidates to use learning science and technology to change what and how they teach. For example, simSchool incorporates many learning theories such as the zone of proximal development (Vygotsky, 1979), mastery, and performance goals (Elliot, 1999), multiple intelligences (Gardner, 1993), differentiation of instruction (Tomlinson, 1995), and culturally responsive teaching (Gay, 2000). Additional psychological and sociological theories (Gibson, 2007) that support the foundation of teacher-student relationships include the big five model of personality (Digman, 1990; McCrae & Costa, 1996), circumplex theories of personal interactions (Cattell, 1957; Digman, 1990; Leary, 1957), the integration of personality theories with intelligence and performance theories (Brooks, 1999; Chamorro-Premuzic & Furnham, 2004; Gardner, 1983; Hawkins & Blakeslee, 2004; Hofstee, De Raad, & Goldberg, 1992; Howard & Howard, 2000; Leary, 1957; McGrew, 2005; Pfeifer & Bongard, 2007), social theories of personality (Bandura & Walters, 1963; Moberg, 1999), and computational models of these processes (Busetta, Bailey, & Ramamohanarao, 2002; Parunak, Bisson, Brueckner, Matthews, & Sauter, 2006; Rao & Georgeff, 1992; Silverman, 2001).

In addition to a strong foundation of learning science, simSchool provides technology-supported learning experiences that have been shown to improve teaching confidence

and teaching experience. Learning experiences in simSchool integrate the ISTE NETS teaching skills listed in Figure 44 with examples of how those skills are used in the simulation.

ISTE NETS teaching skill	simSchool Activity Student(s)* refers to preservice teacher
Inspire student* learning and creativity	• simSchool is a platform for students* to apply learning science with real situations that occur in the classroom • Through reflections and collaborative tools (wikis, blogs, forums) students conceptualize their thinking and planning in creative processes
Design and develop digital-age learning experiences and assessments	• Students* develop teaching experience in a simulated classroom that increases the belief in their own ability to teach • Digital feedback of teaching performance and academic achievement is provided for students* to analyze their learning and adjust teaching strategies
Model digital-age work and learning	• Students* collaborate with peers and trainers to communicate ideas about teaching practices • Modeling of instructional strategies in a simulated environment promotes knowledge building
Promote and model digital citizenship and responsibility	• The diverse needs of all learners are addressed in simulated classroom experiences • Students* can create all types of learners and tasks using the simulator to safely gain knowledge about the teacher and student relationships
Engage in professional growth and leadership	• Students* develop practice of teaching skills • Engage with peers • Reflect on their growth • Expand their knowledge of lifelong learning

Figure 46. ISTE NETS skills and application of skills in simSchool.

Final Thoughts

Individual personality traits of preservice teachers may have a significant influence on teaching confidence and teaching experience. This study found a relationship between personality traits and teaching effectiveness. In this study, the general population of preservice teachers that were more confident and experienced before any treatments were those that had

more extraversion and less openness. At the post-test time those preservice teachers that were more emotionally stable reported higher confidence. The most conscientious preservice teachers lost confidence from pre-treatment to post-treatment, whereas, the more open preservice teachers gainedd in confidence and experience from pre-treatment to post-treatment.

Learning about personality traits of preservice teachers can offer insight into new ways to prepare them to be better communicators, collaborators, and critical thinkers to effectively teach in the 21st century. SimSchool enables transformational experiences for teacher candidates to improve in general teaching skills, connect learning theories in the classroom, and develop confidence without the ill impacts of practicing on real students. SimSchool provides knowledge-building experiences that can increase confidence, experience, and self-efficacy. The results of this dissertation study have the potential to enhance teacher preparation training and foster effective teaching.

APPENDIX A

SURVEY INSTRUMENTS

Permission was granted by Dr. David Gibson to use the Survey of Teaching Skills and OCEAN Survey in this research study and to use in the Appendix.

Survey of Teaching Skills

Knowledge of students

- Reading and using student records to make instructional decisions
- Pre-planning assessment and instruction to meet individual and group needs
- Observing in-classroom behavior and making inferences about adaptations needed in instruction and assessments

Experience Level	Very low	Moderately low	Medium	Moderately high	Very high
Confidence Level	Very low	Moderately low	Medium	Moderately high	Very high

Pre-planning instruction

- Knowing what subject one is prepared to teach
- Knowing how many and what kinds of tasks are suited and fit with a subject
- Estimating the number of class sessions needed to teach a particular set of tasks

Experience Level	Very low	Moderately low	Medium	Moderately high	Very high
Confidence Level	Very low	Moderately low	Medium	Moderately high	Very high

Making and using tasks

- Designing appropriate tasks
- Sequencing tasks for best effect

Experience Level	Very low	Moderately low	Medium	Moderately high	Very high
Confidence Level	Very low	Moderately low	Medium	Moderately high	Very high

Making and using assessments

- Aligning assessment items to assess a given objective
- Estimating the number of and what kinds of assessment items/measures are suited and fit for a particular set of objectives
- Understanding the data produced by administration of a pre-assessment

Experience Level	Very low	Moderately low	Medium	Moderately high	Very high
Confidence Level	Very low	Moderately low	Medium	Moderately high	Very high

Re-planning Instruction

- Prior to instruction, choosing whole-class instructional strategies based on (aligned with) pre- assessment results
- Prior to instruction, choosing individual strategies based on (aligned with) student records and individual pre-assessment results.

Experience Level	Very low	Moderately low	Medium	Moderately high	Very high
Confidence Level	Very low	Moderately low	Medium	Moderately high	Very high

Classroom decision-making

- Interpreting in-class performance (on task vs off task behaviors) as academic vs emotional issues
- "Reading" students via participation clues and language
- Speaking to students in effective and appropriate ways
- Grouping students for differentiated instruction
- Adjusting instructional strategies based on in-class performance
- Individualizing tasks
- Focusing talk and discussion on improved student performance

Experience Level	Very low	Moderately low	Medium	Moderately high	Very high
Confidence Level	Very low	Moderately low	Medium	Moderately high	Very high

Making and using a post-assessment

- Designing appropriate and aligned test items to assess a given "unit of study" (objectives plus the instructional strategies and adaptations that have occurred during a number of class sessions)
- Estimating the number of and what kinds of assessment items/measures are suited and fit for the unit of study
- Understanding the data produced by administration of a post-assessment

Experience Level	Very low	Moderately low	Medium	Moderately high	Very high
Confidence Level	Very low	Moderately low	Medium	Moderately high	Very high

Reflections on teaching

- Making mental notes (and possibly written records such as grade book notations) about the evolution of a unit of study – the interaction of one's plans with the realities of teaching
- Abstracting and articulating lessons learned from the whole experience

Experience Level	Very low	Moderately low	Medium	Moderately high	Very high
Confidence Level	Very low	Moderately low	Medium	Moderately high	Very high

Figure A.1. Survey of teaching skills.

