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TEACHERS' END-USER ATTITUDES TOWARD THE IMPLEMENTATION OF SCHOOL-BASED SOCIAL NETWORKING SITES IN K-8 SCHOOLS: AN EXTENTION OF THE TECHNOLOGY ACCEPTANCE MODEL

by

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A dissertation

submitted in partial fulfillment

of the requirements for the degree of

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DEDICATION

This dissertation is dedicated to Jazmin, my wife, as well as my parents, grandparents, family, and other influential figures in my life.

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I would like to acknowledge and thank my committee members for helping me complete my dissertation.

ABSTRACT

Advancement in technologies, such as smartphones and social networking sites (SNSs), are transforming traditional school-based communication in education. School-based SNSs are a web-based system that enables administrators and teachers to (1) create or join a semi-public online school community within a bounded system, (2) construct a virtual classroom with individual student profiles, or avatars, (3) invite parents and guardians to create a profile and link with their child's profile, (4) and communicate with students, parents, and guardians about students' school experiences using the classroom management and communication platform. ClassDojo, a school-based SNS, has over three million teachers and 35 million students using the platform (Williamson, 2017a). Teachers create and manage the virtual community; therefore, it is crucial to understand teachers' end-user attitudes towards adopting school-based SNSs. An extension of the Technology Acceptance Model (TAM) examined K-8 teachers' end-user attitudes to integrate school-based SNSs in United States' primary and middle schools. The TAM's foundation, extensions, and correlation to teachers' attitudes towards technology presented as an ideal model to ground the study. Thus, using theoretical and empirical studies related to teachers' adoption of technology and SNSs, this research study extended TAM using the following factors: (1) perceived usefulness (PU), (2) perceived ease of use (PEOU), (3) security awareness (SA), (4) subjective norm (SN), (5) attitude toward using SNSs (ATT), and (6) intention to use SNSs (ITU). TAM research traditionally relies on obtaining self-reported data from participants through survey.

This survey-research collected data from 264 kindergarten to eighth-grade teachers throughout the United States. The survey data was used to analyze descriptive statistics between TAM variables, as well as perform path analyses on the relationships between the TAM variables. In this study, the TAM was extended to include subjective norm (SN) and security awareness (SA). In summary, a majority of K-8 teachers had a generally favorable attitude about ClassDojo's: (1) perceived usefulness, (2) perceived ease of use, (3) security awareness, (4) subjective norm, (5) attitude towards use, and (6) intention to use. Path analysis with latent factors utilized multiple regressions to assess the direct and indirect influences of variables within a model (Hatcher, 2013). The extended TAM model was reliable and illustrated that seven out of the eight path analyses were statistically significant. Teachers' attitudes towards ClassDojo use had the most statistically significant influence on teachers' intentions to use ClassDojo. Similar to findings from traditional TAM studies, perceived usefulness had the largest statistically significant influence on teachers' attitudes toward ClassDojo use. A thematic analysis of teachers' comments about ClassDojo provided support for the extended TAM path analysis. In conclusion, this study synthesized other TAM variables to establish, the Teacher Technology Acceptance Model of Social Networking Sites (T-TAMS), to identify and explore factors that positively influenced K-8 teachers' end-user attitudes towards school-based SNSs use. Lastly, limitations and future research were presented. This study advanced research on teachers' TAM of SNSs, teachers' end-user attitudes toward ClassDojo, and school-based communication. Thus, these findings can be used to boost ClassDojo's adoption rates among K-8 schools in the United States.

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LIST OF ABBREVIATIONS

DoI	Diffusion of Innovation
SM	Social Media
SNS	Social Networking Site
T-TAMS	Teachers' Technology Acceptance Model of Social Network Sites
TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action

Abbreviations for TAM Factors

ATT	Attitude Towards Use
ITU	Intentions to Use
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
SA	Security Awareness
SN	Subjective Norm

CHAPTER ONE: INTRODUCTION

The permeation of smartphones (Barrett-Greenly, 2013; Ho, Hung & Chen, 2013; Can, 2016; Thompson, Mazer, & Grady, 2015; "Mobile fact sheet," 2018) and social network sites (SNSs) (Olmstead, 2013; Williamson, 2017b; Manolev, Sullivan, Slee, 2019) into education generated a paradigm shift in parent-teacher communication (Thompson et al., 2015). Teachers use smartphones and school-based SNSs, such as ClassDojo, to communicate with parents and family members about students' behavior and academic progress (Williamson, 2017b; Manolev et al., 2019). School-based SNSs are a web-based system that enables administrators and teachers to (Robacker, Rivera, & Warren, 2016; Dillon, Radley, Tingstrom, Dart, & Barry, 2019; Williamson, 2017b; Manolev et al., 2019) (1) create or join a semi-public online school community within a bounded system (Williamson, 2017b; Manolev et al., 2019), (2) construct a virtual classroom with individual student profiles, or avatars (Williamson, 2017b; Homer, Hew, & Tan, 2018; Manolev et al., 2019), (3) invite parents and guardians to create a profile and link with their child's profile (Chiarelli, Szabo, & Williams, 2015; Robacker et al., 2016; Krach, McCreer, & Rimel, 2017; Williamson, 2017a; Williamson, 2017b; Homer et al., 2018; Lipscomb, Anderson, & Gadke, 2018; Manolev et al., 2019), and (4) communicate with students, parents, and guardians about students' school experiences (Williamson, 2017b; Manolev et al., 2019) through the classroom management (Chiarelli et al., 2015; da Rocha Seixas, Gomes & de Melo Filho, 2016; Robacker et al., 2016; Lynne, Radley, Dart, Tingstrom, Barry, & Lum, 2017; Williamson, 2017a; Homer et al.,

2018; Lipscomb et al., 2018) and communication platform (Hammonds, Matherson, Wilson, & Wright, 2013; Burger, 2015; Robacker et al., 2016; Williamson, 2017a; Williamson, 2017b; Wilson, 2017). School-based SNSs resemble larger networking sites, like Facebook, in its layout and navigation (Williamson, 2017b). Therefore, the platforms establish an online community, with no monetary investment (Burger, 2015), that is devoted to supporting students' success in the classroom (Williamson, 2017b; Wilson, 2017; Manolev et al., 2019) and schoolwide (Williamson, 2017b). School-based SNS platforms include ClassDojo (Williamson, 2017b; Manolev et al., 2019), Bloomz (Peck, 2018), Remind (Chang & Pearman, 2018), Edmodo for Parents, Appletree, and ClassFlow Moments ("Apps," 2016).

ClassDojo is "driven by ambitions to become the main social media platform for schools" (Williamson, 2017b, p. 60). Over 3 million teachers and 35 million students around the world use ClassDojo (Williamson, 2017a). According to ClassDojo's website, the platform "is actively used in 95% of all K-8 schools in the U.S. and 180 countries" ("About us," 2019). ClassDojo provide teachers with student behavior management tools (Chiarelli et al., 2015; da Rocha Seixas et al., 2016; Robacker et al., 2016; Lynne et al., 2017; Williamson, 2017a; Homer et al., 2018; Lipscomb et al., 2018), parent instant messaging (Hammonds et al., 2013; Burger, 2015; Robacker et al., 2016; Williamson, 2017a; Williamson, 2017b; Wilson, 2017), student portfolios, and a class/school newsfeed. However, minimal research explores why teachers are voluntarily adopting ClassDojo into their classroom. Technology acceptance theories and models support that an individual's behaviors are succeeded by their behavioral intentions to perform an

action (Teo, 2013). Therefore, teachers' attitudes toward ClassDojo integration are likely to influence their acceptance and use behaviors (Teo, Lee, & Chai, 2008).

