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**Teachers' Attitudes and Beliefs about Adolescents' Use of Digital Technology and the Effect on Copresence Face-To-Face Social Skills: An Exploratory Study Using Q-Methodology**

Guillermina F. Garcia

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Teachers' Attitudes and Beliefs about Adolescents' Use of Digital Technology and  
the Effect on Copresence Face-To-Face Social Skills: An Exploratory  
Study Using Q-Methodology

by

Guillermina Garcia

A Dissertation Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Education

Presented to  
The Faculty of the  
College of Education, Information, and Technology

October 2018

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Long Island University  
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# ATTITUDES ABOUT EFFECTS OF TECHNOLOGY ON SOCIAL SKILLS

## DEDICATION

This dissertation is dedicated to my amazing husband, son, daughter, grandson, and son-in-law. Thank you for being so understanding and supportive. I would not have been able to complete this journey without your love, help, patience, and support.

# ATTITUDES ABOUT EFFECTS OF TECHNOLOGY ON SOCIAL SKILLS

## ACKNOWLEDGEMENTS

First and foremost, I would like to thank my family. My family has been an incredible source of love and strength along my journey. First, I would like to thank my husband, Victor, for his patience, support, encouragement, and for believing in me. Secondly, I would like to thank my children, Sandra and Victor, for all your encouragement and support.

Thank you to all the faculty, staff, and cohort members in the Doctor of Education Interdisciplinary Educational Studies program; at Long Island University for their support and help during these past few years. I would like to thank my professor Red Owl, for introducing me to Q-methodology, for the help with the development of my statements and writing the methods section of my study. I would like to thank my friends, Valerie, Paula and Marilyn for your words of encouragement and help. Also, I would like to thank Dr. Ramlo for teaching me the principles of Q-methodology, and for editing and guiding me with Chapters IV and V.

I would also like to thank the other committee members, Dr. Piro, and Dr. Goubeaud for their input and support. Lastly, I would like to thank my committee chair, Dr. James Dunne, for his tireless efforts in helping me through this process. He made me feel comfortable with asking questions and was patient with me throughout the program. Thank you for all the endless time you spent with me. Your guidance and encouragement is greatly appreciated.

# ATTITUDES ABOUT EFFECTS OF TECHNOLOGY ON SOCIAL SKILLS

## TABLE OF CONTENTS

LIST OF TABLES .....	vii
LIST OF FIGURES .....	viii
ABSTRACT.....	2
CHAPTER 1: INTRODUCTION .....	3
Statement of the Problem.....	8
The Need for Further Research.....	14
Purpose of the Study .....	16
Research Questions .....	16
Definition of Terms.....	16
Organization of the Dissertation .....	18
CHAPTER II: REVIEW OF THE LITERATURE .....	19
Technological History.....	19
Digital Technology .....	22
Technology Through the Generations .....	23
Digital Technology and Copresence Face-to-Face Interactions .....	24
Impact on Reading Nonverbal Cues .....	25
Impact on Verbal Skills .....	27
Impact on the Human Brain .....	28
Psychological Impact .....	31
Social Skills and Face-to-Face Interaction .....	32
Family Dynamics .....	33
Adolescents .....	34

# ATTITUDES ABOUT EFFECTS OF TECHNOLOGY ON SOCIAL SKILLS

Theoretical Framework.....	36
Social Cognitive Theory .....	37
Media of Communication Theory.....	39
Social Networks .....	42
Digital Natives and Social Networks .....	46
Use of Technology.....	46
Identity Development.....	49
Positive Impacts .....	51
Self-Disclosure on Social Networks .....	53
Netiquette.....	56
Educational Implications .....	57
Communication Skills in the Classroom.....	61
Interdisciplinary Approach to the Study .....	63
Social Psychology View .....	64
Media Psychology View .....	64
Educational Psychology View .....	66
Chapter Summary .....	67
CHAPTER III: METHODOLOGY .....	69
Q-Methodology.....	69
Q-Sorts .....	71
Factor Analysis .....	72
Research Questions.....	73
Participants.....	73

# ATTITUDES ABOUT EFFECTS OF TECHNOLOGY ON SOCIAL SKILLS

Instrument/Design.....	74
Condition of Instruction.....	81
Focus Groups .....	81
Data Collection .....	82
Data Analysis .....	83
Validity and Reliability.....	86
Limitations .....	87
Implications.....	88
Ethical Considerations .....	88
Confidentiality .....	88
Human Participants Research Board .....	88
Disclosure and Control of Potential Researcher Bias.....	89
Chapter Summary .....	90
CHAPTER IV: ANALYSIS AND FINDINGS.....	91
Analysis of Data.....	91
Participants.....	93
Post Q-Sort Questionnaire.....	94
Q-Sort.....	95
Q-Factor Analysis.....	96
Scree Plot.....	96
Confounders.....	98
Factor Rotation.....	98
Correlations among Factors.....	103

# ATTITUDES ABOUT EFFECTS OF TECHNOLOGY ON SOCIAL SKILLS

Factor Arrays.....	104
Participants' Demographics Loading on Factors (Ranked).....	108
Participants Not Included in Any Model.....	111
Q-Scores and Q-Models.....	111
Identifying Q-Models.....	112
Q-Model Factor 1: Represents Adolescents having Trouble Navigating During a Conversation in Terms of Being Able to Take the Other Person's Perspective.....	114
Distinguishing statements for Q-Model Factor 1.....	119
Post Q-Sort comments: Narrative insights from the survey.....	122
Q-Model Factor 1: Post Q-sorts comments and clarification of this model.....	123
Q-Model Factor 1- Summary.....	126
Q-Model Factor 2: Represents Students Behaving Appropriately During Conversations.....	126
Distinguishing statements for Q-Model Factor 2.....	131
Q-Model Factor 2: Post Q-sort comments and clarification of this model.....	135
Q-Model Factor 2- Summary.....	136
Q-Model Factor 3: Represents Difficulties in Understanding Nonverbal and Verbal Cues.....	136
Distinguishing statements for Q-Model Factor 3.....	142
Q-Model Factor 3: Post Q-sort comments and clarification of this model.....	144
Q-Model Factor 3- Summary.....	144
Consensus Statements.....	144
Findings of Research Questions.....	146



# ATTITUDES ABOUT EFFECTS OF TECHNOLOGY ON SOCIAL SKILLS

Findings.....	146
Research Question 1: What are Teachers’ Attitudes and Beliefs Regarding how Digital Technology Affects Students’ Copresence FtF Social Skills?.....	147
Research Question 2: What are Teachers’ Beliefs Regarding how Digital Technology Affects the Academic Setting as it Relates to Students’ Copresence FtF Social Skills?.....	150
Summary.....	152
CHAPTER V: CONCLUSION AND IMPLICATIONS.....	154
Synthesis of Teachers’ Views Regarding the Digital Technology and FtF Social Skills Problem.....	156
Q-Model Factor 1: Represents Adolescents Having Trouble Navigating During a Conversation in Terms of Being Able to Take the Other Person’s Perspective.....	157
Q-Model Factor 2: Represents Students Behaving Appropriately During Conversations.....	158
Q-Model Factor 3: Represents Difficulties in Understanding Nonverbal and Verbal Cues.....	159
Summary of Q-Models.....	161
Post Q-Sort Qualitative Data.....	161
Theoretical Frameworks.....	163
Implications.....	164
General Recommendation.....	166
Future Research, Limitations, and Conclusions.....	167
REFERENCES.....	170
APPENDIX A: Invitation Email and Online Survey Link.....	195
APPENDIX B: Demographic and Technology Questions.....	196

ATTITUDES ABOUT EFFECTS OF TECHNOLOGY ON SOCIAL SKILLS

APPENDIX C: Categories that Emerged from Participants Answers to Open-Ended Questions.....198

APPENDIX D: Cumulative Communalities Matrix.....200

APPENDIX E: Eigenvalues and Percent Variance Explained.....202

# ATTITUDES ABOUT EFFECTS OF TECHNOLOGY ON SOCIAL SKILLS

## LIST OF TABLES

Table 3.1. Q-Sample Theoretical Framework: Themes, Q-Statements, and Sources.....	75
Table 4.1. Factor Matrix with an X Indicating a Defining Sort.....	100
Table 4.2. Correlations between Factor Scores.....	104
Table 4.3. Factor Arrays for All Three Factors.....	105
Table 4.4. Factor Matrix with Demographic Information.....	110
Table 4.5. Factor Scores for Q-Model Factor 1.....	117
Table 4.6. Distinguishing Statements for Q-Model Factor 1.....	121
Table 4.7. Factor Scores for Q-Model Factor 2.....	129
Table 4.8. Distinguishing Statements for Q-Model Factor 2.....	134
Table 4.9. Factor Scores for Q-Model Factor 3.....	140
Table 4.10. Distinguishing Statements for Q-Model Factor 3.....	143
Table 4.11. Consensus Statements: Those That Did Not Distinguish Between Any Pairs of Factors.....	146

LIST OF FIGURES

Figure 2.1. Bandura’s Social Cognitive Theory emphasizes influences of behavior, environment, and personal cognitive factors ..... 39

Figure 3.1 An example of a generic sorting template that might be employed in a Q-study..... 81

Figure 4.1. Q-sort completed by participants.....95

Figure 4.2. Scree Plot.....97

## ABSTRACT

As people increasingly use digital technology to communicate with others, social networks and Smartphone's are changing the ways people interact with each other and what they disclose about themselves. The purpose of this study is to examine teachers' attitudes and beliefs regarding how digital technology affects adolescents' copresence face-to-face social skills as they grow up in a digital world and its impact upon the academic setting. This research will utilize Q-technique, a scientific mixed methods interdisciplinary approach, which uses both quantitative and qualitative methods to identify viewpoints that are shared among teachers. Teachers' points of view can be investigated using Q-technique as this technique preserves the meaning of participants as it reveals their perspectives via Q-sort. The demographic characteristics that will be examined are gender, professional teaching experience, educational degree, and technology experience. This study will analyze data from thirty to forty teachers in Nassau and Suffolk county school districts in New York. The results of this study may have contributions to curriculum development, teacher education, and policymaking.

*Keywords:* digital technology, computer-mediated communication, copresence face-to-face, social skills, adolescents

## CHAPTER I

## INTRODUCTION

Digital technology not only influences the way people live their daily lives, but it also changes the way in which daily life activities are held. Technology impacts how people interact with their friends and families and how they maintain personal relationships in general. The digital age is distinguished by rapid transformations in the types of technological mediation people encounter in their daily lives when in communication with each other (Baym, 2010). Never before have humans encountered so many different kinds of technologies available for communication, whether it be via emails, mobile phone calls, text messages, instant messages, chats, web boards, social networks, video sharing, Instagram, Snapshot, or online multiplayer gaming (just to name a few). Today's adolescents are considered Digital Natives because they are people who have been familiar with information technology since childhood, compared to Digital Immigrants, a term used for people who have become familiar with computers, the Internet, and other digital technology as a young adult or later in life (Prensky, 2001).

Social media innovations have resulted in a variety of new social spaces. A social space refers to a virtual space such as online social media platform or a physical space where people can get together and interact (Papacharissi, 2011). Social media is defined as an Internet-based application on Web 2.0 involving User Generated Content and there are six categories: collaborative projects, blogs, content communities, social networking sites, virtual game worlds, and virtual social worlds (Kaplan & Haenlein, 2010). Collaborative projects enable the joint creation of content by many users through online sites such as Google docs. Blogs are special types of websites that contain date-stamped entries and are usually managed by one person; they come in different variations, from personal diaries and journals to summaries of information in

one specific content area. In content communities, the main objective is the sharing of media content between users.

Social networking sites enable users to connect through creating personal information profiles and sending emails and instant messages to each other. Virtual game worlds replicate a three-dimensional environment where users can appear in the form of personalized avatars and interact with each other in ways similar to real life; an avatar is a graphical representation of the user, chosen by the user to reflect preferred characteristics. Finally, virtual social worlds allow users to choose behaviors more freely and essentially live a virtual life similar to their real life; alternatively, some users may choose a virtual life very different from their everyday experience, for example, *Second Life*. (Kaplan & Haenlein, 2010). These virtual worlds may offer users a reprieve from the responsibilities of real life.

In light of these new technologies that allow people to communicate in different ways and through different avenues, researchers have discovered that digital technologies are changing how human brains function (Carr, 2010; Small & Vorgan, 2008; Turkle, 2011; Wolpert, 2014). Researchers have argued that as technology distracts people from their usual relationships, their neural circuitry changes every day and social skills may begin to decline (Boyd, 2014; Rosen, Cheever & Carrier 2010; Small & Vorgan, 2008; Turkel, 2005, 2011). Small and Vorgan (2008) indicated that, “With the weakening of the brain’s neural circuitry, controlling human contact social interactions may become awkward, misinterpretation may occur, and subtle nonverbal messages may be missed” (p. 2). These changes have been deemed particularly important for young people; as the adolescent brain evolves and shifts focus on new technological skills, it moves away from face-to-face (FtF) social skills (Small & Vorgan, 2008).

Furthermore, the new forms of social spaces may be contributing to changes in the set of skills that teens develop in the course of their daily lives in positive and negative ways (Ma & Leung, 2006; Rosen, 2007; Rosen, Carrier, & Cheever, 2010; Tapscott, 1998; Turkle, 2005, 2011). For example, as early as 1998, Tapscott argued that adolescents were using new ways to interact and communicate online and demonstrating more awareness of verbal content and less awareness of nonverbal cues as they communicated through text messaging. Some researchers have also expressed their concerns that human communication has become shallow and that mediated interaction, or communication through information communication technology instead of FtF, seems to threaten personal relationships (Ludden, 2010; McPeck, 2011). Other researchers have the optimistic view that social media offers more opportunities to make new relationships and maintain existing relationships (Baym, 2010; Harankhedkar, 2016). Both views reflect a sense that digital technology might be changing the nature of human social connections.

According to Griffiths (1997), by the age of 7, a child's interactions with family, friends, school, social networks, and media play an important role in the development of their interpersonal skills. "Social development is defined as the process by which children develop role taking skills, learn to comprehend the motivations and consequences of behaviors, and come to understand human relationships in the social world" (Wartella & Jennings, 2000, p. 36). Some research has shown that digital technology use contributes to a child's self-perception and affects a child's socialization skills in a variety of ways; spending too many hours interacting with technology may, therefore, impact children's FtF interactions with others (Engelberg & Sjoberg, 2004; Kerr, 2012; Lenhart, Ling, Campbell, & Purcell, 2010; Rideout, Foehr, & Roberts, 2010; Wartella & Jennings, 2000).



The Internet and social networks may be impacting the way adolescents communicate with each other. Rideout et al. (2010) indicated that adolescents between the ages of 8 and 18 spend an average of 7 hours and 38 minutes using technological media for entertainment or communication daily. This included using technological media such as televisions, cell phones, computers, and iPods. The Pew Internet and American Life Project (2010) reported that in just 5 years, young adults and adolescents increased the daily amount of time they spent consuming media by 1 hour and 17 minutes. American teenagers' total time spent communicating through daily text messaging increased from 38% in February, 2008 to 54% in September, 2009. Adolescents are sending huge quantities of text messages every day. In 2010, half of American teens sent 50 or more text messages daily, or 1,500 texts a month, and one in three sent more than 100 texts a day, or more than 3,000 texts a month (Lenhart et al., 2010). In 2012, a survey done by the Pew Internet Research Center reported that teenagers are talking less on landline phones and cell phones, are using more Smartphone's, and are averaging 60 texts a day (as cited in Kerr, 2012). It is clear from these findings that text messaging has become the primary way teens contact their friends, surpassing FtF communication (Lenhart et al., 2010).

In recent years, communication has gone from primarily occurring FtF to being computer-mediated, or human-to-machine, but studies have shown that both forms of communication are equally important (Adler, Rosenfeld, & Proctor 2010). Communicating online is the preferred method of communication for teenagers rather than talking FtF (Lenhart et al., 2010; Lenhart, 2012). Pew Research (2012) showed that 39% of teens make and receive voice calls on their mobile phone and only 35% of all teens socialize with other teens in person outside of school on a daily basis. On a daily basis, 39% of teens report that they text to communicate with others, 29% of teens exchange messages through social networking sites, 22%

of teens talk on landlines with people in their lives, and 6% of teens exchange email (Lenhart, 2012).

An updated Pew Research (2015) reported that 79% of all teens instant message their friends but only 27% do so daily; 72% of all teens spend time with friends via social media, but only 23% do so daily; 64% email with friends but only 6% do so daily; 59% video chat with their friends but 7% do so daily; 52% spend time with friends playing video games but 13% do so daily; and 42% spend time on messaging apps such as Kik and WhatsApp. A vast majority of teens (95%) reported spending time with friends in person outside of school, but this is not happening as an everyday occurrence. Just 25% of teens spend time with friends in person outside of school on a daily basis (Lenhart, 2015). Overall, adolescents report that text messaging is their dominant mode of communicating with others (Lenhart, 2012). Even though FtF communication is still important for adolescents, meeting with friends FtF outside of school is occurring less frequently than in the past (Lenhart, 2012; Lenhart 2015). School is the main place where teens interact FtF with their friends (Lenhart, 2015).

According to Stone (2007) the digital revolution has resulted in a “state of continuous partial attention,” described as continually staying busy and keeping tabs on everything while never focusing on anything. During the state of continuous partial attention, the mind is constantly scanning for an opportunity to participate in any type of contact at any moment. It is due to this distracted thinking that adolescents might no longer have time to reflect or make thoughtful decisions. This may put Digital Natives at risk of losing personal contact with people in real life, potentially endangering their relationships. Moreover, Weizenbaum (1976) feared that as humans automate their minds and cease to control the flow of their thoughts, there might be a slow erosion of humanness and/or humanity.

Thus, there are concerns that while the Internet can revive community ties virtually, it can also exacerbate social isolation. There are some additional concerns about the loss of community and loss of FtF relations (Howard & Jones, 2004). Human beings are naturally social beings and need to be part of a community for their emotional and psychological well-being. A meaningful human life requires being connected with others during work and/or school and participating in loving relationships (Howard & Jones, 2004). It is for these reasons that studies into the impacts of digital technology on teenagers' lives are important.

### **Statement of the Problem**

In the wake of the pervasiveness of social media, many parents and educators are deeply interested in the effects of media and technology on teens' lives. With digital technology, much of the communication that previously occurred copresence FtF, occurring at the same place and time, has now moved to computer-mediated communication. While some are optimistic about the benefits of digital technology for learning, for example, the development of interpersonal relationships, communication, and creativity, others are concerned about the negative impacts these technologies may have on teens' social skills and emotional well-being (Rideout, 2012). The current digital generation is the first to have access to Facebook, Twitter, and other social networking sites throughout their teen years. Moreover, digital media use now begins at a very early age and takes up a large amount of time in the informal learning environment. In fact, many children under the age of two are being exposed to mobile devices (Common Sense Media, 2013).

The many hours spent online chatting and sending text messages may be hindering the development of oral communication skills in children, adolescents, and young adults. Addressing this possibility, Meyrowitz (2003) stated that, "With a greater proportion of our

interactions taking place via electronic media, physical copresence is diminishing as a determinant of the nature of interactions” (p. 96). With teenagers and young adults spending more time online with friends and family and less time FtF, their ability to effectively recognize the visual cues important in decoding facial expressions has been weakened (Halberstadt, Denham, & Dunsmore 2001; Tapscott, 1998). Moreover, communication not only involves the face but the entire body, including gestures and postures. Humans communicate both with words and with nonverbal language, which refers to facial expressions, gestures, and body movements (Fortunati, 2005; Knapp & Hall, 2010). Thus, many communication scholars have asserted that the most important social experiences take place in body-to-body interactions (Rafaeli, 1988; Schudson, 1978), and all other forms of mediated communication are not derived from body-to-body communication (Fortunati, 2005; Knapp & Hall, 2010). Also, important to note that, with the increasing usage of social networks, communication may not be as spontaneous as it has been in the past (Fortunati, 2005). As opposed to FtF communication, online communication allows one to plan and edit what messages will be sent to others.

Studies have shown that body language, emotions, and expression are essential parts of communication that may be lessened in the electronic world (McPeck, 2011; Wolpert, 2014). According to one psychological study (UCLA, 2014), children’s social skills may decline as they spend less time engaging in FtF interactions. The senior author of the study stated, “The displacement of in-person social interaction by screen interaction may be reducing social skills” (Wolpert, 2014, p.1). Another researcher suggests that FtF communication utilizes characteristics not available with screen interaction, stating, “A human being in the presence of another human being continues to remain the most suitable condition for expressing the greatest degree of communicative possibilities” (Fortunati, 2005, p. 55). Therefore, communicating

through technological means allows for less sensitivity and a lesser ability for adolescents to read emotional cues, which may be causing them to lose the ability to understand the emotions of other people.

Some research has focused on adolescents and young people's use of social media and increased feelings of anxiety and/or estrangement from family and friends (Turkle, 2011). According to empirical studies, the ease of electronic communication results in teens being less interested in FtF communication with their friends and family (Adler et al., 2010; Rosen, Cheever, & Carrier, 2010; Turkle, 2005). Even when adolescents are sitting next to each other, each person is often interacting intensively through their own device, seemingly unaware of the fact that they are sitting next to another person. The way in which humans interact with technology affects how they interact with each other. Mobile technologies have made it easier for people to be "connected," but this type of connection may come at the expense of the ability to relate to each other at a personal level. Studies have shown Internet use to be negatively associated with media users spending less time in FtF communication with family and friends (Lenhart et al., 2010; Steiner-Adair, 2013). Instead of spending time socializing in person, people are using their Smartphone's to connect to others through texting, Facebook, and email, among other ways.

In contrast, other research shows how the Internet can have important positive social effects on individuals, groups, organizations, communities, and society as a whole. Furthermore, research has highlighted positive influences in terms of how the use of social media has facilitated important friend and family connections. For example, the Internet can broaden social involvement and participation in groups and organizations by distant and/or marginal members. No longer do barriers of distance exist; and thus, technology has brought people from all over the

world closer together. Researchers have found that technology is of great benefit in the formation of new relationships, new online identities, and in its ability to connect isolated persons (Kiesler, Kraut, Cummings, Boneva, Helgeson, & Crawford, 2001). Technological communication advancements, such as video conferencing, have also made it faster for decisions to be made and have led to the development of business around the world (Harankhedkar, 2016). Recent studies have shown positive relationships between online communication and adolescents' connectedness and well-being (Kiesler et al., 2001; Valkenburg & Peter, 2007). Computer-mediated communication (CMC), or human interaction via electronic devices, helps individuals communicate with more people, and allows people to rekindle old friendships as well as meet and talk to new friends (Adler et al., 2010; Ellison, Heino, & Gibbs, 2006; Turnbull, 2010).

With the advances in technology and the ability to access a cellular signal or a wireless Internet connection, people are no longer tied to a computer to communicate electronically. Today, people use a variety of devices to communicate with each other. Another term for online communication is electronically-mediated communication (Dunlap et al., 2015). Electronically-mediated communication includes email, instant messaging, communication through social media, and text messaging be it via cell phones, Smartphone's, and/or iPads. This distinction is important as the impacts of the Internet and digital technology depend on how they are being used.

Besides social skills being very important for successful functioning in society, they are also needed for success in the workplace. Unfortunately, many graduate students are lacking soft skills, the technical term for navigating effectively in the workplace.

Soft skills include the qualities of good communication, punctuality, flexibility, critical thinking, creativity, and collaboration (White, 2013). A survey done by the Workforce Solutions Group found that more than 60% of employers say applicants lack communication and interpersonal skills. This is an increase of 10% in just 2 years, as reported in White's, 2013 study. According to an article by McVeigh (2013) half of employers find that, in general, graduates are not work ready and lack critical thinking, creativity, collaboration skills. Academically graduates are more than qualified, but they have no idea what is expected of them in the corporate world (McVeigh, 2013). In addressing this issue, United Kingdom Minister for Civil Society Nick Hurd stated:

“What we see in survey after survey is employers saying qualifications are important, but that just as important to us are so-called soft skills, character skills, the ability to get on with different people, to articulate yourself clearly, confidence, grit, self-control, these kinds of qualities, and they say we are not seeing enough of this in kids coming out of school” (as cited in Cohen, 2013, p.1).

It is clear there is a gap between university graduates' knowledge and the real-life skills that are expected in the workplace, but college and high school graduates also face challenges in this regards. In 2005, Achieve, a non-profit organization that helps states raise academic standards, found that 34% of employers were dissatisfied with the oral communication skills of high school graduates. Moreover, Barker (2006) reported that 45% of college students and 46% of high school graduates who entered the workforce instead of going to college claimed they struggled with their public speaking abilities. Research findings also show that many young graduates who have had their heads buried in their Smartphone's throughout their teen and young adult years subsequently struggle to make eye contact, offer a firm handshake, and even hold a

conversation (McVeigh, 2013). These studies illustrate that lack of communication and soft skills becomes a serious issue when students must know how to communicate in the workplace but have had limited FtF communication opportunities.

Social skills have therefore been shown to be critical for long-term success in all aspects of life, and many researchers believe these skills should be taught in schools (Webster, 2015; Williams, 2012). Social skills are sometimes referred to as Emotional Intelligence, which is a combination of the ability to understand and manage one's own emotional state and the ability to understand and respond to others (Webster, 2015). As well, Webster (2015) has stated, "Although social skills include understanding and using social conventions, it also includes the ability to understand the 'Hidden Curriculum', the ways in which peers communicate and interact, reciprocity and the ability to build interpersonal relationships" (p. 1). Therefore, it often falls to teachers to ensure that every young person has the skills and experiences needed to become a full participant in society. Teachers must understand and incorporate technologies to provide learning opportunities that are relevant to students today (Williams, 2012).

Some teachers have been reluctant to embrace social media in the classroom, while others have embraced the use of social media for educational purposes (Williams, 2012). The usage of social media may be impacting how youth socialize with others around them, and these impacts can be observed in the classroom. Thus, teachers' perceptions can provide an important viewpoint on how digital technology may be changing adolescents' social skills development and on how educators can address this phenomenon (Williams, 2012). There have been studies conducted on student perceptions of different aspects of social media (Greenhow & Robelia, 2009; Lewis, 2010), but teacher perceptions have been largely ignored (Williams, 2012).



### **The Need for Further Research**

Studies show Internet use may be rerouting the brain's vital pathways and diminishing humans' capacity for contemplation. According to Damasio, the director of USC's Brain and Creativity Institute, the more distracted human minds become, the less they are able to experience in-depth feelings of empathy, compassion, and other emotions (as cited in Carr, 2010). Deep thinking and feelings of empathy and compassion require a calm mind. According to Small and Vorgan (2008), "Scientific evidence suggests that the consequences of early and prolonged technological exposure of a young brain may in some cases never be reversed, but early brain alterations can be managed and social skills learned and honed, and the brain gap bridged" (p. 20). Digital Natives, therefore, need to balance their use of digital technology so their brain can develop the capability to communicate both FtF and online.

In recent years, most empirical research on the use of technology has focused on the implications for children's intellectual development, particularly in terms of texting sexually and cyber bullying. Many studies have concentrated on the frequency of adult and adolescent communication online (Goetz, 2013; Liu, 2010). Researchers and psychologists are currently looking at whether technology affects or changes the development and closeness of children's friendships and relationships (Goetz, 2013; Liu, 2010). Initial qualitative evidence shows that electronic communication may be impacting FtF social skills but more research is needed to see the quality of adolescents' interactions and relationships (Goetz, 2013; Liu, 2010). Research has shown that close childhood friendships help children build trust with people outside their families (Goetz, 2013; Liu, 2010). These connections lay the groundwork needed to build healthy adult relationships, to understand nuances, and to read social cues such as facial expressions and body language (Adler et al., 2010; Steiner-Adair, 2013).

Some studies have also been conducted on the relationship between cell phone use and these human behaviors, and this is an emerging topic of interest (Lepp, 2014).

Psychologists and other experts are starting to examine the extent to which technology may be changing children's and adolescents' friendships and FtF social skills (Dellner, 2011; Stout, 2010). Furthermore, the digital age is still relatively new and its impact on relationships is still evolving. According to Dellner (2011), digital technologies continue to rapidly change the nature of community and structure of relationships. While digital technology provides many useful ways to communicate and learn, some studies suggest that skills in reading human emotions may be diminishing. Therefore, more research is needed to examine the effects of digital media on children's social development (Fortunati, 2005; Goetz, 2013; Rosen, 2007). Teachers and their roles are an important part of such considerations.

Currently, there is little research on the beliefs and attitudes of teachers regarding the effects that digital technology may have on children's and adolescents' FtF social skills. Teachers' attitudes and beliefs are very significant and may even have an influence on their classroom actions (Potter, 2007). Overall, teachers' attitudes, beliefs, and actions may also influence students' academic achievement (Levitt & Red Owl, 2013; Potter, 2007). This is therefore an important area of study that can enable teachers to work to improve student success in the classroom and beyond. Improving understanding of how technology affects students' communication and soft skills is a good beginning. However, teachers' viewpoints could have implications for how strategies are developed and implemented. Further research in this area will aid in decisions related to school policies and curriculum pedagogical approaches.

### **Purpose of the Study**

The purpose of this study is to identify, examine and analyze teachers' attitudes and beliefs regarding the copresence FtF social skills of adolescents growing up in a digital world and the related impact in the academic setting. To solicit teachers' shared viewpoints, this study will employ the use of Q-technique, a mixed methods interdisciplinary approach, which will be discussed in detail in Chapter III. In order to identify teachers' attitudes and beliefs about the effects of digital technology on copresence FtF social skills, an online Q-sort will be conducted. The Q-sort consists of 48 statements, which is a comprehensive collection of stimulus items that represents the topic under investigation. The results will inform educators as to whether digital technology is having an effect on students' copresence FtF social skills. Information from this study will help to generate further exploration by researchers in this field and affect policy-making at the level of higher education and curriculum development. For the purpose of my study, the terms adolescents, teenagers, and teens will be used interchangeably.

### **Research Questions**

This research study seeks to address the following specific research questions:

RQ1: What are teachers' attitudes and beliefs regarding how digital technology affects students' copresence FtF social skills?

RQ2: What are teachers' beliefs regarding how digital technology affects the academic setting as it relates to students' copresence FtF social skills?

### **Definitions of Terms**

For the purpose of this study, the following terms are pertinent:

*Adolescence.* The period of development between the ages of 10 and 19 (MacDonald, 2003).

*Communication.* An exchange of thoughts and ideas. Communication is the outcome of a

feeling of commonness between two individuals (Manohar, 2012).

*Computer-Mediated Communication.* Introduced by J.C.R Licklider and Robert W.

Taylor in 1968, this is a new form of enhanced communication, where large numbers of people use a computer to maintain continuous communication with others and make changes to information. This is a new medium for building and maintaining human relationships (Gunkel, 2012).

*Copresence.* Is the occurrence of two or more things together in the same place and time

(<https://www.merriam-webster.com/dictionary/copresence>).

*Digital.* A signal that is transmitted in a code of pluses and minuses, also known as a binary system (Small & Vorgan, 2008).

*Mass Communication.* A process in which professional communicators use technology to share messages over great distances (Dominick, 2005).

*Mass Media Communication Theory.* This communication theory was developed by Marshall McLuhan. In this theory, media and technology are extensions of people (McLuhan, 1964).

*Mediated Communication.* The use of electronic messages to create meaning (Dominick, 2005).

*Nonverbal Communication.* The use of body language and facial expressions to portray feelings through a series of gestures that translate into messages (Manohar, 2012).

*Social Cognitive Theory.* This communication theory was developed by Albert Bandura. In this theory, humans learn through observing others' behaviors, attitudes, and outcomes of those behaviors (Bandura, 1977).

*Social Network.* A network of friends, colleagues, and other personal contacts (Papacharissi, 2011).

*Verbal Communication.* Defined as communication that involves speaking to each other, it also refers to handwritten or emailed messages (Manohar, 2012).

### **Organization of the Dissertation**

Chapter I introduced background information to contextualize the study, the research questions, and the researcher's agenda. This chapter discussed the need to further explore and evaluate whether digital technology is having an impact on adolescents' copresence FtF social skills. This chapter also defined the key terms used throughout this e-study.