OCEAN Online Survey

Choose the response that best represents your opinion
SD – D – N – A – SA (Strongly Disagree – Disagree – Neutral – Agree – Strongly Agree)

1.	I waste a lot of time before settling down to work	SD – D – N – A - SA
2.	I tend to assume the best about people	SD – D – N – A – SA
3.	Poetry has no effect on me	SD – D – N – A – SA
4.	I like to be where the action is	SD – D – N – A – SA
5.	I often feel helpless and want someone to rescue me	SD – D – N – A – SA
6.	I'm highly productive and usually get everything done	SD – D – N – A – SA
7.	I'm better than most people, and I know it	SD – D – N – A – SA
8.	I deeply experience a wide range of emotions	SD – D – N – A – SA
9.	I like going my own way rather than leading others	SD – D – N – A – SA
10.	I am not a worrier	SD – D – N – A – SA
11.	I never seem to get organized	SD – D – N – A – SA
12.	When insulted, I forgive and forget	SD – D – N – A – SA
13.	Listening to controversial speakers can only confuse or mislead students	SD – D – N – A – SA
14.	My life is fast-paced	SD – D – N – A – SA
15.	I feel completely worthless at times	SD – D – N – A – SA
16.	I'm happy to work toward a clear set of goals	SD – D – N – A – SA
17.	If necessary, I'm willing to manipulate people to get what I want	SD – D – N – A – SA
18.	When I look at a work of art, I feel a chill of excitement	SD – D – N – A – SA
19.	I'd rather work alone than with others most of the time	SD – D – N – A – SA
20.	I rarely feel anxious or afraid	SD – D – N – A – SA
21.	Sometimes, I'm not as dependable or reliable as I should be	SD – D – N – A – SA
22.	I am courteous to everyone I meet	SD – D – N – A – SA
23.	I have no interest in speculating about why things are the way they are	SD – D – N – A – SA
24.	I like having people around me	SD – D – N – A – SA
25.	I often get angry about the way people treat me	SD – D – N – A – SA
26.	I keep my belongings neat and clean	SD – D – N – A – SA
27.	Some people think of me as cold and calculating	SD – D – N – A – SA
28.	I like playing with abstract ideas	SD – D – N – A – SA
29.	I don't get much pleasure chatting with others	SD – D – N – A – SA
30.	I rarely feel lonely	SD – D – N – A - SA

Figure A.2. OCEAN survey.

OCEAN Survey Analysis KEY

SD – D – N – A – SA
(1) – (2) – (3) – (4) – (5)
R (5) (4) (3) (2) (1)

Agreeableness			
Item	Score	Var.	
2.		A	I tend to assume the best about people
7.	R	A	I'm better than most people, and I know it
12.		A	When insulted, I forgive and forget
17.	R	A	If necessary, I'm willing to manipulate people to get what I want
22.		A	I am courteous to everyone I meet
27.	R	A	Some people think of me as cold and calculating
			Agreeableness total
Conscientiousness			
Item	Score	Var.	
1.	R	C	I waste a lot of time before settling down to work
6.		C	I'm highly productive and usually get everything done
11.	R	C	I never seem to get organized
16.		C	I'm happy to work toward a clear set of goals
21.	R	C	Sometimes, I'm not as dependable or reliable as I should be
26.		C	I keep my belongings neat and clean
			Conscientiousness total
Extraversion			
Item	Score	Var.	
4.		E	I like to be where the action is
9.	R	E	I like going my own way rather than leading others
14.		E	My life is fast-paced
19.	R	E	I'd rather work alone than with others most of the time
24.		E	I like having people around me
29.	R	E	I don't get much pleasure chatting with others
			Extraversion total
Neuroticism			
Item	Score	Var.	
5.	R	N	I often feel helpless and want someone to rescue me
10.		N	I am not a worrier
15.	R	N	I feel completely worthless at times
20.		N	I rarely feel anxious or afraid
25.	R	N	I often get angry about the way people treat me
30.		N	I rarely feel lonely
			Neuroticism total
Openness			
Item	Score	Var.	
3.	R	O	Poetry has no effect on me

8.		O	I deeply experience a wide range of emotions
13.	R	O	Listening to controversial speakers can only confuse or mislead students
18.		O	When I look at a work of art, I feel a chill of excitement
23.	R	O	I have no interest in speculating about why things are the way they are
28.		O	I like playing with abstract ideas
			Openness total

Figure A.3. OCEAN survey key.

APPENDIX B

SIMSCHOOL TREATMENT MODULE

Figure B.1. simSchool registration video.

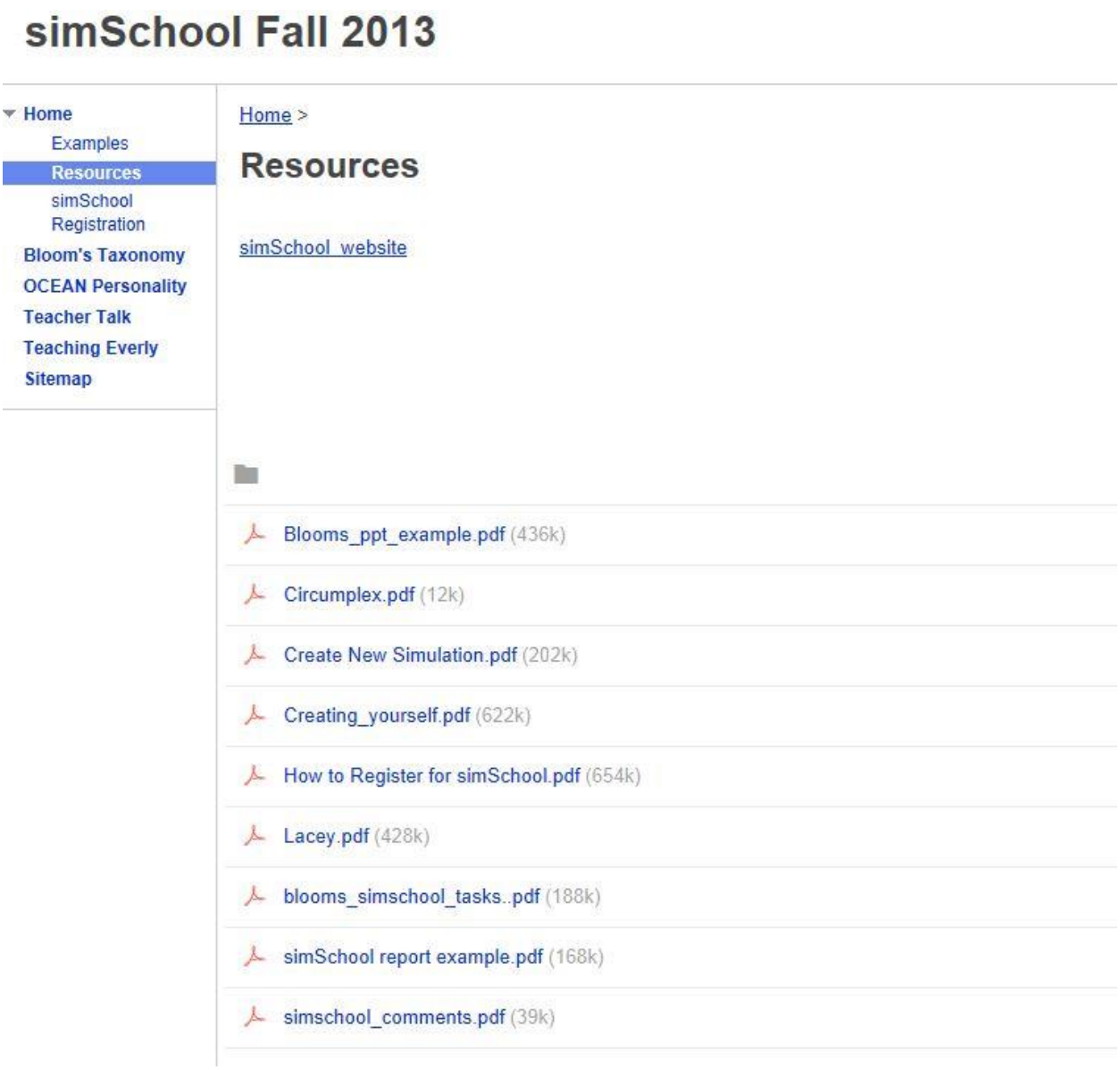


Figure B.2. simSchool resource page.

Figure B.3. simSchool introduction presentation.

Teaching Everly

Everly's Bad Day

Scenario: Everly Kassam is an "on grade level" student. In relationships, he shows self-confidence and likes stimulation. He manages to get along with others most of the time. he is diligent about assignments, follows instructions and stays on task. He is a steady, friendly, warm person with good self-esteem. He's interested in a lot of things, enjoys new ideas, and likes a challenge. When approaching tasks, he talks a lot, likes variety and interaction. He learns best by "doing" and likes to work with others. He is generally positive and enthusiastic. Everly likes to plan and have structure. He needs closure, and thus completes every task. He wants everything "to count" toward the grade. He is creative, makes up hypotheses, improvises answers, and takes risks. Let's see if we can teach him!