The purpose of this study is to understand United States K-8 teachers' end-user attitudes and perceptions to accept, ClassDojo, a school-based SNS. Teachers' attitudes highly influence the success for adopting new technologies (Teo, 2009b; Curran & Lennon, 2011; Teo, Ursavaş, & Bahçekapili, 2012; Akbari, Naderi, Yazdi, Simons, & Pilot, 2016; Elkaseh, Wong, & Fung, 2016; Ursavas & Reisoglu, 2017; Siyam, 2019), such as computers (Teo, 2009b; Teo et al., 2012), social learning systems (Akbari et al., 2016; Akman & Turhan, 2017; Ursavas & Reisoglu, 2017), learning management systems (Hashim, 2011; Fathema, Shannon, & Ross, 2015), information and communication technology (ICT) (Liu, Lin, & Zhang, 2017; Scherer, Siddiz, Tondeur, 2019), and Blackboard (Chen, Sivo, Seilhamer, Sugar, & Mao, 2013). Teachers' end-user attitudes are positively impacted by enjoyment, social influence, drama (Curran & Lennon, 2011), subjective norm (Ursavas & Reisoglu, 2017), number of SNS accounts (Akbari et al., 2016), and social media usage (Elkaseh et al., 2016). Teachers' attitude was the highest statistically significant predictor of SNSs use in formal learning (Akbari et al., 2016). According to Siyam (2019), positive attitudes towards technology use has the potential to increase actual technology use. Overall, teachers' attitudes about new technologies, such as ClassDojo, influence their willingness to adopt and use it (Liu, Lin, & Zhang, 2017). Therefore, it is crucial to understand teachers' end-user attitudes to adopt ClassDojo. The Technology Acceptance Model (TAM) is an ideal framework to assess teachers' attitudes and perceptions to accept ClassDojo. Following TAM's initial development (Davis, 1985) and validation (Davis, 1989; Davis et al., 1989), numerous

studies came out that implemented or extended the model for teachers (Holden & Rada, 2011; Huntington & Worrell, 2013; Quadri, 2014; Scherer et al., 2019; Scherer & Teo, 2019). This chapter includes an analysis of the study's background, problem statement, purpose, research questions and hypotheses, theoretical framework, scope, assumptions, limitations and delimitations, significance, and definitions of important terms.

Background

Technological advancements in information and communication technologies (ICTs) reconstructed teachers' school-based communication with families (Thompson et al., 2015). Teachers communicate by passing signals from the teacher to the individual or the other way around (Graham-Clay, 2005). For instance, teachers communicate with families through newsletters (Chambers, 1998), communication books (Williams & Cartledge, 1997; Davern, 2004), report cards, school websites (Graham-Clay, 2005), face-to-face communication, phone calls home (Love, 1996; Gustafson, 1998), voicemail messages (Clemens-Brower, 1997), parent-teacher conferences (Bilton, Jackson, & Hymer, 2017), learning management systems (LMS) (Blau & Hameiri, 2010), e-portfolios (Higgins & Cherrington, 2017), text messaging (Thompson et al., 2015), and via email (Thompson, 2008; Thompson et al., 2015). As technology continues to advance, the way that teachers communicate with parents and families has become more innovative and time-efficient (Graham-Clay, 2005). Technologies allow continuous communication between teachers and parents that location or school hours does not impede. This section generates an extensive background on teachers' attitudes and perceptions towards the educational shift from traditional parent-teacher communication to the inclusion of smartphones (Barrett-Greenly, 2013; Ho et al., 2013; Can, 2016;

Thompson et al., 2015; “Mobile fact sheet,” 2018) and SNSs in school-based communication (Olmstead, 2013; Williamson, 2017b; Manolev et al., 2019).

Advancement in technology, specifically the Internet and phones, are revolutionizing how teachers socialize and communicate with students, parents, and families (Barrett-Greenly, 2013; Ho et al., 2013; Can, 2016; Thompson et al., 2015; “Mobile fact sheet,” 2018). Early studies on fixed-line phones focused primarily on teachers’ integration of classroom phones and voicemail (Clemens-Brower, 1997; Graham-Clay, 2005). Tidd (2014) explains that there has been a considerable change from fixed line to mobile telephones. A Pew Research study (“Mobile fact sheet,” 2018) found that 95% of Americans own a cell phone and 77% of those are smartphones, which is up from the 35% of smartphone users in 2011. Currently, the integration of “smartphones and other new communication technologies” in society are changing the nature of school-based communication (Thompson et al., 2015, p. 187). Parents’ perceptions of communicating with teachers using mobile phone applications are “positive and useful” (Can, 2016, p. 242). Similarly, teachers’ perceptions of mobile technology’s perceived ease of use (PEOU) and perceived usefulness (PU) had a statistically significant influence on teachers' intentions to use mobile technology (Ho et al., 2013). Therefore, research supports teachers (Ho et al., 2013) and parents (Thompson et al., 2015; Can, 2016) communication through smartphones.

Teachers use smartphones to access email on their devices to support parent-teacher communication (Thompson et al., 2015). In 1972, the Advanced Research Projects Agency Network (ARPANET) contractor Ray Tomlinson invented email (Chang & Pearman, 2018). Email began with users placing messages in other user's file directory

so that an individual could access the message upon logging on (Chang & Pearman, 2018). Email has become a primary parent-teacher communication mode in the 21st Century (Thompson, 2008; Thompson et al., 2015). For example, Thompson et al. (2015) surveyed over 1,389 parents using the Parental Academic Support Scale (PASS) and results illustrated that parents preferred email communication, because it transforms how parents and teachers receive and send messages (Thompson, 2008; Thompson et al., 2015). However, co-founder of Facebook Mark Zuckerberg believed that email did not apply to modern messaging systems (Kolowich, 2011). Zuckerberg suggested that futuristic messaging systems would have short, brief, and informal bursts of messages (Kolowich, 2011), which is similar to social media (SM) and SNSs. Building on Zuckerberg's statement, Thompson et al. (2015) also found that text messaging and social media were emerging parent-teacher communication modes.

Teachers are now using smartphones to communicate with parents' using social media, in particular, SNSs (Olmstead, 2013; Williamson, 2017b; Manolev et al., 2019). The rise of SNSs is a recent phenomenon that began in 2002 with the creation of websites, such as Friendster and Myspace, while Facebook became the most prominent SNSs around 2007 (Boyd & Ellison, 2007). Within this time, society has become much more comfortable communicating online through SNSs (Greenhow & Askari, 2017) and smartphones (Thompson et al., 2015). Therefore, it is logical that school-based communication in K-12 school systems would extend to SNSs. For instance, Olmstead's (2013) survey showed that a third of parents communicated with their child's teacher through Facebook. Similarly, educators are now communicating with parents using the Internet and specific smartphone applications designed for parent-teacher communication

(Ho et al., 2013; Can, 2016; Williamson, 2017b; Manolev et al., 2019). Smartphones expand parent and teachers' communication with SNSs and social media. (Thompson et al., 2015). School-based SNSs create a K-12 online classroom community, similar to popular SNSs like Facebook, that allows teachers, students, and families to comment, private message, photo-share, and video-share through a mobile app (Williamson, 2017b; Manolev et al., 2019).

Teachers integrate school-based SNSs in education to facilitate school-based communication with families, parents, and students (Williamson, 2017b; Manolev et al., 2019). ClassDojo (Williamson, 2017b; Manolev et al., 2019), Bloomz (Peck, 2018), Remind (Chang & Pearman, 2018), Edmodo for Parents, Appletree, and ClassFlow Moments ("Apps," 2016) are all school-based social network sites examples. Williamson (2017b) identified ClassDojo as the primary school-based SNS. ClassDojo's website identifies it as a "school communication platform" ("About us," 2019). However, Manolev et al. (2019) and Williamson (2017b) suggest ClassDojo is a school-based social media platform with ambitions to become schools' main social media platform. ClassDojo began as a classroom behavior management app in 2011 (Williamson, 2017b). In 2016, ClassDojo relaunched to transform into "a social-media community" (Williamson, 2017b, p.60). Following the relaunch, ClassDojo's school-based SNS consists of a communication platform and behavior management system for teachers, students, and families.