Chapter II reviews the literature regarding the history of technology, digital technology, social connections, adolescents' life online, netiquette, educational implications, and adolescents' social connections. It also provides a discussion of two theoretical frameworks: Bandura's Social Cognitive Theory, and McLuhan's Mass Communication Theory as it relates to social interaction and technology mediated communication.

Chapter III describes the research methodology and design employed in this study. A description of the instrument used for the study is given and Q-sort methodology is outlined. An explanation of Q-factor analysis is given along with information about similarities and differences in viewpoints among individuals.

Chapter IV describes the results of the study. The results from the survey are interpreted and analyzed, and the research questions outlined in Chapter I are addressed using Q-technique. Statistical results along with the use of graphs are used to support the findings.

Chapter V consists of a summary, recommendations, and a discussion of limitations of the study. The researcher also addresses implications for middle school practice, as well as high school and higher education practice and policy making.

## CHAPTER II

### LITERATURE REVIEW

This chapter is a research and literature review focusing on the history of technology, adolescents' usage of digital technology, netiquette, and face-to-face (FtF) social skills.

#### **Technological History**

Throughout history, technology has always had an influence on how humans think and act, but technology by itself is not good or bad. Depending on how it is used, technology can have positive or negative impacts. Humans look to technology to seek control over their circumstances, nature, time, and distance, as well as to expand their power. Each century has seen development and progress in communication techniques. Every technological tool has its limitations and at the same time offers many opportunities. In other words, individuals and societies can be transformed by the effects of technology (Carr, 2010). Not since the telephone, invented by Alexander Graham Bell in 1875, has there been such a radical change in media and the communication environment; due to the Internet, these are changing faster than ever before (Senning, 2013). As a result of the Internet and expansions in digital technology, Smartphone have become an integral part of people's lives, including adolescents.

The cell phone emerged from the landline telephone system with the advent of wireless communication. The landline telephone was first patented in 1876 (Lenhart et al., 2010). Shortly after, in the 1900's, mobile radio systems were used, with the first ones being installed in police cars in Detroit in 1921. The blending of landline and radio communication came after World War II. In 1946, one could make calls from fixed to mobile telephones (Farley, 2005). The cell phone emerged from the landline telephone system with wireless communication. AT&T engineers at Bell Laboratories developed the cell tower in the 1950's, but this technology

was too expensive for commercial use at the time. By 1967, mobile technology was available; however, the user had to stay within cell areas (Tech-FAQ, 2013). The first cell phones were big and heavy devices that had little call range. Then in 1970, Amos Edward Joel, an engineer at Bell Laboratories, developed the hand off system, a technology that facilitated phone calls from one area to another that would not be dropped. By the early 1980's, Motorola had developed a portable cellular phone and AT&T had obtained approval from the FCC to provide cellular service until 1990 (Tech-FAQ, 2013). The first cell phones used a 1G analog (first generation) network. Then in the early 1990's, cell phones advanced to 2G digital networks. In 2001, the cell phones advanced again to the 3G network, giving cell phones the capability to support multi-media communication (Tech-FAQ, 2013). The cell phone, or mobile phone, offers mobility, making person-to-person communication possible anywhere regardless of location (Baym, 2010).

For thousands of years social interactions were based on FtF and written communications, but technology has changed this with the invention of the telephone and Internet. Of course, as with any new technology, there are pessimists who express concerns and optimists who argue the positive impacts on society. For example, with the invention of the telegraph during the Victorian era, there were fears that people's social skills would be weakened. Prior to the invention of the telegraph, people could only communicate across distance through a message being transported by foot, horseback, ship, or train. The invention of the telephone added to the fears that social skills would be affected and that there would be moral degeneracy, yet the phone supplemented, and did not supplant social interactions (Christakis & Fowler, 2009).

Now, in our digital society, the cell phone is an influential object embedded in nearly every aspect of life, including school, work, and leisure time. As the use of digital technology continues to increase, pessimists raise concerns that the new ways of communicating might weaken the traditional ways of relating and lead people away from FtF interactions. The optimists argue that these new technologies will extend and supplement the ways people interact and form connections (Christakis & Fowler, 2009). Today's cell phones are mini computers with Internet connections, allowing users to engage in a wide range of activities including surfing the web, gaming, watching videos, connecting to social networking sites, sharing videos and photos, text messaging, and making phone calls (Lepp, 2014). For some young adults and adolescents, the cell phone is a symbol of their identity and status in society. According to Lepp (2014), "Cell phones are important for maintaining social relationships, enhancing feelings of belonging and facilitating processes important for social identity development" (p. 220). Cell phones are changing the way people communicate with each other. For example, text messaging is the choice of communication among Digital Natives. According to a 2010 survey conducted by the Pew Internet and American Life Project, 96% of undergraduate students and 99% of graduate students in the U.S. own a cell phone, and this is changing the way these students perceive and engage with the world around them.

Another Pew Survey, conducted in September 2012, showed that 74% of teens aged 12 to-17 and adults aged 18 to-49, were mobile Internet users who accessed the Internet on cell phones, tablets, and other mobile devices. The survey also found that over one-third (37%) of teens had a Smartphone and that teen ownership had gone up 23% since 2011 (Madden, Lenhart, Duggan, Cortesi, & Gasser, 2013). A recent Pew Survey (2015) reported that 92% of teens go online using a mobile device daily, while 24% of teens use the Internet constantly, with 56%



going online several times a day (Lenhat, 2015). Also, close to three-quarters of teens own or have access to a Smartphone, and 30% have a basic phone. These teens are also diversifying their social network site use and 71% report using one or more social networking sites (Lenhart, 2015). Now compare that to the most recent Pew Survey (2018) which reported that 45% of teens say that they are online constantly, and 95% of teens say that they have access to a Smartphone (Anderson & Jiang, 2018). This is an increase of 22% from the 73% of teens who said this in 2014-2015. Now, teens have more ways to be connected all day and all night long, as the modern cell phone capabilities have gone from basic talking to accessing the Internet and taking photos and videos. According to another Pew Study conducted in 2015, 31% of cell phone owners report that they never turn off their cell phones. This “always-on” reality has disrupted long-standing social norms. The mobile phone easily shifts people’s attention away from their physical conversations and interactions with others (Rainie & Zickuhr, 2015). For instance, in a recent study, 89% of college students reported using their cell phones at their last social gathering. Cell phones now tend to be a lifeline for most people and most people could not imagine spending one day without one (Cullen, 2010).

### **Digital Technology**

Communication through technology is quickly replacing the copresence FtF experiences that are important to the development of a child’s social skills (Small & Vorgan, 2008; Turkel, 2005), but the reality is that electronic communication is here to stay since it provides an efficient way for people to share information. With this influx of digital technology, some people are optimistic about the benefits of social media for learning, development, communication, and creativity. However, others are concerned about the negative impact these

media may have on teens' FtF social skills and emotional well-being (Social Media Social Life, 2012).

### **Technology Through the Generations**

Young adults and adolescents today rarely visit a library or read a hardcopy book. Instead, Google, Yahoo, and other online search engines are the tools that teens use to get their information. This generation, known as the Digital Natives, is immersed in digital technology for much of their education, entertainment, and communication. Unlike Digital Native, Digital Immigrants refers to the generation of individuals born between 1946 and 1964, who were exposed to digital technology as adults. Digital Immigrants' basic neural wiring was developed during a time when direct FtF social interaction was still a main form of communication, something which Digital Natives are lacking (Small & Vorgan, 2008).

To date, the current generation, the iGeneration, lives in the midst of the three most distinct and qualitatively different generations in history. First, there are the Baby Boomers, who were born after World War II, and between the years of 1946 to 1964. Second, there are the Generation Xers, who were born from 1965 to 1979. Finally, there is the Y Generation, born in the 1980s up to 1991, also known as the Net Generation or Millennials. The Net Generation is the first generation of young people who have grown up in an environment in which technology has surrounded their lives; they are the first Digital Natives. Following the Net Generation is the iGeneration, made up of those born in the 1990s and the new millennium. This generation has been raised with all the "i" devices, such as the iPod, iChat, Wii, iTunes, iHome, and iPhone (Rosen et al., 2010).

A new culture of communication has been defined by the Digital Natives of the Net Generation and the iGeneration. They are no longer controlled by time, place, or even by how

they look while video chatting or in photographs posted of them online. These Digital Natives have redefined how people communicate. Even though most adolescents and young adults own a cell phone, its use goes beyond that of a phone. Rather, Digital Natives use it more to send text messages than to talk with others. Smartphones or cell phones are also used to send videos, share pictures, blog, vlog, and transmit information via social networks (Rosen et al., 2010).

While many modes of digital communication are nonverbal (e.g., texting, etc.), communicating through Skype or video chatting offers the opportunity for many social cues to be used, such as voice tones and facial expression, but these modes still lack critical intimacy cues of touch and smell (Baym, 2010).

### **Digital Technology and Copresence Face-to-Face Interaction**

Copresence FtF interaction is a communication method that adolescents and young adults will need to use in the workplace together with human-to-machine interaction. Furthermore, FtF interactions remain a key element in business decisions and in many other aspects of our lives.

Studies show that FtF interactions, although expressed today in a variety of ways, are still important (Brown, 2013; Ludden, 2010; McPeck, 2011), even though adolescents and young adults depend on digital technology for communication, entertainment, information, and social connections to build and maintain relationships. Adolescents need to be exposed to real world interactions to help them understand others more profoundly and allow them to get to know others down to the most fundamental part of which they are (Turkle, 2014). Social media connections do not provide the same level of connectedness (Brown, 2013; Turkle, 2014).

FtF interaction includes using verbal and nonverbal cues to communicate with each other. Understanding nonverbal social cues is important for social interaction because individuals may need to modify their own behavior in response to the reaction of another.

Furthermore, the ability to process emotional cues is associated with many positive personal, social, and academic outcomes (Knapp & Hall, 2010). Understanding verbal social cues is important for the sharing of information between individuals using speech. Strong verbal skills are needed for understanding spoken words, and for ensuring that enunciation, stress, and tone of voice are expressed appropriately (BusinessDictionary, 2015; Small & Vorgan, 2008).

Social media has the potential to make people less social and to become a surrogate for real world communication (Tardanico, 2012). According to Tardanico (2012), only 7% of communication is based on the written or verbal word, while 93% of communication is based on nonverbal language cues, such as body language, eye contact, and tone of voice. Texting, Facebook, Instagram, and Twitter have become the most efficient ways of communicating with others, but without the ability to receive nonverbal cues, the audience may not be getting the full meaning of the message. By 2020, 50% of the workforce will be comprised of the Generation Y and Millennial population, which is made up of individuals who prefer to communicate via instant messaging or other social media rather than stopping by an office and talking with someone FtF. This new preference for communication is one of the “generational gaps” between Baby Boomers and Gen Y and Millennial (Tardanico, 2012). Nevertheless, it is important that FtF time be provided in the workforce to help build relationships between colleagues and create employee engagement and loyalty (Tardanico, 2012).

### **Impact on Reading Nonverbal Cues**

According to some researchers, the lack of FtF communication weakens the important skills of reading body language, facial expressions, voice inflection, and looking someone in the eye during a conversation (Halberstadt, Denham, & Dunsmore, 2001; Small & Vorgan, 2008). Communication through online texting and social networks does not allow people to see other

people's reactions or body language. Words from texts and emails can easily be misinterpreted when body language, facial expressions, and tone of voice are missing. As a result, Small and Vorgan (2008) have argued that many adolescents and young adults are losing their fundamental social skills and are in need of a crash course in direct communication. Therefore, basic lessons on eye contact, empathic listening, and interpreting and responding to nonverbal cues may be needed to improve FtF communication (Small & Vorgan, 2008). While communicating digitally is an efficient way to communicate and exchange information, this mode lacks the emotional connection that copresence FtF communication offers. Over time, digital communication also reduces the ability to recognize emotional and nonverbal cues when engaging in FtF communication (Small & Vorgan, 2008).

Research suggests that digital screen time, even if used for social interaction, could reduce the time spent developing skills in reading nonverbal cues of human emotion. A study conducted by Hofferth (2010) from 1997 to 2003 found that the amount of adolescents' non-screen playtime decreased 20%, while the amount of time watching television, playing video games, and using the computer increased from 21% to 33%. A report from Common Sense Media (2013) showed that although digital technology provides many useful ways to communicate and learn, skills in reading human emotion may be diminished when children's FtF interactions are replaced by technologically mediated communication.

Communicating digitally is an efficient way to communicate and exchange information, but when dealing with other humans, their emotions need to be recognized. People must use their emotional intelligence to help them make decisions, cooperate with others, and understand themselves.

Researchers have shown that most adolescents who immerse themselves in digital technology-related activities may lose some ability to read facial cues and body language (Uhls & Greenfield, 2011). Current empirical research has indicated that media exposure begins at an early age and consumes the majority of adolescents' leisure time, which takes place in many environments and contexts (Uhls & Greenfield, 2011). Moreover, in the world of instant communication, some adolescents seldom take time to examine how they or others are feeling (Bandura, 1997; Halberstadt et al., 2001; Small & Vorgan, 2008).

### **Impact on Verbal Skills**

Barker (2006) stated that spending too much time in online communication may limit the development of verbal communication skills. Teenagers and young adults today rarely use their phone to call people and have conversations; instead, they prefer to communicate via emailing, texting, or chatting through social networks. A lot of conversation is going on in teenagers' bedrooms, but their mouths are not speaking; their fingers are doing all the communication through texting (Barker, 2006). A study from Common Sense Media (2012) reported that 90% of 13 to 17-year-olds have used some form of social media. This study found that 75% of the teenagers had a profile on a social networking site, 87% texted, 77% used email, 63% Instant Messaged, 59% used video chatting, and 28% wrote for or commented on a blog. All of this suggests that adolescents spend only a small portion of their communication engaged in actual FtF communication. This impacts their social skills.

Moreover, according to reporter Brownfield (2013), technology recruitment firms are looking to hire for their Internet technology companies, but recent graduates in the field lack social skills. One survey conducted by California-based recruiter, Robert Half Technologies, showed that 55% of graduates lack interpersonal skills.

To solve this problem, some organizations have their own “charm schools” to teach these skills (Brownfield, 2013). Due to decreasing experience with FtF interaction, Digital Natives may need to fine-tune their people skills before they begin their careers (Brownfield, 2013; Small & Vorgan, 2008). Thus, researchers have shown that learning and honing verbal communication skills is important for adolescents not only for their short-term success, but also for when they move into the workforce.

Good social and verbal skills are critical to successful functioning in daily life and are the road map to a successful life overall. They enable us to know what to say, how to make good choices, and how to behave in diverse situations (Halberstadt et al., 2001; Knapp & Hall, 2010). Adolescents need to acquire good social skills that can positively influence their academic performance, as well as their social and family relationships (NASP, 2000). Social skills are also needed to be successful in school. Adolescents with good social skills are the students who have strong interpersonal skills that let them develop strong relationships that facilitate their success in school. Students who have weak interpersonal skills have difficulties with their relationships with their family, peers, teachers, and parents. Also, weak social skills have been linked with school violence, depression, aggression, anxiety, and poor academic performance (NASP, 2000).

### **Impact on the Human Brain**

According to Small and Vorgan (2008), digital technology is not only changing the way people live and communicate, it is rapidly and profoundly altering human brains. Due to neuroplasticity, human brains are always changing and responding to both external and internal stimuli (Rosen et al., 2012). Neuroplasticity is the brain’s ability to reorganize itself by forming new neural connections throughout life. This refers to the physiological changes in the brain that happen as a result of interactions with one’s environment (Campbell, 2015). A study by Small

(2008) was done using magnetic resonance imaging (fMRI), in which brain scans showed the oxygen flow in the brains of older adults as they used technology to indicate which neural areas in the brain were activated and processing information. When these older adults were surfing the Internet, their brains showed more activity than when they were simply reading a book (Small & Vorgan, 2008). Small (2008) conducted research on the impact of technology on the human brain. His research used magnetic resonance imaging (MRI) to scan the subjects' brains and the results showed that the Web-savvy group reflected about twice as much brain activity compared to the brains of those who were not Web-savvy (Small & Vorgan, 2008).

Digital Natives are surrounded by a world of laptops, Smartphones, text messaging, and social networks, and they spend an average of 8.5 hours a day exposed to digital technology. Small's research indicated that this exposure rewires the adolescent brain's neural circuitry. While this is heightening skills like multi-tasking, complex reasoning, and decision making, it is also diminishing emotional aptitude skills such as empathy (Small & Vorgan, 2008). Consequently, as the adolescent brain evolves and shifts its focus to developing new technological skills, it moves away from fundamental FtF social skills (Knapp & Hall, 2010; Small & Vorgan, 2008). Due to the malleability of the human brain, as technology distracts people from more typical personal FtF interactions, their neural circuitry changes to adapt on a daily basis and traditional social skills begin to decline. As Small and Vorgan (2008) argued, "Drifting away are the fundamental skills, such as reading facial expression during conversations, or grasping the emotional context of a subtle gesture" (p. 2).

Furthermore, Turkle (2005) reported that technology not only impacts how people think, but it also changes people's awareness of themselves, their relationship to the world, and to others. Nie and Hillygus (2002) found that for every hour people spend on the computer,



traditional FtF interaction time with other people drops by nearly 30 minutes. With the weakening of the brain's neural circuitry controlling human contact, social interactions may become awkward, misinterpretation may occur, and subtle nonverbal messages may be missed (Nie & Hillygus, 2002). In other words, these findings show that humans need to communicate and interact with other humans, and communication skills must be developed at a young age.

The increasing use of the Internet by teens during their formative years contributes to a lack of personal communication skills (Affonso, 1999; Greenfield, 2009).

Stone (2014) has argued that the current technological revolution has plunged adolescents and young adults into a state of continuous partial attention, in which they continually stay busy, keeping tabs on everything while never focusing on anything. In this state the mind scans for any type of contact at any moment and when people get used to being in this state, they tend to thrive on perpetual connectivity. Agreeing with Stone, Small and Vorgan (2008) have maintained that once the brain goes into this state of stress, it no longer has time to contemplate, reflect, or make thoughtful decisions. These researchers believe that this perpetual connectivity may be putting Digital Natives at risk of losing personal contact with real-life relationships compared to Digital Immigrants. As discussed above, unlike Digital Natives, Digital Immigrants were exposed to digital technology as adults, so their basic wiring was developed during a time of direct (FtF) social interaction (Small & Vorgan, 2008).

Some scientific evidence suggests that the consequences of early and prolonged technological exposure of a young brain may in some cases never be reversed; but early brain alterations can be managed, and social skills learned (Greenfield, 2009; Rosen et al., 2012).

According to Greenfield (2009), however, while our growing use of social media and technology is changing adolescents' and young adults' brains, if it is used appropriately,

technology is good, as it can increase I.Q. and improve memory. Therefore, it is suggested that adolescents and young adults should not be slaves of technology, but instead strive to be the masters of it (Rosen et al., 2012), balancing their use of digital technologies for communication that involves FtF interactions.

### **Psychological Impact**

Dependence on digital technology to keep us connected may also be doing some psychological harm if we rely too much on it and do not maintain a healthy lifestyle. A healthy lifestyle includes FtF interactions, which gives us the cues and context that are needed to socialize. According to Rosen et al. (2012), through our daily interactions with technologies, many people are on the verge of an iDisorder, which comes with signs and symptoms of one or many psychological disorders, including narcissism, obsessive-compulsive disorder, addiction, depression, attention-deficit disorder, social phobia, schizo-disorders, and antisocial personality disorders. According to a recent study conducted by the Common Sense Media study in 2016, 50% of adolescents feel “addicted” to their mobile devices. Nearly 80% of adolescents check their phones hourly, and 72% reported that they feel compelled to answer immediately to texts and social networking messages (Common Sense Media, 2016). Some young people and adolescents are unable to be away from technology and are very anxious about continuously checking their text messages and their social networking accounts. Feelings of anxiety and loneliness can arise when there are restrictions on texting (Lepp, 2014; Skierkowski & Wood, 2012). This can be problematic in a classroom where the teacher or professor does not allow the usage of cell phones. Many adolescents’ are always worried about what they are missing and they feel isolated when they cannot communicate with friends and family through technological devices (Rosen et al., 2012).

### **Social Skills and Face-to-Face Interaction**

Social skills can be defined as the set of skills people use to interact and communicate with each other. On the other hand, interpersonal skills can be defined as the process by which people exchange information, ideas, and meaning through verbal and nonverbal messages (SkillsYouNeed, 2015). Both social skills and interpersonal communication are the processes by which people exchange information, feelings, and meaning through verbal and nonverbal messages with FtF communication. Interpersonal communication is not just about what is being said, but *how* it is said, along with the non-verbal messages sent through tone of voice, facial expressions, gestures, and body language (SkillsYouNeed, 2015).

The current generation lacks essential interpersonal skills, such as the ability to express ideas and thoughts to others FtF (Harankhedkar, 2016; Pea et al., 2012). An important component of interpersonal skills is the ability to communicate nonverbally. Humans communicate nonverbally in many ways, often to reinforce or modify what was said in words. For example, individuals may nod their heads to represent a yes or no answer. The lack of FtF interaction has reduced the nonverbal grasping power of individuals (Harankhedkar, 2016).

According to McNamara (2006), parents fear that for socially anxious teens this has become a serious issue, as text messaging and IMing (instant messaging) at all hours are substituting for FtF communication. Important emotions appear on human faces that are not exchanged in any way or form through digital communication, and such facial expressions help individuals communicate with each other, whether it is by contorting in disgust or smiling in happiness (Christakis & Fowler, 2009; McNamara, 2006). It is, therefore, problematic when these expressions are not part of many individuals' conversations, due to the fact that they are not communicating FtF.

### **Family Dynamics**

The current explosion in digital technology has disrupted much of the basic life-skills learning that in prior generations would have taken place in almost any tight-knit family. Spending much of their time online may be putting young adults and adolescents at risk of losing personal contact with these important real-life relationships. Nuclear families may still live together under one roof, but family members often substitute cyber interactions for traditional FtF social exchanges between relatives and friends. As Lenhart et al., (2010) argued, “Wireless communication has emerged as one of the fastest diffusing media on the planet, fueling an emergent ‘mobile youth culture’ that speaks with thumbs as it does with tongues” (p.9). Long gone are the art of writing a letter and lengthy FtF conversations, both of which are being replaced by texting and chatting online.

Now more than ever the family is needed to nourish meaningful connections and thoughtful conversations to give children the socializing skills and practice with FtF conversations that have diminished because of technology (Steiner-Adair, 2013). Children need to develop their interpersonal communication skills through opportunities to share feelings, resolve conflicts, engage in FtF conversations, and learn to read body language and social cues. During a conversation, children can practice positive engagement, self-control, problem solving, listening, being curious, developing empathy, and sharing ideas and insights (Steiner-Adair, 2013). Neither the cell phone nor social media should replace these real FtF conversations and social interactions with family and friends. There are many families, who, even at home, communicate using their cell phones or Facebook instead of communicating with each other FtF. Therefore, it is due to the Internet and pervasiveness of digital technology that some families are struggling to maintain a meaningful face-to-face connection with each other in their own home.

This is the paradox of our times that so much opportunity exists for families to be plugged in and yet be disconnected (Steiner-Adair, 2013; Turkle, 2015). For many families, gone are the interactive rich conversations families used to have; instead, these are being replaced with more shallow digital dialogue. Moreover, the family is an important training ground, where children learn the art of social conversation as well as simple courtesies and manners. It is within the family where direct FtF visits and conversations begin to occur, times during which children learn and practice the skills of dialogue. These skills include mutual listening, talking in sentences, extracting meaning from events and feelings, and sharing feelings in the give and take of conversation. For some people, it seems that the days of family small talk and swapping stories have disappeared. Children today stay in their room with their laptop or cell phone until dinner is ready and do not often socialize FtF with their family or friends (Steiner-Adair, 2013).

### **Adolescents**

Since adolescents have turned to texting and posting online to communicate, this has lessened the need for them to participate in full conversations with other people FtF. Many adolescents find family conversations boring, or too slow, and they have a hard time sitting, listening, and participating (Steiner-Adair, 2013). For some adolescents, a conversation in person or over the phone can feel too risky because it happens at the spur of the moment and one cannot plan what one wants to say. Quite the opposite of FtF, while texting another person, one cannot see their emotional response, which means people can feel less vulnerable, than when in a live conversation (Boyd, 2014; Rosen, 2007). Texting, therefore, offers a built in protective shield that live conversations do not. Also, texting allows us to think before we text or even decide not to respond at all.

Consequently, with the advancement of digital technology, adolescents as a group, are losing the ability to take part in the art of spontaneous communication. Digital encounters make it difficult to gauge people's reactions immediately, while FtF encounters allow one to immediately see someone's response and adjust one's own reaction based on what was received. With digital encounters, the audience lives only in the imagination, and there are no external cues (Boyd, 2014; Rosen, 2007). To learn what is socially acceptable in different situations requires one to experience a variety of social situations. This is what adolescents are missing when they communicate FtF.

Most teens feel that using social media has helped their relationships rather than hurt them, while others admit there are some negative consequences. According to a study done by The Common Sense Media (2012), 54% of adolescents say that social networking has made them feel more connected with family and friends. At the same time, 44% say that social networking often distracts them from the people they are with in person. This is important to note, as traditional friendship development most often begins with spatial proximity (Common Sense Media, 2012). At the beginning of an FtF relationship, people often spend time telling the other person about little details of their life, such as, what they like to do during their leisure time. When someone first meets another person FtF, they are often cautious and reserved about revealing too much about his or her life. Some studies, however, have found no difference between online and offline relationships.

Online relationships usually begin with emails or IM messages back and forth, and involve early disclosure by both parties. Chan and Cheng (2004), speculated that online relationships were conducted more cautiously at first, but after 6 months, online relationships became more like offline relationships in that they lasted for 2 years or more.

Certainly, as an e-relationship evolves and trust is developed, one will reveal more about oneself (Rosen, 2007). Adolescents indicate that social media has had either a positive or negative impact on their relationship (Lenhart, Smith, Anderson, 2015). Many adolescents in relationships view social media as a place where they can feel more connected, share emotional connections, and let their significant other know they care (Lenhart, Smith, Anderson, 2015).

Due to digital technology, absent-minded conversation is also becoming prevalent among adolescents and young adults. According to Steiner-Adair (2013), adolescents may be lacking the understanding of what it truly means to communicate FtF. When a situation becomes awkward and difficult moments arise, adolescents will retreat to Facebook or other social networking sites. Most teenagers today are learning to do most of their communication while looking at a screen, and not at each other (Steiner-Adair, 2013; Turkle, 2011). Consequently, they are losing the ability to process incoming and outgoing messages, engage directly with someone, and hear someone's voice. This disconnect is eroding the foundations of communication on which love, deep relationships, and emotional commitments are built (Steiner-Adair, 2013). Never before was it possible for two people to sit next to each other on a couch and talk to each other by texting. Teenagers may be hanging out together, but they are often texting other friends or are on their cell phones and not communicating with each other.

### **Theoretical Framework**

This study is guided by two theoretical frameworks: Bandura's Social Cognitive Theory, and McLuhan's Mass Communication Theory as it relates to social interaction and technology-mediated communication. Both are discussed below.

### **Social Cognitive Theory**

Social Cognitive Theory (SCT), one of Albert Bandura's most influential theories, proposes that parts of an individual's knowledge acquisition can be directly related to observing others within the context of social interactions, experiences, and through outside media influences (Bandura, 1994, 2004). The theory examines how repeated exposure to the media changes human behavior and maintains that human adaptation and change are rooted in social systems (Bandura, 1977). Although humans are the operators in their life course, the information transmitted by today's communication mediums shapes and directs a society's expectations and behaviors (Bandura, 1977, 1994, 2004).

As Bandura (1994) writes, "Social cognitive theory extends the conception of human agency to collective agency" (p. 125). In social cognitive theory, humans are the operators in their life course. Therefore, individuals are agents of experiences rather than individuals going through the experiences. In other words, people are self-organizing, proactive, self-reflecting, and self-regulating, and not just organisms shaped by environmental events (Bandura, 2001). Through symbolization, people give meaning and form to and connect with their experiences (Bandura, 2001). Mass communication exerts a cognitive effect on people as both individuals and as a social group (Ives, 2013). Social cognitive theory examines how repeated exposure to the media changes human behavior, and the theory maintains human adaptation and change are rooted in social systems (Bandura, 1977).

According to SCT, when people have positive outcomes from social interactions, they feel satisfied, proud, and confident. Negative outcomes leave people feeling dissatisfied and disappointed in themselves, both in the moment and in the long term.



These positive and negative interactions provide people with feelings that they integrate and use to form feelings of self-worth (Bandura, 1986). Based on SCT, adolescents are continually revising their sense of self. Adolescents today live in an ubiquitous digital world in which socialization through and with digital gadgetry is a typical behavior for teenagers. Therefore, it is important to try to understand more about the social processes that result from their digital usage (Ives, 2015). Digital technology is a part of adolescents' lives that affects how they communicate and socialize, and even who they are. Bandura coined the term "self-efficacy" to represent the self-evaluation that influences people's decisions about what they do, their confidence in performing tasks, and how they feel about themselves (Ives, 2015).

There are two basic modes of learning (Bandura, 1986). The first mode is when people learn through the direct experience of being rewarded and punished for actions and through the power of social modeling. People learn by watching what others do. The second mode is trial-and-error learning. In this process, people learn from the successes and mistakes of others. With digital technology, new ideas, values, and styles of conduct are rapidly diffused worldwide (Bandura, 2004). SCT is based on the view that behavioral, environmental, personal, and cognitive factors influence one another in a reciprocal fashion (see Figure 2.1). Individuals have the ability to influence their own behavior and their environment in a purposeful way (Pajares, 2002). It is the interaction between the environment, personal factors, and behavior that can stimulate learning and change human behavior (Bandura, 1986, 2001; Pajares, 2002).

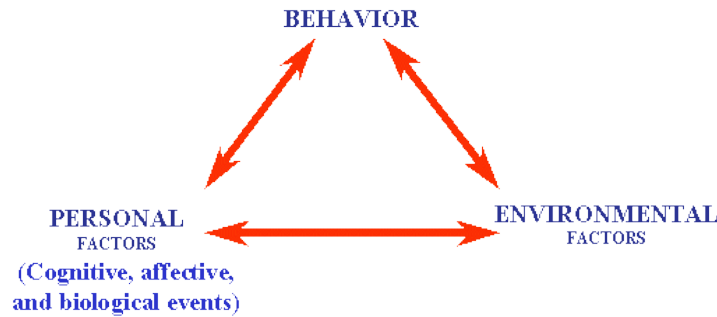


Figure 2.1. Bandura's social cognitive theory emphasizes reciprocal influences of behavior, environment, and personal/cognitive factors. Adapted from "Overview of social cognitive and of self-efficacy," by F.Pajares, (2002).

### Media of Communication Theory

Marshall McLuhan saw technology and machines as the mediums for communication. He was one of the first theorists to recognize the importance and consequence of a medium or technology. Media technology shapes how people think, communicate, feel, and act in society. Furthermore, McLuhan saw each medium as an extension of human sensory organs with the capability to alter the relation of the individual to the surrounding world. McLuhan saw the wheel as an extension of the foot, clothing as an extension of our skin, the telephone as an extension of the ear, the television as an extension of the eye, the computer as an extension of the brain, and electronic media as an extension of the central nervous system (E. McLuhan, 2008; M. McLuhan, 1964). From this viewpoint, technology has become an extension of humanity that helps people reinvent themselves (McLuhan, 1964).

In many ways, a machine alters one's relation to another person and within oneself. The medium or technology involves a change of scale, pace, or pattern that influences human affairs. Furthermore, not only should the medium itself be observed but also the ways in which the medium disrupts tradition and reshapes society (McLuhan, 1964). Davis and Gardner asked, "In McLuhan's terms are the apps simply the newest medium, with its characteristic sensory rate?"

Or do they constitute an ingenious blend of electronic and digital media and open up a new chapter of human psychological possibilities?” (p. 24). McLuhan investigated human interaction with and influence over media and media’s interaction with and influence over society. Through electronic media, social roles are tied into social communication and identity. Networks have influences on society; if the network changes, so does the person’s identity (Meyrowitz, 1994). Moreover, “Electronic media tends to foster new types of shared experiences” (Meyrowitz, 1994, p. 58). Now people can have personal involvement with people who otherwise would have been strangers.