- **Learning objectives explored**
  - Reading and using student records to make instructional planning and teaching decisions
  - Interpreting in-class performance and behaviors as evidence of student interests, aspirations and needs
  - Making mental notes and written records (such as grade book notations and notes about students) about the evolution of a unit of study - the interaction of one's plans with the realities of teaching

Simulation Activities

1. You will work in partners using two computers. One partner will have Google sites open. The other will have simSchool open. The Google sites partner will open simManual lesson 1 in the files at the bottom of this page.
2. The simSchool partner will find the simulation - go to simLibrary. Type in Bad Day (author should be S Hopper 9/12/13). Click Launch.
3. Before beginning the simulation, click on the laptop on your desk to read Everly's profile. 2. Follow the lesson plan left for you by your colleague (simManual Lesson 1) monitoring Everly's performance throughout:
4. Take notes during lecture (15 simMinutes)
5. Go over last week's lessons (15 simMinutes)
6. Take an oral quiz (15 simMinutes)
7. Stop the simulation after 45 simMinutes, and view Everly's performance charts.
8. Look at Everly's chart and do a *print screen* (directions for print screen at bottom of page) of the chart and paste it onto a power point slide.
9. Keep the power point open for later use in Adjusting Everly's day.

Adjusting Everly's Day

Scenario: Now that you have taught Everly, let's look at ways to improve his performance. By exploring different types of tasks in simSchool and looking at Everly's personality, you will select two tasks that you think will be effective for Everly.

Learning Objectives Explored:

- Reading and using student records to make instructional planning and teaching decisions
- Pre-planning tasks, assessment and instruction to meet individual and group needs
- Interpreting in-class performance and behaviors as evidence of student interests, aspirations and needs
- Making mental notes and written records (such as grade book notations and notes about students) about the evolution of a unit of study - the interaction of one's plans with the realities of teaching
- Abstracting and articulating lessons learned from the whole experience

Figure B.4. Everly's Bad Day learning module.

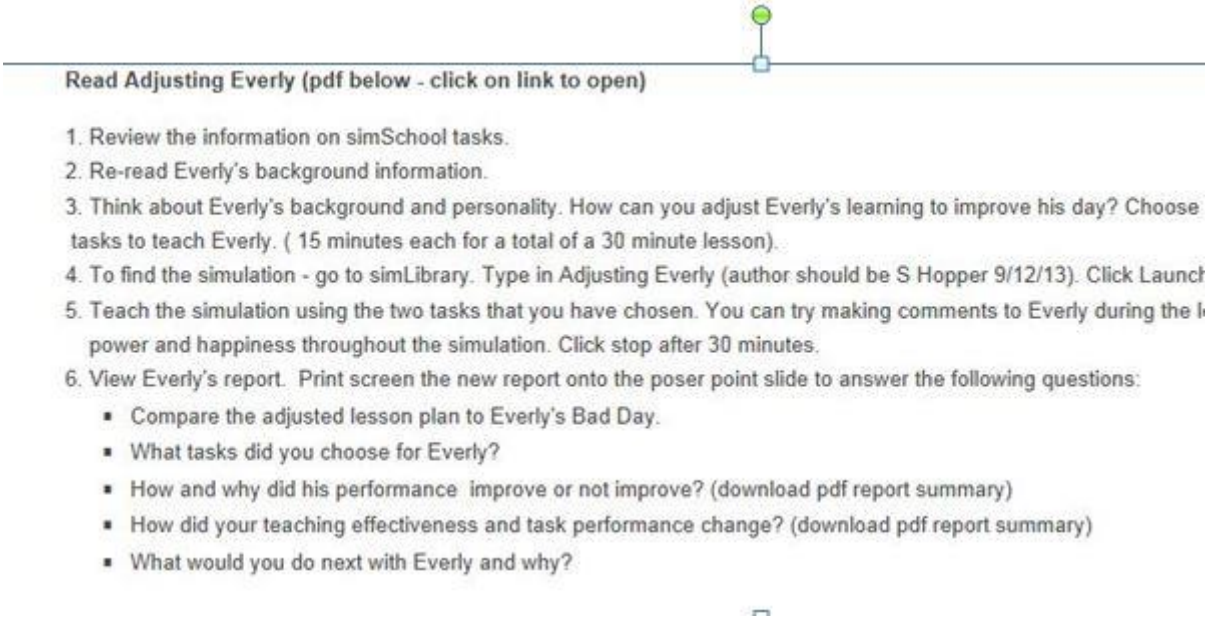
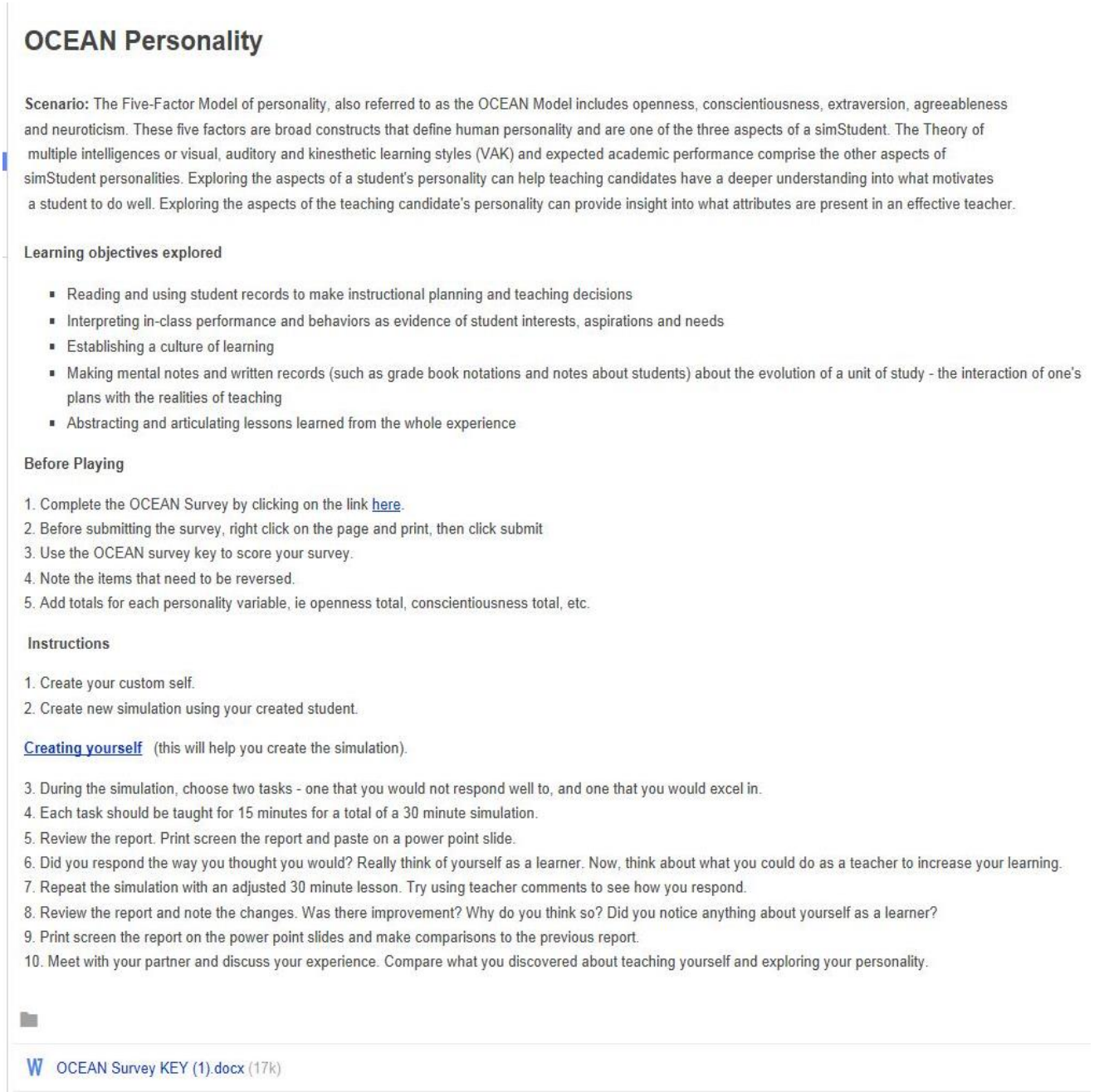


Figure B.5. Adjusting Everly learning module.