ClassDojo often resembles larger networking sites such as Facebook, in its layout and navigation (Williamson, 2017b). ClassDojo creates a private online classroom community for parents, teachers, and students. Teachers print out forms for parents to

join their virtual classroom community. School-based SNSs automatically populate the forms that explicitly state, step-by-step, how to sign up for the platform using a specified class code. Students bring the signup forms to their families to join the class. Upon joining the school-based SNS, teachers and families have direct two-way communication through various tools, such as a shared newsfeed of activities, announcements, alerts, sign-ups, student portfolios, and posts (Williamson, 2017b). Teachers and parents can comment, like, post, and privately message one another through the SNS (Williamson, 2017b). School-based SNSs, such as ClassDojo, provides positive behavior supports that can improve student behavior (Chiarelli et al., 2015) and enhance school-based communication (Burger, 2015). For instance, Chiarelli et al. (2015) analyzed the use of ClassDojo to help with classroom management in guided reading. The results show that using ClassDojo helped redirect negative behaviors, which resulted in fewer interruptions during teacher small group instruction (Chiarelli et al., 2015). Students also became more cognizant and aware of their own behavior choices (Chiarelli et al., 2015). In another study, Burger (2015) explored teachers' use of ClassDojo as a communication platform before its evolution to a SNS (Burger, 2015). Findings supported teachers using ClassDojo for parent-teacher communication (Burger, 2015).

SNSs have the potential to "facilitate increased interaction and networking" through the co-creation of content with K-12 teachers, students, (Greenhow & Askari, 2017, p. 624) and parents. SNSs are a relatively new phenomenon (Greenhow & Askari, 2017) using powerful web-based tools that change the way individuals communicate and learn (Chromey, Duchsherer, Pruett, & Vareberg, 2016). Nevertheless, many educators are still unsure about how to integrate SNSs into education (Greenhow & Askari, 2017).

As with all technology, it takes time for educators to learn, comprehend, and implement unfamiliar practices (Scott, 2013). SNSs allow for continuous two-way communication between parents and teachers using their smartphone devices. Consequently, many modes of static one-way communication, such as communication books (Davern, 2004; Williams & Cartledge, 1997) and newsletters (Chambers, 1998) become two-way communication modes when teachers post information to ClassDojo. Teachers and parents can comment, like, and receive immediate feedback on the post. From SNSs to written communication, teachers control the modes they use to communicate with parents, students, and families. Therefore, researchers need to understand teachers' attitudes and perceptions toward integrating new ICTs, such as school-based SNSs.

Statement of the Problem

Teachers' end-user attitudes towards adopting school-based SNSs, such as ClassDojo, are unclear and need to be studied. ClassDojo is "actively used in 95% of all K-8 schools in the U.S. and 180 countries" ("About Us," 2019). Williamson (2017a) reports that over three million teachers and 35 million students use ClassDojo. In the United States, teachers translate approximately 270,000 messages per week ("About Us," 2019). Furthermore, one in six families that have children under 14 use ClassDojo daily in the United States ("About Us," 2019). Therefore, teachers are actively integrating ClassDojo for school-based communication with parents and students. However, literature focuses primarily on ClassDojo's influence on students' classroom behavior (McHugh, 2016; Robacker et al., 2016; Sherin, 2016; Ford, 2017; Lynne et al., 2017; Wachendorf, 2017; Lipscomb et al., 2018; Homer et al., 2018; Cravalho, 2019; Dillon et al., 2019) rather than on teachers' attitudes to accept and use the platform. Acquiring these teachers' perceptions of ClassDojo is vital, because teachers are ultimately

responsible for integrating the new technology in their classroom (Brown, Brown, Reardon, & Merrill, 2011; Nadelson, Seifert, Moll, & Coats, 2012; Quadri, 2014). School-based SNSs are exclusive to teachers and administrators in education, because the platform only functions with active teacher engagement. For example, teachers create the virtual class, request parents to join the community, integrate the behavior management system, and communicate using the various social media tools. Without teachers, ClassDojo doesn't function or have a purpose, because the community would not exist.

Studies that examine teachers' end-user attitudes towards ClassDojo in education have been scant. Research exhibits challenges with teachers' integrating social media and social networking into instruction (Ajjan & Hartshorne, 2008; Greenhow & Askari, 2017; Manca & Ranieri, 2017), classroom management, and school-based communication. Teachers' attitudes toward technology and SNSs had a statistically significant influence on the success of new technologies (Lin, 2006; Willis, 2008; Zhou, 2011; Dixit & Prakash, 2018). For instance, teachers' attitudes to accept technology are impacted by enjoyment, social influence, drama (Curran & Lennon, 2011), subjective norm (Ursavas & Reisoglu, 2017), number of SNS accounts (Akbari et al., 2016), and social media usage (Elkaseh et al., 2016). Similarly, Scott (2013) found that gender, age, and previous experiences can influence teachers' attitudes toward adopting social networking in education. SNSs are a powerful web-based tool that changes the way individuals communicate and learn (Chromey et al., 2016); however, many educators are still unsure how to integrate SNSs into schools (Greenhow & Askari, 2017). As with all technology, it takes time for educators to learn, comprehend, and implement unfamiliar instructional

practices. Therefore, it is crucial to understand teachers' end-user attitudes for adopting and using school-based SNSs, such as ClassDojo.

Purpose of the Study

This study's purpose was to identify and explore factors that positively influenced K-8 teachers' end-user attitudes to adopt school-based SNSs in the United States. Consequently, the findings can be used to boost teachers' adoption rates of school-based SNSs, like ClassDojo. The Technology Acceptance Model (TAM) was extended to explore teachers' beliefs, attitudes, and intentions to use ClassDojo. The TAM's foundation, extensions, and correlation to teachers' attitudes towards technology presented as an ideal model to ground the study. The purpose of the study was to synthesize other TAM variables to make a new model that analyzed teachers' acceptance and use of ClassDojo. TAM research on new technologies needs to increase focus on "individual difference" variables to improve both usage and user acceptance (Venkatesh, 2000, p 360). Therefore, using theoretical and empirical studies related to teachers' adoption of technology, this research study extended TAM using the following factors: (1) perceived usefulness, (2) perceived ease of use, (3) security awareness, (4) subjective norm, (5) attitude, and (6) intention to use. This study advanced research on teachers' TAM of SNSs, teachers' acceptance of ClassDojo, and parent-teacher communication.

The extended TAM framework could analyze teachers' attitudes toward using other school-based SNSs, such as Bloomz (Peck, 2018), Remind (Chang & Pearman, 2018), Edmodo for Parents, Appletree, and ClassFlow Moments ("Apps," 2016). Teachers can use these findings to implement and support school-based SNSs in their classrooms. Understanding teachers' perceptions and attitudes toward ClassDojo provide school administrators with meaningful information to establish future technological

initiatives, as well as proactively direct professional development decisions (Teo et al., 2008). Traditional technology initiatives begin with the organizations' adoption first, and then teachers' technology integration in the classroom (McGill & Klobis, 2009). However, ClassDojo uses a bottom to top approach that entails teachers adopting the platform, while there is minimal oversight from the school district or administration (Williamson, 2017b). Therefore, teachers' attitudes and perceptions about using school-based SNSs provides crucial first-hand knowledge about the implementation of SNSs for parent-teacher communication.

Research Questions and Hypotheses

As discussed earlier, teachers' end-user attitudes and perceptions for adopting school-based SNSs, including ClassDojo, are unclear and need to be studied. This study synthesized an extended TAM to analyze factors that influence teachers' end-user attitudes towards ClassDojo use. An extension of TAM was grounded in empirical studies focusing on the foundation of TAM (Fishbein & Ajzen, 1975; Davis, 1985; Davis, 1989; Davis et al., 1989), TAM extensions (Taylor & Todd, 1995; Gefen & Straub, 1997; Al-Gahtani & King, 1999; Venkatesh, 2000; Venkatesh & Davis, 2000; Venkatesh & Bala, 2008), the TAM of SNSs (Curran & Lennon, 2011; Qin, Kim, Hsu & Tan, 2011; Choi & Chung, 2013; Teo, 2016), and teachers' TAM of SNSs in education (Akbari et al., 2016; Akman & Turhan, 2017; Ursavas & Reisoglu, 2017; Yildiz Durak, 2019) to establish an extended model. This section reviews research questions and hypotheses about the potential statistically significant relationships in the TAM extension, and how it correlates to teachers' attitudes toward using SNSs, and ultimately, intention to use SNSs. The diagram below illustrates the relationship between hypotheses and the TAM (see Figure 1). The following two research questions and seven hypotheses guided this study:

RQ1: What are the perceptions among K-8 teachers in the United States toward the factors affecting the use of ClassDojo?