McLuhan wrote about the emergence of a global village in which humans around the world would partake, often simultaneously, in a single, generalized consciousness. However, instead of being in a fixed location, people in the current day are more like global nomads. In order to communicate with each other, people no longer need to make dramatic changes and migrate to new cities or countries. As Meyrowitz (2003) wrote, “Unlike our ancient counterparts, we, as global nomads, are able to violate the rules of physical movements or physical limits” (p. 97). Electronic communication is different from spoken communication because it is not bounded by time or physical limitations.

McLuhan (1964) explained media as either being hot or cool. A medium is hot or cool depending on how it is used in society. A hot medium has a high definition, is the state of being filled with data, and requires less participation and stimulation. Hot medium demands little interaction from the user and is restricted to what the source offers at that specific time. Some examples of a hot medium are photographs, film, and radio. A cool medium has a low definition, is the state of being filled with less data, and requires more participation and more interaction from the user.

Some examples of cool medium are the telephone and the television (E. McLuhan, 2008; M. McLuhan, 1964). According to McLuhan (1962, 1964), media alone has no meaning or existence, but a medium acquires meaning when it is in constant interplay with other media.

Media also interact with one another, so the introduction of a new media can change the way the old media are used. Although McLuhan wrote the first draft of his theory of communication in 1959, the pioneering theory has provided society with its current conceptions and awareness of “media” and the “Information age”. Following McLuhan’s lead, society tends to place great value on these technologies. Where some researchers saw cultural decline coming out of the electronic age, McLuhan saw fundamental differences and transformation (Meyrowitz, 2001). Ziv (2014) stated that,

McLuhan sees new technologies replacing older technologies and new paradigms that change human experience itself. He differentiates between a given medium’s perceived value and the invisible quality of the medium, which actually shapes both the human potential and limitations created through engagement with it (p.6).

Thus, McLuhan puts forth that as influential and life-changing as any new medium can be in terms of one’s experience, its direct effects may initially be the least visible. Given that the media acts as an extension of the human senses, it can have an effect on the process of communication. McLuhan warned of an era in which information technology would color human experiences with probably no societal awareness and foreshadowed the challenges of living submerged within the digital medium. Media has become an extremely significant part of people’s daily life; it has made a profound impact on human’s social interaction. Therefore, it is vital for people to make an effort to become more conscious and comprehend the effects of media and technology (Ziv, 2014).

### **Social Networks**

People in the 21st century use social media networks to communicate, whether it is through Facebook, Twitter, or Instagram. One way to define social networking is an online community of a network of friends, colleagues, and other personal contacts who communicate via the Internet (Palfrey & Glasser, 2008). Social networking can be a good form of entertainment and is great for meeting people with the same interests. Information is transmitted and shared among a broad audience through social media. What makes social networks so appealing is that people have access to the whole world through their fingertips. Today, adolescents and young adults have the opportunity to exist in many social landscapes (Rosen et al., 2010). These landscapes include the home landscape, the school landscape, the work landscape, and a new social landscape, the virtual landscape, which has no fixed position in time or space. Information can be gathered from anywhere in the world at any time (Rosen et al., 2010). Now there are no barriers of time or place that affect people's ability to communicate with each other. Social networks have, therefore, changed the way people interact and the type of information they are willing to disclose about themselves.

Social networking sites allow individuals to present themselves in the way they want as well as to establish and maintain connections with others. Online networking offers the ability to communicate with individuals regardless of the distance between them, so people can interact with people they know and do not know. Social networks have become a popular means of communication. They can be a dedicated website or other application that allows users to communicate with each other by posting information, comments, or messages (Papacharissi, 2011).

Another way to describe a social network is that it is a group of people who are more connected to one another than they are to other groups of connected people found on other parts of the network (Christakis & Fowler, 2009).

Basically, a social network is made up of human beings and the connections between them. These connections can be personal, casual, lifelong, or anonymous; and members of the network can decide how interconnected they want to be. Within social networks, people unconsciously have the tendency to associate with others who resemble them and who share some of their likes or dislikes (Christakis & Fowler, 2009). Online communities share a sense of space, resources, identities, and interpersonal relationships. Most online groups are not tied to geographical space, but most people think of them as a shared space. In 1997, Barry Wellman defined communities as groups composed of broadly based relationships in which each community member feels securely able to obtain a wide variety of help (Baym, 2010).

A social network is a social structure made up of nodes that are the people or the organizations in the network; the ties are the connections the nodes have. The patterns of the ties are more important than the individual people themselves and the specific patterns of the tie help in understanding how the network functions (Christakis & Fowler, 2009). Social networks affect every aspect of human life and they exist for a reason, because they spread and influence ideas and knowledge. Smaller communities are highly interconnected while the larger ones are less dense (Papacharissi, 2011). One can compare a social network to a human superorganism because they change, grow, reproduce, survive, and die, with global consequences that touch the lives of thousands every day (Christakis & Fowler, 2009).

All social media spaces share four common characteristics. They all afford communication between people, are mobile, allow 24/7 on-demand access to family, friends, and information, and provide entertainment. Young people have driven the popularity of social networks, as they are the people increasingly using social networks to communicate with others. The ubiquity of social network usage among adolescent students is changing the way in which teens communicate, socialize, and create social identities. Further, the new forms that social spaces have taken have changed the set of skills that teens develop in the course of their daily lives.

Social network sites (SNS), or web-based services, allow individuals to: (a) construct a public or semi-public profile within a bounded system, (b) articulate a list of other users with whom they share a connection, and (c) view and traverse their list of connections and those made by others within the system. Of the hundreds of SNS available on the Internet, Facebook is one of the most popular and is used across a variety of demographic categories (Boyd & Ellison, 2007, p. 211).

According to a 2012 Common Sense Media Research study, almost all teenagers in America have used social media; 90% of 13 to 17-year-olds have used some form of social media. Three out of four teenagers currently use some form of social media on a social networking site. Facebook, a highly interactive virtual social network site that has become a worldwide phenomenon, was created in 2004, and by 2014 it reported having more than one billion registered members (Statistic Brain Research, 2014). Young adults and adolescents have made Facebook their social network of choice. Facebook provides a way for people to keep in touch with friends, family, and acquaintances, while maintaining or intensifying relationships with online social connections.

People use Facebook to post personal information such as pictures, updates on their hobbies and activities, and messages to communicate with friends and family. Twitter, created in 2006, is another popular social networking site that as of August 2015 had 302 million monthly users (Twitter.com, 2015). A 2012 study found that one in five teenagers had a current Twitter account (Common Sense Media, 2012). However, Facebook currently dominates the sites used for social networking among teens. Among those teens using Facebook, 66% say that Facebook is their main social networking site, compared to 33% for Twitter, 13% for Google+, and 3% for Snapchat (Lenhart, 2015). According to the Pew Research Center's latest report on teens and social media, Facebook is still the most popular social media app for American teenagers. Seventy-one percent of teens use Facebook, almost half of all teens use Instagram, 40% use Snapchat, 24% use Vine, and 14% use Tumblr (Lenhart, 2015).

A web community is very similar to a real world community, for they both involve the development of meaningful relationships among people. Author Amy Jo Kim (2000) has conducted research on how people interact with each other online. She has identified several stages that describe the different ways people participate and progress in their use of these online communities. These identified stages are the lurker, the novice, the regular, the leader, and the elder. First, there is the lurker, who visits an online site or community but does not actively participate. The next stage is the novice, who is becoming more interested and invested in the online community. The novice often visits online sites, posts comments, and joins the conversation. After being a novice, an individual becomes a regular established community member who visits online sites and participates regularly. The individual then becomes a leader. The leader is someone who has been a regular for a while and progresses to become a community leader.



At some point, an individual's participation in a community may dwindle and come to an end, and it is at this point that he or she that becomes an elder (Kim, 2000). Virtual communities are increasingly becoming an integrated part of adolescents' lives, serving to fulfill their desires to interact with others.

### **Digital Natives and Social Networks**

#### **Use of Technology**

Today's youth have a wider variety of options for communicating with their friends. Social media plays a very important role in the lives of Digital Natives in that they are hyper-connected or always on and connected through online interactions that complement or supplement their FtF social encounters. Adolescents communicate with friends via email chat rooms, mobile phones (by "texting"), online social networks, video communication such as Skype, and online gaming. Adolescents, especially females and young women, are increasingly using video chat tools like Skype and FaceTime to communicate (Lenhart, 2012). These new technologies enable adolescents and young adults to create and maintain social bonds in completely different ways.

For most Digital Natives, the shopping mall is no longer the cool place to hang out with their friends. Instead, these adolescents find it cool to hang out online via Facebook and Twitter (Boyd, 2014). Among adolescents, text-based technologies are the most popular communication technologies. People can communicate and express feelings through online networking sites with words, but one can go further to express emotions with emoticons or by posting a video on Facebook (Dunlap et al., 2015). Emoticons are digital icons or a sequence of keyboard symbols that serve to represent a facial expression (Dunlap et al., 2015).

People use emoticons to show feelings, but the icons also used as a textual representation of various nonverbal behaviors and cues typically prevalent in FtF communication (Dunlap et al., 2015). Pre-teenagers and teenagers from the digital generation do not converse in paragraphs but, instead, communicate using abbreviated snatches of cell phone texts, instant messages, or through Facebook and MySpace bulletins. These modes and methods of communication have resulted in new forms of socialization, particularly for these groups. This also has implications for FtF interactions and work within the academic settings.

Text messaging has become a vital mode of communication because it allows individuals to speak to one or many people simultaneously in real time. A mobile youth culture is emerging in which they speak as much with their thumbs as with their tongues. In fact, for many teens, chatting on a cell phone or via email is now passé. Based on a Pew Internet and American Life Project (2010), a typical teenager in the United States sends at least 50 texts messages a day or 1,500 texts a month. When comparing how often U.S teens text to teens in Korea, Norway, or Denmark, researchers discovered that teens in these countries receive only 15 to 20 texts a day on average (Lenhart et al., 2010). Texting is now the most common way that American teenagers communicate with their friends. They text their friends 54% of the time, followed by talking on a cell phone 38% of the time, and talking FtF only 33% of the time. Texting has even expanded to the classroom where note passing has been replaced by text messaging (Lenhart et al., 2010). Recent research has found that adolescents' favorite form of communication is texting (33%), followed by social networking (0.07%), rather than talking on the phone (0.04%) (Common Sense Media, 2012). Today's youth communicates with informal language that is full of shortcuts, acronyms, and other abbreviations, and the fewest keystrokes possible. It seems that adolescents are more comfortable texting than talking to another person.

Consequently, adolescents think that they can say anything through texts without having to commit to the effects of face-to-face vocal conversations (Lenhart et al., 2010). Talking to people is a skill and as with any skill, practice makes perfect.

The level of technology integrated into teens' lives is so entrenched that it is hard for them to separate the online world from the offline world (McNamara, 2006). More than 80% of American teenagers use the Internet and over 75% use e-mails, instant messaging or other online communication technologies. Furthermore, over 50% of teens have several email addresses or screen names through which they interact anonymously with others (Christakis & Fowler, 2009). A more recent Pew Research Center's Internet and The American Life Project (2013), reported that 74% of teens aged 12 to-17 accesses the Internet on cell phones, tablets, and other mobile devices (Madden et al., 2013).

According to a national survey from the CTIA Wireless Association and Harris Interactive, in the United States, four out of five teens, or approximately 17 million young people, have a wireless device, and 48% believe their social life would end if they didn't have a cell phone. Also, 81% of youth under the age of 25 sleep with their phone next to them in bed (as cited in Springsteen, 2014). Furthermore, Rideout et al. (2010) reported that American children between the ages of 8 and 18 spend an average of 7.5 hours a day using some sort of electronic device, whether it is a Smartphone, handheld video game player, laptop, MP3 player, or computer.

Some researchers argue that technology is fast replacing many FtF experiences that are crucial in the development of a child's social skills. Furthermore, young adults will need to use human-to-human interaction skills to succeed in the workplace (Rosen et al., 2012; Turkle, 2011).

A study done by Goetz (2013) showed that adolescents who exhibited more compulsive Internet use illustrated less accuracy when identifying facial emotions. This findings supports other theoretical frameworks from Amichal-Hamburger and Ben-Artizi, (2003), Caplan (2003), Engelberg and Sjoberg (2004), and Nie and Erbring (2000). These scholars believe that excessive Internet usage ultimately competes with an adolescent's social activities, may interfere with the development and preservation of social relationships, and may be changing social skills (as cited in Goetz, 2013).

### **Identity Development**

Adolescence is an important developmental stage of life and is often a confusing time, particularly as teenagers go through many physical and psychological changes. Suddenly they find themselves in a maturing body as well as facing new social pressures in the digital era, pressures that were not faced generations ago by their parents (Rosen et al., 2010; Small & Vorgan, 2008). This is a time of exploration, of trying to fit in, of self-creating, and of building relationships, which means that developing social networks is crucial at this stage of life (Turkel, 2005, 2011).

There are two forms of identity that people develop. One form of identity is a personal identity, which is derived from personal interests, favorite activities, and the special interests one has. The other form of identity is one's social identity, which is developed through interactions with the members of one's family, as well as friends and neighbors (Palfrey & Gasser, 2008).

Individuals create an online representation of their identity in the form of an avatar, which is a virtual representation of an online user (Palfrey & Gasser, 2008). In digital interactions, an avatar identity can be changed or adjusted several times depending on the given online game, social network, or virtual world in which one is taking part.

Many Digital Natives are ongoing creators of their own life as they change or update their avatars and online profiles, post videos, make and share music, post news, and tag and bookmark stories on the Web. This online explosion of creativity and possibility has given rise to new forms of expression for adolescents, allowing them to create their digital collage called remix or mashup (Palfrey & Glasser, 2008). Teenagers who use the Internet may encounter remixes that are forwarded by their friends. According to Palfrey and Glasser (2008), “remixes allow Digital Natives and others to interact with cultural objects in a way that affects how cultures develop and are understood” (p.115)

Throughout history, adolescents have struggled with developing their personal and social identities, but never before has it been easier for adolescents to recreate or change their personal identities than it is today with digital technology. According to Palfrey and Gasser (2008), before the age of technology, in the agrarian age, if a young person wanted to change their personal identity they would have to move a sufficient distance away so they could disappear and cut all relations with friends and family for good. Now, in the digital age, an adolescent’s social identity can be shaped and reshaped in full sight of family and friends both online and in the offline world. Since it is so easy for people to change one’s identities and morph oneself in the digital age, there are more acceptances around doing this. Thus, it is not just that a young people can reshape their online identity, it is also that friends and family allow them to do so. There is something at work here that goes beyond just capability- something that has changed in society (Boyd, 2014; Gardner & Davis, 2013; Palfrey & Glasser, 2008). From the perspective of the Digital Native, one’s identity is not broken into a personal and social identity, nor is it broken into online and offline identities. Both worlds exist simultaneously (Palfrey & Gasser, 2008).

Today's kids use the Cyberworld to explore their identity and to figure out who and what they want to be when they grow up; they have adopted the Internet as the way to represent themselves. The Cyberworld is the world of computers and communications, and most preteens and teens are wired and even tied to this technology from the moment they wake up to the moment they go to sleep. Additionally, many are addicted to their cell phone and even answer text messages during the night (Rosen et al., 2010).

Adolescents also explore their identity in virtual worlds where people can experience a "Second Life" (Palfrey & Gasser, 2008), a multi-player online virtual world. When they are online, adolescents feel they can hide behind their computer screens and will share information that they might not share if they were standing FtF with another individual (Palfrey & Gasser, 2008). In a virtual world, people can create a whole new persona and interact with others as that person. Finally, the iPod is another technological means for avoiding personal interactions, just by putting in ear buds and immersing oneself in music while in public (Palfrey & Gasser, 2008). This technology can bring negative consequences because adolescents are constantly cutting themselves off from personal interactions and real-life experiences (Affonso, 1999).

### **Positive Impacts**

Occasionally, online relationships will carry over to offline relationships. Based on a study done by Rosen et al., (2010), out of 1,200 MySpace users, 78% of teenagers reported being more comfortable communicating from behind a screen and being better able to be honest online; this online honesty transferred to their offline relationships. According to Matheson and Zanna (2008), however, "Users of computer-mediated communication reported greater private self-awareness and marginally lower public self-awareness than subjects communicating face-to-

face” (p. 228). Therefore, it seems that if users experience reduced self-awareness they are more likely to self-disclose using online communication (Joinson, 2001).

Despite the majority of their communication not occurring through FtF interactions, teenagers and young adults are still engaging in meaningful connections with family and friends as they post photos online and customize their profiles (Rosen et al., 2010). Recent studies have shown that teens think that using social media has helped their relationships with friends and family. A majority of teens say social media helps them to keep in touch with friends they can't see regularly (88%), get to know other students (69%), and connect with new people who share a common interest (57%) (Common Sense Media, 2012). Common Sense Media (2012) also found that even though they are avid social media users, teenagers still enjoy talking to their friends in person (49%). Also, 44% of adolescents do perceive the impact of spending more time on social networks and less time with friends in person. According to Sherman, Michikyan, and Greenfield (2013), people have higher levels of bonding in copresence FtF conditions as compared to audio-only chat or IM conditions. Also, there are significantly higher levels of bonding in video chat as compared to IM conditions.

Some adolescents still prefer FtF conversations because they are more fun (38%), and they can understand what people really mean better in person (29%). On the other hand, the main reason some teens prefer texting is that it is quick (30%), easy (23%), gives them more time to think about how to respond (16%), and is more private (11%) (Common Sense Media, 2012). Most teens report that using social media has a positive impact on their social and emotional well-being. However, some teens wish that they, their friends, and their family members, could unplug and disconnect from technology.

Forty-five percent of teens say they sometimes get frustrated with their friends for texting, checking their social networking sites, or surfing the Internet while they are hanging out together (Common Sense Media, 2012).

According to Palfrey and Gasser (2008), Digital Natives need to experiment with, develop, and learn to represent their identity in a place that feels more private and controlled, so that they can develop and express themselves in various ways. These new ways of developing identity involve the disclosure of personal information on the Internet, a new form of peer communication that replaces old forms of communicating such as FtF communication as well as writing diaries or letters (Palfrey & Gasser, 2008).

### **Self-Disclosure on Social Networks**

People tend to disclose more information about themselves on the Internet than in FtF communication (Leung, 2002). Self-disclosure is a way of showing others who we are and what we want. People are more willing to self-disclose if they have the promise of confidentiality (Corcoran, 2001). During online communication, one does not see the person on the other end, and one may therefore feel more anonymous, even if the other person is one's best friend. This phenomenon of not being seen in our electronic generation is called disinhibition. People will ask for things or say things on screen that they would never say FtF (Turkle, 2011). With this invisibility, people are more willing to behave in ways outside the norm (Suler, 2004). According to Suler (2004), "Avoiding eye contact and face-to-face visibility disinhibits people" (p. 322), and, therefore "Absent face-to-face cues combined with text communication can alter self-boundaries" (p.323).



Most computer-mediated communication (CMC) contains two key features: (1) visual anonymity, and (2) limited communication (text only, no visual cues). Self-disclosure is heightened when there is visual anonymity and reduced self-awareness (Joinson, 2001). If Internet users are concerned with accountability through self-awareness, they are less likely to self-disclose, but self-disclosure seems to be important for relationship quality in CMC.

According to Greenfield and Subrahmanyam (2008), college students who self-disclosed more information also reported having higher quality relationships with friends. Therefore, “Communication frequency and self-disclosure play a role in CMC and online friendships just as they do in FtF interactions and offline friendships” (Greenfield & Subrahmanyam, 2008, p. 13). Internet users can still develop personal relationships by adapting their behaviors to these nonverbal cues (Ma & Leung, 2006).

Research by Joinson (2001) claimed that new, meaningful relationships can be formed on the Internet despite any restrictions. The Internet is a place where people reveal more of themselves behind pseudonyms and computer screens. This self-disclosure includes a variety of factors such as depth of intimacy, honesty, amount, and intentions. Healthy people tend to disclose more positive than negative information to friends, spouses, or parents (Leung, 2002). If people feel fear or anxiety, they are less likely to participate. This is also true if they feel interactions are manipulative or untruthful. Based on a study done by Joinson (2011), online relationships can lead to more disclosure than offline relationships. According to Ma and Leung (2006), “People who are less socially anxious and/or are willing to participate in real-life communication tend to disclose themselves more intimately, reveal more positive and desirable feelings, as well as talk more frequently about themselves” (p. 31). People are also more willing to self-disclose if they have the promise of confidentiality (Corcoran, 2001).

If the Internet is perceived as a sociable medium, people are more willing to disclose personal information. In a study conducted by Moon (2000), participants were more likely to disclose intimate information when: (1) disclosure was initiated first, and (2) disclosure escalated gradually to include more personal information. A key feature to self-disclosure is intimacy and, more recently, textual intimacy. Intimacy is the quality of interactions between people that results in feelings of reciprocity to help them maintain a comfortable level of closeness (Pietromonaco, 1998). Online users experience textual intimacy and feel close to people, even if they are far away. It is through this feeling of intimacy that they can experience feelings from what others write or type (van Manen, 2010).

According to Reis and Shaver (1998), intimacy is achieved through a speaker and listener revealing personal information to one another. Information is disclosed through thoughts, feelings, emotions, or nonverbal behaviors. The speaker and listener repeat this process and intimacy grows. The information exchanged can be either factual or emotional. Factual disclosures expose personal facts and information, while emotional disclosures reveal private feelings, opinions, and judgments; emotional disclosures tend to lead to greater intimacy. When a person feels their partner is being responsive to their disclosures, intimacy is enhanced.

Self-disclosure “is an important means for decreasing interpersonal distance between individuals” (Chelune, Sultan, & Williams, 1980, p. 462). However, self-disclosure does not always lead to intimacy. Self-disclosure is part of the process of two people becoming intimate. There is a need to feel understood, accepted, and cared for, and these feelings are made known through revealing and sharing. If there is motivation to seek personal relationships, intimacy may be increased (Pietromonaco, 1998). Disclosure is more likely to occur when intimacy heightens due to casual exchanges becoming more personal exchanges (Moon, 2000).

### **Netiquette**

With the explosion of digital technologies and new ways of communicating, there need is a for rules of etiquette to govern what conduct are socially acceptable online. Etiquette, which encompasses manners, respect, honesty, and social norms, is traditionally taught to us both by family and through societal expectations. The word etiquette comes from the French language, and refers to “little signs” that tell us how to act (Senning, 2013). Social “rules” and norms change over time. According to Baym (2010), “Social norms have been diversifying and evolving since they first appeared a millennia ago, and will continue to evolve as long as there are people” (p.154). In the current day, people have the power to shape their personal connections through the ways they choose to understand and use embodied interaction, whether it be through old media or new media. However, since online communication lacks co-presence FtF communication skills, some information can be misinterpreted and there may be misunderstandings regarding the information given (Baym, 2010). Digital communications affect many different types of relationships; whether these relationships are with family, friends or coworkers, it is important to figure out which is the best way to communicate with them on the Internet.

There is a digital divide between what Digital Immigrants and Digital Natives think is rude (Senning, 2013). For example, Digital Immigrants think it is rude to text others while you are speaking to another person, but teenagers (Digital Natives) generally do not think so. In response to the bad online behavior of our time, Brad Templeton coined the word “netiquette” to give us suggestions for the dos and don’ts in our digital mobile world (Senning, 2013).

Netiquette includes not using a phone in hospitals, libraries, elevators, restaurants, museums, and professional offices; being at least ten feet away from other people when speaking on a cell phone; keeping conversations private; and not answering a phone call or a text during a face-to-face business or social meeting (Senning, 2013).

By the mid-1990s, the Emily Post Institute had answered the public outcry about impolite uses of mobile phones. The Institute came up with mobile manners that addressed texting, leaving voice messages, instant messaging, video chatting, browsing the Internet, playing games, posting pictures, tagging, and using one's mobile device in public places. The main idea is to treat people with respect, keep the volume down, and think about how your actions affect the other people around you. The ability to build positive relationships with digital media will always depend on the way people use it (Senning, 2013).

Balancing the new demands of accessibility and being hyperconnected is challenging for some Digital Natives. A 2010 study done by PEW Research discussed how teenagers also address the issues of unwanted cell phone interruptions and annoyance when their friends or family violate cell phone etiquette (Lenhart et al., 2010). This study showed that it annoys some teenagers when people do not respond to their text messages or when people try to reach them at all times, even when they are unavailable. In our technology assisted world, there needs to be some consensus on rules and manners related to online communication. Therefore, parents and teachers share the responsibility of teaching manners and etiquette within these new areas of communication and interaction.

### **Educational Implications**

Some posit that since Digital Natives' brains may be rewired because of their use of technology, they could be learning differently (Carr, 2010; Small & Vorgan, 2008).

As discussed above, digital technology has changed the way students think, act, and socialize.

With the aid of the Internet and social networks, students have an array of information at their fingertips, which helps them with their education and learning. Never has it been easier for students to form study groups, swap notes, share homework, contact teachers or professors, work in groups, and have access to books and an array of learning materials (Rosen et al., 2010). Due to the increased presence of technology in education, teachers need to teach their students the skills required to use this technology accurately and analyze its accuracy through effective critical thinking. In other words, students need to be taught to evaluate, analyze, and synthesize information.

Research also suggests that digital technology can have detrimental effects on the developing brain in ways that affect learning at an early age. Tremendous brain changes occur in the first two years of a baby's life. Too much technology at any age will affect the brain, but this happens especially if the child is exposed to a lot of technology when very young (Carr, 2010; Small & Vorgan, 2008). Excess technology may interrupt or weaken the connections for comprehension, deep thought process, language use, writing, higher level-thinking skills, and capacity for sustained attention, reflection, and deep thinking. The brain also needs embedded connections to stimulate language development (Small & Vorgan, 2008; Steiner-Adair, 2013). These early brain changes can affect how small children learn before they are old enough to be in an educational setting, and can certainly affect how they perform once they get into school. Technology is transforming what we know, what it means to be a student, and the very process of education itself (Steiner-Adair, 2013). No longer is a trip to the library needed to get books or information for research. Digital Natives rely on the Internet to get all the information they need for their lives (Palfrey & Gasser, 2008).

Additionally, some studies show that Digital Natives are used to a fast, shallow pace of information and get bored when trying to learn information at the rates that were normal for their parents. They are used to multitasking, which means they can be talking FtF with someone while at the same time checking text messages and listening to music from their phone or MP3 player with earphones plugged in their ears (Dunlap, 2011; Prensky, 2001; Rosen et al., 2010). In today's technologically rich world, multitasking is the norm, especially among adolescents and college students. Therefore, in educational settings today, teachers must create a balance between using traditional teaching resources and activities (e.g., textbooks, worksheets, workbooks, FtF social skills activities) and technology. While FtF communication is an important skill that teachers must incorporate into their students' classroom experience, they must also incorporate technology and allow students to communicate and learn through online methods (Rosen et al., 2010).

A major purpose of education is to provide knowledge and develop students' critical thinking skills. Teachers do not need to change the curriculum but do need to know how children depend on technology for many aspects of their life, particularly since some adolescents' brains may have been rewired due to all the technology they consume. Therefore, teachers need to meet the related emerging challenges and match education and teaching methods to students' online experiences and preferences. Preparing students for a career in the global marketplace requires helping them master 21st Century skills, which include digital literacy, inventive thinking, effective communication, and teamwork (Partnership for 21st Century Skills Learning, 2009). Teachers need to teach their students the skills that will allow them to use technology accurately and analyze information through effective critical thinking. Since there has been a pedagogical shift in learning, educators need to rethink how and what they

teach to their students. The Digital Immigrant teacher may therefore be at a disadvantage and may struggle with the technological changes within the system, and this may cause a disconnect between educators and students (Williams, 2012).

The perceptions of teachers are important because it may provide a view of how digital technology may be changing adolescents' affective and cognitive development, and thus, how educators need to address this phenomenon (Porter, 2007; Williams, 2012). Research has shown that teachers' perceptions of instructional benefits or the effectiveness of digital technology are an influential factor that affects technology integration in classrooms (Badia, Meneses, Sigales, & Fabregues, 2014; Inan & Lowther, 2010). Petko (2012), explains that the effectiveness of technology should include the items related to "whether the use of digital media could improve the quality of teaching, learning outcomes, interest, and creativity, collaborative work and learning strategies for students" (p.1355). A study conducted by Badia, Meneses, Sigales, & Fabregues (2014) suggested that factors such as teaching area, digital literacy, educational ICT training, and Internet access are important predictors of teachers' perceptions of the instructional benefits of digital technology. Educators must understand how to incorporate technologies into their classrooms to provide learning opportunities that are relevant to today students (Williams, 2012).

Today, educators no longer debate whether social networking should play a role in education. Instead, they debate which social networking tools work best and how to use them in the classroom (Herold, 2011). One of the benefits of social networking sites is that they allow students to work cooperatively on projects in an online environment with which they are familiar. Also, teachers have reported that, in many cases, a student who does not speak up in class will be more engaged on a social networking site (Herold, 2011).

On the other hand, some teachers are wary about security, advertising, information-sharing, and social interaction (Herold, 2011). To tackle these challenges, teachers must themselves continue to learn in order to teach today's Digital Native students and to effectively utilize and integrate technology into their classrooms and curriculum. To assist educators in incorporating new communication and socialization tools into the practice of teaching and learning, more websites and social outlets are being developed (Williams, 2012).

### **Communication Skills in the Classroom**

Several empirical studies have indicated that the acquisition of certain social skills is crucial to the overall success of the individual child at school (Baym, 2010; Carr, 2010; Steiner-Adair, 2013; Wartella & Jennings, 2000). The problem teachers face is that technology is advancing at a rapid pace and Digital Natives are the ones on the cutting edge (Rosen et al., 2010). Since many students today feel more comfortable chatting behind the scenes, many are not comfortable with traditional class discussions. Rather, they would be more willing to have intense online discussions. Adolescents also have their own technological language, and many no longer converse in paragraphs. Instead many communicate using abbreviated texts, instant messages, or posts to social networking sites. These text messages use abbreviations such as LOL (lots of laughs or laugh out loud) and IDK (I don't know), as well as emoticons to represent emotions (Grinter & Eldridge, 2003; Small & Vorgan, 2008). This has implications for written assignments and later in work settings in which written communication is important (whether via email or paper reports) and one has to present oneself professionally. These skills are often learned (or expected to be learned) at school.



Moreover, students may not be reading original works or reading as deeply as teachers would like; instead, they have access to online summaries and information, which allows them to learn the material quickly, through the use of shortcuts, but not deeply through close reading (Small & Vorgan, 2008; Steiner-Adair, 2013).

An important job in the middle school setting is to teach children the rules of engagement. Children need to learn how to make their way in a larger social group, read social cues, and develop skills for making friends. Learning how to communicate is one of life's greatest challenges and gifts. It is a skill to be able to communicate well, without getting upset, and to talk about what one is thinking and feeling when someone else has different thoughts and feelings. This is a core life skill (Steiner-Adair, 2013). This type of emotional intelligence begins to expand when children learn to identify and make sense of emotions and when they start to be able to express emotions in a healthy productive way. Erik Erikson observed that during early childhood, a child's inner stage seems all set for entrance into life as they go off to school. For young children, these formative years are the critical time for moral development, as well as for cognitive, social, and emotional growth (as cited in Steiner-Adair, 2013). Steiner-Adair's (2013) study suggests that children who go into kindergarten with good social-emotional awareness are better connected with their teachers and peers, are more academically engaged, and are more successful overall than children who are lacking in social-emotional awareness. In the higher grade levels teachers of adolescents need to help students build on these same abilities to ensure that adolescents can communicate in our technologically-mediated culture.

According to Harankhedkar (2016), technology has transformed the once vast world into a tiny global village. Now communication has no barriers, making it easier to strengthen close and long distance relationships and to keep in contact with old and new friends.

Digital services now available, like video conferencing, have made it possible to provide an education to students via the web that is delivered by expert faculty. The walls of the classroom no longer limit a student's educational experience. Given this, teachers need to utilize technological advances to enhance students' communication skills and help them to be successful in the changing world. Teachers need to create collaborative learning spaces and learning communities where social connections and curriculum are connected to the real world.