OCEAN Personality

Scenario: The Five-Factor Model of personality, also referred to as the OCEAN Model includes openness, conscientiousness, extraversion, agreeableness and neuroticism. These five factors are broad constructs that define human personality and are one of the three aspects of a simStudent. The Theory of multiple intelligences or visual, auditory and kinesthetic learning styles (VAK) and expected academic performance comprise the other aspects of simStudent personalities. Exploring the aspects of a student's personality can help teaching candidates have a deeper understanding into what motivates a student to do well. Exploring the aspects of the teaching candidate's personality can provide insight into what attributes are present in an effective teacher.

Learning objectives explored

- Reading and using student records to make instructional planning and teaching decisions
- Interpreting in-class performance and behaviors as evidence of student interests, aspirations and needs
- Establishing a culture of learning
- Making mental notes and written records (such as grade book notations and notes about students) about the evolution of a unit of study - the interaction of one's plans with the realities of teaching
- Abstracting and articulating lessons learned from the whole experience

Before Playing

1. Complete the OCEAN Survey by clicking on the link here.
2. Before submitting the survey, right click on the page and print, then click submit
3. Use the OCEAN survey key to score your survey.
4. Note the items that need to be reversed.
5. Add totals for each personality variable, ie openness total, conscientiousness total, etc.

Instructions

1. Create your custom self.
2. Create new simulation using your created student.

Creating yourself (this will help you create the simulation).

3. During the simulation, choose two tasks - one that you would not respond well to, and one that you would excel in.
4. Each task should be taught for 15 minutes for a total of a 30 minute simulation.
5. Review the report. Print screen the report and paste on a power point slide.
6. Did you respond the way you thought you would? Really think of yourself as a learner. Now, think about what you could do as a teacher to increase your learning.
7. Repeat the simulation with an adjusted 30 minute lesson. Try using teacher comments to see how you respond.
8. Review the report and note the changes. Was there improvement? Why do you think so? Did you notice anything about yourself as a learner?
9. Print screen the report on the power point slides and make comparisons to the previous report.
10. Meet with your partner and discuss your experience. Compare what you discovered about teaching yourself and exploring your personality.

OCEAN Survey KEY (1).docx (17k)

Figure B.6. OCEAN personality module.

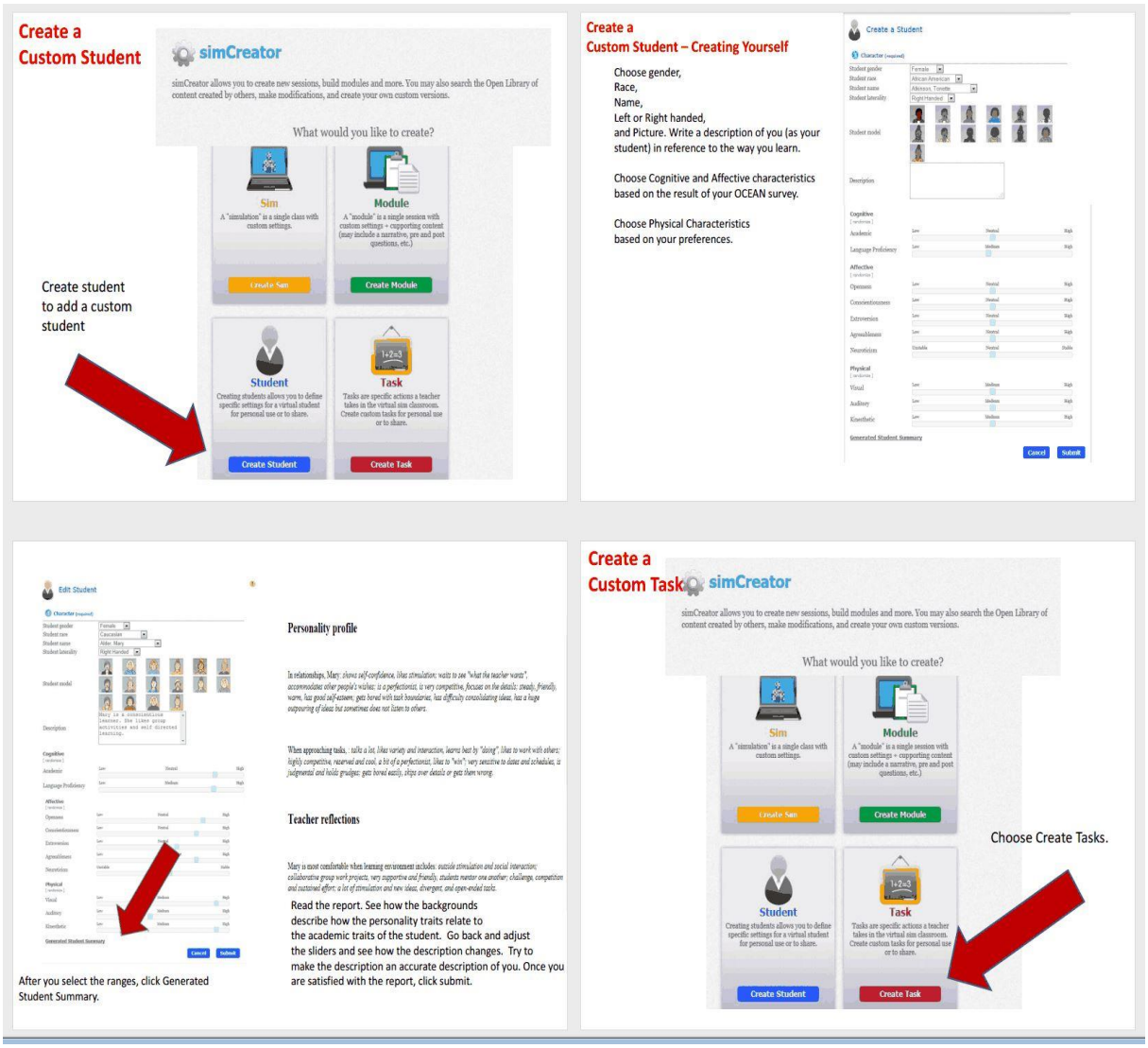


Figure B.7. Tutorials to create a simSchool custom student.