RQ2: What are the relationships between the latent variables in the proposed TAM for this study?

H1: Teachers' attitude toward using (ATT) ClassDojo have a statistically significant positive effect on their intention to use (ITU) ClassDojo.

H2: Perceived usefulness (PU) has a statistically significant positive effect on teachers' intention to use (ITU) ClassDojo.

H3: Teachers' perceived usefulness (PU) of ClassDojo has a statistically significant positive effect on their attitude toward ClassDojo use (ATT).

H4: Teachers' security awareness (SA) of ClassDojo has a statistically significant positive effect on their attitude toward ClassDojo use (ATT).

H5: Subjective Norm (SN) of ClassDojo has a statistically significant positive effect on teachers' attitudes toward using (ATT) ClassDojo.

H6: Subjective Norm (SN) of ClassDojo has a statistically significant positive effect on teachers' perceived usefulness (PU) ClassDojo.

H7: Perceived ease of use (PEOU) has a statistically significant positive effect on teachers' perceived usefulness (PU) of ClassDojo.

H8: Security awareness (SA) has a statistically significant positive effect on teachers' perceived usefulness (PU) of ClassDojo.

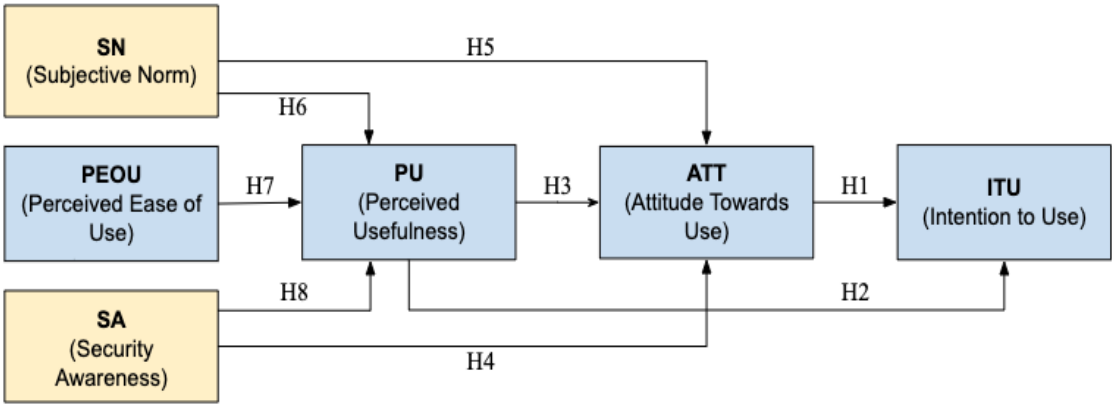


Figure 1 Hypothesis in Teachers' TAM of SNSs (T-TAMS)

Theoretical Framework

The Technology Acceptance Model (TAM) analyzed teachers' attitudes towards accepting and using ClassDojo. TAM consists of external variables that have causal relationships between perceived usefulness (PU) and perceived ease of use (PEOU) that influence an individual's attitude toward using the technology, which, in turn, affects their behavioral intention to use, and finally, their actual technology use (Davis, 1985). Davis (1985) defines perceived usefulness as "the degree to which an individual believes that using a particular system would enhance his or her job performance" (p. 26). Perceived ease of use is "the degree to which an individual believes that using a particular system would be free of physical and mental effort" (Davis, 1985, p. 26). Essentially, a teacher's beliefs about ClassDojo's perceived ease of use and perceived usefulness impact that individual's behavioral intentions to use the information technology (IT). This study established an extended TAM model by synthesizing information from studies focusing on the foundation of TAM (Fishbein & Ajzen, 1975; Davis, 1985; Davis, 1989; Davis et al., 1989), TAM extensions (Taylor & Todd, 1995; Gefen & Straub, 1997; Al-Gahtani & King, 1999; Venkatesh, 2000; Venkatesh & Davis, 2000; Venkatesh & Bala, 2008), TAM of SNSs (Curran & Lennon, 2011; Qin et al.,

2011; Choi & Chung, 2013; Teo, 2016), and teachers' TAM of SNSs in education (Akbari et al., 2016; Akman & Turhan, 2017; Ursavas & Reisoglu, 2017; Yildiz Durak, 2019) to provide strategic determinants to understand teachers' SNS use and acceptance (See Figure 2 below). TAM research supports teachers' integration of SNSs into education, such as Edmodo (Ursavas & Reisoglu, 2017; Yildiz Durak, 2019), Facebook, LinkedIn, Google Plus+, Twitter, Hyves (Akbari et al., 2016), and SNSs as a whole entity (Akman & Turhan, 2017). To the researcher's knowledge, there was no prior literature directly between teachers and acceptance of school-based SNSs.

The Teachers' Technology Acceptance Model of SNSs (T-TAMS) in education proposed two additional external variables that influence teachers' acceptance and use of ClassDojo. Therefore, T-TAMS formulated a unified TAM for teachers and SNSs in education that includes the determinants: perceived ease of use (PEOU), perceived usefulness (PU), attitude toward using (ATT), intention to use (ITU), security awareness (SA), and subjective norm (SN). A comprehensive literature analysis reviewed statistically significant findings from TAM's four core determinants perceived ease of use (Teo, 2009a; Teo, 2009b; Akbari et al., 2016; Ursavas & Reisoglu, 2017; Sánchez-Prieto, Olmos-Migueláñez, & García-Peñalvo, 2017; Siyam, 2019), perceived usefulness (Teo et al., 2012; Akbari et al., 2016; Teo, 2016; Akman & Turhan, 2017; Ursavas & Reisoglu, 2017; Siyam, 2019), attitude toward using SNSs (Curran & Lennon, 2011; Ursavas, Sahin, & McIroy, 2014; Akbari et al., 2016; Elkaseh et al., 2016; Ursavas & Reisoglu, 2017; Dixit & Prakash, 2018; Siyam, 2019), and intention to use SNSs (Teo, 2009; Teo et al., 2012; Chen et al., 2013; Ursavas & Reisoglu, 2017; Dixit & Prakash, 2018). The teacher and SNS TAM extension was proposed strategically with the

determinants security awareness (Arpaci, Cetin, & Turetken, 2015; Akman & Turhan, 2017; Almaiah, 2018), and subjective norm (Venkatesh & Davis, 2000; Yuen & Ma, 2008; Teo, 2009b; Tarcan, Varol, & Toker, 2010; Kriederman, 2017; Ursavas & Reisoglu, 2017).

The proposed TAM extension advanced research as the first TAM focusing on teachers and school-based SNS acceptance. Minimal research explores teachers and the technology acceptance model (TAM) of SNSs, as well as external variables that influence these teachers' acceptance of SNSs. Limited studies use teacher samples to synthesize extended TAMs for SNSs (Akman & Turhan, 2017; Siyam, 2019). Instead, TAM research in education predominantly uses university students (Lau & Woods, 2009; Curran & Lennon, 2011; Hashim, 2011; Chen et al., 2013; Rauniar, Rawski, Yang, & Johnson, 2014; Harmon, 2015; Akbari et al., 2016; Akman & Turhan, 2017; Almaiah, 2018; Dixit & Prakash, 2018) and pre-service teachers (Teo, 2009a; Teo, 2009b; Gyamfi, 2017; Sánchez-Prieto et al., 2017; Ursavas & Reisoglu, 2017) to investigate SNSs and other web-based technology use. Additionally, limited research investigates mobile communication apps between teachers and parents in schools (Can, 2016). Therefore, this study advanced research on teachers' TAM for SNSs.