Changes to society's many cultural elements are ongoing, and as new skills and perspectives are gained, old skills and perspectives can be lost. Affonso reported in 1990 that educators and psychologists were starting to have concerns about how the Internet would impact the social skills and psychological well-being of children. In the years since, researchers have had different points of view on this topic. Some researchers suggest that the Internet will have a negative impact on children's social skills, while others think it will have a positive impact and consider it a positive enhancement to children's growth (Carr, 2010; Palfrey & Gasser, 2008; Rosen et al., 2010; Small & Vorgen, 2008; Steiner-Adair, 2013).

### **Interdisciplinary Approach to the Study**

This research study will utilize an interdisciplinary approach and will be grounded in social skills development, technology-mediated communication, and the cognition disciplines. In order to prepare students for 21<sup>st</sup> century thinking and learning, it is essential to examine and analyze teachers' attitudes and beliefs about the copresence FtF social skills, and make meaning through a disciplinary lens. Currently there is little research on this topic. In order to further understand the impact digital technology may have on FtF social skill and assist teachers with their pedagogy on improving these copresence FtF social skills, an interdisciplinary approach will ultimately benefit the goals of the research.

**Social Psychology View**

The research relates to social skills developmental view, a subset of social psychology, because it is important to determine appropriate adolescent communication skills in the classroom. Developing social skills enhances a person's ability to succeed in school, family, and the workforce. In this discipline, a sociological study of the development of structure, interaction, and collective behavior of adolescents is being conducted. Adolescents first learn social skills from their parents and family, and then the teacher becomes an important agent of socialization (Berk, 2002). Digital technology has changed the way students think, act, and socialize. It would be important for educators to incorporate social skills development in their curriculum to balance out the deficiencies that may be caused by digital technology. Teachers' roles are to facilitate and encourage prosocial behaviors, therefore activities should be provided to help students acquire social skills and understand why the skill is needed (Johnson, Ironsmith, Snow, & Poteat, 2000).

**Media Psychology View**

This research relates to technology-mediated communication view, which is explored in the discipline of media psychology. Media psychology is the key to understanding the implications of technology (Rutledge, 2010). According to Rutledge (2010), "the goal of media psychologists is to try to answer those questions by combining an understanding of human behavior, cognition, and emotions with an equal understanding of media technologies" (p.2). Human interactions and technology are being understood by using the lens of media psychology (Rutledge, 2010).

This study is guided by two theoretical frameworks: Bandura's Social Cognitive Theory, and McLuhan's Mass Communication Theory. Bandura's SCT proposes that parts of an individual's knowledge acquisition can be directly related to observing others within the context of social interaction and experiences, and through outside media influences. Bandura (1971) argued that humans are active information processors and they think about the relationships between their behavior and consequences. Therefore, how a person feels or thinks will affect how they behave. Due to the influential role the mass media play in society, it is important to understand the mechanisms through which symbolic communication influences human thought, affect, and action (Bandura, 2001). Adolescents today live in a world infused with digital technology, where socialization with digital gadgetry is a typical behavior for teenagers. Therefore, it is important to try to understand more about how digital usage is affecting their social processes.

In addition to Social Cognitive Theory, McLuhan's Mass Communication Theory guides the current study. Marshall McLuhan was one of the first theorists to see the importance and consequence of technology in communication skills. He saw technology and machines as the mediums for communication and gave insight on how media influences human's social lives (McLuhan, 1964; McLuhan, 2008). Since media influences the development of society, it is important not only to examine the message but also which media have transmitted the message. Besides understanding media, McLuhan's Mass Communication theory also explores the way electronic media reflect and influence modern times.

### **Educational Psychology View**

The research relates to a cognition view, which is a subset of educational psychology, in relation to educator's pedagogy, curriculum, and teachers' attitudes towards digital technology and the impact it may have on adolescents' FtF social skills. Educational psychology is the branch of psychology dealing with the scientific study of human learning, the study of the learning process, from both the cognitive and behavioral perspectives (wikipeda, 2016). Due to digital technology, education is in a period of transition as digital tools find their place in schools and libraries. Some research has shown that today's adolescents have a shorter attention span, scan when they read, and are multi-taskers (Palfrey & Gasser, 2008). According to Palfrey and Gasser (2008), teachers need to learn how their students are learning and how they can build literacy skills into their core curriculum. Learning has gone through a big transformation in the last thirty years. Education is in a transition period, and educators must discern what to preserve about traditional educations and what to replace with digitally mediated processes (Palfrey & Gasser, 2008).

Using an interdisciplinary approach, the research is first looking at teachers' attitudes, beliefs, and perceptions of teachers and their students exhibited or least exhibited FtF social skills in the classroom. Secondly, the information from this study will hopefully generate further exploration from researchers' in this field and affect policy-making at the level of higher education and curriculum development.

### Chapter Summary

All animal species have systems for communicating. The history of human communication dates back to eras of cave paintings, going from lines to symbols to alphabet letters and writing, along with the printing press, telegraph, radio, telephone, television, cell phone, Internet, and social media. Communication is important in that it allows us to inform, express ideas, and form a sense of community. As humankind's forms of communication have evolved, so have their means of communicating. Today's adolescents and young adults are being raised in an era of digital technology. They live in a virtual world and are immersed in technology. Many technological innovations have affected society; however, digital technology may not only be changing the way we live and communicate, but may be rapidly and profoundly altering peoples' brains (Small & Vorgan, 2008). These changes in the human brain may begin to occur over decades rather than millennia (Small & Vorgan, 2008).

Some research connects how technology can affect children's social development and can lessen their social skills (Boyd, 2007; Liu, 2010). Since teachers spend a significant amount of time each day with students, they see first-hand the impact of technology on children. Children growing up in a world interacting with cell phones and social media have exchanges which may lack the depth and complexities of FtF interactions (Carr, 2010; Steiner-Adair, 2013). Since digital technology is an emerging topic, few studies regarding teachers perceptions of various aspects of social media have been conducted (Williams, 2012). Therefore, it is important to acquire teachers' views on how digital technology may be influencing students FtF social skills because this information can provide a knowledge base for measures needed to address emerging concerns of how this new phenomenon is being manifested in the education system (Williams, 2012).

As Albert Einstein once said, “It has become appallingly clear that our technology has surpassed our humanity” (quoteworld.org, 2015). This reference is relevant more now than ever as technology is affecting every aspect of people’s lives, rewiring their brains and changing the way humans live, learn, and communicate with each other. This is nowhere more apparent than in the educational setting where technology is impacting how students learn, socialize, and cooperate with each other.

### CHAPTER III

#### RESEARCH DESIGN AND METHODOLOGY

The comprehensive review of the literature presented in Chapter II summarized the varying attitudes and beliefs around the positive and negative effects of digital technology on face-to-face (FtF) social skills. An analysis of beliefs around the effect of digital technology on the school environment and student academic performance as it relates to copresence FtF social skills was examined in this study. The purpose of this chapter was to discuss the rationale for the research methods developed for this study, to describe how to address the purpose and answer the research questions. This chapter also presented the methodological approach, an online Q-sort, which were used to measure the objective and subjective views of middle school and high school teachers practicing across Long Island, New York.

#### Q-METHODOLOGY

Q-methodology, a mixed-method used to investigate the perceptions of any group of people. In order to identify teachers' attitudes and beliefs about the effects of digital technology on adolescents' social skills, an online Q-sample was distributed to teacher participants to solicit the appropriate information to conduct the study. Before outlining the Q-study, a review of Q-methodology is given below.

In 1935, William Stephenson first introduced the Q-methodology or Q-technique via a letter to the journal entitled *Nature*. The new technique was to be used exclusively for studies of human subjectivity. According to Stephenson (1935) the method well-known as Q-technique is an approach where the science of behavior can be immeasurably improved by attending to a few principles. Q-technique is a combination of qualitative and quantitative techniques that provides a systematic way to explore personal beliefs and attitudes (Brown, 1996; Gould, 2007; Ramlo,



2018; Watts & Stenner, 2013). According to Stephenson (1953), “Q-technique provides a systematic way to handle a person’s retrospections, his reflections about himself and others, his introjections and projections, and much else of an apparent subjective nature” (p. 86). Q-technique is well-suited to the study of behavior where the focus is placed on representing personal choice and preferences of all varieties (Talbot, 1971).

According to McKeown and Thomas (2013), Q-methodology is a mixed methods approach to research that usually involves small numbers of participants. As McKeown and Thomas (1988) explains that Q-technique is not concerned with how many people believe in a certain topic or have certain viewpoints, but with why and how they believe what they do. In other words, “The nature of subjectivity under investigation is the factor” (McKeown & Thomas, 1988, p. 36).

The design of the current study allowed for Q-technique to be used to explore the similarities and differences among teachers’ attitudes and objective and subjective views. Q-technique was used to obtain objective opinions of teachers in Long Island, New York on whether digital technology affects adolescents’ copresence Ft F social skills. Q-technique is useful as it is a robust methodology designed to extract understanding within populations, and therefore it allowed the researcher to understand how people think (Brown, 1996, 1997). This study was referring to the modified version of Q-methodology as Q-technique to reflect the modified degrees used on the template scale, factor analysis is used instead of principal components analysis, and factor rotation using varimax (R.H. Red Owl, personal communication, March 11, 2016). As stated by R.H. Red Owl, another reason the researcher is labeling the study a Q-technique instead of a Q-methodology is that the statements being used are asking for reports of objective observations, not subjectivity dependent upon the attitudes,

opinions, or beliefs of the respondents (R.H. Red Owl, personal communication, October 21, 2015). The goal of the current study was to better understand teachers' attitudes about copresence FtF social skills and Q-technique is the method that allows for identifying the opinions and attitudes of a population. Therefore, this was the preferred method of choice.

Perceptions, attitudes, viewpoints, and objective and subjective opinions are often explored in the field of education and psychology as they help researchers better understand human behavior (Beck, 2014; Brown, 2004; Watts & Stenner, 2005). Additionally, this method allowed participants to express, evaluate, and prioritize their individual viewpoints (Gould, 2007).

### **Q-Sorts**

For this study, Q-technique consisted of obtaining several Q-sorts or statements reflecting teachers' attitudes and beliefs about digital technology and how it affects adolescents' social skills. Q-sorting is a process whereby a subject models his or her point of view by rank-ordering stimulus items based on what is personally significant to him or her (McKeown & Thomas, 1988; Watts & Stenner, 2013). Q-sorts go through a ranking procedure in which the participant places items in categories so as to approximate a normal curve of distribution with a standard deviation (Stephenson, 1953). Q-sorts can be ranked by using a free distribution grid or a forced distribution grid. For this Q-sort, the researcher chose to use "forced distribution" because participants were forced to distribute statements in groups in a normal distribution around a zero point. Q-sorting participants are called the P-set, and they are asked to rank-order the statements from their original point of view based on a judgment or feeling about them. According to Brown (1971), "Q-technique is a modified ranking procedure whereby *S* distributes a series of stimuli according to some condition of instruction" (p. 283).

Q-sorts are positioned on a rating scale to be ranked in the order of most agreed (+5) to least agreed (-5) according to participants' points of view. Statements with relative personal insignificance are placed in the middle (0). Research suggests the appropriateness of anchoring the scale with a true zero as the midpoint (Brown, 1980; Coladonato, 2013; Stephenson, 1953).

### **Factor Analysis**

Once all stimulus statements were ranked, these individual viewpoints or Q-sorts were submitted to correlation and factor analysis. The basic function of a factor analysis is to explain as much as possible about the relationships that hold between the many Q-sorts in the group. Also, through identifying any sizeable portions or common or shared meanings that are present the factors can be found (Watts & Stenner, 2013). Therefore, each factor represents a certain, unique point of view compared to all other factors. This method is designed to facilitate the expression of personal viewpoints, and it allows individuals to self-categorize on the basis of the Q-sort statements provided on a topic (Watts & Stenner, 2013). Using factor analysis, factors can be extracted to represent dimensions relevant to the research questions (Brown, 2004). Factor analysis creates profiles or groupings of people based on patterns of data. Factor analysis allows us to better identify the patterns that already exist (Susan Ramlo, personal communication, February 25, 2018). Webler et al., (2009) states that,

In the case of Q-method, the factor analysis identifies patterns among the Q-sorts. The analysis produces some number of "factors," which are particular arrangements of the Q-statements. Factors are actually q-sorts. These are called "idealized sorts" since they are produced by the analysis, not the participant. They are called "social perspectives" because they compromise many people's subjective expressions (p. 26).

These profiles can be used to identify the underlying constructs that can assist in classifying people in a meaningful way. So, in Q-technique studies factor analysis is slightly different than traditional factor analysis. Rather than the factor analysis identifying factors (or groups of items) that fit together, it is grouping people together who have similar patterns of responses.

### **RESEARCH QUESTIONS**

This research study addressed the following specific research questions:

RQ1: What are teachers' attitudes and beliefs about the effects of digital technology on copresence face-to-face social skills?

RQ2: What are teachers' beliefs about the effect of digital technology on the academic setting as it relates to co-presence face-to-face social skills?

### **Participants**

For this study, Q-technique involved the process of selecting participants from middle schools and high schools. This step is referred to as putting together the P-sample, P- set, or person-sample (Gould, 2007). The term P-set will be used in this study. Thirty to forty teachers will be invited to participate in this study in order to better understand teachers' overall subjective views. According to Watts and Stenner (2013), it is important to select participants who have defined viewpoints to express, and, even participants whose viewpoint matters in relation to the subject at hand" (p.71). Large numbers of participants are not needed to obtain good Q-technique or Q-methodological study results (Watts & Stenner, 2013).

The participants were 31 female and male teachers, who have taught at the high school level or middle school level. All participants were teachers from Long Island, New York school districts. The middle school and high school teachers represented various school districts on Long Island, New York and they were carefully selected to represent each of the demographic

categories needed to complete the P-set portion of this study. The demographic characteristics that were examined are gender, professional teaching experience, educational degree, and technology experience. Written consent was obtained from teachers prior to their participation. Participants confidentially were maintained by providing each participant with a web link to the anonymous online Q-sort survey implemented by an HtmlQ program. Participants were asked to complete the sorting task independently.

### **Instrument/Design**

The first step of the Q-technique involved developing a Q-sample, which is a comprehensive collection of stimulus items that represents the topic under investigation. These statements utilized were made through ready-made Q-samples derived from two sources: the review of the literature and conventional rating scales. Examples of conventional rating scales used for extrapolating items such as Q-sample statements are: Orion's Pragmatic Language Skills Questionnaire (2016); Jed Baker's (2003); Social Skills Menu and Secondary Social Skills Checklist (Escambia County School District, 2015); and Dimensions of Social Skills (Gresham, Sugai, and Horner's, 2001). Taking this information into account, a collection of forty-eight statements referring to teacher's perceptions of students' FtF social skills was created. Out of these statements, the researcher discovered six predominant themes for the Q-sample. The six themes that emerged were: nonverbal communication, expressive skills, conversational topic maintenance skills, conversational skills, speech conventions, and peer skills. The Q-sort was completed by the participants via the Internet application HtmlQ. HtmlQ by Aproxima Gesellschaft für Markt- und Sozialforschung Weimar, is used to create documents on the Internet. HtmlQ is a web-based interface that allows participants to perform Q-sorts over the Internet and is compatible with settings files of FlashQ. Once they had been collected,

participant responses were emailed to the investigator. Then, the data was analyzed with PQ Method, a DOS-based program designed to statistically analyze Q-data. PQ Method program was created by Peter Schmolck. The structured Q-set in this study captured teachers' attitudes and beliefs regarding how and the impact of digital technology on the academic setting. The Q-sample that was used in this study is shown in Table 3.1.

Table 3.1

*Q-Sample Theoretical Framework: Themes, Q-Statements, and Sources*

Themes	Q-Statements	Source
Nonverbal Communication	1. Maintains eye contact with speaker when talking to others	Bremer & Smith (2004) Gresham, Sugai, & Horner (2001)
	2. Uses appropriate facial expressions during conversations	Bremer & Smith (2004) (Small & Vorgan, 2008)
	3. Seldom understands the facial expressions of others	Bremer & Smith (2004)
	4. Responds appropriately to the facial expressions of other people	Small & Vorgan (2008)
	5. Recognizes nonverbal cues and gestures (body language)	Small & Vorgan (2008)
	6. Behaves and acts at an age-appropriate adolescent level	Bremer & Smith (2004)
	7. Maintains appropriate distances between people and objects	Baker (2003) Gresham, Sugai, & Horner (2001)
	8. Appropriately uses facial expressions during conversations	Baker (2003) Gresham, Sugai, & Horner (2001)

Expressive Skills	1. Tends to make inappropriate noises during social interactions	Small & Vorgan (2008)
	2. During a conversation speaks clearly and does not mumble	Baker (2003)
	3. Seldom uses appropriate volume when speaking to others	Baker (2003) Bremer & Smith (2004)
	4. Uses different tones of voice during social interactions	Bremer & Smith (2004) Escambia County School District (2011)
	5. During conversations understands the other person's perspective	Baker (2003)
	6. Does not seem to be aware of other people's interests	Blatner (2009)
	7. Usually reacts to sarcasm in an age-appropriate manner	LoGiudice & Johnson (2008)
	8. Uses metaphors appropriately during social interactions	LoGiudice & Johnson (2008)
	9. Often does not let go of an argument when speaking to others	LoGiudice & Johnson (2008)
Conversational Topic Maintenance	1. Responds to inquiries about self with more than "I don't know"	LoGiudice & Johnson (2008) Baker (2003)
	2. Seldom chooses a conversational topic appropriate to setting	LoGiudice & Johnson (2008) Gresham, Sugai, & Horner (2001)
	3. Often makes a variety of comments related to the topic	LoGiudice & Johnson (2008) Baker (2003)
	4. Introduces and discusses topic clearly with audience	LoGiudice & Johnson (2008)
	5. Often does not interpret the body language of others	LoGiudice & Johnson (2008)
	6. Chooses a conversational topic age-appropriate for setting	LoGiudice & Johnson (2008)

	7. During conversations expresses relevant information	LoGiudice & Johnson (2008)
	8. Seldom expresses relevant information concisely to others	LoGiudice & Johnson (2008)
Conversational Skills	1. Keeps conversation going when speaking to others	Skillsyouneed (2015)
	2. Does not change topic appropriately during conversations	Skillsyouneed (2015)
	3. Always tailors conversation appropriately to audience	Skillsyouneed (2015)
	4. Asks others “Wh” (who, what, why, when, where) questions	Bremer & Smith (2004)
	5. Responds insightfully to others five “Wh” questions	Bremer & Smith (2004)
	6. Often does not wait and take turns in conversations	Bremer & Smith (2004)
	7. Does not monopolize the conversation when speaking to others	Bremer & Smith (2004)
	8. During conversations appropriately interrupts peers	Baker (2003) Bremer & Smith (2004)
	9. Appropriately interrupts adults during social interactions	LoGiudice & Johnson (2008)
Speech Conventions	1. Often does not attend to what the other person is saying	Bremer & Smith (2004)
	2. Waits to be acknowledged before speaking to others	Bremer & Smith (2004) Gresham, Sugai, & Horner (2001)
	3. During conversation asks speaker to clarify comments made	Bremer & Smith (2004)
	4. Does not appear frustrated when there is a change in topic	Bremer & Smith (2004)



	5. Frequently refuses to listen to other people’s perspectives	Bremer & Smith (2004)
	6. When speaking often tends to impose their own perspectives	Bremer & Smith (2004)
	7. Often compromises appropriately during a conversation	Bremer & Smith (2004)
	8. Is sensitive in asking the speaker to explain what is meant	LoGiudice & Johnson (2008)
Peer Skills	1. Frequently negotiates appropriately during a conversation	LoGiudice & Johnson (2008)
	2. Responds appropriately to compliments given by adults	Bremer & Smith (2013)
	3. Does not respond appropriately to compliments given by peers	Bremer & Smith (2013)
	4. Appropriately describes own feelings when speaking to others	Bremer & Smith (2004)
	5. Seldom chooses to ask for directions or assistance	Bremer & Smith (2004)
	6. Responds appropriately to instructions given by adults	Bremer & Smith (2004)

The Q-sorts of the statements are prearranged distributions, also known as forced-choice distributions. An 11-point sorting scale slots for 48 statements were used to accommodate the statements in the Q-sample. The forced distribution is on a scale ranging from Most exhibited behavior (+5) to Least exhibited behavior (-5), where 0 is neutral. Q-sort is called forced distribution because participants are forced to distribute the statements in groups in a normal distribution around a zero-point skewness, with a standard deviation of 1 and a kurtosis in the range of 2.6 through 3.

This response scale avoids “yes” and “no” answers. This positioning on scale anchoring with a true zero as the midpoint of the scale has been strongly supported by Brown (1980) and Stephenson (1953). However, other scholars support and prefer scales with anchors presented on a unipolar, *least to most* scale anchor, versus bipolar, *most to most* scale anchor (North, Hosti, Zaninovich, & Zainnes, 1963; R.H. Red Owl, 2012). This study used the most to least scale anchor to score or value to an expression according to centrality to teachers’ points of view.

As R. H. Red Owl stated:

The *most to most* anchoring approach in *Q*-methodology and *Q*-technique studies may in some cases, lead to invalid (indeed, factually incorrect) measures. If a subject does not disagree with a given *Q*-statement but that subject is nevertheless “forced” to sort that statement into a *most disagree* (or any other degree of *disagree*) column on the fixed-distribution template, that subject’s response comprises substantial if not pure measurement error. If, on the other hand, that subject were to strongly disagree with the given <2 statement, that subject’s score on that statement would be accurate and correct (at least to some degree) whether the statement was sorted into a column on either the *most disagree* side of the sorting template or a column on the *least agree* side of the template. It is my view that the psychological anchor in *Q* is the middle point of a sorting scale and that it does not matter whether that half-way point is between *most to most* or *least to most*. Under either anchoring scheme, the middle score still represents the point at which a respondent’s view is least salient. (R. H. Red Owl, as cited in Coladonato, 2013, p. 54).

Regardless of, the preference of scale anchors being employed, the items which participants feel strongest about are sorted into the columns toward the extremes of the template

scale. The items toward which the participants feel less strong, as well as those subjects on which participants have no opinion or consider irrelevant, are positioned to the center of the sorting template (Coladonato, 2013; Watts & Stenner, 2013).

In the current study, the Q-sample is a set of statements that was used to elicit participants' perspectives based upon their points of view. In the Q-sample the statements represent the sample, and therefore the number of statement, which is the sample size (Ramlo, 2018). This template design and the 48 statements were incorporated into an online Q-sort program, HtmlQ, which let participants perform their individual Q-sorts online. HtmlQ is a user friendly HtmL5 application for performing Q-Sorts online. Participants must drag and drop virtual cards into slots in the online template. In this way, the participants will judge and sort the Q-statements according to their own personal perceptions and views regarding the effects or implications of digital technology on adolescents' social skills, as well as the factors that might be influencing their FtF social skills. Below is an example of a Q-sorting template that was employed in this study.

Most unlike								Most like
-4	-3	-2	-1	0	1	2	3	4

Figure 3.1. An example of a generic sorting template that might be employed in a Q study.

**Condition of Instruction**

The researcher has designed this study to explore teachers' perceptions on how modern digital technology affects adolescents' FtF social skills. Therefore, the Q-statements highlight the social skills that students should acquire in school. The code of instruction refers to the instructions that participants are given prior to beginning the Q-sort. The single code of instruction also describes the purpose of the Q-sort and the basis upon which the sorting judgments are to be made. The single condition of instruction for this study reads as follows: "Using your professional insight and experience as an educator think about the increasingly widespread adolescents' use of social media and cell phones, complete this Q-sort based upon your observations of students' social skills throughout your educational career. Please sort the following statements into the template in terms of your views of the most exhibited to the least exhibited social skills."

According to Watts and Stenner (2013), participants must be able to respond effectively to the question in line with an appropriate condition of instruction, for example, by sorting a set of provided items along a single, subjective criterion, such as most agree to most disagree, and most important to most unimportant. Participants were asked to first carefully read all items to get a sense of the total list. After reading through all the items, they were asked to rank-order the Q-statements on a template scale, which ranged from most frequently exhibited social skills in the education setting (+5) to the least frequently exhibited social skills in education (-5). The participants were offered the opportunity to review their sorting decisions and rearrange the placement of any statement cards.

**Focus Groups**

Two focus groups were conducted to test the Q-sample, which was designed to best represent social and language skills. The focus groups were conducted using eight middle school

and high school teachers from Long Island School Districts. The sole purpose of the focus groups was to gather information for clarity, and to validate the aspects and design of the research instrument prior to its use. Some of the aspects being investigated during the focus groups will be to examine if the clarity of directions for the Q-sort, the ease with which the participants could sort the statements, and the interpretation and clarity of the Q-statements.

Participants reviewed statements based on their content and domains. By investigating teachers' rankings in the focus groups, the researcher determined that the Q-set is somewhat reliable. No changes to the Q-set were made and focus group sessions were approximately one hour in duration. The time required to complete the Q-sort online was approximately 30 minutes.

#### **DATA COLLECTION**

Q-technique provides a foundation for the systematic study of subjectivity, objectivity, and a person's viewpoint, opinion, beliefs, and attitudes (Brown, 1993). This methodology enabled the participants to model their viewpoints regarding the Q-sort in a systematic ranking that is most in line with their viewpoints.

The Q-sorting process gives objective and subjective meaning to the Q-statements as the participants read the Q-sorts, and then assesses and connects them with their own experiences and feelings.

Using HtmlQ, participants sorted the statements based on the social skills they have seen to be most and least exhibited in the classroom (Watts & Stenner, 2013). The instructions provided in the survey explained the nature of the piles as follows: (1) the pile on the right is for the statements the participants view as representing the most exhibited social skills behaviors in their classrooms; (2) the pile on the left is for the statements participants view as representing the least exhibited social skills behaviors in their classrooms; and (3) the center pile is for the

statements about which participants have no opinion or that represent behaviors not observed in their classrooms.

Next, the participants were asked to sort the statements into the grid where +5 is the “most exhibited” and +1 “slightly less exhibited,” and -5 is the “least exhibited,” and -1 “slightly less exhibited.” Participants should work their way from the outside of the grid to the inside of the grid, by placing the +5 and -5, then +4 and -4, then +3 and -3, +2 and -2, and +1 and -1, and then the 0’s. Participants were asked to keep sorting the statements until all the boxes under most exhibited, least exhibited, and neutral contain statements. Participants were offered the opportunity to review their sorting decisions and rearrange the placement of any statement card before their results are recorded.

After completing the Q-sort, participants answered socio-demographic questions. Due to convenience, data was collected online, but it was important for the participants to be engaged with the Q-sorting process.

With this in mind, the HtmlQ software was chosen for the collection of the statements, as it is very effective in reproducing all the aspects of the by-hand sorting process (Watts & Stenner, 2013).

### **DATA ANALYSIS**

Stephenson (1935, 1953) was interested in providing a way to reveal the subjectivity involved in any situation. Q-methodology is an innovative by-person adaptation of the traditional multivariate technique of by-variable factor analysis (Coladonato, 2013). In traditional R methodology, normal factor analysis is used to find correlations between variables and is concerned with a selected population of individuals. On the other hand, with Q-technique, factor analysis is used to analyze data by reducing many individual viewpoints down

to a few factors (Watts & Stenner, 2013). According to McKeown and Thomas (1988), “Data analysis in Q typically involves the sequential application of three sets of statistical procedures: correlations, factor analysis, and the computation of factor scores” (p. 46). The next step of the Q-technique study was to compare the individual arrangements of using statistical analysis. After the data was coded and collected, the software program PQ Method was used to complete the data analysis.

First, the correlation matrix of all Q-sorts was created through the intercorrelation of each Q-sort with every other sort (Watts & Stenner, 2013). Hence, levels of agreement and disagreement between the individual sorts, or the degree of similarity to dissimilarity in points of view between the individuals will be represented (Brown, 1980, 1993). Participants with the same views will share the same factors. According to Watts and Stenner (2013)

According to Watts and Stenner (2013), looking for this meaning (and sorting) variability present in the data is known as the study of variance.

This overall variance can be divided into three types of variances. The first type of variance is the common variance, where meaning and variability in a Q-sort are held in common with the group. The second variance is the specific variance, where the meaning is particular to specific persons and to specific Q-sorts. The third variance is error variance and this is produced by random error. Error variance can also be produced by the imperfections introduced by all methods and systems of data gathering. On the other hand, Ramlo states,

Actually, variance is of little importance within Q methodology. It is more about the patterns and the descriptions of the viewpoints and not how many people are represented by each viewpoint (which is really all the variance accounted for represents) – although we all typically

mention the number of sorters identified on a factor in Q (Personal communication, February 25, 2018).

Next, this correlation matrix went through factor analysis. The basic function of factor analysis was to identify the number of natural groupings of Q-sorts through the virtue of their being similar or dissimilar to one another and to account for variance (Brown, 1980; 1993; Van Exel & Graaf, 2005). Factors were derived from the common variance and are often called common factors. Next was the process of factor extraction, which involved the identification and removal of distinct portions of common variance from the correlation matrix (Watts & Stenner, 2013). This gave a measure of the extent to which each individual Q-sort exemplifies that factor. This measure is known as factor loading. A factors eigenvalue (EV) is calculated by summing the squared factor loading of all the Q-sorts on that factor. Furthermore, eigenvalue and variance figures ought to explain a decent proportion of the study variance and that is highly likely to involve a set of factors with relatively high eigenvalues. Also, factors with eigenvalues higher than 1.00 should be extracted (Watts & Stenner, 2013).

The next step of the analysis was factor rotation, which is done to preserve as much of the variance as possible and arrive with a final set of factors. Rotation may be either objective, according to some statistical principle (varimax), or theoretical (or judgmental), driven by theoretical concerns, some prior knowledge of the investigator, or an idea explored by the study (Brown & Robyn, 2004; Van Exel & Graaf, 2005). Through factor rotation, the investigator in the study ensured that each factor offers the best and most meaningful point of view that teachers hold about digital technology and adolescents' FtF social skills.

The final step taken before the factors were described and interpreted, was the calculation of factor scores and difference scores. In Q-studies, interpretations are based primarily on factor



scores which are the normalized weighted average statement scores (*Z*-scores) of respondents that describe that factor (Van Exel & Graaf, 2005). Van Exel and Graaf (2005) state that, “Based on their *Z*-scores, statements can be attributed to the original quasi-normal distribution, resulting in a composite Q-sort for each factor” (p. 9). Once factors were computed, the investigator looked back at the Q-sorts and saw how high or low their loadings were on the different factors. Factor loading statistical significance levels can be calculated as a *z* (sum of eigenvalues/ $\sqrt{n}$ ), where *n* is the number of Q-statements in the Q-set and *z*-score reflects a specified confidence level.

### VALIDITY AND RELIABILITY

Q-methodology claims to capture the viewpoints, or perspectives, of participants in the form of their Q-sorts. According to Watts and Stenner (2013), “Repeated administration of a Q-sort to a single participant actually tells you more about reliability, or otherwise, of the participant’s viewpoints than it does about the reliability of the method” (p. 51). The emergence of similar factors in a Q-technique is an example of reliability or reliable schematics, when similar Q-studies are carried out with identical or closely related groups of participants (Watts & Stenner, 2013). Q-studies produce reliable results and the internal consistency of Q-scores has been demonstrated via test-retest reliability and through the analyses of Q-sorts in ranges of .80 upward.

Additionally, Q-sorts can be repeated with results of 85% consistency (Brown, 1980; Coladonato, (2013). The most important type of reliability for Q is replicability ((Brown, 1980; Thomas & Baas, 1993; Van Exel & Graaf, 2005). As Ramlo states, “Certainly the results of Q-studies have been found to be replicable (personal communication, February 25, 2018). Validity can increase the accuracy and ensures that a study measures what it purports to measure.

However, according to Brown (1980), since there is no external criterion for any person's point of view, the issue of validity of Q-sorts does not apply and is not relevant in Q-methodology. The test-retest reliability of the Q sorts has been shown to be 0.80 or higher (Brown, 1980). Q-technique is therefore an appropriate choice whenever a researcher wants to explore various perspective and consensus within a group regarding any topic (McKeown & Thomas, 1988; Newman & Ramlo, 2011).