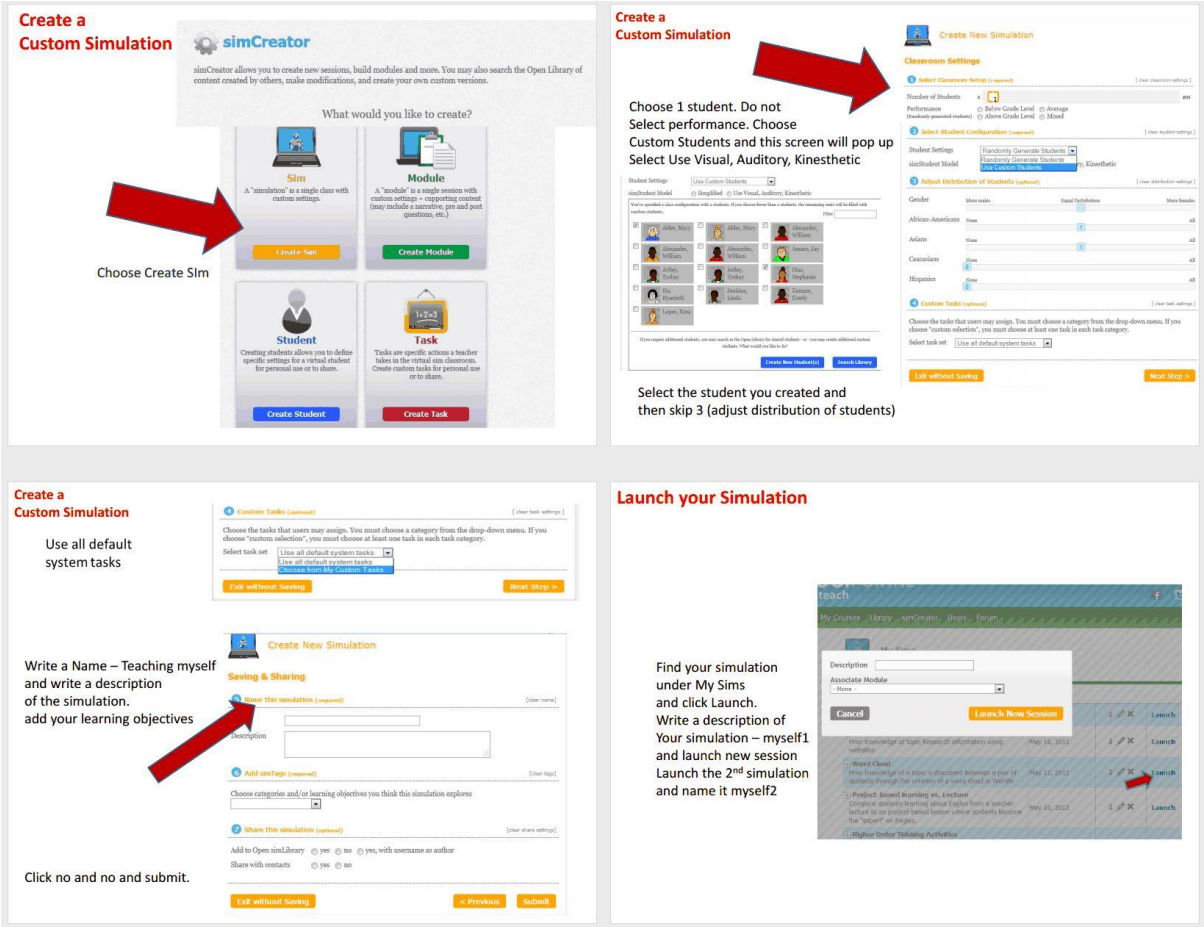


Figure B.8. Tutorials to create a simSchool custom simulation.

simSchool Fall 2013

- Home
  - Examples
  - Resources
  - simSchool Registration
- Bloom's Taxonomy
- OCEAN Personality
- Teacher Talk
- Teaching Everly
- Sitemap

Teacher Talk

Scenario: Teacher talk can set off all types of reactions in students. A kind word about student performance can encourage a student to work harder, whereas a harsh comment could shut a student off to learning. How teachers interact with students by the words they choose and the tone they use directly effects student performance. simSchool provides a classroom where pre-service teachers can experiment with different types of comments from dominant-friendly to aloof-submissive. Exploring the Interpersonal Circumplex provides pre-service teachers practice of "know how" to balance power and affiliation when interacting with students.

Learning objectives explored

- Reading and using student records to make instructional planning and teaching decisions
- Interpreting in-class performance and behaviors as evidence of student interests, aspirations and needs
- Building trust with students
- Establishing a culture of learning
- Making mental notes and written records (such as grade book notations and notes about students) about the evolution of a unit of study - the interaction of one's plans with the realities of teaching
- Abstracting and articulating lessons learned from the whole experience

Before Playing ..

Please complete the following items prior to launching the simulation:

1. Watch the youtube video on Comments in simSchool.

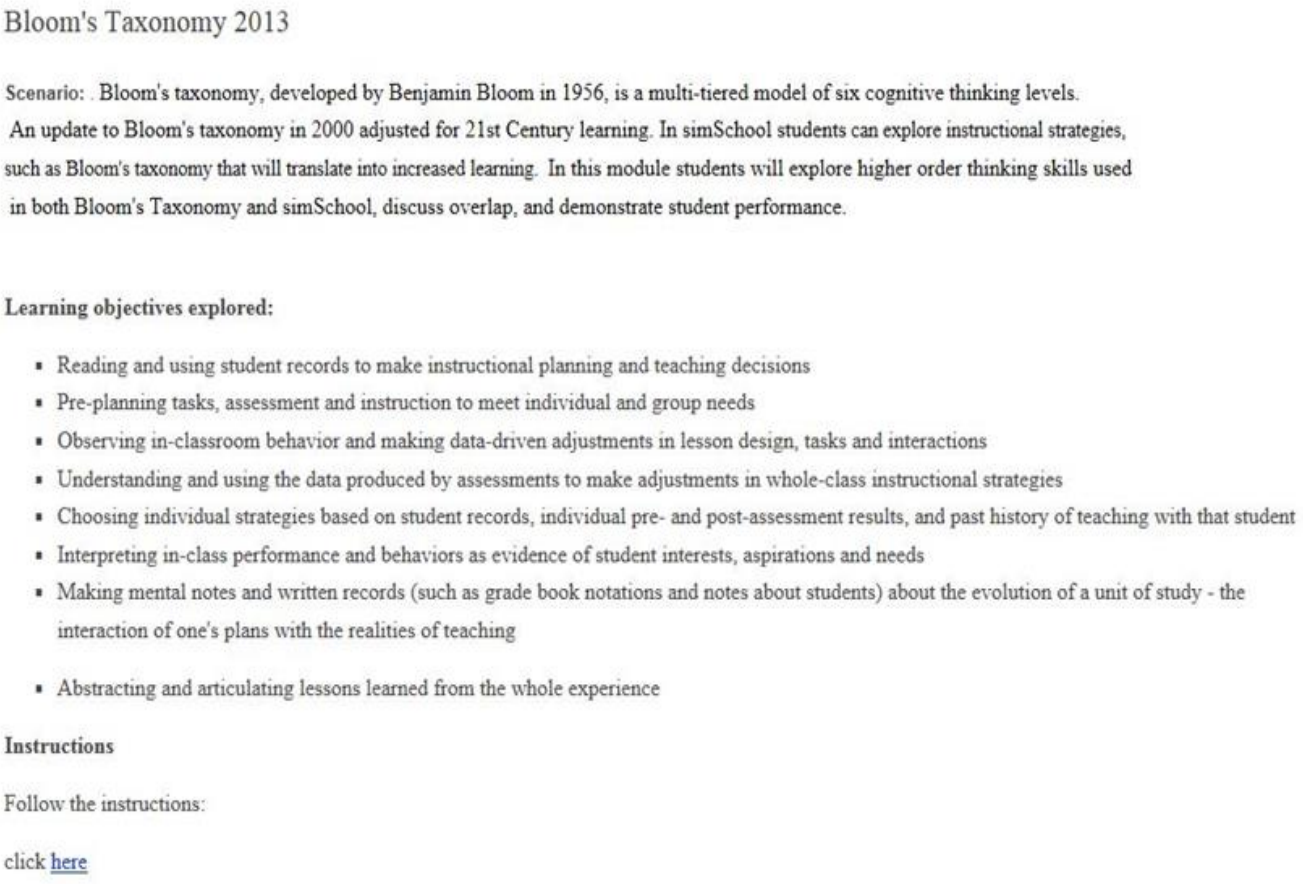
2. During the video have the Circumplex and simSchool Comments pdf's open (posted below) to refer to the resources during the video.
3. Open Lacey.pdf below and read the information and follow the instructions.

Circumplex.pdf (12k)

Lacey.pdf (428k)

simschool_comments.pdf (39k)

Figure B.9. Resource for how to use simSchool teacher talk.



Bloom's Taxonomy 2013

Scenario: . Bloom's taxonomy, developed by Benjamin Bloom in 1956, is a multi-tiered model of six cognitive thinking levels. An update to Bloom's taxonomy in 2000 adjusted for 21st Century learning. In simSchool students can explore instructional strategies, such as Bloom's taxonomy that will translate into increased learning. In this module students will explore higher order thinking skills used in both Bloom's Taxonomy and simSchool, discuss overlap, and demonstrate student performance.