The extended TAM dictated teachers specific SNS acceptance and use factors or determinants based on prior research and literature. This section reviewed the different factors within the TAM extension, and how it correlates to TAM, teachers' behavioral intentions, and ultimately, adoption and use. The four core determinant categories enhance understanding of teachers' ClassDojo acceptance. The first core determinant, subjective norm, identifies an individual's belief that influential people, or referent

groups, think they should or should not complete a specific behavior (Teo, 2009b). Subjective norm is associated with the theory of planned behavior (TBP) which is described as a framework that can predict and explain users' behaviors (Fishbein & Ajzen, 2010). According to the theory of planned behavior (Steinmetz, Knappstein, Ajzen, Schmidt, & Kabst, 2016, p. 218), "subjective norm rests on beliefs about the normative expectations of important others (normative beliefs)." Concerning this study, subjective norm was teachers' perception that people around them think they should or should not use ClassDojo. The next core determinant, security awareness, described the level of procedures in a technology to secure users' data from outside attacks or threats (Almaiah, 2018). Related to this study, security awareness identified the level of procedures teachers perceived that ClassDojo implements to secure users' data from outside attacks and threats. In conclusion, the teachers' TAM of SNSs (T-TAMS) consisted of four of Davis' (1985) core determinants and two external factors that provided a model to analyze teachers' perceptions and attitudes towards using ClassDojo.

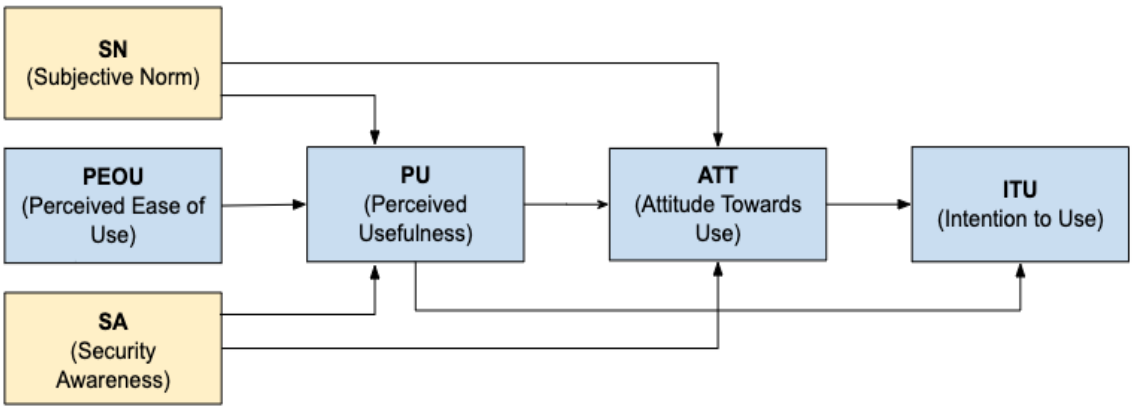


Figure 2 Teachers' TAM of SNSs (T-TAMS)

Scope of the Study

This study's scope was limited to the relationship between teachers' intentions to use (ITU), attitude toward using (ATT), perceived ease of use (PEOU), perceived

usefulness (PU), perceived security awareness (SA), and subjective norm (SN) of accepting and adopting SNSs for school-based communication with students, parents, and families. In particular, these factors were chosen based on prior research about an individual's attitude toward using or not using a specific technology (Davis, 1989; Davis et al., 1989), such as school-based SNSs. Therefore, this study incorporated Davis' core variables, as well as included additional external variables regarding teachers and school-based SNSs to synthesize a TAM extension.

Assumptions

Assumptions refer to items or things that researchers take for granted within the study; however, the absence of these assumptions, essentially, make the study irrelevant (Simon, 2011). Realistic and unrealistic assumptions from a study assist the researcher to adequately theorize the results and findings (Foss & Hallberg, 2014). While developing this study, the researcher identified several statistically significant assumptions. First, the preservation of all participants' anonymity and confidentiality facilitates accurate and honest survey question responses online (Quadri, 2014; Flowers, 2015; Avilez, 2017; Parcell, 2017). Participants received confidentiality statements to ensure that identifying digital information, such as survey results, was concealed and destroyed upon the study's completion (Tsang, 2019). The second assumption was that participants have access to the Internet and email to complete the survey and experience using computers, smartphones, and connecting with others using social networks (Tsang, 2019).

Another assumption was that the volunteer participants, teachers, could freely withdraw from the survey at any point without retribution (Quadri, 2014). Also, the researcher assumed participants answered the survey questions honestly and factually (Quadri, 2014; Tsang, 2019). Research suggests that participants can misrepresent facts,

or their perception about the facts, to establish a more favorable position with the researcher (Leedy & Ormrod, 2005). On the other hand, survey research can also alleviate challenges with participants' anonymity and promote more truthful answers than traditional forms of data collections like face-to-face interviews (Leedy & Ormrod, 2005). Therefore, the survey research findings are dependent upon respondents' "authenticity, accuracy, knowledge and perceptions" (Hashim, 2011, p.6). The final assumption is that the survey accurately measured teachers' intentions to use SNSs in school-based communication (Parcell, 2017; Avilez, 2017).

Limitations and Delimitations

Delimitations describe expectations that a researcher sets for the reader (Sampson, 2012). Therefore, delimitations are factors the researcher controls that could influence the study (Sampson, 2012). For instance, this study had several crucial delimitations. First, the study only tested one TAM extension on teachers' end-user attitudes toward ClassDojo as a SNS. Additional models and testing provide further validity and reliability for the model. Next, the study's participants were not a random sample and limited to K-8 teachers. Thus, the results are likely not representative of all K-12 teachers' experiences with accepting and using SNSs for school-based communication. Lastly, the study's location surveyed only the United States. Therefore, the results are likely not generalizable to other teachers located in different schools throughout the United States or the world. In conclusion, this meant that the findings were only "generalizable to a population exactly like the research population" (Avilez, 2017, p. 16). While delimitations focus on factors within the researcher's control, limitations focus on factors outside of the researcher's control.

Limitations are factors a researcher is incapable of controlling that can potentially influence a study (Sampson, 2012). This study's first limitation was the focus on teachers' attitudes and perceptions of using school-based SNSs, instead of establishing a cause and effect from use. Also, the teachers' usage of SNSs for school-based communication was voluntary and could affect participants' responses and attitudes to complete the surveys. Based on the method of sampling and sample size, another limitation was that the results cannot be generalized to all K-8 schools in the United States. In the TAM, the number of responses has a statistically significant influence on the path analysis between factors. Therefore, a small sample could influence the survey instrument to "have been limited in content, validity, and direction of the results" (Quadri, 2014, p. 12). Lastly, this study focused exclusively on teachers' attitudes and perceptions to use school-based SNSs. To further scholarly research, multiple users, such as administrators, families, parents, and students, must participate in the TAM and school-based SNS studies.

Significance of the Study

This study synthesized additional TAM variables to establish an extended model, the Teacher Technology Acceptance Model of Social Networking Sites (T-TAMS), to investigate and explore factors that had a statistically significant influence on teachers' end-user attitudes to adopt ClassDojo. The TAM constructs of subjective norm (SN), security awareness (SA), and perceived ease of use (PEOU) had a statistically positive influence on teachers' perceived usefulness (PU) towards ClassDojo. In turn, perceived usefulness (PU) positively influenced teachers' attitudes of ClassDojo (ATT), and ultimately, led to teachers' intentions to use ClassDojo (ITU). The T-TAMS examined teachers' acceptance of ClassDojo by integrating the variables security awareness (SA),

and subjective norm (SN). To the researcher's best knowledge, the T-TAMS was the first model to analyze K-8 teachers' acceptance and use of SNSs, in particular, school-based SNSs. This study significantly addressed the factors that influence teachers' adoption and use of school-based SNSs. Therefore, these findings can be used to boost ClassDojo's adoption rates among K-8 schools in the United States.