### LIMITATIONS

There were a few limitations to this study. First, Q-technique studies are not meant to be replicated into a larger set of participants due to the objective and subjective nature of this type of study; thus, the use of this technique could be considered limiting regarding the ability to generalize sample results to the general public. During an online communication with Susan Ramlo (personal communication on February 25, 2018) she explained,

Typically, generalizability is a desirable goal of social science research. However, Q is not generalizable in the typical sense of that term. Thomas and Baas (1993) distinguish two types of generalizability in social science research by focusing on two types of generalizability: statistical inference and substantive inference. The more typical generalizability would be statistical inference, where the purpose is generalizing to a larger audience from a large, random sample of participants. Q methodology, however, uses substantive inference, where the focus is a more qualitative one about the phenomenon (Thomas & Baas, 1993). In Q-methodology, Q factors represent generalizations about how persons of a certain perspective think about the topic under investigation (Brown, 1980; Thomas & Baas, 1993). In other words, generalizations in Q relate to general principles such as the relations of and between factors (Brown, 1980).

Next, since participation in this study was anonymous, it is not possible to follow up with participants in interviews or to ask them any further questions. Furthermore, in this study there were no interviews or written comments regarding the sorting process or selection of most salient statement. Also, there were more females than males represented in this study. Another limitation in this study was that the participants were from one geographic area that shares similar demographic features. Participants were only from Nassau and Suffolk county schools on Long Island, New York.

### **IMPLICATIONS**

This study may lead to a better understanding of teachers' perceptions around how digital technology is impacting adolescents' FtF social skills. This research may prompt higher education or pre-service educational programs to supply strategies so that teachers can adjust their teaching to best meet the needs of this new digital generation of students.

### **ETHICAL CONSIDERATIONS**

#### **Confidentiality**

The anonymous participants who volunteered for the study were professional teachers from schools located in the Nassau and Suffolk counties, New York. The identity of the participants, as well as the data sets, was kept confidential. The real names of the participants were not used in any part of the study. Any identifying information was excluded from all written reports. The anonymous survey posed no known threat or anticipated risk to the participants nor to the institutions do they represent.

#### **Human Participants Research Board**

All guidelines as prescribed by the Institutional Review Board (IRB) of Long Island University were employed to ensure the protection of all subjects. All participants in the study

read a digital copy of an informed human subject consent document prior to participating in the study. All implications for participating in the study were clearly outlined in the information about and explanation of the study. All the participants had an opportunity to withdraw from the study without any explanation by simply refusing to grant permission for their results to be utilized. And withdrawing from the study did not penalize them in any way.

### **Disclosure and Control of Potential Researcher Bias**

Given that the researcher's occupation is an educator, it was essential that steps were taken to reduce any potential bias. Approval or exempt status for this research was requested from the Long Island University Institutional Review Board to collect and analyze data.

Researcher bias was controlled by using a mixed methods approach which was to combine focus groups, Q-technique, and Q-set. Participants voluntarily agreed to participate in the study. Also, participants were provided with an explanation of the study prior to their participation. Allowing for transparency by regarding all methodological judgments and decisions within this study further reduces the potential of researcher bias (Coladonato, 2013). Information generated from the online survey was not revealing the identities of the subjects or the school district where they are employed. Using well-crafted Q-statements derived from the literature review reduced the potential for opposing influence due to researcher bias. R.H. Red Owl reviewed the Q-statements sample to assure that the Q-sample was a representative of both the favorable and unfavorable viewpoints (R.H. Red Owl, personal communication, October 21, 2015). Additionally, using a mixed methods approach assisted in minimizing potential bias through qualitative and quantitative measures.

### CHAPTER SUMMARY

This chapter introduced the overall design of the study. Q-technique was employed as a research method for this study because it provided a systematic approach to investigate and develop a better understanding of teachers' perceptions, beliefs, and attitudes, and as it develops meaning from personal experiences (Brown, 1970; McKeown & Thomas, 1988). Q-technique was chosen because through factor analysis it provided information on the viewpoints held by participants at the time of the study, and it allowed the researcher a means to identify clusters of those viewpoints.

The next chapter presents and discusses findings and the formal results of the study. Descriptive statistics are also presented and described, followed by a discussion inclusive of conclusions, implications, recommendations for policy and practice and recommendations for future research.

## CHAPTER IV

### ANALYSIS AND FINDINGS

The purpose of this Q-methodology [Q] study was to identify, contrast, and describe the shared viewpoints and beliefs held by middle school and high school teachers about how digital technology affects students' copresence face-to-face (FtF) social skills and how these effects relate to the academic setting. Additionally, this research examined how and to what extent demographic factors are associated with the shared viewpoints of teachers. Q was utilized in this study and Q-sorts were conducted with 31 participants from Long Island School Districts. The findings are based on data obtained from the Q-sorts discussed in Chapter III.

The first section of this chapter describes the participant demographics and the data collection processes. Next, the Q analyses, which were completed using the computer program PQMethod 2.35 (Schmolck, 2014) are discussed. Finally, a discussion of the research results based on the analyses concludes this chapter.

#### ANALYSIS OF DATA

After the data collection phase of the research was completed, the computer program PQMethod 2.35 (Schmolck, 2014) was utilized to complete the data entry and analysis. The analysis included the correlation of Q-sorts, and factor analyses of the correlation matrix and the computation of factor scores (McKeown & Thomas, 1988). Analyses of the factors in Q provide highly descriptive content-rich results (Newman & Ramlo, 2010). During a phone conversation and email correspondence with Peter Schmolck, he explained:

People's views expressed in their Q-sorts certainly aren't idiosyncratic in general.

There exists the possibility, or more precisely, possibilities to construct certain generalization types of view under which many or most of the individuals' views can be subsumed. I would like to claim that the human brain would be able, in principle, to find

such generalized ideas when looking through all Q-sorts, sorting and resorting presumed underlying ideas in one's head, and aligning them to real expressions in individuals' Q-sorts. The reason for this claim is that I wish not to overload the task of factor analysis with unverified premises (personal communication, August 10, 2017).

Factor analysis is the most important statistical tool in Q-methodology (McKeown, 1988). It provides a way through which participants' viewpoints can be represented by factors. Each factor represents a unique view of the topic being studied. Once the data is gathered and factors have been produced, tables are created to represent each factor and distinguishing statements for each factor (Newman & Ramlo, 2011). Hence, Q-methodology is an appropriate choice whenever a researcher wants to examine the various perspectives and consensus in a group regarding a topic (Brown, 1980).

An initial unrotated factor solution (see Appendix A) is the starting point for the factor analysis followed by factor rotation and factor identification. Initial factors represent latent variables, and the PQMethod 2.35 is a specialized computer program used to uncover these latent variables. In this study, PQMethod automatically extracted eight unrotated factors and calculated the strength of each Q-sort on those factors.

Using the PQMethod computer program, 48 statements were correlated and factor analyzed. Three factors were extracted and rotated, which together explained 44% of the study variance. Of the 48 statements, (79%), 38 loaded significantly on one or another of these three factors. Factor loadings of  $\pm 0.38$  or greater were significant at the  $p < 0.01$  level (Brown, 1980; Watts & Stenner, 2012). The unrotated factor solution (see Appendix B) conducted in QPCA, Principal Components Analysis (PCA) with varimax rotation, computed all eigenvalues and corresponding percentage figures.

Although an original solution contained five factors (with PCA extraction and varimax rotation), Q expert Susan Ramlo's review of the data, including the scree-test, indicated a more probable three-factor solution with centroid factor extraction and hand (theoretical) rotation based upon theoretical significance (Ramlo, personal communication, March 3, 2018). The final factor solution contained two factors, including a bipolar factor. The software allowed the researcher to divide the bipolar factor into two factors (one with positive loading sorts and the other with negative loading sorts) for ease of interpretation. For this same reason, the third (negative) factor was inverted so that the loadings were positive. Separating the bipolar factor allowed for improved factor interpretation.

This three-factor solution resulted from a centroid extraction following a hand (judgmental) rotation. From a theoretical standpoint, the three-factor solution is a better solution than the former five-factor solution, as triangulated by referencing written comments of participants and the literature review. The three factors were extracted together and explained 44% of the study variance. In addition to the data output, all notes taken during the focus group and all information gathered from the Q-sort survey, including participants' answers to both demographic and open-ended questions were analyzed.

### **Participants**

The 31 participants in this study were educators teaching in middle schools or high schools in Long Island, New York. The Q-sorts were completed by the participants during the spring or summer of 2017. There was variation in the age, teaching experience, and educational levels of the participants. An identification number was assigned to each participant in numeric order beginning with one and ending with 31, according to the order in which they completed their anonymous online Q-sort. The eight demographic questions gathered information from the



participants included questions on gender, age, level of higher education, teaching experience, and academic level of teaching.

The respondents that participated in this study were 20 females and 10 males. One participant decided not to reveal his or her gender. The highest educational level obtained by the participants was as follows: 11 teachers had their Masters, six teachers had Masters+30, four teachers had their Masters+45, and ten teachers had their Masters+60. Years teaching ranged from four years or less to 20 years or more. Four participants had been teaching four years or less, eight teachers had been teaching between five and ten years, ten teachers had been teaching between 11 and 20 years, and eight teachers had been teaching 20 years or more. One participant did not provide their years of teaching experience. Eight out of the 31 participants do not utilize social networks for personal use. These participants (Participants 5, 7, 10, 12, 13, 14, 22, and 27) varied in age, gender, and years of teaching experience.

There was a good representation of all the age groups within the categories provided. Five participants were in their twenties, nine participants were in their thirties, six participants were in their forties, four participants were in their fifties, and seven participants were in their sixties. Most of the participants taught sixth grade (twelve participants), with eight participants teaching seventh grade, seven participants teaching eighth grade, and four participants teaching at the high school level. Table 4.4 provides the demographic data collected from the 31 participants who completed the Q-sorts.

### **Post Q-Sort Questionnaire**

In addition, in a post Q-sort questionnaire teachers answered three open-ended questions regarding their viewpoints and beliefs about students' social networks. Since the Q-sorts was anonymous and had specific statements on verbal and nonverbal social skills, the researcher

wanted to obtain teachers’ perspectives regarding digital technology and adolescents’ FtF social skills. Specifically, they were asked about students’ digital technology usage and the effect, if any, it is having on students’ social skills and how this may be impacting their social interactions with others. Additionally, teachers were also asked to describe their knowledge of instructional technology. All 31 participants responded to these open-ended questions. Five categories emerged, and they will be discussed later in the Q-models descriptions. In this study, there were no interviews or written comments regarding the sorting process or selection of the most or least salient statements.

**Q-Sort**

Participants completed a Q-sort with 48 statements. There was no right or wrong way to distribute these statements. It was up to the sorter (i.e., participating teachers) to decide how to interpret these statements based on his or her view of their meaning (Newman & Ramlo, 2011). This sorting process is self-referential (Brown, 1980; Stephenson, 1953). A forced-choice, normal distribution was used to complete the Q-Sorts. Figure 4.1 demonstrates a Q-sort finished by one participant.

**Q-Sort Completed by Participant 11**

Least Observed

Most Observed

-5	-4	-3	-2	-1	0	1	2	3	4	5
2	16	4	8	3	1	6	10	17	31	29
13	25	37	9	7	5	12	14	18	36	40
	48	45	28	11	15	20	26	27	47	
		46	42	21	19	22	33	35		
			43	30	23	24	34			
				41	32	44				
					38					
					39					

Figure 4.1. Completed Q-sort with 48 statements regarding adolescents’ social skills placed on a quasi-bell chart.

### Q-FACTOR ANALYSIS

In Q, factor analysis is conducted to identify clusters of persons with shared viewpoints. In this study, the viewpoints were regarding the effects of digital technology on adolescents' FtF social skills and were used in the creation of the Q-models. The Q factors identify distinct clusters of participants with similar views. Other results from the analyses were used in the development of the Q-models which describe each distinct viewpoint. As stated earlier, the factor analysis was based on the best theoretical solution using centroid extraction with hand rotation. Using the command QPCA in PQ Method, the Principle Component Analysis (PCA) was performed and a table of eigenvalues was displayed (see Appendix E).

#### Scree Plot

A scree plot (Catell's Scree Test, 1966) was created and used to inspect the eigenvalue criterion for factor extraction. A scree plot of the eigenvalues helped the researcher visualize the relative importance of the factors. Usually the factors above the "elbow" point in the scree plot explain the largest amount of variance. On this scree plot, the elbow or the slope flattens out at three factors and at eight factors. An analysis was performed for a three, four, five, seven, and eight factor solution. Since the three-factor solution explained 44% of the variance, it was determined that the three-factor solution would be used to capture the nuances of adolescents FtF interactions and teachers' perceptions about them. Factor 1 explains 20% of the variance; Factor 2 explains 12% of the variance; and Factor 3 explains 12% of the variance. There remains an unexplained variance (58%) in this Q-sample that cannot be captured without interviewing the participants. Figure 4.2 shows the scree plot that was created and used to examine the eigenvalue criterion for factor extraction.

Based on the visual inspection of the scree plot, the three factors selected have the following eigenvalues (EV): F1= 7.22, F2= 3.76, F3= 2.09. The percent variance explained for each factor is F1= 23.30%, F2= 12.11%. F3= 6.73%.

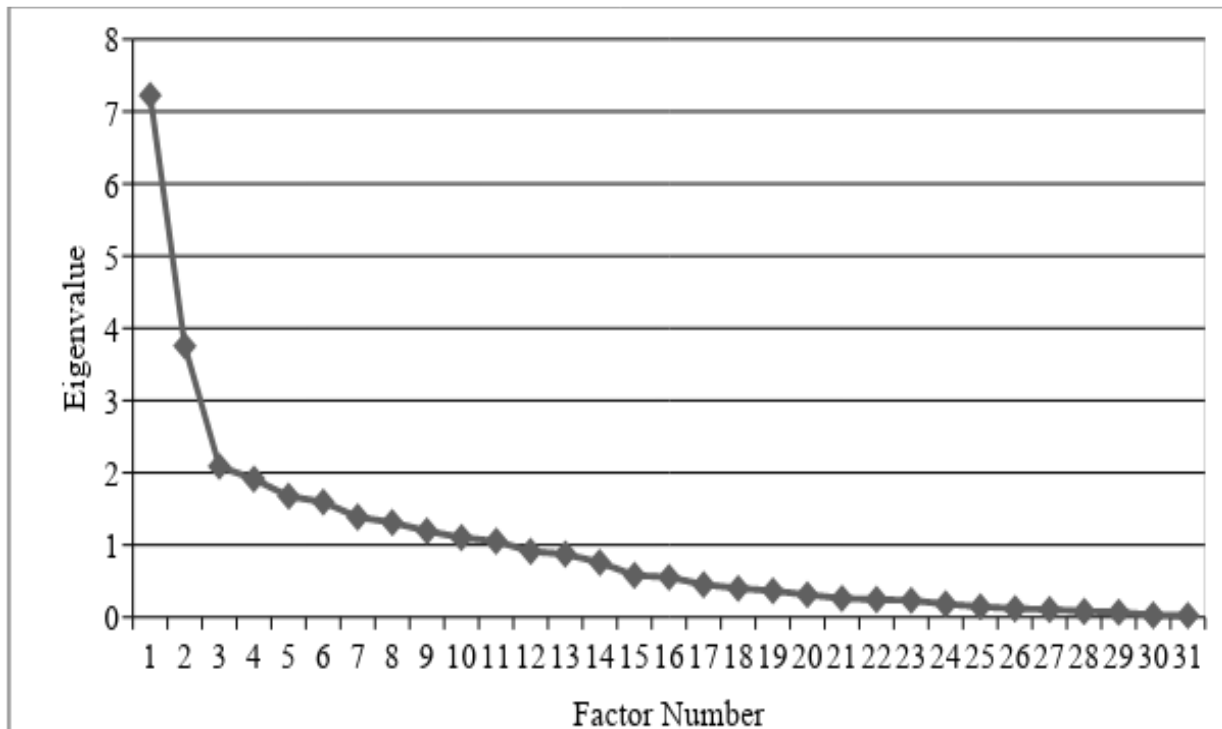


Figure 4.2. Scree plot of eigenvalues by factor number. This plot was used in determining the number of factors to be extracted and analyzed.

The median, medium, and maximum factor loadings (in absolute value form) were calculated for each of the three-factors as indicators of the strength of the views used in the interpretation of each viewpoint. The minimum absolute value of Factor 1 was .38 and the maximum was .77, with a median of .67. The minimum absolute value of Factor 2 was .37 and the maximum was .73, with a median of .52. The minimum absolute value of Factor 3 was .30 and the maximum was .49, with a median of .44. Standardized factor scores (z) were produced for each statement for each factor to determine specific models to describe the shared viewpoints and beliefs held by middle school and high school teachers about the effects of digital technology on copresence FtF social skills.

### **Confounders**

One should choose a model in which the number of “confounders” (those who load on more than one factor) and “non-loaders” (those that do not load on any factor) are minimized (Webler, Danielson, & Tuler, 2009). Confounded Q-sorts are excluded from the analyses because they are not associated with a single-factor. The three-factor solution had less “confounders” and “non-loaders”. A total of 21 of the 31 (68%) participants loaded on only one factor. Nine participants were considered “non-loaders as they had low loadings across the three factors. One participant, P9, had shared representation across Factors 1 and 2. This participant was considered to be a confounder.

### **Factor Rotation**

Factor rotation is important to use in order to find a more interpretable factor solution and to view each Q-sort from different vantage points. According to Brown (1999), “Factors are a function of the lived experience of individuals, and they are purely inductive in the sense that their number and character have been induced from those individuals who produce them” (p. 619). Using the PQMethod program, an initial varimax rotation was performed by taking in the unrotated matrix file created by QPCA, and rotating all the factors. Devised by Kaiser (1960), varimax factor rotation is strictly mathematical and provides an orthogonal solution.

However, the final solution used centroid extraction, followed by hand rotation. Since the researcher is interested in subjectivity, the use of centroid extraction in conjunction with hand rotation illustrates the strong qualitative aspect of factor analyses.

The use of centroid extraction of factors, followed by hand rotation, allows the investigator the opportunity to rotate based upon the hunches and to examine the data from a theoretical standpoint (Brown, 1986; Newman & Ramlo, 2010; Stephenson, 1953).

After the centroid extraction and hand (judgmental) rotation were performed, sorts were identified with factors (flagged). The flagging was used to select those sorts that loaded highly (positively or negatively) on each factor. “Flagging is important because the final description of each factor will be based on a weighted average of only those sorts flagged as loading on that factor” (Webler et al., 2009, p. 31). In the PQMethod manual, Schmolck (2014) explains:

The *pre-flagging algorithm* is designed to flag ‘pure’ cases only, according to the rule: Flag loading *a* if (1)  $a^2 > h^2/2$  (factor ‘explains’ more than half of the common variance) *and* (2)  $a > 1.96 / \text{SQRT}(\text{nitens})$  (loading ‘significant at  $p < .05$ ’). The communality,  $h^2$ , of a sort assesses the proportion of its variance accounted for by the factors.  $h^2$  is computed as the sum of the squared factor loadings ( $a^2$ ), and therefore increases with the number of factors extracted. Communality coefficients are not affected by factor rotation, i.e., rotation of a given number of extracted (unrotated) factors, does not change any sort’s  $h^2$ . The Cumulative Communalities Matrix is a synoptical table that displays the  $h^2$  coefficients for any number of extracted factors one might decide to keep for rotation (p. 14).

Defining sorts were flagged with an “X” highlighted in grey to mark them. Table 4.1 presents the factor matrix with the flagged sorts for each factor.

Table 4.1

*Factor Matrix with an X Indicating a Defining Sort*

QSORT	Factor 1	Factor 2	Factor 3
P1	0.5701x	-0.2124	0.2124
P2	0.4347x	0.2125	-0.2125
P3	0.7180x	-0.2167	0.2167
P4	0.3826x	0.1252	-0.1252
P5	0.0963	0.5244x	-0.5244
P6	-0.157	0.6791x	-0.6791
P7	0.4606x	-0.1827	0.1827
P8	-0.3392	0.7257x	-0.7257
P9	-0.4618	0.5824	-0.5824
P10	-0.1089	0.3662x	-0.3662
P11	0.2289	0.0409	-0.0409
P12	0.3054	0.1491	-0.1491
P13	0.6723x	-0.0939	0.0939
P15	0.6723x	-0.1802	0.1802
P16	0.4860x	0.0753	-0.0753
P17	0.1182	-0.0382	0.0382
P18	0.3623	0.4089	-0.4089
P19	0.3724	0.2581	-0.2581
P21	-0.0944	0.3767x	-0.3767

(continued)

Table 4.1. Factor Matrix with an X Indicating a Defining Sort (continued)

QSORT	Factor 1	Factor 2	Factor 3
P22	0.2005	-0.4401	0.4401x
P23	0.6847x	0.1827	-0.1827
P24	-0.0804	0.1093	-0.1093
P25	0.6330x	-0.1769	0.1769
P26	-0.0955	0.4858x	-0.4858x
P27	0.6841x	-0.0803	0.0803
P28	0.4592	-0.3941	0.3941
P29	0.3317	0.0854	-0.0854
P30	0.0349	0.6231x	-0.6231
P31	0.6515x	-0.2501	0.2501
P14	-0.0077	-0.2975	0.2975x
% variance explained	20	12	12

*Note.* This model explains 44% of the variance.

In all factor analysis, negative loadings are just as important as positive loadings. Both negative and positive loadings have an equal influence in defining the meaning of a factor. A positive loading of 1.0 is a perfect correlation, a -1.0 loading is a perfect negative correlation, and a correlation of zero indicates that there is no correlation between the two variables (Brown, 1980; Ramlo & Newman, 2010).

In Q, the correlation between factors is useful for indicating which pairs of Q-sorts bear a resemblance to each other (Brown, 1980). According to Brown (1993), the correlation that is between 2 and 2.5 times the standard error is considered significant. However, Watts and Stenner (2012), argue that this cut-off point leads to the extraction of too many factors. Furthermore, Brown (1980), agrees that this cut-off point could lead to meaningful and “significant factors” (factors with eigenvalues less than 1.00) being left behind.



Upon completion of the correlation matrix, the correlation coefficients were determined. To determine if a participant's view was strongly related to the calculated common view across a group of participants, a standard error for a factor loading was used. McKeown and Thomas (1988) noted, "The standard error for a zero-order factor loading is given by the expression  $SE = 1/\sqrt{N}$ , where  $N$  = the number of items in the Q-sample" (p. 50). Furthermore, according to Brown and Good (2010), "The standard error, therefore, enables us to evaluate the strength of a correlation coefficient by comparing it to a theoretical situation where all is random" (p.284). A forced-choice, normal distribution was used to complete the Q-sorts. Each Q-sort had a mean of 0, a standard deviation of 2.609, and a standard error of .144 ( $SE = 1/\sqrt{48} = .144$ ). No participant deviated from the sorting grid provided. A correlation matrix (see Appendix D) was used as it indicates the extent to which each Q-sort is correlated or uncorrelated in terms of significant or insignificant loadings (Brown, 1991).

After the participants were flagged and associated with a specific factor, factor arrays were created for each factor. A computational procedure consisted in standardizing every Q-sort, and then applying different weights for every sort depending on the sort's factor loading and computing the weighted average (Schmolck, 2014). According to Schmolck (2014):

Every factor score is z-standardized again, i.e. every factor score has the same mean (0) and standard deviation (1), and hence scores are directly comparable across factors. The formula for the factor weights, according to Brown (1980) originates from Spearman (1927):  $w_{ij} = a_{ij} / (1 - a_{ij}^2)$ , where  $a_{ij}$  is the factor loading of the  $i$ th individual on the  $j$ th factor, and  $w_{ij}$  is the weight. Compared to the regression approach for the computation of exact factor scores (à la SPSS, see below), this is a very simple formula. In effect

the weights over proportionally increase the impact of higher loadings on the respective factor (p.11).

This is done by weighting the item response of each of the persons most highly associated with a given factor by the degree to which they are loaded on that factor. The higher a person's loading on the factor, the greater the weight. The Q analyses include the computation of the factor scores to accommodate the fact that the groupings of persons that are selected as factor representatives do not usually fall into orthogonal positions in factor space, as do the factor axes themselves, which are located for representing the configuration of sorts with maximal parsimony (Schmolck, 2014). Maximal parsimony is the principle in science where the simplest answer is preferred. Although the sorts may not be orthogonal to each other, the factors are orthogonal. That's why the factors are looked at instead of the individual sort (Susan Ramlo, personal communication, May 10, 2018) Therefore, factor scores are correlated to at least a small to medium degree, with the size of the correlations reflecting the relative degree of similarity vs. distinctiveness (Schmolck, 2014).

### **Correlation among Factors**

A factor represents a grouping of persons around a common pattern of sorting items and they elucidate the viewpoint being expressed by a particular factor. Therefore, a factor represents a type of person and determines which set of people cluster together (Brown, 1993). The three-factor Q-model was extracted using centroid rotation, and a hand (judgmental) rotation, which produced a shared variance between factors 1 and 2 ( $r = -.31$ ), factors 1 and 3 ( $r = .21$ ), and factors 2 and 3 ( $r = -.68$ ). "For a correlation between a Q-sort and a factor to be regarded as significant it must exceed the point of 1.96" (Kobbernagel, 2013, p. 74).

Table 4.2 presents the correlations between factors. Inter-correlations of the various factor arrays give a basic indication of the relationship between the factors.

Table 4.2

*Correlations between Factor Scores*

	1	2	3
1. Factor 1	--	--	--
2. Factor 2	-0.306	--	--
3. Factor 3	0.213	-0.679	--

*Note.* Explains 44% of variance, and a correlation of -.68 between factors at highest between the split bipolar factor.

### Factor Arrays

An important output table generated from the PQMethod program is the table of factor arrays (ranging from +5 to -5), which indicates the extent to which each of the 48 statements characterizes each of the three factors (Brown, 1996; McKeown & Thomas, 1988; Schmolck, 2014). Participants were asked to sort the statements into the grid where +5 is referred to the “most exhibited” FtF social skills being observed, +1 meant “slightly less exhibited” FtF social skills were observed, -5 meant the “least exhibited” FtF social skills behavior were observed, -1 meant “slightly less exhibited” FtF social skills were observed, and a 0 was neutral or nothing was observed. Each factor array serves two functions. The first function is to constitute a composite Q-sort reflective of the views of the participants on a specific factor, and the second is to use these scores to differentiate the factors/viewpoints (McKeown & Thomas, 1988).

Factor arrays, along with other analysis output, elucidate the viewpoint being expressed by a particular factor. According to Brown (1993), factor analysis reveals the number of factors, which is purely empirical and wholly dependent on how the Q-sorts are performed.

The factors are a representation of how the participants ranked the statements to create the factor arrays. Table 4.3 presents the factor array for the three-factor solution, where the distinguishing statements are highlighted in dark grey and the consensus statements are highlighted in light grey.

Table 4.3

*Factor Arrays for All Three Factors*

No.	Statement	Factor		
		1	2	3
1	Maintains eye contact with speaker when talking to others	1	-1	0
2	Uses appropriate facial expressions during conversations	2	0	-3
3	Seldom understands the facial expression of others	2	-3	5
4	Responds appropriately to the facial expression of other people	1	-1	-3
5	Recognizes nonverbal cues and gestures	0	0	0
6	Behaves and acts at an age-appropriate adolescent level	-1	2	-4
7	Maintains appropriate distances between people and objects	0	1	-1
8	Appropriately uses facial expressions during conversations	1	0	1
9	Tends to make inappropriate noises during social interaction	2	-3	3
11	Seldom uses appropriate volume when speaking to others	3	-2	1
12	Uses different tones of voice during social interactions	2	0	2

(continued)

Table 4.3. Factor Arrays for All Three Factors (continued)

No.	Statement	1	2	3
13	During conversations understands the other person's perspect.	2	1	2
14	Does not seem to be aware of other people's interests	-2	0	0
15	Usually reacts to sarcasm in an age-appropriate manner	1	0	-4
16	Uses metaphors appropriately during social interactions	-4	0	-1
17	Often does not let go of an argument when speaking to others	4	-2	1
18	Responds to inquiries about self with more than I don't know	0	2	4
19	Seldom chooses a conversational topic appropriate to setting	2	-4	0
20	Often makes a variety of comments related to the topic	1	-5	3
21	Introduces and discusses topic clearly to audience	1	3	0
22	Often does not interpret the body language of others	0	-4	4
23	Chooses a conversational topic age-appropriate for setting	-1	4	-2
24	During conversations expresses relevant information	0	4	-2
25	Seldom expresses relevant information concisely to others	3	-3	1
26	Keeps conversation going when speaking to others	-1	2	-2
27	Does not change topic appropriately during conversations	2	-4	2

(continued)

Table 4.3. Factor Arrays for All Three Factors (continued)

No.	Statement	1	2	3
28	Always tailors conversation appropriately to audience	-3	-1	-3
29	Asks others “Wh” (who, what, where, etc.) questions	0	3	-1
30	Responds insightfully to others’ five “Wh” questions	-2	0	-1
31	Often does not wait and take turns in conversations	5	-2	0
32	Does not monopolize the conversation when speaking to others	-2	-1	4
33	During conversations appropriately interrupts peers	-4	1	0
34	Appropriately interrupts adults during social interactions	-5	2	0
35	Often does not attend to what the other person is saying	4	-2	3
36	Waits to be acknowledged before speaking to others	-5	-1	2
37	During conversation asks speaker to clarify comments made	-1	2	-5
38	Does not appear frustrated when there is a change in topic	-1	3	-2
39	Frequently refuses to listen to other people’s perspective	5	-2	2
40	When speaking often tends to impose their own perspective	4	-2	1
41	Often compromises appropriately during a conversation	5	1	1
42	Is sensitive in asking the speaker to explain what is meant	-4	1	-1

(continued)

Table 4.3. Factor Arrays for All Three Factors (continued)

No.	Statement	1	2	3
43	Frequently negotiates appropriately during a conversation	-2	0	2
44	Responds appropriately to compliments given by adults	-3	3	-3
45	Does not respond appropriately to compliments given by peers	3	5	-5
46	Appropriately describes own feelings when speaking to others	-3	4	-4
47	Seldom chooses to ask for directions or assistance	-1	-4	0
48	Responds appropriately to instructions given by adults	-3	5	-2

*Note:* The distinguishing statements are highlighted in dark grey, and the consensus statements are highlighted in light grey.

### Participants' Demographics Loading on Factors (Ranked)

The factor matrix provided in Table 4.4 demonstrates how each participant loaded on each of the three factors. Participants who loaded similarly on a given factor will be described as a group. The final step is to provide a descriptive account of the factors. This was done by first looking at the positioning of each statement in relation to the other statements and drawing on the post Q-sort open-ended questions to support and aid in the interpretation of the study. A table of all factors and the ranking assigned to each statement in each factor was then constructed to serve as a basis for factor interpretation.

The Q-factors were converted into z-scores and then into whole numbers using factor arrays (the range of numbers from the Q-sorting process). Q-models were then created that provided participants opinions and viewpoints, supported by the statistical salient and non-salient relevance of statements. This section provides a descriptive account of the factors based on the Q-sorting of FtF verbal and nonverbal social skills statements. The goal of factor interpretation is to uncover, understand, and explain the viewpoints captured by each factor and shared by the

loadings of participants. The factor interpretations in this study created three Q-models, which are described below.

The 13 participants (Participants 1, 2, 3, 4, 7, 13, 15, 16, 20, 23, 25, 27, and 31) who loaded on Q-Model Factor 1 described adolescents as having trouble navigating during a conversation in terms of being able to take the other person's perspective. This participant group varied in gender, age, years of experience, and grade level that they were teaching. The majority of the participants that loaded on this factor were females (8 out of 13), ten were over 40-years of age, three were over 27-years of age, three had less than ten years of teaching experience, and nine had over 11 years of teaching experience. Participants were spread across grade levels taught (from 6th grade to- high school). One participant did not disclose years of teaching experience.

The second group of Q-sorts (Participants 5, 6, 8, 10, 21, 26, and 30) loaded high on Q-Model Factor 2. This Q-model represented students behaving appropriately during conversations. The participants on this factor had less of a variation in gender, age, years of experience, and grade level that they are teaching. Following are the demographic statistics of the participants on this Factor 2. The participants who loaded on this factor were 4 females and 3 males. All participants were over the age of 30, and had over 11 years of teaching experience. Participant spread across grade levels taught (6th grade to –8th grade).

The third group of Q-sorts (Participants 22 and 26) loaded highly on Q-Model Factor 3. This model represented difficulties in understanding nonverbal and verbal cues. The participants on this factor had less of a variation in gender, age, years of experience, and grade level that they are teaching. Only two participants loaded on this factor, one female and one male. Both participants taught in middle school and were over the age of 35, and the female had over 20



years of teaching experience. The male participant did not disclose his years of teaching experience.