Learning objectives explored:

- Reading and using student records to make instructional planning and teaching decisions
- Pre-planning tasks, assessment and instruction to meet individual and group needs
- Observing in-classroom behavior and making data-driven adjustments in lesson design, tasks and interactions
- Understanding and using the data produced by assessments to make adjustments in whole-class instructional strategies
- Choosing individual strategies based on student records, individual pre- and post-assessment results, and past history of teaching with that student
- Interpreting in-class performance and behaviors as evidence of student interests, aspirations and needs
- Making mental notes and written records (such as grade book notations and notes about students) about the evolution of a unit of study - the interaction of one's plans with the realities of teaching
- Abstracting and articulating lessons learned from the whole experience

Instructions

Follow the instructions:

click here

Figure B.10. Bloom's taxonomy simSchool learning module.

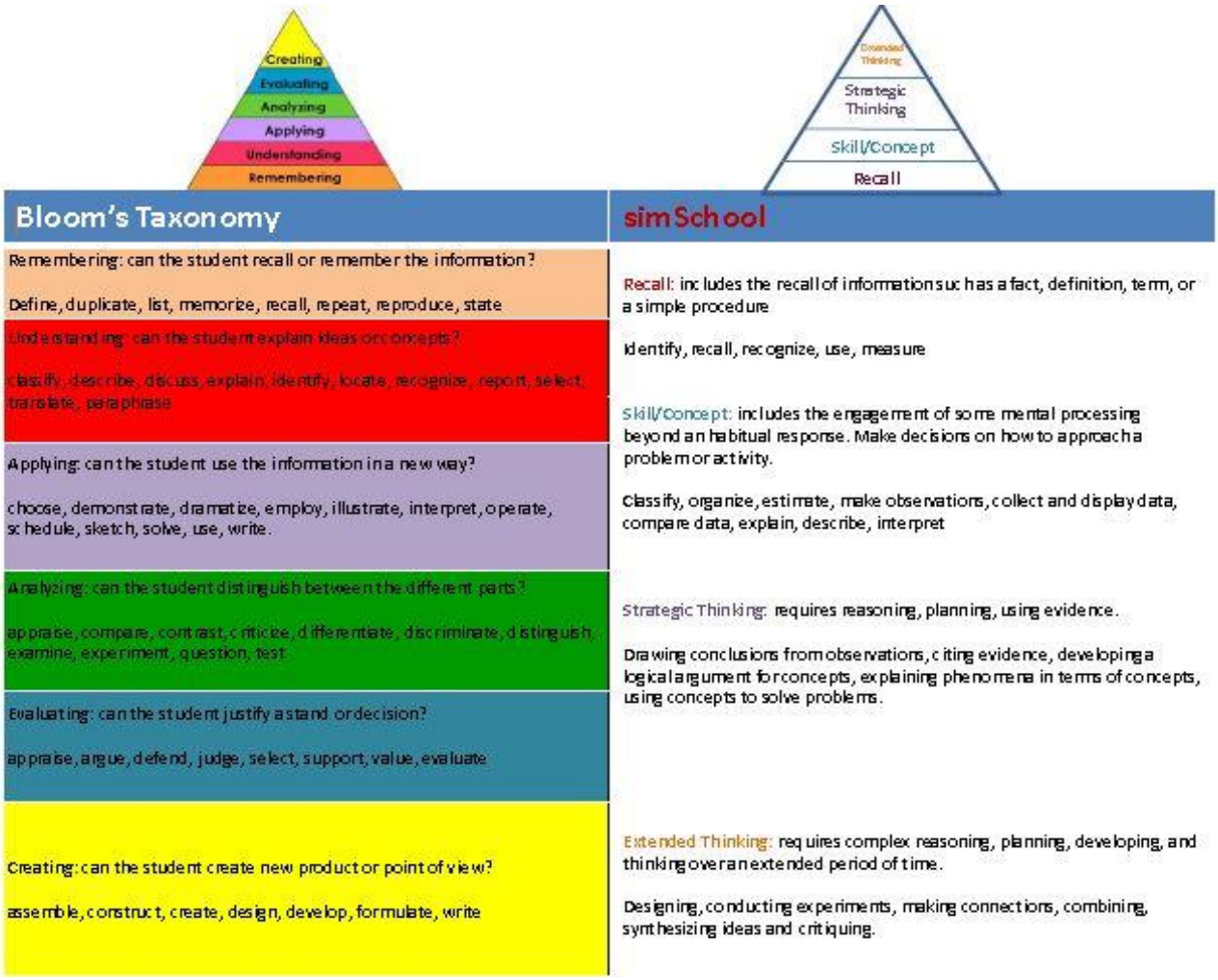


Figure B.11. Comparison of Bloom's taxonomy and simSchool higher order thinking skills.

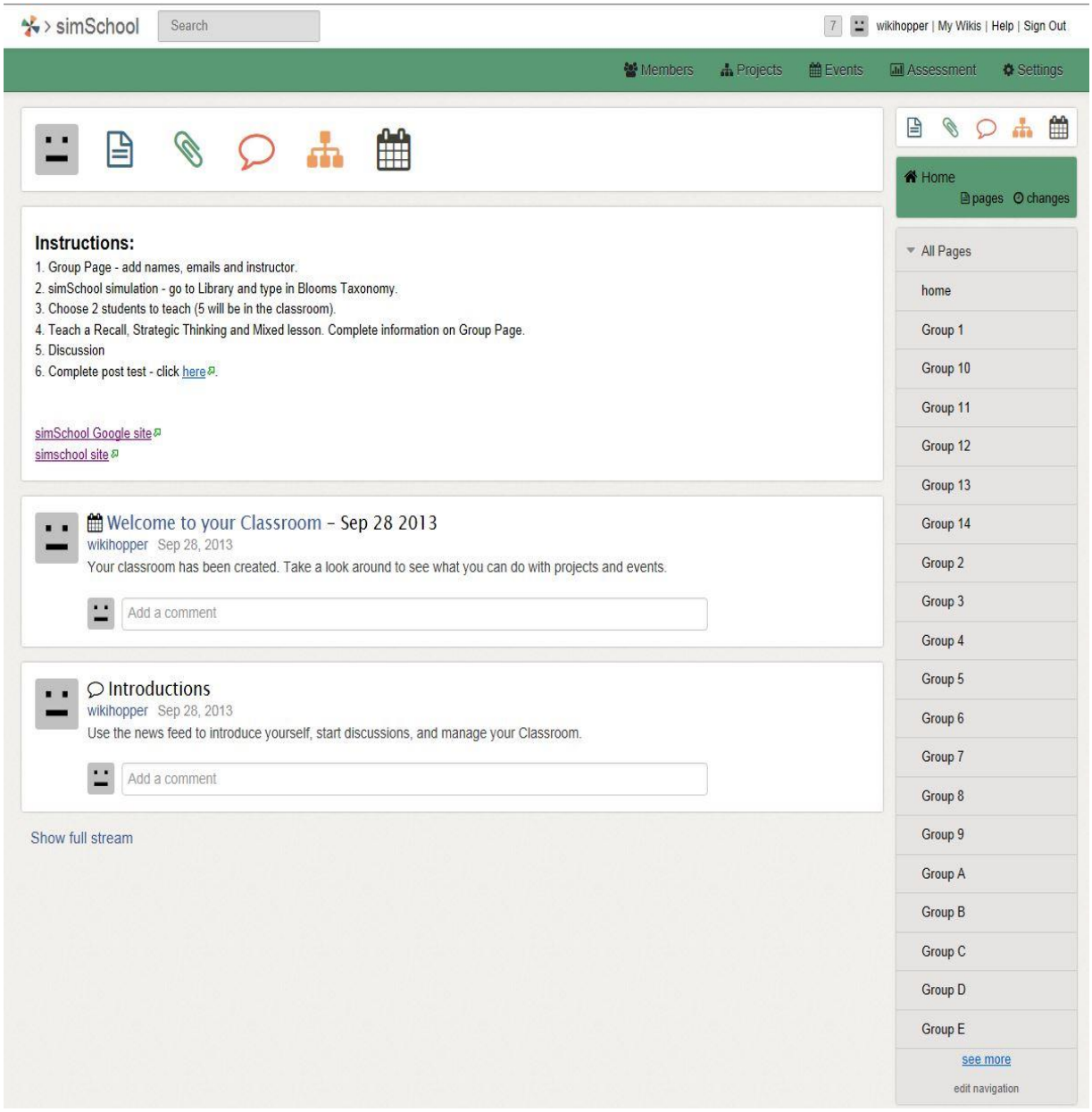


*Figure B.12.*Class wiki for collaboration and reflection.