Definitions

In this study, the following definitions for important terms will be used:

Communication "occurs when an organism (the receiver) which decodes the signal and is capable of responding appropriately" (Beattie & Ellis, 2014, p. 3).

Diffusion of Innovations (DoI) is "the process by which (1) an innovation (2) is communicated through certain channels (3) over time (4) among the members of a social system" (Rogers, 2003, p. 11).

Information and Communication Technologies (ICTs) are "electronic devices (e.g., laptops, chrome books), handheld devices (e.g., iPads®, iPods), interactive devices (e.g., interactive white boards), application software, and social media tools" (Kiru, 2018, p. 165).

Parent in the term parent-teacher communication refers to any individual that is the primary caregiver for a student, including extended family or foster parents.

Perceived Ease of Use is "the degree to which an individual believes that using a particular system would be free of physical and mental effort" (Davis, 1985, p. 26).

Perceived Usefulness is "the degree to which an individual believes that using a particular system would enhance his or her job performance" (Davis, 1985, p. 26).

School-Based Social Network Sites (SNSs) are a web-based system that enables administrators and teachers to (Robacker et al., 2016; Dillion et al., 2017; Williamson,

2017b; Manolev et al., 2019) (1) create or join a semi-public online school community within a bounded system (Williamson, 2017b; Manolev et al., 2019), (2) construct a virtual classroom with individual student profiles, or avatars (Williamson, 2017b; Homer et al., 2018; Manolev et al., 2019), (3) invite parents and guardians to create a profile and link with their child's profile (Chiarelli et al., 2015; Robacker et al., 2016; Krach et al., 2017; Williamson, 2017a; Williamson, 2017b; Homer et al., 2018; Lipscomb et al., 2018; Manolev et al., 2019), and (4) communicate with students, parents, and guardians about students' school experiences (Williamson, 2017b; Manolev et al., 2019) through the classroom management (Chiarelli et al., 2015; da Rocha Seixas et al., 2016; Homer et al., 2018; Lipscomb et al., 2018; Lynne et al., 2017; Robacker et al., 2016; Williamson, 2017a) and communication platform (Burger, 2015; Robacker et al., 2016; Hammonds et al., 2013; Williamson, 2017a; Williamson, 2017b; Wilson, 2017).

Security Awareness is the level of procedures in a technology to secure users' data from outside attacks or threats (Almaiah, 2018).

Subjective Norm refers to an individual's "perception that most people who are important to him or her think he should or should not perform the behavior in question" (Teo, 2009b, p. 93).

Theory of planned behavior (TBP) is described as a "prominent framework for predicting and explaining behavior in a variety of domains" (Steinmetz et al., 2016, p. 216).

Technology Acceptance Model (TAM) is a model that can identify and predict the adoption of numerous technologies (Lorenzo-Romero, Constantinides, & Alarcon-del-Amo, 2011).

Teachers are instructors that educate students in K-12 school systems.

CHAPTER TWO: LITERATURE REVIEW

Research on teachers' attitudes towards accepting and using ClassDojo is limited. This comprehensive literature review provides a scholarly academic foundation to synthesize a Technology Acceptance Model (TAM) extension to evaluate teachers' use and acceptance of ClassDojo. Scholarly research has investigated ClassDojo's behavior management systems (Chiarelli et al., 2015; da Rocha Seixas et al., 2016; Robacker et al., 2016; Lynne et al., 2017; Williamson, 2017a; Homer et al., 2018; Lipscomb et al., 2018); however, there is minimal current research related to teachers' acceptance and use of ClassDojo as a school-based SNS. Therefore, an extensive literature review will provide an overview of school-based SNSs (McHugh, 2016; Robacker et al., 2016; Williamson, 2017b; Manolev et al., 2019), teachers' integration of school-based SNS (Burger, 2015; Chiarelli et al., 2015; da Rocha Seixas et al., 2016; Williamson, 2017a; Williamson, 2017b; Homer et al., 2018; Manolev et al., 2019), the datafication of education (Robacker et al., 2016; Sherin, 2016; Ford, 2017; Krach et al., 2017; Wachendorf, 2017; Williamson, 2017a; Williamson, 2017b; Homer et al., 2018; Cravalho, 2019; Manolev et al., 2019), and teachers and SNSs in education (Davis, 2010; Warschauer & Matuchniak, 2010; Howard, 2013; Wastiau et al., 2013; Nathan, MacGougan, & Shaffer, 2014; Manca & Ranieri, 2017; Pasquini & Evangelopoulos, 2017; Hornby & Blackwell, 2018). Following the analysis of teachers and school-based SNSs, the section will review the foundation of TAM (Fishbein & Ajzen, 1975; Davis, 1985; Davis, 1989; Davis et al., 1989), TAM extensions (Taylor & Todd, 1995; Gefen & Straub, 1997; Al-Gahtani &

King, 1999; Venkatesh, 2000; Venkatesh & Davis, 2000; Venkatesh & Bala, 2008), TAM of SNSs (Curran & Lennon, 2011; Qin et al., 2011; Choi & Chung, 2013; Teo, 2016), and teachers' TAM of SNSs in education (Ursavas & Reisoglu, 2017; Yildiz Durak, 2019; Akbari et al., 2016; Akman & Turhan, 2017). Prior research and studies will be synthesized to create an extended TAM model to assess teachers' TAM of SNSs using the determinants: perceived ease of use (PEOU), perceived usefulness (PU), attitude toward using SNSs (ATT), intention to use SNSs (ITU), security awareness (SA), and subjective norm (SN). The proposed TAM extension advanced research as one of the first TAMs focusing on teachers and SNS acceptance.

School-Based Social Network Sites (SNSs)

School-based SNSs are innovative parent-teacher communication platforms (McHugh, 2016; Robacker et al., 2016) that connect teachers, students, and families by integrating social media tools into school-based communication (Williamson, 2017b; Manolev et al., 2019). Users can access school-based SNSs, such as ClassDojo, through the web application and mobile device application suite using computers, tablets, or smartphones (Robacker et al., 2016). Teachers continue to lack access to "best practices for integrating" social media into education (Greenhow & Askari, 2017, p. 626; Manca & Ranieri, 2017). In addition, research on teachers' attitudes toward accepting and using school-based SNS is scant. Furthermore, minimal research has examined how major SNSs, such as Twitter and Facebook, facilitate parent-teacher communication (Trevino, 2012; Sharnoff, 2014). Scholarly academic literature on teachers' integration of ClassDojo primarily investigates students and classroom management systems (Chiarelli et al., 2015; da Rocha Seixas et al., 2016; Williamson, 2017a; Homer et al., 2018). Therefore, an investigation into teachers' attitudes towards accepting and using school-

based SNS will focus on communication tools (Hammonds et al., 2013; Burger, 2015; Robacker et al., 2016; Williamson, 2017a; Williamson, 2017b; Wilson, 2017), digital token economy (McHugh, 2016; Robacker et al., 2016; Sherin, 2016; Ford, 2017; Lynne et al., 2017; Wachendorf, 2017; Homer et al., 2018; Lipscomb et al., 2018; Cravalho, 2019; Dillon et al., 2019), behavior interventions (McHugh, 2016; Ford, 2017; Lynne et al., 2017; Lipscomb et al., 2018; Dillon et al., 2019), and the datafication of education (Robacker et al., 2016; Sherin, 2016; Ford, 2017; Krach et al., 2017; Wachendorf, 2017; Williamson, 2017a; Williamson, 2017b; Homer et al., 2018; Cravalho, 2019; Manolev et al., 2019). A comprehensive analysis will identify current literature about teachers' acceptance and use of ClassDojo.