Table 4.4

*Factor Matrix with Demographic Information*

Q-sort	Gender	Yrs	Grade Taught	Years of Experience	Factor 1	Factor 2	Factor 3
P1	Male	27	HS	< 4 years	X		
P2	Female	30	6 <sup>th</sup>	--	X		
P3	Female	69	7 <sup>th</sup>	< 4 years	X		
P4	Male	33	8 <sup>th</sup>	5-10 years	X		
P5	Female	65	7 <sup>th</sup>	20+ years		X	
P6	Female	63	6 <sup>th</sup>	20+ years		X	
P7	Female	41	7 <sup>th</sup>	11-20 years	X		
P8	Female	32	8 <sup>th</sup>	11-20 years		X	
P9	Female	60	6 <sup>th</sup>	20+ years			
P10	Male	38	8 <sup>th</sup>	< 4 years		X	
P11	Female	37	6 <sup>th</sup>	< 4 years			
P12	Female	60	7 <sup>th</sup>	11-20 years			
P13	Female	48	6 <sup>th</sup>	11-20 years	X		
P15	Female	47	8 <sup>th</sup>	11-20 years	X		
P16	Female	44	6 <sup>th</sup>	11-20 years	X		
P17	Female	23	8 <sup>th</sup>	< 4 years			
P18	None	33	6 <sup>th</sup>	< 4 years			
P19	Male	27	HS	< 4 years			
P20	Female	60	7 <sup>th</sup>	20+ years	X		
P21	Male	31	6 <sup>th</sup>	< 4 years		X	
P22	Female	35	8 <sup>th</sup>	11-20 years			X
P23	Male	36	7 <sup>th</sup>	11-20 years	X		
P24	Male	58	6 <sup>th</sup>	20+ years			
P25	Female	60	6 <sup>th</sup>	20+ years	X		
P26	Male	47	6 <sup>th</sup>	--		X	X
P27	Male	50	7 <sup>th</sup>	20+ years	X		
P28	Female	50	6 <sup>th</sup>	11-20 years			
P29	Female	28	8 <sup>th</sup>	< 4 years			
P30	Female	47	7 <sup>th</sup>	11-20 years		X	
P31	Female	53	HS	20+ years	X		
P14	Male	29	HS	< 4 years			X
% of Variance explained					20%	12%	12%
<i>Note.</i> Participants' loaders for each Q-models							

### **Participants Not Included in Any Model**

The following ten participants did not share any views with participants on each of the above three factors and were not included in any of the Q-models. Participants 11, 12, 14, 17, 18, 19, 24, 28, and 29 did not load at a level of at least  $\pm .35$  on any one factor. These participants are described as non-loaders and are not included in the Q-factor analyses. Also, Participant 9 is described as a confounder and is not included in the Q-factor analyses. These non-loading participants are teachers who may hold a unique viewpoint from the other participants, a mixture of the three unique viewpoints that emerged, or an undefined viewpoint. Six out of the ten participants were females, two were males, and one participant did not disclose his/her gender. Five out of the ten participants had less than four years of teaching experience and were 33 years old or younger.

### **Q-Scores and Q-Models**

Now that clusters of individuals who shared subjectivities have been identified the Q-models can be described. The z-score scores were used to create a factor array for each viewpoint. The z-scores were converted into grid positions to create a factor array that represents each of the viewpoints (models, factors) that emerged. These factor arrays (range of numbers from the Q-sorting process) assisted in creating the key descriptions for each model (Susan Ramlo, personal communication, March, 2018). The PQMethod program has a built-in function that created the factor estimates for each factor (Watts & Stenner, 2012).

Furthermore, the Q-sorts for each person were represented by the Q-model factors. The factors were first used to create the statement list, which could then be used to create a Q-sort representing each factor. The ranking of the z-scores was used to determine the grid position.

The positive salient statements with a Q-score of  $Q \geq +1.00$  have been highlighted in light grey, and negative salient statements with a Q-score of  $-1.00$  have been highlighted in dark grey.

### IDENTIFYING Q-MODELS

Tables 4.5 to - 4.7, and 4.9 demonstrate how statements loaded on each of the three Q-models. Some of the statements loaded on more than one model. Watts and Stenner (2012) explain that rotated factor loadings show how close a particular Q-sort is to the factor's viewpoint. Differences among the Q-models in the study were identified using factor arrays, narratives, and distinguishing statements (Webler, et al., 2009). The narratives in the study were derived from the written comments made in the post Q-sort survey regarding students' behaviors observed in the classroom. A representative sort (factor array) was then created via the listing of all the statements, placed in ranked order of largest positive to largest negative z-score. It is these z-scores that represent each statement's position in the sorting grid (Brown, 1980; McKeown & Thomas, 1988).

Distinguishing statements and consensus statements were also identified in the analyses (Brown, 1980; McKeown & Thomas, 1988). In this study, distinguishing statements were identified and placed in tables in order to distinguish one Q-model from another. These types of distinguishing statements can have the signs (+ or -) in the same directions; statements that have opposite signs are called contrasting or dissensus statements. Distinguishing statements provide insightful and additional information (Newman & Ramlo, 2010). Within the tables of distinguishing statements provided below, an asterisk indicates a significance at the  $p < 0.01$  level; other statements are significant at a 0.05 level. Both the grid position and z-score are also shown on these tables. Tables 4.6, 4.8, and 4.10 contain the distinguishing statements that, together with the narratives, helped to identify the differences among the Q-models in the study

(Webler et al., 2009). Narratives are a holistic approach through which to interpret the subject matter and the resultant stories (Crossley, 2000; Watts & Stenner, 2005).

Finally, the literature review was used to assist in interpreting the factors/ Q-models. The literature review on digital technology and the effects it may have on adolescents' FtF social skills, and the six predominant themes for the Q-sample (nonverbal communication, expressive skills, conversational topic maintenance skills, conversational skills, speech conventions, and peer skills), were reviewed in Chapter I and Chapter II. The literature review provides insight for defining, interpreting, and understanding all the Q-models in terms of teachers' perceptions on the effects of digital technology on students' FtF social skills and how it affects the academic setting as it relates to students' copresence FtF social skills. According to Watts and Stenner (2005),

The interpretative task in Q methodology involves the production of a series of summarizing accounts, each of which explicates the viewpoint being expressed by a particular factor. These accounts are constructed by careful reference to the positioning and overall configuration of the items in the relevant. The interpretative task in Q methodology involves the production of a series of summarizing accounts, each of which explicates the viewpoint being expressed by a particular factor. These accounts are constructed by careful reference to the positioning and overall configuration of the items in the relevant "best-estimate" factor array (p. 82).

Three models were identified in the current data: (1) Represents Adolescents Having Trouble Navigating During a Conversation in Terms of Being Able to Take the Other Person's Perspective; (2) Represents Students Behaving Appropriately during Conversations; and (3) Represents Difficulties in Understanding Nonverbal and Verbal Cues. The Q-models of shared

viewpoints were derived from the Q-scores, and are discussed below to answer the research questions. The research questions for this study were:

**RQ1:** What are teachers' attitudes and beliefs regarding how digital technology affects students' copresence FtF social skills?

**RQ2:** What are teachers' beliefs regarding how digital technology affects the academic setting as it relates to students' copresence FtF social skills?

**Q-Model Factor 1: Represents Adolescents having Trouble Navigating During a Conversation in Terms of Being Able to Take the Other Person's Perspective**

Q-Model Factor 1 accounts for the greatest amount of explained variance in this study (20%), with 13 out of the 31 (42%) participants represented by this factor. These 13 participants (Nos. 1, 2, 3, 4, 7, 13, 15, 16, 20, 23, 25, 27, and 31) had loadings that ranged from 0.38 to 0.77. The participants who loaded on Factor 1 varied in age, gender, years' of experience, and grade level they were teaching. This factor reflects participants' beliefs that adolescents have trouble navigating a conversation in terms of being able to take the other person's perspective into account. The statements that are not highlighted in tables are defined as "non-salient" because their Q-scores do not provide evidence of strong viewpoints that are useful as defining statements for the substantive interpretation of models (see Table 4.5).

Teachers on Factor 1 viewed students as egocentric, selfish, and self-centered, and held steadfast to their viewpoints. They perceived adolescents as having the following characteristics: often do not wait or take turns (statement 31 positively scored, *Often does not wait and take turns in conversations*, a distinguishing statement, with a grid position of +5), often impose their own perspective (statement 40 positively scored, *When speaking often tends to impose their own perspective*, distinguishing statement, with a grid position of +5), refuse to listen to others'

perspectives (statement 39, positively scored, *Frequently refuses to listen to other people's perspective*, a distinguishing statement, with a grid position of +4), do not let go of an argument (statement 17, *Often does not let go of an argument when speaking to others*, a distinguishing statement, with a grid position of +4), and do not seem aware of others' interests (statement 14, *Does not seem to be aware of other people's interests*, a distinguishing statement, with a grid position of +3, and statement 35, *Often does not attend to what the other person is saying*, with a grid position of +4).

Additionally, participants in this model perceived that adolescents' conversational style is not always appropriate in that they do not express relevant information concisely (positively-scored, negatively-worded statement 25, a distinguishing statement, with a grid position of +3). Participants in this model also valued positively scored statement 40 (*When speaking to often tends to impose their own perspective*, with a grid position of +5), statement 39 (*Frequently refuses to listen to other people's perspective*, with a grid position of +4), and statement 44 (*Responds appropriately to comments given by adults*, a distinguishing statement, with a grid position of +3). Statement 31 was the most positive scored statement in this model with a z-score of 1.96, and a grid position of +5.

In contrast, Factor 1 participants disagreed that adolescents wait to be acknowledged before speaking (statement 36), interrupt other speakers (statements 33, with a grid position of -4, and statement 34), interrupt other speakers in an appropriate manner (statement 41), and compromise appropriately during a conversation (statement 43). These items reflect that participants represented by this factor tended to describe adolescents as not waiting to be acknowledged before speaking (statement 36), as interrupting adults and peers inappropriately (statement 34), as not using metaphors correctly (statement 16, with a grid position of -4), as not

compromising appropriately (statement 41), and as not describing feelings appropriately when speaking with others (statement 46, with a grid position of -3). The following least exhibited statements (36, 34, 33, 41, 43, 46, and 16) support teachers' views that adolescents do not appropriately navigate conversations, in that they compromise or interrupt during a conversation, do not wait to be acknowledged by others, and do not respond appropriately to compliments given by adults.

The following are negative salient statements for this Factor 1 Q-model: statement 34 (*Appropriately interrupts adults during social interactions*, with a grid position of -5), statement 33 (*During conversations appropriately interrupts peers*, with a grid position of -4), statement 41 (*Often compromises appropriately during a conversation*, with a grid position of -5), statement 43 (*Frequently negotiates appropriately during a conversation*, with a grid position of -2), statement 46 (*Appropriately describes own feelings when speaking to others*, with a grid position of -3), and statement 16 (*Uses metaphors appropriately during social interactions*, with a grid position of -4). Also, statement 36 (*Waits to be acknowledged before speaking*, with a grid position of -5), was the least valued, or most negatively scored statement in this model, with a z-score of -2.29.

Derived from one of the six prominent themes from the Q-sort (see Table 3.1), statements 14, 16, 17, 25, 31, 33, 34, 35, 36, 39, 40, 41, 43, and 44 are examples of expressive social skills, conversational skills, and speech conventions skills. In this Q-model (see Table 4.5), high school and middle school teachers' viewed students as having selfish or self-centered conversational behaviors.

Table 4.5

*Factor Scores for Q-Model Factor 1*

No.	Statement	Z-scores
31	Often does not wait and take turns in conversations	1.959
40	When speaking often tends to impose their own perspective	1.786
35	Often does not attend to what the other person is saying	1.661
39	Frequently refuses to listen to other people's perspective	1.575
17	Often does not let go of an argument when speaking to others	1.570
44	Responds appropriately to compliments given by adults	1.237
14	Does not seem to be aware of other people's interests	1.182
25	Seldom expresses relevant information concisely to others	1.172
11	Seldom uses appropriate volume when speaking to others	0.963
27	Does not change topic appropriately during conversations	0.884
12	Uses different tones of voice during social interactions	0.838
9	Tends to make inappropriate noises during social interaction	0.669
3	Seldom understands the facial expression of others	0.630
2	Uses appropriate facial expressions during conversations	0.507
8	Appropriately uses facial expressions during conversations	0.491
4	Responds appropriately to the facial expression of other people	0.384
19	Seldom chooses a conversational topic appropriate to setting	0.325
20	Often makes a variety of comments related to the topic	0.216
15	Usually reacts to sarcasm in an age-appropriate manner	0.200

(continued)



Table 4.5. Factor Scores for Q-Model Factor 1. (continued)

No.	Statement	Z-scores
1	Maintains eye contact with speaker when talking to others	0.196
5	Recognizes nonverbal cues and gestures	0.152
10	During a conversation speaks clearly and does not mumble	0.114
18	Responds to inquiries about self with more than I don't know	0.110
22	Often does not interpret the body language of others	0.087
29	Asks others "Wh" (who, what, where, etc.) questions	-0.007
24	During conversations expresses relevant information	-0.122
45	Does not respond appropriately to compliments given by peers	-0.123
7	Maintains appropriate distances between people and objects	-0.172
26	Keeps conversation going when speaking to others	-0.242
37	During conversation asks speaker to clarify comments made	-0.309
38	Does not appear frustrated when there is a change in topic	-0.320
47	Seldom chooses to ask for directions or assistance	-0.341
6	Behaves and acts at an age-appropriate adolescent level	-0.353
23	Chooses a conversational topic age-appropriate for setting	-0.459
13	During conversations understands the other person's perspective	-0.471
21	Introduces and discusses topic clearly to audience	-0.600
42	Is sensitive in asking the speaker to explain what is meant	-0.829
32	Does not monopolize the conversation when speaking to others	-0.894
30	Responds insightfully to others' five "Wh" questions	-0.927
48	Responds appropriately to instructions given by adults	-0.960

(continued)

Table 4.5. Factor Scores for Q-Model Factor 1. (continued)

No.	Statement	Z-scores
28	Always tailors conversation appropriately to audience	-0.999
43	Frequently negotiates appropriately during a conversation	-1.041
41	Often compromises appropriately during a conversation	-1.291
16	Uses metaphors appropriately during social interactions	-1.295
33	During conversations appropriately interrupts peers	-1.513
34	Appropriately interrupts adults during social interactions	-2.219
36	Waits to be acknowledged before speaking to others	-2.290

*Note.* All Items with asterisks (\*) are significant at  $p < .01$ . The positive salient statements are highlighted in light grey, the least positive, or negative statements are highlighted in dark grey.

#### **Distinguishing statements for Q-Model Factor 1.**

By examining the distinguishing statements in, Q-Model Factor 1, it becomes clear that middle school and high school teachers view digital technology as influencing adolescents such that they seem to be having trouble navigating during a conversation in terms of being able to take the other person's perspective. Adolescents seem to be focused on their own interests, are having difficulty describing their feelings, and are lacking the social cues to sustain a conversation without interrupting their peers or adults.

The statements that were most salient and distinguishing in Q-Model Factor 1 (see Table 4.6) were statement 31 (*Often does not wait and take turns in conversations*, with a grid position of +5), statement 40 (*When speaking often tends to impose their own perspective*, with a grid position of +5), statement 34 (*Appropriately interrupts adults during social interactions*, with a grid position of -5), statement 36 (*Waits to be acknowledged before speaking to others*, with a grid position of -5), statement 39 (*Frequently refuses to listen to other people's perspective*, with

a grid position of +4), statement 17 (*Often does not let go of an argument when speaking to others*, with a grid position of +4), statement 33 (*During conversation appropriately interrupts adults during social interactions*, with a grid position of -3), and statement 19 (*Seldom chooses a conversational topic appropriate for setting*, with a grid position of 1). All of these describe adolescents as having a hard time listening to and understanding the perspective of others. According to some researchers, this current generation of adolescents lacks the essential interpersonal skills to express their ideas to others or to understand how others are feeling (Bandura, 1997; Halberstadt et al., 2001; Harankhedkar, 2016; & Pea et al., 2012). Adolescents are not extracting meaning from events and sharing feelings in a give and take way during conversations (Steiner-Adair, 2013).

In this model, teachers also viewed adolescents as not being sensitive to others, not using or understanding the facial expressions of others, and so not using metaphors appropriately, and not behaving or acting appropriately for their age. The most highly valued statements were: Statement 16 (*Uses metaphors appropriately during social interactions*, with a grid position of -4), statement 3 (*Seldom understands the facial expressions of others*, with a grid position of +2), statement 6 (*Behaves and acts at an age-appropriate adolescent level*, with a grid position of -1), statement 42 (*Is sensitive in asking the speaker to explain what is meant*, with a grid position of -2), and statement 32 (*Does not monopolize the conversation when speaking to others*).

Even though adolescents are having trouble navigating appropriately during a conversation, some teachers did describe adolescents as having responded appropriately to compliments given by adults (statement 44, with a grid position of +3) and said that adolescents are using appropriate facial expression during conversations (statement 2, with a grid position of +2). Besides Statements 44 and 2, these statements represent views from teachers that

adolescents are having trouble navigating a conversation in terms of being able to take the other person's perspective, they refuse to listen to others', and seldom express relevant information to others.

Table 4.6

*Distinguishing Statements for Q-Model Factor 1.*

No.	Statement	Q-Sort	Z-score
31	Often does not wait and take turns in conversations	5	1.96*
40	When speaking often tends to impose their own perspective	5	1.79*
39	Frequently refuses to listen to other people's perspective	4	1.57*
17	Often does not let go of an argument when speaking to others	4	1.57*
44	Responds appropriately to compliments given by adults	3	1.24*
14	Does not seem to be aware of other people's interests	3	1.18
25	Seldom expresses relevant information concisely to others	3	1.17
3	Seldom understands the facial expression of others	2	0.63*
2	Uses appropriate facial expressions during conversations	2	0.51*
4	Responds appropriately to the facial expression of other ppl.	1	0.38
19	Seldom chooses a conversational topic appropriate to setting	1	0.33*
22	Often does not interpret the body language of others	0	0.09*
45	Does not respond appropriately to compliments given by peers	0	-0.12*
37	During conversation asks speaker to clarify comments made	-1	-0.31*
47	Seldom chooses to ask for directions or assistance	-1	-0.34
6	Behaves and acts at an age-appropriate adolescent level	-1	-0.35*
42	Is sensitive in asking the speaker to explain what is meant	-2	-0.83*
32	Does not monopolize the conversation when speaking to others	-2	-0.89*
46	Appropriately describes own feelings when speaking to others	-3	-1.13

(continued)

Table 4.6. Distinguishing Statements for Q-model Factor 1. (continued)

No.	Statement	Q-Sort	Z-Score
41	Often compromises appropriately during a conversation	-4	-1.29
16	Uses metaphors appropriately during social interactions	-4	-1.29*
33	During conversations appropriately interrupts peers	-4	-1.51*
34	Appropriately interrupts adults during social interactions	-5	-2.22*
36	Waits to be acknowledged before speaking to others	-5	-2.29*

*Note.* All items are distinguishing statements and are significant at  $p < .05$ . Items with asterisks (\*) are significant at  $p < .01$ . QS= Q-sorts. ZS= Z-scores.

### **Post Q-Sort comments: Narrative insights from the survey.**

A qualitative analysis was conducted to further the understanding of viewpoints held by middle school and high school teachers regarding the effects of digital technology on copresence FtF social skills, and related effects on the academic setting. Since the Q-sorts were created with questions based on specific social skills and were anonymous, the researcher wanted to start with a blank slate in terms of what social skills teachers were thinking of regarding the effects of digital technology. Therefore, after the Q-sort, there were open-ended questions (Watts & Stenner, 2005) from the post-sort survey that helped the researcher gather supporting information from participants regarding their views on how digital technology may be affecting social skills. All 31 participants answered three open-ended questions in the post Q-sort survey. Teachers answered questions regarding students' social networks and digital technology usage, and the effect, if any, digital technology is having on students' social skills and how this might be impacting their social interactions with others.

Five categories emerged from the Factor 1 participants' written comments about the open-ended questions the posed to them after the Q-sort. The categories were determined by the researcher from the responses given by the teachers. The first category was that the digital world

seems to be more important than the real world in which the students live. The second category that emerged was that students seem to be lacking in conversational skills and/or the understanding of social cues. The third category was that some students lack focus and have a need for immediate gratification. The fourth category that emerged was that adolescents have less respect for each other. The last category was that some students spend too much time connected online. Findings showed that gender, age, grade level taught, and years of teaching experience were not associated with any of the shared viewpoints in the three Q-models.

For the open-ended questions in the post Q-sort, all participants reported using digital technology for both personal and instructional purposes. Although 7 participants (Nos. 5, 7, 10, 12, 13, 14, and 28) reported using Smartphones, computers, and laptops, they reported not using social media as a way of communicating with others. All other participants had used or were using social media as a means of communicating with their students, family, colleagues, and friends. For instructional use, participants reported using Google Classroom, Remind, Chrome Books, iPads, Smartboards, Smartphones, Epson Boards, Twitter, You Tube, E-Readers, and Discovery Education. For personal use, participants reported using Facebook, Twitter, Smartphones, tablets, iPads, Kindle, Linked, Instagram, and social media. Appendix C provides the categories and statements that emerged.

#### **Q-Model Factor 1: Post Q-sort comments and clarification of this model.**

The first category that emerged was determined by 13 out of the 31 teacher responses. This category shows that teachers perceive that the digital world appears to be more important to adolescents than the 3D real world in which they live. Teachers reported that conversations among students revolved around the latest posts on social media and were overly focused on students' social media interests. This reveals students' inability to see outside of themselves and

their own interests. Students seemed to prefer the alternate realities of social media and games over interacting FtF with people. Participants 1, 2, 7, 15, 23, and 27 reported that adolescents are spending more time talking about their digital lives, are not engaging in the sharing of ideas and thought and are unable to see outside of themselves. Furthermore, they stated that adolescents are overly focused on their social interests, and that, digital technology is replacing students' need for FtF interactions, as now students can text instead of seeing their peers FtF. Participants 2, 7, and 15 stated that most school conversations revolve around the latest posting on Instagram, Facebook, and Snapchat. Teachers reported that adolescents are spending more time talking about their digital lives, are not engaging in sharing of ideas and thoughts, and are unable to see outside themselves. Hence, this is having an impact, with students not being able to hold a conversation, or decode verbal and nonverbal cues.

The second category that emerged was that students seem to be lacking in conversational skills and/or the ability to read social cues. Some teachers reported that their students struggle with social interactions and dealing with real-life situations, and the participants attributed this to students finding it easier to communicate from behind their phones rather than FtF. Teachers also reported that students seem to have less empathy. This is seen during conversations, as students tend to cut each other off in mid-sentence, are no longer listening to each other, and are short and abrupt with each other. Participants 1, 2, 3, 7, 13, 15, 16, 10 and 27 stated that adolescents do not know how to speak FtF or hold a conversation with other individuals, cannot have meaningful conversations, and are not able to socialize properly. Adolescents struggle to behave while having to socialize FtF because they are doing it less often. Participant 27 stated that students' creating and sustaining of discourse with each other as well as with adults is suffering and becoming weaker. Other statements reported by teachers were that adolescents are

unable to speak FtF or hold a conversation with other individuals, cannot have meaningful conversations, are not able to socialize properly, struggle to behave FtF because they are doing it less often, and cannot create and sustain discourse with each other or with adults (Participants 1, 2, 7, 16, 20, and 27). Also, participants 3 and 13 thought that digital technology is affecting the ability to show empathy.

Participants' statements from Category 3 also support the views of those found in Q-Model Factor 1. Participants 7 and 15 felt that immaturity is most glaring when the students are unable to see the seriousness of certain situations. Participants 4, 15, and 20 noticed that students lack focus and are more easily distracted and have a shorter attention. Furthermore, students demand more of their teachers' attention (Participant 25). Participants 7, 15, 20, and 25, also stated that it seems that students expect and wait for a quick answer or response to their inquiries and display no patience to sit and think over a solution to a problem. This category of teachers also seemed to view some adolescents as being self-centered, and this supports the participants' views from Q-Model Factor 1.

A fourth category that emerged was that students are displaying less respect and are becoming meaner to each other. Participant 23 reported that it seems that some students do not think before sharing online; as a result, they sometimes react before thinking when speaking FtF. Participant 3 stated that adolescents have less filters and statements are often made that are inappropriate and hurtful to their peers and adults. This category also seems to portray some adolescents as being self-centered and lacking social skills to help navigate appropriately during conversations.



**Q-Model Factor 1 – Summary.**

This Q-model represents adolescents having trouble navigating during a conversation in terms of being able to take the other person's perspective. The statements in this model had mostly to do with adolescents having difficulties navigating conversations, not having an awareness of other's perspectives, imposing their own perspectives, and not waiting and taking turns during a conversation. Overall, it represents adolescents having trouble navigating a conversation in terms of being able to take the other person's perspective.

**Q-Model Factor 2: Represents Students Behaving Appropriately During Conversations**

Q-Model Factor 2 accounts for the second largest amount of explained variance in this study (12%) with 7 out of the 31 (23%) participants represented by this factor. The 7 participants (Nos. 5, 6, 8, 10, 21, 26, and 30) had factor loadings that ranged from 0.38 to 0.73. This factor seems to reflect participants' beliefs that adolescents respond appropriately to instructions and compliments by adults, and that they can describe their own feelings, choose conversational topics that are age-appropriate, express relevant information and negotiates appropriately, asks questions, and makes comments related to the topic during conversations. The statements that are not highlighted are defined as "non-salient" because their Q-scores do not provide evidence of strong viewpoints that are useful as defining statements for substantive interpretation of models (see table 4.8).

The negative salience of items on this factor seems to reflect the lacking of appropriate navigation of conversational skill. Rather, these items reflect that participants who are represented by this factor tend not to describe adolescents as responding inappropriately to compliments, as choosing inappropriate conversation topics, as not asking for directions, as not changing topics appropriately, and as not misinterpreting body language or making inappropriate

noises during conversations. Participants in this model also viewed adolescents as accepting of changes in course topics.

The following most salient statements (20, 23, 24, 29, 38, 43, 44, 46, and 48) best seem to support this view. This factor model is described as students behaving appropriately during conversations. Teachers in this factor viewed adolescents as having appropriate conversational skills and that digital technology may not be having a negative impact on adolescents' FtF social skills. Statement 48 (*Responds appropriately to instructions given by adults*) was the most positively-scored statement in this model, with a Q-score of 2.21, and a grid position of +5. Participants in this model viewed adolescents as making appropriate comments during conversations (*Statement 20: Often makes a variety of comments related to the topic, with a grid position of +3*), and are able to choose appropriate topics (*Statement 23: Chooses a conversational topic age-appropriate for setting, with a grid position of +4*). Participants also valued positively-worded statement 24 (*During conversations expresses relevant information, with a grid position of +4*), statement 29 (*Asks others "Wh" questions, with a grid position of +4*), statement 43 (*Frequently negotiates appropriately during a conversation, with a grid position of +3*), statement 46 (*Appropriately describes own feelings when speaking to others, with a grid position of +4*), and statement 44 (*Responds appropriately to compliments given by adults, with a grid position of +3*). Participants in this model also viewed adolescents as not appearing frustrated when there is a change in topic (positively-scored, negatively-worded statement 38, with a grid position of +3).

On the contrary, based on items with negative salience, participants believed that adolescents express relevant information, properly interpret body language, choose appropriate topics, and respond appropriately to compliments.

The following least salient statements (3, 9, 19, 22, 25, 27, 45, and 47) support teachers' views that adolescents behave appropriately during conversations. Teachers' view adolescents as able to choose a conversation topic, express relevant information when speaking to others, and are able to interpret the body language of others. Participants also negatively-scored, negatively-worded statements such as statement 3 (*Seldom understands the facial expression of others, with a grid position of -3*), statement 22 (*Often does not interpret the body language of others, with a grid position of -4*), statement 19 (*Seldom chooses a conversational topic appropriate to setting, with a grid position of -5*), statement 25 (*Seldom expresses relevant information when speaking to others, with a grid position of -3*), statement 47 (*Seldom chooses to ask for directions or assistance, with a grid position of -4*), and statement 27 (*Does not change topic appropriately during conversations, with a grid position of -4*). Furthermore, participants negatively-scored, one positively-worded statement 9 (*Tends to make inappropriate noises during social interactions, with a grid position of -3*). Also, statement 45 (*Does not respond appropriately to compliments given by peers, with a grid position of -5*), was the least valued or the most negatively-scored statement in this model, with a Q-score of -188.

Derived from one of the six prominent themes from the Q-sort (see Table 3.1), statements 3, 9, 19, 20, 22, 23, 24, 27, 29, 38, 43, 44, 45, 46, 47, 48 are examples of nonverbal communication, speech, and peer social skills. In this Q-model (see Table 4.8), high school and middle school teachers viewed students as having appropriate conversational interaction.

Table 4.7

*Factor Scores for Q-Model Factor 2*

No.	Statement	Z-scores
48	Responds appropriately to instructions given by adults	2.206
44	Responds appropriately to compliments given by adults	2.138
46	Appropriately describes own feelings when speaking to others	1.461
23	Chooses a conversational topic age-appropriate for setting	1.420
24	During conversations expresses relevant information	1.406
43	Frequently negotiates appropriately during a conversation	1.391
29	Asks others "Wh" (who, what, where, etc.) questions	1.222
20	Often makes a variety of comments related to the topic	1.153
38	Does not appear frustrated when there is a change in topic	1.077
26	Keeps conversation going when speaking to others	0.776
37	During conversation asks speaker to clarify comments made	0.716
34	Appropriately interrupts adults during social interactions	0.575
18	Responds to inquiries about self with more than I don't know	0.480
6	Behaves and acts at an age-appropriate adolescent level	0.459
40	When speaking often tends to impose their own perspective	0.359
41	Often compromises appropriately during a conversation	0.353
7	Maintains appropriate distances between people and objects	0.343
12	Uses different tones of voice during social interactions	0.271
33	During conversations appropriately interrupts peers	0.259

(continued)

Table 4.7. *Factor Scores For Q-Model Factor 2.* (continued)

No.	Statement	Z-scores
21	Introduces and discusses topic clearly to audience	0.208
30	Responds insightfully to others' five "Wh" questions	0.170
8	Appropriately uses facial expressions during conversations	0.140
15	Usually reacts to sarcasm in an age-appropriate manner	0.107
5	Recognizes nonverbal cues and gestures	0.066
13	During conversations understands the other person's perspect.	-0.064
16	Uses metaphors appropriately during social interactions	-0.147
42	Is sensitive in asking the speaker to explain what is meant	-0.175
2	Uses appropriate facial expressions during conversations	-0.176
4	Responds appropriately to the facial expression of other ppl.	-0.207
10	During a conversation speaks clearly and does not mumble	-0.222
28	Always tailors conversation appropriately to audience	-0.249
32	Does not monopolize the conversation when speaking to others	-0.281
36	Waits to be acknowledged before speaking to others	-0.397
1	Maintains eye contact with speaker when talking to others	-0.475
31	Often does not wait and take turns in conversations	-0.492
35	Often does not attend to what the other person is saying	-0.494
39	Frequently refuses to listen to other people's perspective	-0.596
17	Often does not let go of an argument when speaking to others	-0.747
11	Seldom uses appropriate volume when speaking to others	-0.863
14	Does not seem to be aware of other people's interests	-0.879

(continued)

Table 4.7. *Factor Scores For Q-Model Factor 2.* (continued)

No.	Statement	Z-scores
3	Seldom understands the facial expression of others	-1.122
9	Tends to make inappropriate noises during social interaction	-1.206
25	Seldom expresses relevant information concisely to others	-1.456
22	Often does not interpret the body language of others	-1.524
27	Does not change topic appropriately during conversations	-1.618
47	Seldom chooses to ask for directions or assistance	-1.650
19	Seldom chooses a conversational topic appropriate to setting	-1.836
45	Does not respond appropriately to compliments given by peers	-1.877

*Note.* Note. All items are distinguishing statements and are significant at  $p < .05$ . Items with asterisks (\*) are significant at  $p < .01$ . The positive salient statements are highlighted in light grey, the least positive, or negative statements are highlighted in dark grey.