Recall Activity:

Run a recall /skills & concepts simulation for 40 - 45 min. Choose 2-3 tasks to teach three students. Make 2-3 teacher comments for each student as you see needed. Insert graphs for each student on the recall activities here.

Recall Activities in order: Started off with silent reading, then doing a oral presentation from memory, and then did a oral quiz

Student 1: Marcus Arnold

Teacher Comments: He earned two points for the pizza party, I'm sure you can get your work done on time

Observations: He finishes it very quickly, but then gets bored, but his academic is super high. When we did the oral quiz he was distracting others and did not get back on task

Student 2: Linda Jenkins

Teacher Comments: She's setting a good example for others

Observations: She finished the silent reading very quickly, but took a little longer on the presentation. When we did the oral quiz she was distracting others but then gets back on tasks.

Conclusions about the lesson: The oral presentation was successful for both students and their academic levels stayed high through the activity. The oral quiz was not very effective, both students performed poorly. The silent reading activity for Marcus made him use his intellect but his intellect went down with the next two tasks, probably because they were too easy. Marcus doesn't like change and did not like the experience. His conscientiousness went up but his agreeableness was way low, but it was a good activity for him because he learned and was stable with his emotional stability. Linda on the other hand did not like any of the activities. However, her academic, persistence and extroversion, increased with the first two activities. The oral quiz was not a good activity for Linda because most of her levels dropped.

Figure B.13. Example of student recall activity using simSchool.

Strategic and Extended Thinking Activity:

Run a strategic thinking and extended thinking simulation for 40 -45 min. Choose 2-3 tasks to teach the same three students. Make 2-3 teacher comments for each student as you see needed. Insert graphs for each student on the strategic and extended thinking activities here.

Strategic and Extended Thinking tasks in order: Assign a compare and contrast, team worksheet, analyze a text
Student 1: Marcus Arnold
Teacher Comments: Thumbs up Marcus,
Observations: Marcus is participating, maybe he needed something more challenging. He liked the thumbs up! Marcus doesn't look happy while doing the team worksheet, but he is doing it. Marcus is doing homework for another class.
Student 2: Linda Jenkins
Teacher Comments: Smiles at Linda, How are you doing in the team worksheet,
Observations: Linda is not happy with the compare and contrast activity but her academic is increasing. Linda is distracting others while analyzing the text.

Conclusions about the lesson: Overall it went pretty well. Marcus and Linda performed well in the first and second task. Their intellect went down in the team worksheet activity. They didn't like the analyze a text, even though they were academically engaged.

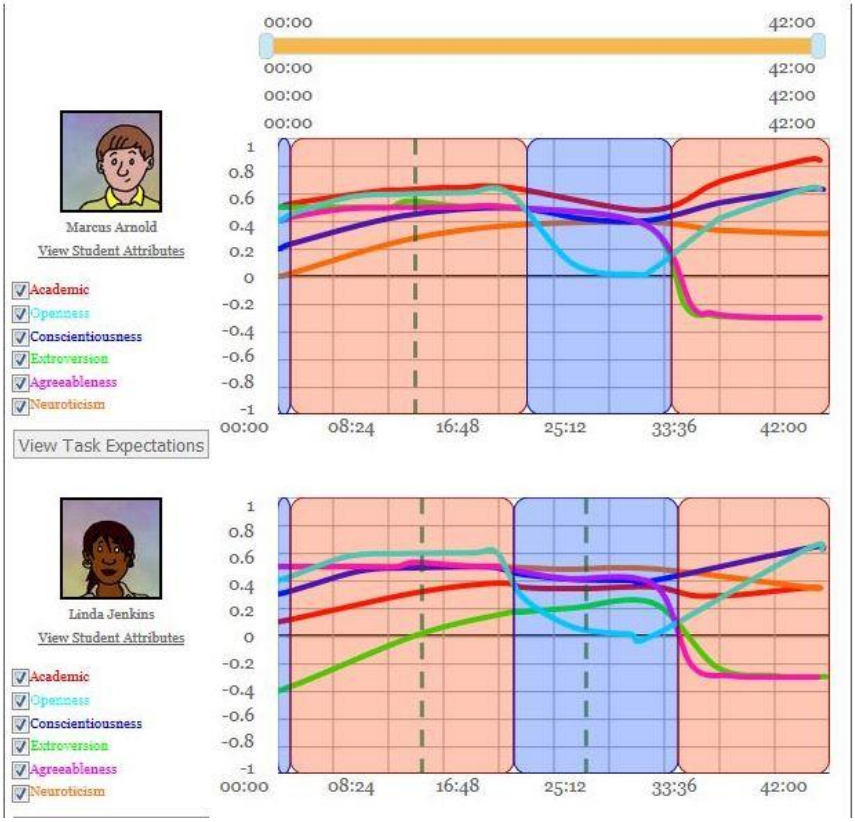


Figure B.14. Example of student strategic and extended thinking activity using simSchool.

Mixed Activity: ***You decide! Mixed tasks based on the reports in the previous two lessons.***

How did your students perform? Run mixed simulation for 40-45min. You choose task levels and number of tasks with the same students. Insert graphs for each student on the mixed activities here.

Mixed Activities in order: Start with a brief presentation, make a creative project, do a design on multiple criteria.
Student 1: Marcus Arnold
Teacher Comments: I need your attention (Activity 1), I can see how thorough your work is,
Observations: Marcus is distracting others while doing the first activity. After we made the first comment, Marcus was still distracting others. His academic is super high. Marcus likes the design on multiple criteria activity.
Student 2: Linda Jenkins
Teacher Comments: Do I need to show you? (Activity 1), I can see how thorough your work is, Do you need my help on the multiple criteria activity.
Observations: Linda is distracting others while doing the first activity. After we made the first comment Linda started listening. Linda is finishing very quickly with the creative project. Linda doesn't enjoy the design on multiple criteria activity, but her academic is going up.

Conclusions about the lesson: Overall they both did really well because their academic and conscientiousness stays high throughout the activities. They both really enjoyed the design a multiple criteria activity, even though Linda was distracted the whole time.

Figure B.15. Example of a mixed activity using simSchool.

Summary - Reflections

- *Write a summary based on the following questions:*
- *Briefly compare the student's ability vs. their performance.*
- *How were you able to adjust activities to improve performance?*
- *How did teaching effectiveness increase or decrease throughout the simulations?*
- *How did you balance the needs of all students?*
- *What happens when activities are more difficult? What happens when they are too easy?*
- *What would you implement next for your students (based on the mixed ability graph) and why?*
- *How does Bloom's Taxonomy challenge teachers in preparing lessons?*
- *How does simSchool challenge teachers in student learning?*

"Linda and Marcus both have the ability to do the activities, if the activities were too easy they weren't engaged enough and they seemed to perform well when we assigned them something more challenging. The level of extraversion does not directly relate to the academic level and they both were very persistent throughout all the activities. They performed better when the tasks were higher level. We adjusted the tasks to fit their personalities so we would get a better outcome. The teacher effectiveness increased the more we interacted with the students. We tried to keep a balance group and individual tasks as well as with their individual personalities. When the activities were challenging, our students were more engaged and their academic levels went up, but if tasks were too easy they would lose their interest and become off task. Based on the mixed ability graph we would implement something creative because they respond well to higher level thinking. Bloom's Taxonomy helps the teacher to give a variety of different level tasks. SimSchool challenges teachers to rethink their curriculum and their responses to students."