Communication Platform

Teachers use ClassDojo to communicate with parents, guardians, and families about students' progress using the behavior management tools (Chiarelli et al., 2015; Robacker et al., 2016; da Rocha Seixas et al., 2016; Lynne et al., 2017; Williamson, 2017a; Homer et al., 2018; Lipscomb et al., 2018), parent instant messaging (Hammonds et al., 2013; Burger, 2015; Robacker et al., 2016; Williamson, 2017a; Williamson, 2017b; Wilson, 2017), student portfolios, and a class and/or school newsfeed. ClassDojo resembles larger networking sites such as Facebook, in its layout and navigation (Williamson, 2017b). ClassDojo supports teachers' behavior management system by creating a private online classroom community for parents, teachers, and students. Upon joining ClassDojo, teachers, students, and families can view a shared newsfeed of activities, announcements, alerts, sign-ups, student portfolios, and posts (Williamson, 2017b). Teachers and parents can comment, like, post, and privately message one another

through the SNS platform (Williamson, 2017b). All communication in ClassDojo is private, and there is no exchange of phone numbers between teachers and parents (Jackson, 2016). Therefore, this section will investigate all scholarly literature that focuses on teachers integrating SNSs, such as ClassDojo, for school-based communication.

School-based SNSs facilitate teachers' school-based communication with families and students through instant messaging and the class newsfeed. Instant messaging allows teachers to send and receive messages with parents in real-time (Robacker et al., 2016). Teachers can send "photos and other attachments to intended recipients, similar to how text (SMS) and multimedia messaging services (MMS) work" (Robacker et al., 2016, p. 42). Additionally, ClassDojo supports the translation of these messages into over 35 different languages (Manolev et al., 2019). ClassDojo's newsfeed, similar to Facebook, provides teachers and parents the ability to create and upload user-generated content, such as photos, videos, or text into the private classroom group (Williamson, 2017b; Manolev et al., 2019). Teachers use ClassDojo to post student portfolios and work on the platform as well. The integration of ClassDojo encourages a participatory culture between teachers and parents through public and private comments, likes, and discussions about the students and classroom (Williamson, 2017b; Manolev et al., 2019). Teachers can censor posts and limit parent-parent communication within the app. This management feature helps establish a controlled classroom culture both online and in the classroom. Nevertheless, research focusing on teachers' integration of ClassDojo as a SNS is still limited.

To the researcher's best knowledge, Burger (2015) is the only article to analyze teachers' perceptions of using ClassDojo for school-based communication. Prior to ClassDojo establishing its SNS, Burger (2015) examined teachers' and students' perceptions of ClassDojo's effectiveness in middle school classrooms. Findings indicate that participants believe "basic knowledge of how to operate a computer is sufficient in order to implement ClassDojo well" (Burger, 2015, p. 142). Teachers integrate ClassDojo with no monetary investment (Burger, 2015). One teacher identified ClassDojo's messenger feature as a significant benefit for parent-teacher communication (Burger, 2015). Explicitly, the teacher explained that the messenger was an easy, convenient, and fast way to communicate using her smartphone (Burger, 2015). All study participants, both teachers and students, think a mobile device is essential to use ClassDojo as an immediate communication platform (Burger, 2015). According to Burger (2015), teachers will get the most out of ClassDojo with "the audio and/or video component(s)" (Burger, 2015, p. 157). Lastly, teachers reported that administrators "generally like their use of ClassDojo" (Burger, 2015, p. 3) Use of ClassDojo in education requires the development of specific school policies and procedures to protect teachers, students, and families.

Digital Token Economy

Teachers use school-based SNSs' behavior management system as a token economy (Robacker et al., 2016; Sherin, 2016; Ford, 2017; Wachendorf, 2017; Homer et al., 2018; Storti, 2018; Cravalho, 2019) that functions similar to popular social networking sites. Token economies are classroom point systems that encourage specific student learning and behavior (Donaldson, DeLeon, Fisher, & Kahng, 2014; Hirst,

Dozier, & Payne, 2016). Teachers establish rules about how students earn or lose tokens (Cravalho, 2019), objects with no inherent value (Hirst et al., 2016), and the criteria for exchanging tokens for prizes or rewards (Donaldson et al., 2014). Traditionally, token economies use a paper and pencil method to record points, desired behaviors, and rewards (Cravalho, 2019). ClassDojo exposed, digital token economies, a new type of token economy (Sherin, 2016). A digital token economy uses a technology device (Hammonds et al., 2013) to reward and remove tokens digitally (Sherin, 2016).

ClassDojo provides teachers a behavior management system to give real-time feedback to parents and guardians about students' behaviors and expectations by using preprogrammed positive and negative behaviors (Manolev et al., 2019). ClassDojo's token economy functions similar to teachers 'liking' or 'disliking' content on Facebook. Instead, the teacher is liking or disliking students' profiles, or avatars, based on specific classroom behaviors. Each student in the school-based SNS has their own unique profile and avatar to customize, such as a dojo monster (Williamson, 2017b) or flower. Based on the teacher's discretion, parents and guardians can receive notification to their smartphone for a student's positive and negative behaviors, only positive behaviors, or no notifications with families. Digital token economies allow student data to be "summarized, tracked, and shared with relevant stakeholders" (Sherin, 2016, p. 11) to positively influence teachers' classroom management strategies.

Teachers are free to edit the behavior names, total points awarded/deducted, select a corresponding emoji, and base awards on target skills. For example, positive notations may include phrases such as hardworking, participating, on task, respectful, teamwork, turned in homework, caring, following directions, and respectful. On the other hand,

negative remarks may include going to the bathroom right after recess, acting irresponsible, disruptive, messy area, unkind words, and talking during independent work time. ClassDojo's "behavior surveillance and management tools reinforce students' behaviors in order to get them to repeat behaviors that earn positive reinforcements and refrain from ones that earn negative reinforcements" (Williamson, 2017a, p. 444). A token economy allows students to earn points over time for expected and appropriate behaviors from ClassDojo (Robacker et al., 2016; Sherin, 2016; Ford, 2017; Wachendorf, 2017; Homer et al., 2018; Cravalho, 2019). Often, teachers will create a reward system to redeem points and prizes for positive behaviors (Robacker et al., 2016; Sherin, 2016; Ford, 2017; Wachendorf, 2017; Homer et al., 2018; Cravalho, 2019).

Teachers integrate digital token economies within school-based SNSs. For instance, ClassDojo's ease of use and versatility have "the potential to change the way practitioners apply token economies" in the classroom (Robacker et al., 2016, p. 43). Robacker et al. (2016) presents educators with steps and strategies to integrate ClassDojo's token economy. To establish a digital token economy, teachers need to create a virtual classroom, program desired behaviors, reward students for positive behaviors, exchange points, and communicate with parents (Robacker et al., 2016). Saeger (2017) examined ClassDojo as a behavioral management tool to promote positive behaviors and decrease undesired behaviors in a second-grade classroom. The class consisted of three students with attention deficit hyperactivity disorder (ADHD) and one student had oppositional defiance disorder (ODD) (Saeger, 2017). A two-phase pre-post group experimental design allowed for data comparison that illustrated how ClassDojo implementation, along with weekly goal setting, achieved "both an increase in positive

behaviors and a decrease in negative behaviors" (Saeger, 2017, p. 34). Students also displayed a positive viewpoint toward using ClassDojo in the classroom (Saeger, 2017).

Comparative studies assess traditional token economies and the correlation to ClassDojo. Homer et al. (2018) compared digital badges-and-points with classroom token systems using ClassDojo to assess English as a second language (ESL) students' achievement of specific behavioral and learning goals. The field experiment results showed that "ClassDojo significantly improved student learning in two class (Grades 3 and 4) but not in Grade 1 and 2 classes" (Homer et al., 2018, p. 137). Students reported enjoying ClassDojo's digital badges-and-points, and the teacher explained that students were more positive and on-task compared to the non-digital token system class (Homer et al., 2018). Wachendorf (2017) compared ClassDojo and traditional token economies to examine the influence of ClassDojo, as a token economy, on students with down syndrome (DS). Students' ClassDojo data was averaged weekly to evaluate "positive behavior, attendance, and pre-vocational skills" (Wachendorf, 2017, p. 25). Results illustrate that the ClassDojo token economy led to an increase in both positive behaviors and pre-vocational skills (Wachendorf, 2017). Teachers integrate ClassDojo to support all students' learning and classroom behavior.