### **Distinguishing statements for Q-Model Factor 2.**

To further distinguish this viewpoint from the other two perspectives, the researcher considered distinguishing statements for this factor. The distinguishing statements in this Q-model showed that, the middle school and high school teachers perceived that digital technology is not having a negative impact on adolescents' social skills and that adolescents behave appropriately during conversations. According to the literature review some researchers are optimistic that these new technologies will help with the development of interpersonal relationships, and communication skills (Christakis & Fowler, 2009; Lepp, 2014). Moreover, some researchers state that digital technology helps adolescents develop personal relationships in that they adapt their behaviors, self-disclose more online, and communicate via social networks (Joinson, 2001; Palfrey & Gasser, 2008; Turkle, 2011).

It seems that with online communications, adolescents are still engaging in meaningful connections with family and friends (Rosen et al., 2010). The results from this Q-model appear to reflect these researchers' findings.

The statements that were most salient and distinguishing in Q-Model Factor 2 were statement 48 (*Responds appropriately to instructions given by adults*, with a grid position of +5), statement 44 (*Responds appropriately to compliments given by adults*, with a grid position of +5), statement 45 (*Does not respond appropriately to compliments given by peers*, with a grid position of -5), statement 19 (*Seldom chooses a conversational topic appropriate to setting*, with a grid position of -5), statement 46 (*Appropriately describes own feelings when speaking to others*, with a grid position of +4), statement 43 (*Frequently negotiates appropriately during a conversation*, with a grid position of +3), and statement 47 (*Seldom chooses to ask for directions or assistance*, with a grid position of -4). The statements that were identified in Q-Model Factor 2 seem to reflect participants' beliefs that adolescents respond appropriately to instructions and compliments from adults, are capable of describing their own feelings, and they choose conversational topics that are age-appropriate.

Teachers described adolescents as using and responding to appropriate facial expressions (statement 4, with a grid position of -1; and statement 3, with a grid position of -3). According to the results, adolescents also ask questions (statement 29, with a grid position of +3; and statement 37, with a grid position of +2), change topics appropriately (statement 43, with a grid position of +3), and make comments related to the topic under discussion during conversations (statement 20, with a grid position of +3; and statement 26, with a grid position of +2).

Furthermore, according to the participants, adolescents use an appropriate volume when speaking (statement 11, with a grid position of -3), let go of an argument (statement 17, with a grid position of -2; and statement 38, with a grid position of +3), tailor conversations when speaking to others (statement 43, with a grid position of +3; statement 41, with a grid position of +1; and statement 32 with a grid position of -1), and are sensitive to others and listen to other peoples' perspectives (statement 42, with a grid position of 0; statement 35, with a grid position of -2; statement 35, with a grid position of -2; and statement 39, with a grid position of -2).

In this factor Q-Model, adolescents were described as students behaving appropriately during conversations. Adolescents were also described as being able to read verbal and nonverbal social cues. Additionally, participants thought that adolescents are sensitive to other peoples' perspectives, are able to change topics during a conversation, and behave age-appropriately.



Table 4.8

*Distinguishing Statements for Q-Model Factor 2*

No.	Statement	QS	ZS
48	Responds appropriately to instructions given by adults	5	2.21*
44	Responds appropriately to compliments given by adults	5	2.14*
46	Appropriately describes own feelings when speaking to others	4	1.46*
23	Chooses a conversational topic age-appropriate for setting	4	1.42*
24	During conversations expresses relevant information	4	1.41*
43	Frequently negotiates appropriately during a conversation	3	1.39*
29	Asks others "Wh" (who, what, where, etc.) questions	3	1.22*
20	Often makes a variety of comments related to the topic	3	1.15*
38	Does not appear frustrated when there is a change in topic	3	1.08*
26	Keeps conversation going when speaking to others	2	0.78*
37	During conversation asks speaker to clarify comments made	2	0.72*
6	Behaves and acts at an age-appropriate adolescent level	2	0.46*
41	Often compromises appropriately during a conversation	1	0.35*
7	Maintains appropriate distances between people and objects	1	0.34
42	Is sensitive in asking the speaker to explain what is meant	0	-0.18*
2	Uses appropriate facial expressions during conversations	0	-0.18
4	Responds appropriately to the facial expression of other ppl.	-1	-0.21
28	Always tailors conversation appropriately to audience	-1	-0.25
32	Does not monopolize the conversation when speaking to others	-1	-0.28*
36	Waits to be acknowledged before speaking to others	-1	-0.40*
35	Often does not attend to what the other person is saying	-2	-0.49*
39	Frequently refuses to listen to other people's perspective	-2	-0.60*
17	Often does not let go of an argument when speaking to others	-2	-0.75*
11	Seldom uses appropriate volume when speaking to others	-2	-0.86*
14	Does not seem to be aware of other people's interests	-3	-0.88*
3	Seldom understands the facial expression of others	-3	-1.12*
9	Tends to make inappropriate noises during social interaction	-3	-1.21*
25	Seldom expresses relevant information concisely to others	-3	-1.46*
22	Often does not interpret the body language of others	-4	-1.52*
27	Does not change topic appropriately during conversations	-4	-1.62*
47	Seldom chooses to ask for directions or assistance	-4	-1.65*
19	Seldom chooses a conversational topic appropriate to setting	-5	-1.84*
45	Does not respond appropriately to compliments given by peers	-5	-1.88*

*Note.* All Items with asterisks (\*) are significant at  $p < .01$ . QS= Q-sorts. ZS= Z-scores.

**Q-Model Factor 2: Post Q-sort comments and clarification of this model.**

Q-Model Factor 2 describes adolescents as behaving appropriately during conversations, but the statements reported by the 7 participants' responses on this Q-model describe a different picture based on their response from the post Q-sorts questions. These statements on Q-Model Factor 2 describe that the digital world appears to be more important to students than the 3D real world in which they live. Participant 5 reported two statements. The first statement was that adolescents have their heads buried in their phones or game systems, rather than communicating with others FtF. Also, this participant stated that kids need to be entertained with electronics, and they no longer read a book to be entertained.

Another category in which participants' statements did not match with the views of Q-Model Factor 2 was Category 2. This category described students as seeming to be lacking in conversational skills and/or the ability to read social cues. Participants 5, 6, 21, and 26 stated that adolescents do not know how to speak FtF or hold a conversation with other individuals, cannot have meaningful conversations, are not able to socialize properly, and struggle to behave FtF because they are doing it less often. Participant 5 stated that adolescents are having fewer interactions with friends and family members. Participant 6 stated that adolescents are waiting for a quick answer responses to their inquiries, have no patience to sit and think over a solution to a problem.

Participants' statements from Category 3 also disagree with the views of Q-Model Factor 2. Participant 6 felt that adolescents expect the immediate gratification when having conversations due to the immediate gratification they get from their devices. Also, this participant reported that adolescents wait for the quick response to their inquiries and have no

patience to sit and think over a solution to a problem. Participant 10 reported that adolescents lack focus, are more easily distracted, and have shorter attention spans.

Participants' statements from Category 5 also disagree with the views of Q-Model Factor 2. In this category, the statements written showed that students are spending too much time online and not socializing much FtF. This participant reported that adolescents should have boundaries when it comes to digital technology, and that they are connected 24 hours a day through their smart devices.

### **Q-Model Factor 2 – Summary.**

This Q-model represents students behaving appropriately during conversations. The statements in this model had mostly to do with adolescents not having difficulties navigating during a conversation, responding appropriately to instructions and compliments by adults, behaving appropriately during conversations, and being able to describe their own feelings. The participants also talked about adolescents being able to choose an age-appropriate topic of conversation, interprets body language, and express relevant information. In this model, adolescents seemed to be perceived as having the appropriate nonverbal language (e.g., eye contact, gestures) and verbal language (e.g., voice inflection, giving and receiving compliments) cues that are needed to be successful in academia and the workforce.

### **Q-Model Factor 3: Represents Difficulties in Understanding Nonverbal and Verbal Cues.**

Q-Model Factor 3 explained a 12% variance in this study, with 2 out of the 31 (6%) participants loading onto this factor. The two participants (22 and 26) had factor loadings that ranged from 0.30 thru 0.44. Participants represented by this factor viewed students as having difficulties understanding nonverbal and verbal cues. While the negative pole of the factor seems to suggest that participants do not see adolescents as navigating conversations with a

correct interpretation of compliments, sarcasm, feelings, and facial expressions, the positive pole reflects both positive and negative aspects of conversational behavior. The statements that are not highlighted are defined as “non-salient” because their Q-scores do not provide evidence of strong viewpoints that are useful as defining statements for the substantive interpretation of models (see Table 4.9).

While participants tended to state that adolescents do not monopolize conversations, and that they do respond to inquiries with more than “I don’t know” and speak clearly, they also stated that adolescents do not respond appropriately to compliments from peers, do not understand facial expressions, do not correctly interpret body language, and seldom choose topics appropriate to the setting. So, while adolescents seem to navigate the actual mechanics of a conversation, in terms of interpreting verbal and nonverbal cues, body language, and the deeper meaning of compliments, these interactions still pose a challenge.

This factor was inverted so that those on this factor are positive loaders (even though they were negative loaders on Factor 2), so the negative items represent negative salience and not the opposite (positive salience). In this case, the participants represented by this factor tended not to describe adolescents as generally responding appropriately to compliments, asking to clarify comments, appropriately describing feelings to others, reacting appropriately to sarcasm, responding to and using appropriate facial expressions, and behaving at an age-appropriate level. This factor might be the most interesting and relevant finding in the current study. It seems to suggest that adolescents can navigate the mechanics of a conversation, but that those cues and nuances of a conversation that are learned through practice with FtF conversations seem to be more problematic.

The following most salient statements (3, 9, 10, 18, 19, 22, 32, 35, and 45) best seem to support this view. Participants in this model viewed adolescents as having appropriate conversational behaviors in that they can navigate the actual mechanics of the conversation; but, they do have difficulties interpreting the verbal and nonverbal cues and body languages. Also, teachers on this factor viewed students to be self-centered and selfish. Statement 3 (*Seldom understands the facial expression of others*) was the most positively-scored statement in this model, with a Q-score of 2.13, and a grid position of +5. Participants in this model also valued positively-scored, negatively-worded statement 19 (*Seldom chooses a conversational topic appropriate to setting*, with a grid position of 3), statement 35 (*Often does not attend to what the other person is saying*, with a grid position of +3), statement 22 (*Often does not interpret the body language of others*, with a grid position of +4), statement 45 (*Does not respond appropriately to compliments given by peers*, with a grid position of +5), statement 32 (*Does not monopolize the conversation when speaking to others*, with a grid position of +4), and positively-scored, positively-worded statement 18 (*Responds to inquiries about self with more than I don't know*, with a grid position of +4). Additionally, participants in this model viewed students as speaking clearly and not mumbling (positively-worded statement 10, with a grid position of +3), which supports this model.

In contrast, participants disagreed that adolescents behave or negotiate appropriately during conversations. The following least salient statements (4, 6, 15, 37, 43, 44, and 46) best seem to support teachers' views that adolescents appropriately navigate conversations, use appropriate facial expression, and are considerate of others. Participants negatively-scored, positively-worded statements such as statement 4 (*Responds appropriately to the facial expression of other people*, with a grid position of -3), statement 6 (*Behaves and acts at an age-*

*appropriate adolescent level*, with a grid position of -4), statement 15 (*Usually reacts to sarcasm in an age-appropriate manner*, with a grid position of -4), statement 28 (*Always tailors conversations appropriately to audience*, with a grid position of -3), statement 37 (*During a conversation asks speaker to clarify comments made*, with a grid position of -5), statement 43 (*Frequently negotiates appropriately during a conversation*, with a grid position of -3), statement 37 (*During conversations asks speaker to clarify comments made*, with a grid position of -5), and statement 46 (*Appropriately describes own feelings when speaking to others*, with a grid position of -4). Also, statement 44 (*Responds appropriately to compliments given by adults*) was the least valued, or most negatively-scored, statement in this model, with a Q-score of -2.57, and a grid position of -5.

Derived from one of the six prominent themes from the Q-sort (see Table 3.1), statements 3, 4, 6, 9, 10, 15, 35, and 37 are examples of nonverbal communication, expressive, conversational, and speech conventions social skills. Additionally, statements 18, 19, 22, 32, 43, 44, 45, and 46 are examples of conversational, conventional topic maintenance, and peer social skills. In this Q-model, high school and middle school teachers viewed students as having difficulties in understanding nonverbal and verbal cues.

Table 4.9

*Factor Scores for Q-Model Factor 3*

No.	Statement	Z-Score
3	Seldom understands the facial expression of others	2.129
45	Does not respond appropriately to compliments given by peers	1.640
32	Does not monopolize the conversation when speaking to others	1.560
18	Responds to inquiries about self with more than I don't know	1.390
22	Often does not interpret the body language of others	1.377
19	Seldom chooses a conversational topic appropriate to setting	1.228
10	During a conversation speaks clearly and does not mumble	1.165
35	Often does not attend to what the other person is saying	1.079
9	Tends to make inappropriate noises during social interaction	1.022
42	Is sensitive in asking the speaker to explain what is meant	0.813
36	Waits to be acknowledged before speaking to others	0.733
27	Does not change topic appropriately during conversations	0.564
12	Uses different tones of voice during social interactions	0.556
14	Does not seem to be aware of other people's interests	0.516
8	Appropriately uses facial expressions during conversations	0.514
39	Frequently refuses to listen to other people's perspective	0.502
11	Seldom uses appropriate volume when speaking to others	0.426
17	Often does not let go of an argument when speaking to others	0.414
25	Seldom expresses relevant information concisely to others	0.401

(continued)

*Table 4.9. Factor Scores for Q-Model Factor 3. (continued)*

No.	Statement	Z-Score
40	When speaking often tends to impose their own perspective	0.365
47	Seldom chooses to ask for directions or assistance	0.325
5	Recognizes nonverbal cues and gestures	0.264
13	During conversations understands the other person's perspective	0.189
31	Often does not wait and take turns in conversations	0.162
20	Often makes a variety of comments related to the topic	0.048
34	Appropriately interrupts adults during social interactions	0.000
1	Maintains eye contact with speaker when talking to others	-0.021
33	During conversations appropriately interrupts peers	-0.237
30	Responds insightfully to others' five "Wh" questions	-0.327
21	Introduces and discusses topic clearly to audience	-0.374
16	Uses metaphors appropriately during social interactions	-0.401
7	Maintains appropriate distances between people and objects	-0.502
29	Asks others "Wh" (who, what, where, etc.) questions	-0.506
41	Often compromises appropriately during a conversation	-0.590
48	Responds appropriately to instructions given by adults	-0.596
26	Keeps conversation going when speaking to others	-0.617
24	During conversations expresses relevant information	-0.678
23	Chooses a conversational topic age-appropriate for setting	-0.678
38	Does not appear frustrated when there is a change in topic	-0.833
2	Uses appropriate facial expressions during conversations	-0.949

(continued)



Table 4.9 *Factor Scores for Q-Model Factor 3. (continued)*

No.	Statement	Z-Score
28	Always tailors conversation appropriately to audience	-0.983
43	Frequently negotiates appropriately during a conversation	-1.058
4	Responds appropriately to the facial expression of other people	-1.077
6	Behaves and acts at an age-appropriate adolescent level	-1.274
15	Usually reacts to sarcasm in an age-appropriate manner	-1.369
46	Appropriately describes own feelings when speaking to others	-1.742
37	During conversation asks speaker to clarify comments made	-2.000
44	Responds appropriately to compliments given by adults	-2.569

*Note.* All items are distinguishing statements and are significant at  $p < .05$ . Items with asterisks (\*) are significant at  $p < .01$ . The positive salient statements are highlighted in light grey, the least positive, or negative statements are highlighted in dark grey.

### **Distinguishing statements for Q-Model Factor 3.**

In examining the distinguishing statements, it became clear that Q-Model Factor 3 middle school and high school teachers' view was that digital technology is creating difficulties in understanding nonverbal and verbal cues. This is supported by the literature review in that some researchers state that adolescents need to be exposed to copresence FtF communication to help them understand others, and to learn how to read facial cues and body language (Barker, 2006; Turkle, 2014; Uhls & Greenfield, 2011). Spending too much time communicating online can have a negative impact on the development of verbal communication skills (Barker, 2006).

The statements that were most salient and distinguishing in Q-Model Factor 3 (see Table 4.1 with Q-sort and z-scores) were statement 3 (*Seldom understands the facial expressions of others*), with a z-score of 2.13, statement 45 (*Does not change topic appropriately during conversation*), statement 32 (*Does not monopolize the conversations when speaking to others*), statement 18 (*Responds to inquiries about self with more than I don't know*), statement 44

(*Responds appropriately to compliments given by adults*), and statement 37 (*During conversation asks speaker to clarify comments made*).

These statements that were identified with Q-Model Factor 3 help support the view that adolescents are having difficulties navigating conversations with the correct understanding of nonverbal and verbal cues and body language, which bring a deeper meaning to comments and interactions. Although adolescents can navigate the mechanics of conversations, students seem to be lacking in those cues and nuances that are learned through practice with copresence FtF conversations.

Table 4.10

*Distinguishing Statements for Q-Model Factor 3.*

No.	Statement	Q-Sort	Z-score
3	Seldom understands the facial expression of others	5	2.13*
45	Does not respond appropriately to compliments given by peers	5	1.64*
32	Does not monopolize the conversation when speaking to others	4	1.56*
18	Responds to inquiries about self with more than I don't know	4	1.39*
22	Often does not interpret the body language of others	4	1.38*
19	Seldom chooses a conversational topic appropriate to setting	3	1.23*
10	During a conversation speaks clearly and does not mumble	3	1.17*
42	Is sensitive in asking the speaker to explain what is meant	2	0.81*
36	Waits to be acknowledged before speaking to others	2	0.73*
14	Does not seem to be aware of other people's interests	2	0.52
39	Frequently refuses to listen to other people's perspective	1	0.50*
17	Often does not let go of an argument when speaking to others	1	0.41*
25	Seldom expresses relevant information concisely to others	1	0.40
47	Seldom chooses to ask for directions or assistance	0	0.33
41	Often compromises appropriately during a conversation	-1	-0.59
2	Uses appropriate facial expressions during conversations	-3	-0.95
4	Responds appropriately to the facial expression of other people	-3	-1.08*
6	Behaves and acts at an age-appropriate adolescent level	-4	-1.27*
15	Usually reacts to sarcasm in an age-appropriate manner	-4	-1.37*
46	Appropriately describes own feelings when speaking to others	-4	-1.74
37	During conversation asks speaker to clarify comments made	-5	-2.00*
44	Responds appropriately to compliments given by adults	-5	-2.57*

*Note.* All Items with asterisks (\*) are significant at  $p < .01$ . QS= Q-sorts. ZS= Z-scores.

**Q-Model Factor 3: Post Q-sort comments and clarification of this model.**

Only two participants reported statements that supported the views from this Q-model. The category that supports Q-Model Factor 3 is Category 2, which describes students as seeming to be lacking in conversational skills and/or the ability to read social cues. Some teachers reported that their students struggle with social interactions and dealing with real-life situations, and attributed this to students finding it easier to communicate from behind their phones rather than FtF. Participant 22 and 26 stated that adolescents don't know how to speak FtF or hold a conversation with other individuals, and they cannot have meaningful conversations, are not able to socialize properly, and struggle to behave FtF because they are doing it less often.

**Q-Model Factor 3 – Summary.**

This Q-model represents difficulties in understanding nonverbal and verbal cues. The positive salient statements are highlighted in light blue, and the least or negative statements are highlighted in green. The statements in this model represent that adolescents had difficulties in understanding nonverbal and verbal cues.

**Consensus Statements**

Consensus statements do not distinguish between any of the factors, and the opinion of the participants is mostly shared as it relates to these statements (Brown, 1980). These statements therefore fail to distinguish one factor from others, because all factors may give the same statement the same score. Positive consensus statements are salient and positive statements across all Q-models and negative consensus statements are salient and negative statements across all Q-models (Newman & Ramlo, 2010). Salience is defined as a strongly held opinion, belief, or viewpoint. There was neither positive consensus nor negative consensus statements in this study.

Below are the consensus statements (see Table 4.11) for which the rankings did not distinguish between any pair of factors. In all study factors these statements were ranked or valued in the same way, and this shows that views were common across all the factors. These statements should not be ignored because they can be useful in analyzing the data (Watts & Stenner, 2012). In all three Factor models, statement 5 (*Recognizes nonverbal cues and gestures*) ranked with a neutral score of 0. This is interesting as it reflects that none of the participants had strong feelings about recognizing nonverbal cues and gestures. Statement 8 (*Appropriately uses facial expressions during conversations*) ranked with a score of +1 in Q-Model Factor 1 and a neutral score of 0 in Q-Model Factor 3. This statement was not seen as an important skill for teachers, as observed in their classrooms. Although statement 12 (*Uses different tones of voice during social interactions*) was viewed as somewhat more important for Factor Models 1 and 3, with a rank score of +2, and a score of +1 in Factor 2. Lastly, statement 13 (*During conversations understands the other person's perspective*) had a neutral rank of score of 0 in Factors 2 and 3, but had a rank score -2 in Factor 1. This statement implies that teachers tended to hold similar views regarding students' use of the mechanics of navigating conversations. They perceived that students recognize nonverbal cues, maintain appropriate distances, use different tones of voice, and understand the perspective of others.

Table 4.11

*Consensus Statements: Those That Did Not Distinguish Between ANY Pair of Factors*

No. Statement	Factors		
	1 Q-sort	2 Q-sort	3 Q-sort
5* Recognizes nonverbal cues and gestures	0	0	0
7 Maintains appropriate distances between people and objects	0	1	-1
8* Appropriately uses facial expressions during conversations	1	0	1
12 Uses different tones of voice during social interactions	2	1	2
13 During conversations understands the other person's perspective	-2	0	0

*Note.* All listed statements were non-significant at  $p > .01$ , and those flagged with an \* are also non-significant at  $p > .05$ .

### Findings Related to the Research Questions

#### Research Questions

RQ1: What are teachers' attitudes and beliefs regarding how digital technology affects students' copresence FtF social skills?

RQ2: What are teachers' beliefs regarding how digital technology affects the academic setting as it relates to students' copresence FtF social skills?

#### Findings

All three Q-models demonstrated unique and distinctive views. These were identified as: (1) Represents Adolescents Having Trouble Navigating During A Conversation In Terms of Being Able to Take the Other Person's Perspective, (2) Represents Students Behaving Appropriately During Conversations, (3) Represents Difficulties In Understanding Nonverbal and Verbal Cues.

According to Brown (1993), each Q-sort provides a view of how each person sees the world, and each factor represents a version of the world that is commonly held and that speaks to us through the unison of factor scores. In the analysis process, the most exhibited, the least exhibited, and the distinguishing factors were the characteristics of each perception that were considered.

Factor z-scores, post-sort comments, and distinguishing and consensus statements were analyzed in order to answer Research Question 1: (What are teachers' attitudes and beliefs regarding how digital technology affects students' copresence FtF social skills?), and Research Question 2: (What are teachers' beliefs regarding how digital technology affects the academic setting as it relates to students' copresence FtF social skills?).

### **Research Question 1: What are Teachers' Attitudes and Beliefs Regarding how Digital Technology Affects Students' Copresence FtF Social Skills?**

In interpreting the results in terms of Research Question 1, teachers associated with Q-Model Factor 1, seemed to perceive that digital technology may be impacting adolescents' copresence FtF social skills. In this model, teachers viewed adolescents as being selfish and self-centered, and as not exhibiting appropriate conversational behaviors. For example, in this model, teachers tended to believe that adolescents don't wait their turn in conversations, and refuse to listen to other people's perspectives, and that their conversational style is not always appropriate. It therefore appears that students are having difficulties sustaining conversations.

Similar to Q-Model Factor 1, Q-Model Factor 3 shared a view that teachers associated with this Q-model seemed to perceive that digital technology may be impacting adolescents' FtF social skills. In this Q-model, there were contradicting positions. On one hand, with the positively-scored statements, teachers viewed adolescents as having appropriate conversational behaviors in that they can navigate the actual mechanics of the conversation; however, they felt

that interpreting verbal and nonverbal cues and body language poses a challenge for students. To be successful in academia and the workforce, students need appropriate copresence FtF social skills in order to be able to communicate well with other people. To develop and strengthen social skills, adolescents need opportunities to practice using verbal and nonverbal social skills; therefore, schools will have to incorporate copresence FtF social skills opportunities.

Category 1, Category 2, and Category 4, created out of teachers' responses to the Q-sort questions, support the view that digital technology may be having a negative effect on adolescents' copresence FtF social skills. The first category shows that the digital world appears to be more important to the students than the 3D real world that they live in. Some teachers perceive adolescents as not seeing outside of themselves and as focusing only on themselves, making them seem to be selfish and self-centered. Teachers' reported that conversations among students revolve around the latest posts on social media, are overly focused on students' social media interests, and revealed students' inability to see outside of themselves and their own interests. Furthermore, they stated that adolescents are overly focused on their social interests that digital technology is replacing students' need for FtF interactions, and that now students can text instead of seeing their peers FtF. Overall, this category also seemed to view some adolescents as being selfish and self-centered.

Additionally, Category 2 viewed students as lacking in conversational skills and/or the ability to read social cues. Some teachers reported that their students struggle with social interactions and dealing with real-life situations, and they attributed these shortcomings to students' finding it easier to communicate from behind their phones rather than FtF. Teachers also reported that students seem to have less empathy, and that during conversations, students tend to cut each other off in mid-sentence, are no longer listening to each other, and are short and

abrupt with each other. Other statements reported by teachers were that adolescents do not know how to speak FtF or hold a conversation with other individuals, cannot have meaningful conversations, are not able to socialize properly, struggle to behave FtF because they are doing it less often, and cannot create and sustain discourse with each other or with adults.

This category also seems to portray some adolescents as being self-centered, as lacking the social skills necessary to navigate appropriately during conversations, and as being weak in their ability to read verbal and nonverbal social cues. Some teachers perceived adolescents as not having the skills to navigate appropriately during conversations and felt that they may be lacking verbal and nonverbal social skills. This is a concern because if they do not exhibit appropriate conversational behaviors, how will students be able to sustain a conversation with other people?

Furthermore, Category 4 viewed students as displaying less respect for each other and as becoming meaner to each other. It seems that some students do not think before sharing online; as a result, they sometimes react before thinking when speaking FtF. Teachers reported that as adolescents do not think before sharing their thoughts online, they sometimes react before thinking when speaking FtF, have less filters, and make statements that are often inappropriate and hurtful to their peers and adults. Also, adolescents depend on social media to make friends and become more popular. However, their true emotions and feelings (through texting, Instagram, etc.) and expressions of how they feel can be lost, confused and misunderstood. These behaviors may make it difficult for students to socialize with other students.



**Research Question 2: What are Teachers' Beliefs Regarding how Digital Technology Affects the Academic Setting as it Relates to Students' Copresence FtF Social Skills?**

In interpreting the data for Research Question 2, it seems that teachers associated with Q-Model Factor 2 perceive that digital technology may not be impacting adolescents FtF social skills, and that it is not having an effect on the academic setting. In this model, teachers viewed adolescents as appropriately responding to comments and instructions given by adults, describing their feelings, and negotiating during a conversation. Although Q-Model Factor 3 interprets Research Question 1, it also interprets Research Question 2. According to the negatively-scored, least exhibited statements in this Q-model, students seem to have difficulty describing their feelings and using appropriate facial expressions.

Not reading social cues and being self-centered may impact students' ability to work with others. If adolescents do not always attend to what the other person is saying and seldom ask for directions or assistance, these behaviors can have an effect on how well they can complete assignments. It appears that students do not attend to what others are saying, and instead impose their own interests on others and are not concerned with the interests of other people. If students are not able to socialize and create discourse, then they cannot work out problems with other students, which may impact the academic learning environment.

Category 3 and Category 5 created by the Q-sorts questions support the view that digital technology may be having a negative effect on adolescents' FtF social skills and adversely impacting the academic setting. Category 3 viewed students as lacking focus and needing immediate gratification. Some teachers reported that they believe some students expect immediate gratification when having conversations. These participants attributed this lack of patience during FtF contact to the immediate gratification students get from their devices. These

teachers also stated that it seems that students expect and wait for a quick answer or response to their inquiries while display no patience to sit and think over a solution to a problem. This category supports and answers Research Question 2. Overall, in this category, teachers viewed adolescents as expecting immediate gratification, lacking focus, being easily distracted, having a reduced attention span, and reading and learning content material in little snippets. All of these learning behaviors may have a negative impact on student learning in the academic setting.

The last category (Category 5) that emerged from the teachers' responses was that some students spend too much time connected online. Some teachers reported that students are connected 24 hours a day through their smart devices, but thought that students should have boundaries when it comes to their use of digital technology. Also, teachers believed that adolescents depend on social media to make friends and become more popular. However, their true emotions and feelings and expressions of how they feel can be lost, confused, and misunderstood through texting, Instagram, etc. Some teachers reported that adolescent social anxiety now follows students from school to home, as students appear to feel like they are missing out if they turn their devices off and go to sleep. Also, teachers are observing that students are sleeping in class because of lack of sleep due to their late-night social activities (e.g., online gaming and being an online social butterfly).

This category supports Research Question 2. Overall, in this category, some teachers reported that adolescent social anxiety is now prevalent in school and at home, as adolescents do not turn off their devices. This can lead to students sleeping in class because of a lack of sleep due to late night, digital social activities, which will have a negative impact on the academic learning environment.

### Summary

This chapter presented the analysis of the data and findings regarding teachers' views of the effects of digital technology on adolescents' copresence FtF social skills and the effects on the academic setting as it relates to adolescents' copresence FtF social skills. The study used Q-technique, in which the data analysis included the correlation between Q-sorts and factor analysis. Using PQMethod, a correlation matrix was created. An initial factor analysis was run with PCA and varimax. Q-sorts were then varimax. A subsequent analysis used centroid extraction with hand (judgmental) rotation to get a better theoretically-based solution for the data. A three-factor model was chosen that best represented participants Q-sorts and explained 44% of the variance, with a correlation of .41 at the highest between factors. Tables were created to help analyze the data. The analyses reported in this chapter identified three major viewpoints shared by various clusters of teachers:

- Q-Model Factor 1: *Represents Adolescents Having Trouble Navigating During A Conversation in Terms of Being Able To Take the Other Person's Perspective*
- Q-Model Factor 2: *Represents Students Behaving Appropriately During Conversations*
- Q-Model Factor 3: *Represents Difficulties in Understanding Nonverbal and Verbal Cues*

The first and third viewpoints reflect high school and middle school teachers' views that digital technology may be impacting adolescents' copresence FtF social skills. Teachers' seem to have observed students exhibiting to selfish and self-centered behaviors, and having difficulties appropriately navigating in conversations, which can impact how students interact with each other and how well they can work together during group activities. The second viewpoint reflects high school and middle school teachers' views that digital technology may not

be impacting adolescents' copresence FtF social skills. This viewpoint reflects adolescents as behaving appropriately during conversations.

In Chapter V, the implications of the Q-models and other findings from this study and how it may impact schools, teachers, and policy, as well as suggestions for future research will be discussed.

## CHAPTER V

## CONCLUSIONS AND IMPLICATIONS

Chapter V presents the conclusions this study in relation to educational policy, professional practice, and future research. The implications and recommendations in this study are based upon the literature review in Chapter II and the analyses of the empirical evidence that was discussed in Chapter IV. The interpretations of the factor models take place through my lens as a middle school teacher.

The purpose of this study was to identify, examine, and analyze teachers' attitudes and beliefs about the copresence face-to-face (FtF) social skills of adolescents growing up in a digital world, and the related impact in the academic setting. Aspects of digital technology may be affecting adolescents' FtF copresence social skills and impacting the academic setting according to quantitative studies and research (Boyd, 2007; Liu, 2010; Small & Vorgan, 2008). However, qualitative research, which gives teachers perceptions on this topic, is lacking. This study acknowledges the need to better understand the shared viewpoints about the effects of digital technology on adolescents' copresence FtF social skills. This mixed methods study was developed in multiple stages to answer the following research questions and reveal pertinent information on teachers' attitudes and beliefs:

RQ1: What are teachers' attitudes and beliefs regarding how digital technology affects students' copresence FtF social skills?