Figure B.15. Example of student reflections using simSchool.

APPENDIX C

PEDAGOGICAL BALANCE AND SELF EFFICACY

A Comparison of Dissertation and Pilot Studies

This section contains a comparison of the dissertation and pilot studies of the effect of simSchool on self-reported teaching experience and confidence. It contains a discussion of two proposed measures for simSchool data: pedagogical balance and self-efficacy. Comparison of findings between the dissertation and pilot studies are shown in Table C1.

Table C.1

Comparison of Confidence (Conf) and Experience (Exp) Findings in the Dissertation and Pilot Studies

	Dissertation Study						Pilot Study						
V	Test	*n*	*M*	*SD*	*p*	*d*	*V*	Test	*n*	*M*	*SD*	*p*	*d*
Tr	Pre	36	2.88	.78			Tr	Pre	31	2.50	.80		
Exp	Post	37	3.32	.64	.003	.62	Exp	Post	31	3.20	.64	.000	.97
Tr	Pre	36	3.18	.64			Tr	Pre	27	2.73	.86		
Conf	Post	37	3.36	.61	.164	.29	Conf	Post	27	3.00	.78	.006	.33
Co	Pre	80	2.60	.90			Co	Pre	31	2.80	.82		
Exp	Post	77	2.61	.83	.990	.01	Exp	Post	31	3.30	.49	.000	.76
Co	Pre	80	2.90	.88			Co	Pre	27	3.03	.71		
Conf	Post	77	2.90	.83	.951	*	Conf	Post	27	3.34	.71	.000	.58

*no effect size

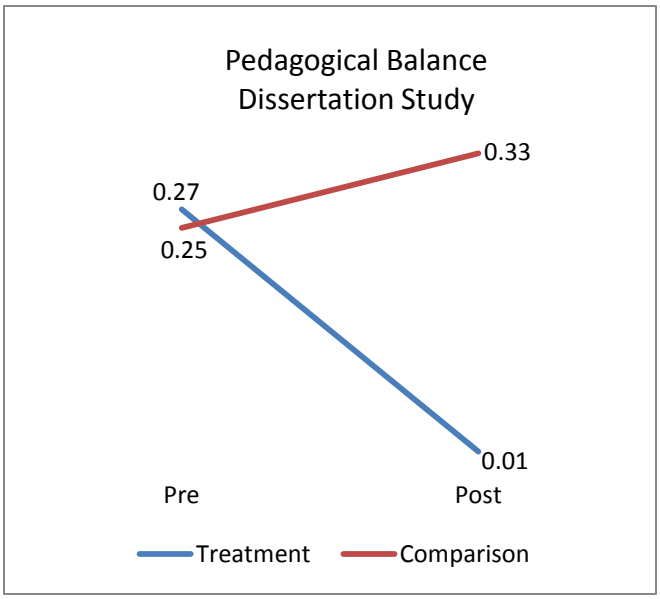


Figure C.1. Pedagogical balance for the comparison group became more out of balance (further away from 0); however, the simSchool treatment group improved pedagogical balance (closer to 0) (statistically significant, p =.033).

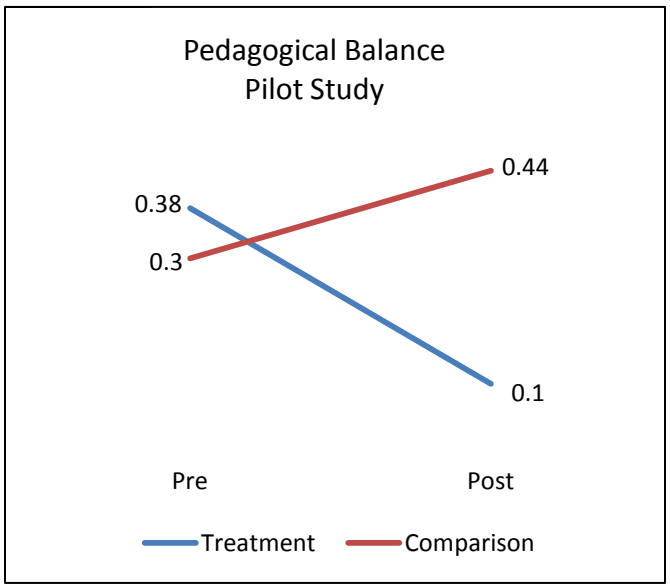


Figure C.2. Pedagogical balance for the comparison group became more out of balance (further away from 0); however, the simSchool treatment group improved pedagogical balance (closer to 0) (statistically significant, p =.031).

Table C.2

Comparison of Pedagogical Balance (PB) Findings in the Dissertation and Pilot Studies

	Dissertation Study						Pilot Study					
V	Test	*n*	*M*	*SD*	*p*	*d*	*V*	Test	*n*	*M*	*SD*	*p*	*d*
Tr	Pre	34	.27	.56			Tr	Pre	31	.38	.73		
PB	Post	34	.01	.25	.00	.59	PB	Post	31	.10	.41	.05	.46
Co	Pre	75	.25	.66			Co	Pre	27	.30	.34		
PB	Post	75	.33	.69	.22	.12	PB	Post	27	.44	.49	.00	.33

p (one-tailed)

Table C.3

Comparison of Self-efficacy (SE) Findings in the Dissertation and Pilot Studies

	Dissertation Study						Pilot Study					
V	Test	*n*	*M*	*SD*	*p*	*d*	V	Test	*n*	*M*	*SD*	*p*	*d*
Tr	Pre	34	6.12	1.26			Tr	Pre	31	5.39	1.45		
SE	Post	34	6.67	1.26	.00	.43	SE	Post	31	6.50	1.07	.03	.87
Co	Pre	75	5.53	1.60			Co	Pre	27	5.77	1.54		
SE	Post	75	5.61	1.56	.38	.05	SE	Post	27	6.44	1.42	.00	.45

p (one-tailed)

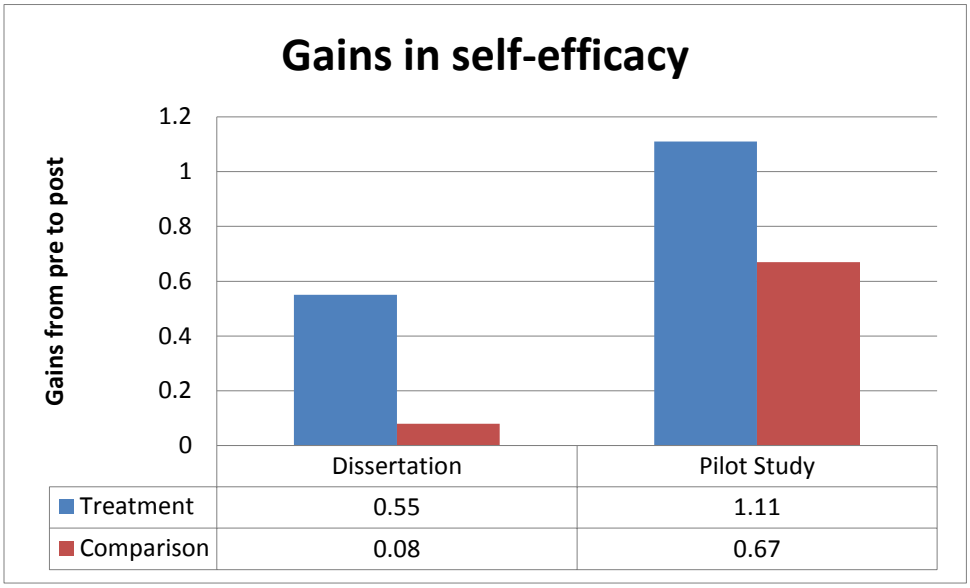


Figure C.3. Pre- to post-gains in instructional self-efficacy in dissertation and pilot studies

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