RQ2: What are teachers' beliefs regarding how digital technology affects the academic setting as it relates to students' copresence FtF social skills?

The study began with the development of the Q-set, which consisted of forty-eight statements referring to teachers' perceptions of students' FtF social skills. Out of these statements, the researcher discovered six predominant themes for the Q-sample. The six themes that emerged were: nonverbal communication, expressive skills, conversational topic maintenance skills, conversational skills, speech conventions, and peer skills. Next, two focus groups were conducted to test the Q-set, which was designed to best represent social and language skills. No changes had to be made. Then, the participants completed an anonymous online Q-sort and answered some demographic and open-ended questions.

Finally, the qualitative and quantitative analysis component of Q-methodology was completed. PQMethod was used to run all the data with varimax rotation and then a hand rotation. Q-factors were produced based on the group of shared viewpoints across the Q-sorts. Three models of shared viewpoints were identified, and each of the three Q-factors was identified as the following Q-models: Represents Adolescents Having Trouble Navigating During a Conversation in Terms of Being Able to Take the Other Person's Perspective (Factor 1); Represents Students Behaving Appropriately during Conversations (Factor 2); and Represents Difficulties in Understanding Nonverbal and Verbal Cues (Factor 3).

This chapter begins with a synthesis of the views created in the Q-models presented in Chapter IV. Then I will present my conclusions, implications of the shared viewpoints that were revealed in this study, and recommendations for teachers, higher education, and school policymakers. Prior to this study, there was a lack of research that gave teachers a voice regarding their perceptions on the impacts of digital technology and the effects on the academic setting as it relates to adolescents copresence FtF social skills. This study has been conducted to fill that gap in the literature.

## **Synthesis of Teachers' Views Regarding the Digital Technology and FtF Social Skills**

### **Problem**

In the wake of the phenomenon of digital technology and social media, many parents and educators are deeply interested in the effects of media and technology on adolescents' lives. With digital technology, much of the communication that previously occurred copresence FtF, has now moved to computer-mediated or human-machine communication. There are positive and negative views on the benefits of digital technology for learning, and regarding the development of interpersonal relationships, communication, and creativity (Rideout, 2012; Small & Vorgan, 2008).

As mentioned in the literature review, digital technology not only influences the way people live their daily lives, but it also changes the way in which the activities of daily life are held. Technology impacts how people interact with their friends and families, and how they maintain personal relationships. With adolescents spending more time communicating using digital technology with friends and family, they are spending less time communicating copresence FtF, and their ability to effectively recognize the visual cues important in decoding facial expressions has been weakened (Halberstadt, Denham, & Dunsmore, 2001; Tapscott, 1998). Social skills are not only important for successful functioning in society, but they are also needed for success in the workplace.

Studies have been conducted on student perceptions of different aspects and usage of social media (Greenhow & Robelia, 2009; Lewis, 2010), but teacher perceptions have rarely been examined (Williams, 2012). Therefore, this is an important area of study that can enable teachers to work to improve student success in the classroom and beyond.

This exploratory study developed an empirically-grounded, framework that revealed that middle school and high school teachers within this study held three distinct viewpoints regarding their perceptions of the effects of digital technology on adolescents' FtF social skills. The empirical evidence synthesized in Chapter IV revealed that the majority of the teachers perceived that digital technology is having an impact on adolescents' copresence FtF social skills and that it also affects the academic setting as it relates to FtF social skills. Most students today have access to Smartphones and are constantly connected to digital technology. Therefore, the influence of digital technology on adolescents' copresence FtF social skills is important to explore.

**Q-Model Factor 1: Represents Adolescents Having Trouble Navigating during a Conversation in Terms of Being Able to Take the Other Person's Perspective**

Q-Model Factor 1 provides a glimpse into teachers' perceptions on the impacts of digital technology on adolescents' copresence FtF social skills and the effects on the academic setting. In interpreting the data in terms of Research Question 1 and Research Question 2, teachers associated with this Q-model seemed to perceive that digital technology may be impacting adolescents' FtF social skills. This factor reflects participants' beliefs that adolescents have trouble navigating a conversation in terms of being able to take the other person's perspective into account. According to the participants, students of this age group often do not wait or take turns, often impose their own perspective, refuse to listen to others' perspectives, do not let go of an argument, do not seem aware of others' interests, and seldom express relevant information to others. The following most salient statements (14, 17, 25, 31, 35, 39, 40, and 44) best seem to support this view. Statement 31 (*Often does not wait and take turns in conversations*) was the most positively-scored statement in this model, with a z-score of 1.96, and a grid position of +5.



These perceptions align with existing research that suggests that adolescents are having problems navigating FtF conversations. Some research has shown that with adolescents spending more time communicating online and less time FtF, their ability to effectively recognize the visual cues important in decoding facial expressions, gestures, and body movements has decreased (Fortunati, 2005; Knapp & Hall, 2010; Schudon, 1978; Small & Vorgen, 2008). With the increasing usage of social networks, communicating online may not be as spontaneous as it has been in the past because online communication allows one to plan and edit what messages will be sent to others (Fortunati, 2005). Since adolescents are planning what they say online, this may weaken their ability to take turns in conversations, be aware of others interests, and discuss relevant information about themselves.

In contrast, these participants do not believe adolescents wait to be acknowledged before speaking; instead, they are interrupting other speakers, and they do not compromise appropriately during a conversation. The following least salient statements (36, 34, 33, 41, 43, 46, and 16) support teachers views that adolescents do not appropriately navigate by compromising or interrupting during a conversation or wait to be acknowledged by other. Statement 36 (*Waits to be acknowledged before speaking*, with a grid position of -5), was least valued, or most negatively-scored statement in this model with a Q-score of -2.29.

### **Q-Model Factor 2: Represents Students Behaving Appropriately During Conversations**

Q-Model Factor 2 provides a further glimpse into teachers' perceptions on the impacts of digital technology on adolescents' copresence FtF social skills and the effects on the academic setting. In interpreting the findings through Research Question 1 and Research Question 2, teachers associated with this Q-model seemed to perceive that digital technology may be impacting adolescents' FtF social skills. This factor seems to reflect participants' beliefs that

adolescents respond appropriately to instructions and compliments from adults, and that they can describe their own feelings. This model also seems to reflect a view that adolescents choose topics that is age-appropriate, ask questions, and make comments related to the topic under discussion during conversations. The following most exhibited statements numbers 20, 23, 24, 29, 38, 43, and 46, best seem to support this view. Statement 48 (*Responds appropriately to instructions given by adults*) was the most positively-scored statement in this model, with a z-score of 2.21, and a grid position of +5.

These perceptions do align with some of the existing research that suggests that digital technology will have a positive impact on children's social skills and that it is a positive enhancement to children's' growth (Carr, 2010; Palfrey & Gasser, 2008). Some research has shown that, if digital technology is used correctly, it can improve the quality of teaching, learning outcomes, interests, creativity, collaborative work, and learning strategies for adolescents (Badia, Meneses, Siglaes, & Fabregues, 2014 ;Petko, 2012). Furthermore, some studies have shown that social media can help students build and maintain relationships with friends and family (Common Sense Media, 2012).

### **Q-Model Factor 3: Represents Difficulties in Understanding Nonverbal and Verbal Cues**

Q-Model Factor 3 provides a glimpse into teachers' perceptions on the impacts of digital technology on adolescents' copresence FtF social skills and the effects on the academic setting as it relates to copresence FtF social skills. In interpreting Research Question 1 and Research Question 2 in light of the findings, teachers associated with this Q-model seemed to perceive both positive and negative aspects of conversational behavior and perceive that digital technology may or may not be impacting adolescents' copresence FtF social skills. Teachers in this model viewed those students as having difficulties with understanding nonverbal and verbal

cues. According to these participants, adolescents seem not to be navigating conversations using correct interpretations of compliments, sarcasm, feelings, and facial expressions. However, the teachers' view was that adolescents do not monopolize the conversation, and that they can answer with more than "I do not know". In contrast, they also thought that adolescents do not respond appropriately to compliments, do not correctly interpret body language, and seldom choose appropriate topics during conversations. The following most salient statements numbers 9, 10 18, 19, and 35, best seem to support these views. Statement 3 (*Seldom understands the facial expression of others*) was the most positively-scored statement in this model, with a z-score of 2.13, and a grid position of +5.

These perceptions align with existing research that suggests that adolescents are having difficulties understanding nonverbal and verbal cues. Some research shows that children need to develop their interpersonal communication skills through copresence FtF opportunities. Both social skills and interpersonal communication are the processes through by which people communicate with each other (Harankhedkar, 2016; Pea et al., 2012; SkillsYouNeed, 2015). Research suggests that the current generation lacks such essential interpersonal skills, such as the ability to express ideas and thoughts to others (Harankhedkar, 2016; Pea et al., 2012; SkillsYouNeed, 2015). Social skills are not only important for successful functioning in society, but they are also needed in the workplace. In fact, studies have shown that graduate students are lacking soft skills (e.g., good communication, punctuality, flexibility, creativity, and collaboration) that are necessary for navigating effectively in the workforce (McVeigh, 2013; White, 2013). This lacking of soft skills becomes a problem if students do not know how to communicate in the workplace, and this may be due to limited copresence FtF communication opportunities.

### **Summary of Q-Models**

As mentioned in Chapter IV, Q-Models Factor 1 and Factor 3 reveal that the teachers viewed adolescents as being selfish, self-centered, and not having appropriate conversational behaviors. Adolescents are having difficulties waiting their turn in conversations, listening to other people's perspectives, and asking for directions. Additionally, teachers viewed adolescents as not understanding nonverbal and verbal cues, and as having weak conversational behaviors. Students also misinterpret body language, have difficulty maintaining eye contact when speaking to others, and are monopolizing conversations. When people engage in FtF interactions, social information is communicated by vocal and visual cues within the context of the situation. Also, nonverbal communication is an important part of communicating because one may have to modify one's behavior in response to the reaction of others (Knapp & Hall, 2010). Today's adolescents and young adults are inundated with digital technology, and they communicate with others from behind screens, which may be curtailing or replacing the copresence FtF experiences critical for developing social skills.

In contrast, Q-Model Factor 2 reflects high school and middle school teachers' views that digital technology may not be impacting adolescents' copresence FtF social skills. This model reflects the view that adolescents are behaving appropriately during conversations, and are being able to read and understand verbal and nonverbal social cues.

### **Post Q-Sort Qualitative Data**

The qualitative data from the open-ended questions derived from the Q-sorts created five categories, that seems to confirm that teachers perceive that digital technology may be weakening and impacting adolescents' FtF copresence social skills and the academic setting as it relates to those skills.

The first category was that the digital world is more important than the 3D real world that students live in. Teachers' view their students as focused on their social media interests and are concerned about students' inability to see outside of themselves and their own interests. Students seem to not be engaging in the sharing of ideas and thoughts. This category supports and addresses Research Question 1 and Research Question 2, and supports Q-Model Factor 1 and Q-Model Factor 3.

The second category that emerged was that students seem to be lacking conversational skill and/or social cues. Teachers' reported that students struggle with FtF social interactions and they find it easier to communicate from behind their phones. Also, teachers reported that students seem to have less empathy and no longer listen to each other. This category supports and answers Research Question 1 and Research Question 2. It also shares the views Q-Model Factor 1 and Q-Model Factor 3.

The third category that emerged was that some students have a lack of focus and need immediate gratification. Teachers' reported that students want quick answers and, display no patience to sit and think over a problem. This category supports and answers Research Question 2, in that the lack of these learning behaviors may have a negative impact on students' learning in the academic setting. According to some students are easily distracted, have a short attention span, read content material in snippets, and want immediate gratification. This category supports the views from Q-Model Factor 1, Q-Model Factor 2, and Q-Model Factor 3.

The fourth category that emerged was that adolescents have less respect for each other and are becoming meaner to each other. Teachers' viewed students as having less filters, and as reacting before thinking or speaking to each other. At times, students make statements that are inappropriate and hurtful to their peers and adults. This category supports and answers Research

Question 1 and Research Question 2, in that the lack of learning these behaviors may have a negative impact on students' learning in the academic setting. This category supports the views from the Q-Model Factor 1 and Q-Model Factor 3, as adolescents seem to be selfish, self-centered, and have difficulties navigating appropriately during conversations.

The last category that emerged was that some students spend too much time connected online. Teachers' reported that students are connected 24 hours a day through their smart devices, and that they depend on social media to make friends. It seems that adolescents' social anxiety now follows them from school to home, as students appear to feel like they are missing out on things if they turn off their devices. This category seems to support the thinking that students are self-centered and lack the understanding of verbal and nonverbal social cues, and it supports the views from Q-Model Factor 1, and Q-Model Factor 3. This category also supports and answers Research Question 2, in that the lack of these learned behaviors may have a negative impact on students' learning in the academic setting.

### **Theoretical Frameworks**

This study was guided by two theoretical frameworks: Bandura's Social Cognitive Theory (SCT), and McLuhan's Mass Communications Theory. Bandura's SCT proposes that parts of an individual's knowledge acquisition can be directly related to observing others within the context of social interactions, and experiences, as well as through outside media influence. Whether, directly, or indirectly, information transmitted by today's communication mediums shapes a society's expectations and behaviors (Bandura, 1994, 2004). SCT examines how repeated exposure to media changes human behavior, and maintains that human adaptation and change are rooted in social systems (Bandura, 1977). Since an adolescent's life today is infused with digital technology, socialization using digital gadgetry is a typical behavior for teenagers.

Thus, it is important to try to develop a better understanding of how digital technology usage is affecting social processes.

In addition, McLuhan's Mass Communication Theory saw technology and machines as the mediums for communication and gave insight on how media influences humans' social lives. He was the first theorist to recognize the importance and consequence of a medium or technology in terms of communication skills. McLuhan saw each medium as an extension of human sensory organs with the capability to alter the relation of the individual to the surrounding world (E. McLuhan, 2008; McLuhan, 1964). From this viewpoint, technology has become an extension of humanity that helps people reinvent themselves (McLuhan, 1964).

### **Implications**

The role of teachers in society is very important, and their attitudes and beliefs are very significant, and may have an influence on their actions in the classroom (Potter, 2007). Also, teachers' attitudes and beliefs may influence students' academic achievement, and this could have implications for how strategies are developed and implemented. The perceptions of teachers are important because they can provide a viewpoint on how digital technology may be changing adolescents' affective and cognitive development, and thus, on how educators can address this phenomenon (Williams, 2012). In this study, several teachers reported that their perception that adolescent' communication skills have decreased and that a lot of these students do not know how to communicate FtF. Moreover, some teachers felt that digital technology is a distraction that negatively impacts education and learning. In their responses to the open-ended questions, some teachers reported that adolescents spend too much time using social media and are not sleeping enough. They come to school tired, and this may be impacting their learning. Palfrey and Gasser (2008) state that teaching should not only be mediated by new technologies,

but should also offer opportunities for dialogue, with people working together to exchange views, look at topics in depth, question, and explore issues in a copresence FtF social setting. Obviously, students are not taking part in such learning strategies-and-cannot if they are spending too much time with digital technology.

Adolescents' extensive use of digital communication methods can weaken the prevalence of the copresence FtF experiences they need in order to develop and master important social skills (Giedd, 2012). Nonverbal communication is an important part of communicating, and it includes eye contact, tone of voice, and the ability to read facial expressions (app & Hall, 2010). So much of language communication involves gestures, facial expressions, voice tone, and inflection. Therefore, although digital technology can certainly aid in communication, sometimes a lot of context can be lost because there is very little verbal and nonverbal communication going on. Adolescents with good social skills are the student who has a strong interpersonal skill set, which helps them develop strong relationships and helps them to go on and be successful in school and in life (Knapp & Hall 2010; NASP, 2000). The question is, if adolescents are lacking in critical FtF social skills, will it be the school's responsibility to teach students these interpersonal skills? If such a responsibility is mandated, it may have a significant impact on how teachers deliver their lessons. They will also have to implement specific programs to help adolescents develop and sustain copresence FtF social skills.

Due to the increased presence of digital technology in education and in adolescents' lives, teachers need to teach their students the skills required to use this technology accurately, as well as learn to analyze its accuracy through effective critical thinking. In today's educational setting, teachers must create a balance between using traditional resources and technology, while incorporating copresence FtF communication-building activities. Adolescents' ability to process



verbal and nonverbal cues is known to be associated with personal, social, and academic success (Knapp & Hall, 2010). Being able to read verbal and nonverbal cues is a major component in social communication. This study has shown that if adolescents do not limit the use of digital technology, they may have poor copresence FtF social skills, and this may affect their learning. Besides learning how to read and write in school, children learn how to get along with other people and develop social skills. School is a natural environment in which adolescents can spend time with other adolescents, and it is a good setting for children to practice social skills (Levine, 1998).

Using an interdisciplinary approach, this research looked at teachers' attitudes, beliefs, and perceptions regarding their students' most exhibited or least exhibited FtF social skills in the classroom. It is hoped that the information from this study will generate further exploration from researchers in this field, and affect policy-making at the level of higher education and in the classroom curriculum.

### **General Recommendations**

Several empirical studies have indicated that the acquisition of certain social skills is crucial to the overall success of the individual child at school (Baym, 2010; Carr, 2010; Steiner-Adair, 2013; Wartella & Jennings, 2000). Based on the empirical evidence produced in the Q-models in this study, the results of this study indicate that teachers should implement opportunities and strategies to help children improve their social skills (Levine, 1998). Children need to learn how to make their way in a larger social group, read social cues, and develop skills for making friends. Even though teachers do not have the opportunity to teach social skills directly, they can be facilitators in helping children gain social skills by involving them in cooperative group work and pairing a socially inept child with a socially adept child.

Teachers need to understand adolescents' social weaknesses and create a classroom environment in which diversity is accepted and celebrated (Levine, 1998). Teachers should help children feel like they belong and help them to develop positive self-esteem. Thus, the literature and this study support the idea that teachers need to create collaborative learning spaces and teach communities of students in which social connections and the curriculum are related to the real world.

A teacher's role is to facilitate and encourage prosocial behaviors; therefore activities should be provided to help students acquire social skills and understand why each skill is needed (Johnson, et. al., 2000). Administrators can help by developing programs in schools that improve student' social skills by promoting positive behavior, and academic success. Previous studies in conjunction with this study further indicate that schools need to develop classes to improve adolescents' skills in reading body language and, identifying verbal and nonverbal cues, and also strengthening their interpersonal skills. Strong interpersonal and soft skills are needed for success in relationships, as well as in the academic and workforce settings. Ideally, higher education courses, as well as in-service and continuing education courses, would be effective in training teachers how to enhance and strengthen their students' copresence FtF social skills.

### **Future Research, Limitations, and Conclusion**

Currently, there is little research on teachers' perceptions regarding this topic. This Q-methodology study provides an initial exploration of teachers' attitudes around the effects of digital technology on adolescents' copresence FtF social skills. This is therefore an important area of study that can enable teachers to work to improve student success in the classroom and beyond. The message of teachers' perceptions seems to be that digital technology may be impacting their students' copresence FtF social skills and also impacting the academic setting.

Some students are having difficulties working with others, are not empathetic, and are lacking the ability to read verbal and nonverbal social cues. Teachers' input in the areas of curriculum, educational improvements, and the development of effective teaching of copresence FtF social skills is extremely important. A future research study might examine adolescents' own perspectives on the effects of digital technology on their copresence FtF social skills. Future research could also look into how programs could be developed on a larger scale to assist teachers to work with parents and other professionals to encourage and nurture the development of social skills in children to provide learning experience inside and outside the classroom.

Given that this study was only given in one area of the country so replicating this study within other school districts and geographic areas would be a good idea. While this research study was designed to assess teachers' perceptions of the impact of digital technology on adolescents' copresence FtF social skills, a notable omission is the perception of the adolescents themselves. Further research will therefore need to consider students' perceptions to form an overall view that incorporates all parties. Moreover, since the influence of digital technology is still in its infancy, longitudinal studies will be needed to adequately determine the effects of digital technology on adolescents' FtF social skills. In a future study, the open-ended questions could include inquiries into why each participant sorted the statements as he or she did. This would give more information into how and what participants are thinking while sorting the statements. This information was lacking in this study.

As this study has shown, today's youths have a wide variety of options for communicating with their friends, including via chat rooms, Smartphones, social networks, video communications, face-time, and online gaming, etc.

These new modes and methods of communication have resulted in new forms of socialization, which are having implications in copresence FtF interactions and seem to be impacting the academic and workforce setting. Currently, there is little research on this topic. To better understand the impact digital technology is having on copresence FtF social skill, and to further assist teachers with their pedagogy on improving these copresence FtF social skills, more research will be needed.

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## Appendix A

## Invitation Email and Online Survey Link

Dear Colleague:

As a special education teacher and a doctoral student, I am interested in the role of the teacher over time, as it is perceived by experienced teachers like you. My doctoral dissertation research focuses on the professional views and personal insights of teachers concerning their attitudes and beliefs about the face-to-face social skills of adolescents growing up in a digital world and the related impact in the academic setting.

I am writing to ask for a few minutes of your valuable time to complete an anonymous, online survey, which is critical to my study. In pilot testing, I have found that most respondents complete the survey in less than 30 minutes, so I hope you will be willing to take a small amount of your time to help me by sharing your expert views and perceptions related to adolescents' use of digital technology and the effect on face-to-face social skills. If you participate, your responses will be completely anonymous. You will not be asked to provide your name or the name of the school you are affiliated with. My findings will be reported only in terms of overall views or those of groups of teachers with similar backgrounds.

**You can access the online survey at [www.guillysq-sort.com](http://www.guillysq-sort.com). Please feel free to forward this information to any teacher colleagues who might be interested in participating. Responding to the survey indicates your informed consent to participate in this anonymous survey.**

I would be very grateful for your participation in my dissertation research. Your perspectives are important to the success of this study. If you have any questions or would like to discuss the survey, please send me an email at [guillermina.garcia@my.liu.edu](mailto:guillermina.garcia@my.liu.edu) or feel free to contact me at 516-924-6476.

Sincerely,  
Guillermina Garcia, Doctoral Candidate  
Long Island University, LIU Post Campus  
College of Education, Information, and Technology

Appendix B  
Demographic and Technology Questions

Directions: For questions 1- 10, please choose the appropriate letter.

1. How many years have you been a teacher?
  - A. 4 years or less
  - B. between 5 and 10 years
  - C. between 11 and 20 years
  - E. greater than 20 years
2. What is your gender?
  - A. Male
  - B. Female
3. What is the highest educational degree do you currently hold?
  - A. Masters
  - B. Masters +30
  - C. Masters + 45
  - D. Masters + 60
  - E. Other (Please specify)\_\_\_\_\_
4. What grade level do you teach? (Please check all that you currently teach)
  - A. 6
  - B. 7
  - C. 8
  - D. 9-12
5. How would you describe your knowledge of instructional technology?
  - A. I am an expert in instructional technology
  - B. I am very knowledgeable about instructional technology
  - C. I have some knowledge of instructional technology
  - D. I know very little about instructional technology

6. Do you think digital technology (for example: social media, cell phones, Smartphones, Instagram) is having an effect on student's interpersonal skills? (for example; listening, empathy, or emotional intelligence)
  - A. Yes
  - B. No
7. In your opinion, do you think digital technology is having an effect on student's face-to-face social skills?
  - A. Yes
  - B. No
8. What was your most recent birthday?
9. What effect, if any, do you think digital technology is having on students' social skills with their social interactions with others?
10. Do you utilize social networks? If yes, please explain if you are using social networks for personal use, for instructional use, or for both personal and instructional use.
11. What digital technologies do you currently use? (for example iPad, iPod, Smartphone, Smart Board)



## Appendix C

## Categories that Emerged from Participant Answers to Open-Ended Questions

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**Category #1: Digital World More Important than Real World**

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Examples of Statements:

Most Associating friendships with how many Instagram friends they have or how long their streak is on Snapshot. (Participant: 1)

Most school conversations revolve around the latest posting on Instagram, Facebook, Snapchat, etc. (Participants: 2, 7, and 15)

Spending time talking about their digital lives and are not engaging in sharing of ideas and thoughts/unable to see outside of themselves. (Participants: 2, 15, and 7)

Overly focused on their social interests. (Participant: 7)

Digital Technology is replacing students' needs for face-to-face, interactions behind the screen (can text instead of seeing them face-to-face). (Participants: 19, 24)

Prefer alternate reality that comes with social media and games over interacting face-to-face with people. Personae student have in their digital world are more pronounce or replace the 3D world. (Participants: 23 and 27)

Heads are buried in their phones or game systems. (Participant: 5)

Kids need to be entertained and no longer read a book to be entertained. (Participant: 5)

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**Category #2: Lack of Conversational Skill and Social Cues**

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Examples of Statements:

Struggle with social interactions and dealing with real-life situations because it's easier to do it behind their phones. (Participants: 1, 19, and 24)

Takes away the feeling part of interacting. (Participant: 1)

Don't know how to speak face-to-face or hold a conversation among individuals, cannot have meaningful conversations, not able to socialize properly, struggle to behave face-to-face because doing it less often. (Participants: 1, 2, 6, 7, 12, 16, 18, 20, 21, 22, 26, 27, and 28)

Don't project appropriate social cues or other body language. (Participant: 3)

Creating and sustaining discourse with each other as well as with adults is suffering. (Participant: 27)

Don't talk in a normal volume. (Participant: 13)

They do not know how to speak on the phone with other individuals. (Participants: 1 and 17)

Less interactions between friends and family members. (Participant: 5)

Affecting students' ability to show empathy. (Participants: 3, 13, 12, and 29)

Prevents student from developing maturity and consideration for others. (Participants: 3 and 29)

Cutting each other off in mid-sentence and no longer listening to each other. Are short and abrupt with each other. (Participants: 13, 15, and 28)

Hard time developing probing questions. Participant: 7)

Lost the ease of back and forth conversation. (Participants: 6 and 12)

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Category #3: Lack of Focus and Need of Immediate Gratification

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Examples of Themes:

They expect immediate gratification when having conversations due to immediate gratification they get from their devices. (Participants: 6, 7, 15, and 17)

Waiting for the quick answer response to their inquiries, no patience to sit and think over a solution to a problem. Participants: 6, 15, 20, 24, and 25)

Read and learn content in little snippets and not in a sustained manner. (Participant: 6)

Immaturity is most glaring when they are unable to see the seriousness of certain situations.

Everything is a joke and temporary in their eyes. (Participant: 29)

Lack of focus/more easily distracted/lowering attention span. (Participant: 4, 9, 10, 11, 15, 20, and 27)

Lowering grit and patience. (Participants: 4, 6, and 12)

Lowering recall capacity. (Participant: 4)

More dependent on visual cues. (Participant: 24)

Demand teachers' attention. (Participant: 25)

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Category #4: Lack of Respect for Each Other

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Examples of Statements:

Kids don't think before sharing online, as a result they sometimes react before thinking when speaking face-to-face. (Participant: 23)

Less filters and statements made are often made that are inappropriate and hurtful to their peers and adults. (Participant: 3)

Don't respect peers or adults. (Participants: 3, 13)

Can be mean and deceitful because of what they see or hear in social media. #13

Depend on social media to make friends and become more popular and their true emotions and feelings (through texting, Instagram, etc.) and expression of how they feel can be lost, confused and misunderstood. (Participant: 24)

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Category #5: Too Much Time Connected

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Examples of Statements:

Should have boundaries when it comes to the digital technology. (Participant: 8)

Are connected 24 hours a day through their smart devices. (Participant: 8)

Adolescent social anxiety now follows school to home and they feel like they are missing out if they turn their devices off and go to sleep. (Participant: 4)

Sleeping in class because of lack of sleep due to late night social activities (online gaming and being the social butterfly). (Participant: 4)

## Appendix D

## Cumulative Communalities Matrix

SORTS	Factors						
	1	2	3	4	5	6	7
1 P1	0.3667	0.3702	0.3740	0.3960	0.4099	0.4502	0.4551
2 P2	0.0885	0.2341	0.2580	0.3279	0.3337	0.3629	0.4035
3 P3	0.5481	0.5625	0.5789	0.5819	0.6194	0.6447	0.6448
4 P4	0.0835	0.1621	0.2684	0.4580	0.4945	0.5313	0.5636
5 P5	0.0205	0.2843	0.3739	0.3774	0.3790	0.4223	0.5100
6 P6	0.1926	0.4859	0.4980	0.5100	0.6409	0.6427	0.6664
7 P7	0.2441	0.2455	0.2821	0.3652	0.3901	0.3908	0.4578
8 P8	0.3881	0.6417	0.6440	0.6487	0.6527	0.6868	0.7859
9 P9	0.4494	0.5525	0.5765	0.6120	0.6122	0.6166	0.6331
10 P10	0.0668	0.1460	0.2865	0.3094	0.3108	0.4866	0.4886
11 P11	0.0353	0.0541	0.0647	0.1616	0.3179	0.3331	0.3419
12 P12	0.0437	0.1155	0.2453	0.2692	0.2702	0.2908	0.3001
13 P13	0.4165	0.4608	0.4944	0.4969	0.5210	0.5429	0.5429
14 P15	0.4669	0.4845	0.5498	0.5664	0.6050	0.6084	0.6141
15 P16	0.1630	0.2418	0.2563	0.4818	0.4844	0.5344	0.5438
16 P17	0.0151	0.0154	0.0242	0.1341	0.1779	0.1784	0.2692
17 P18	0.0214	0.2984	0.3103	0.3117	0.3467	0.4198	0.4423
18 P20	0.0491	0.2054	0.2071	0.3411	0.3949	0.4491	0.4563
19 P20	0.5485	0.6003	0.6003	0.6234	0.6435	0.6664	0.6872
20 P21	0.0625	0.1508	0.2369	0.2976	0.3195	0.3528	0.3533
21 P22	0.1392	0.2339	0.3430	0.3699	0.4416	0.5020	0.5162
22 P23	0.2865	0.5021	0.5140	0.5165	0.5545	0.5637	0.6125

(continued)

Appendix D. Cumulative Communalities Matrix. (continued)

SORTS	Factors						
	1	2	3	4	5	6	7
23 P24	0.0145	0.0184	0.0473	0.0488	0.1185	0.1326	0.1906
24 P25	0.4179	0.4320	0.4883	0.4959	0.5953	0.6231	0.6310
25 P26	0.0893	0.2451	0.2463	0.2473	0.2831	0.3150	0.3614
26 P27	0.4226	0.4744	0.4835	0.5566	0.5736	0.5812	0.5819
27 P28	0.3428	0.3661	0.6194	0.6392	0.6444	0.6689	0.7241
28 P29	0.0680	0.1173	0.1764	0.1866	0.1914	0.3211	0.3546
29 P30	0.0585	0.3894	0.4005	0.4645	0.5110	0.5211	0.5227
30 P31	0.4832	0.4869	0.5305	0.5335	0.5628	0.5701	0.6633
31 P14	0.0152	0.0886	0.0925	0.0990	0.1086	0.1088	0.1131
cum% expl.Var.	21	31	36	40	44	47	50

Appendix E  
Eigenvalues and Percent Variance Explained

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Factors	Eigenvalue	% Variance	Cumulative % Variance
1	7.224	23.30	23.30
2	3.755	12.11	35.42
3	2.088	6.73	42.15
4	1.912	6.17	48.32
5	1.675	5.40	53.72
6	1.595	5.15	58.87
7	1.386	4.47	63.34
8	1.311	4.23	67.57
9	1.193	3.85	71.42
10	1.102	3.56	74.97
11	1.052	3.39	78.37
12	0.911	2.94	81.31
13	0.874	2.82	84.13
14	0.759	2.45	86.57
15	0.580	1.87	88.44
16	0.554	1.79	90.23
17	0.452	1.46	91.69
18	0.401	1.29	92.98
19	0.365	1.18	94.16
20	0.312	1.01	95.16
21	0.260	0.84	96.00
22	0.245	0.79	96.79
23	0.232	0.75	97.54
24	0.184	0.59	98.14
25	0.146	0.47	98.61
26	0.119	0.38	98.99
27	0.107	0.34	99.33
28	0.082	0.27	99.60
29	0.069	0.22	99.82
30	0.030	0.10	99.92
31	0.026	0.08	100.00

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*Note.* The eigenvalues and variances have been calculated using the factor loadings of all the Q-sorts included in the study.

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