A digital token economy provides teachers with behavior management strategies that enhance the classroom environment and learning. Storti (2018) explored conventional reward systems, including token economies, to enhance homework completion rates with classroom management tools. Comparing two classes over multiple school terms, the author describes how both classes implemented a Zone Board for behavior management the first term, and the second term one class used ClassDojo while

the other classes remained with the traditional management system (Storti, 2018). Results illustrate that "homework turn-in rates can" improve over several weeks if a classroom behavior management systems, such as ClassDojo, incorporates "homework, school work and classroom behavior within the same reward structure" and supports the students' motivational factors like intrinsic engagement (Storti, 2018, p. 3). ClassDojo was not identified as the "motivationally pertinent factor," because the teachers' use of the platform is what supported students' learning and behavior (Storti, 2018, p. 3). Another study measured the effectiveness of ClassDojo on kindergarten students' behavior and classroom management, as well as teachers' and parents' perceptions about using ClassDojo (Wilson, 2017). There was no significant difference or change in the kindergarten students' observed behaviors, teacher's classroom management system, and parental perceptions about using ClassDojo (Wilson, 2017). Nevertheless, teachers did indicate their appreciation for ClassDojo's "convenience, accessibility, and immediate feedback," which helped establish a focus on teaching and instruction versus behavior management (Wilson, 2017, p. 38). ClassDojo also supports teachers' integration of behavior interventions for students.

Behavior Interventions

Teachers use school-based SNSs, such as ClassDojo, in conjunction with well-researched behavior interventions to support classroom management systems (McHugh, 2016; Ford, 2017; Lynne et al., 2017; Lipscomb et al., 2018; Dillon et al., 2019). Teachers incorporate behavior intervention plans for students that "demonstrate significant problem behaviors that impede their learning and that of others" (Vostal & Mrachko, 2019). Behavior interventions involve teachers identifying reasons for student

misbehavior, establishing appropriate student behaviors and expectations, and creating a plan to positively influence the behavior (Vostal & Mrachko, 2019). Scholarly literature focuses on teachers that integrate ClassDojo with Tootling (McHugh, 2016; Lipscomb et al., 2018; Dillon et al., 2019) and the Good Behavior Game (GBG) (Lynne, 2016; Ford, 2017; Lynne et al., 2017). Integrating ClassDojo and behavior interventions can "get students active, motivated, and engaged in creating and following" the classroom management system (Chiarelli et al., 2015, p. 83).

Tootling, the opposite of tattling, is a behavioral intervention that encourages students to monitor and record other classmates positive behaviors (Skinner, Skinner, & Cashwell, 1998). Traditional tootling interventions encourage students to fill out note cards about their peers' prosocial behaviors that teachers collect, read aloud, count, chart, and pass back (Skinner et al., 1998). Tootling interventions take time to implement and lack meaningful data about individual students and the "positive behaviors they were exhibiting to earn the tootle" (Dillon et al., 2019, p. 19). ClassDojo incorporates a technological component that addresses traditional tootling limitations (McHugh, 2016; Dillon et al., 2019) by providing a platform that automatically collects and organizes student data. The ClassDojo system enhances tootling by publicly displaying students' avatars, positive points for appropriate behaviors, negative points for inappropriate behaviors, and behavior data (Dillon et al., 2019).

Dillon et al. (2019) explored how tootling intervention with ClassDojo influenced fifth-grade students' class wide behavior and academic engagement. Through an ABAB withdrawal design analysis, the findings indicated a decrease in class wide disruptive behaviors and an increase in students' "academically engaged behaviors during

intervention phases" (McHugh, 2016; Dillon et al., 2019, p. 18). To further research, Lipscomb et al. (2018) compared the effects of using ClassDojo alone versus integrating ClassDojo plus tootling in a postsecondary special education classroom. ClassDojo alone produced the "greatest reduction in problem behavior" for the majority of students and the entire class (Lipscomb et al., 2018, p. 1287). Therefore, ClassDojo, as a technological platform, could have more influence on behavior than tootling. Additional interventions like the Good Behavior Game align well with teachers' ClassDojo use.

The Good Behavior Game is an interdependent group contingency that divides the class into teams that work with each other toward accomplishing a common goal (Lynne, 2016). Integrating a variation of the Good Behavior Game with ClassDojo, teachers can use the interventions to diminish students' disruptive behavior and improve academically engaging behavior (Ford, 2017; Lynne et al., 2017). Barrish, Saunders, and Wolf (1969) published the first Good Behavior Game article that illustrated how the interventions could reduce fourth-grade students' shouting out and out-of-seat behavior. All done by hand, the teacher placed the class into two teams, reviewed the rules, gave points for appropriate behaviors, and rewards to the winners (Barrish et al., 1969). Recently, researchers are now using a technology-enhanced version of the Good Behavior Game to make intervention procedures more manageable and increase student feedback rates (Lynne et al., 2017).

Teachers can consider integrating ClassDojo with the Good Behavior Game to streamline "some of the intervention's procedures (e.g., recording points, tracking progress over time) without compromising" the intervention's efficacy (Lynne et al., 2017, p. 1062). For instance, Lynne et al. (2017) explored how teachers from three

different elementary classes use ClassDojo to manage teams' progress during a variation of the Good Behavior Game. Results indicated that elementary students had minimized disruptive behavior and an increase in academically engaging behavior (Lynne et al., 2017). Teachers were also observed communicating an increase of behavior-specific praise statements in all classrooms (Lynne et al., 2017). Additionally, Ford (2017) investigated the effects of a positive version of the Good Behavior Game by utilizing ClassDojo in a middle school setting. The intervention procedures improved student behavior and were socially valid with teachers and accepted by students (Ford, 2017).

Datafication of Education

ClassDojo provides a communication platform (McHugh, 2016; Robacker et al., 2016) and digital token economy (Robacker et al., 2016; Sherin, 2016; Ford, 2017; Wachendorf, 2017; Homer et al., 2018; Cravalho, 2019) that converts teachers, students, and families' interactions into quantifiable data for tracking and monitoring students' real-time behavior (Krach et al., 2017; Williamson, 2017a; Williamson, 2017b; Manolev et al., 2019). Datafication is the power of individuals to decide what data is collected, who controls the data and can change it, the interpretation process, and the goals for data collection (Bradbury & Roberts-Holmes, 2017). ClassDojo encourages a participatory culture by bringing targeted groups, such as parents, teachers, students, and administrators, together in the platform (Manolev et al., 2019). Essentially, users' participation in ClassDojo creates data; in turn, the users become data subjects, generators, and consumers (Manolev et al., 2019). Reducing students down to data points facilitates new possibilities with normalizing student surveillance and behavior by numbers (Manolev et al., 2019). Datafication of discipline can positively (Robacker et al.,

2016; Sherin, 2016; Ford, 2017; Wachendorf, 2017; Homer et al., 2018; Cravalho, 2019) and negatively (Krach et al., 2017; Williamson, 2017a; Williamson, 2017b; Manolev et al., 2019) influence teachers' attitudes toward acceptance and use of ClassDojo.

Positives from Datafication.

Teachers use data from school-based SNSs' behavior management tools to positively influence student's behavior. ClassDojo's digital token economy (Robacker et al., 2016; Sherin, 2016; Ford, 2017; Wachendorf, 2017; Homer et al., 2018; Cravalho, 2019) and communication tools (Burger, 2015) supply data to teachers to improve student behavior and learning in the classroom. Datafication of students creates multiple numerical points when explaining and quantifying a students' actions to parents or administrators. ClassDojo offers a private and safe platform intended for parent-teacher communication without the challenge of exposing personal and private information online (Williamson, 2017b). For example, "ClassDojo employs three independent privacy consultants to guide it in relation to data privacy regulation in North America and Europe" (Williamson, 2017b, p. 68). Also, the privacy consultants work "with a team of security researchers to continually test ClassDojo for vulnerabilities" (Williamson, 2017b, p. 68). ClassDojo has over 20 third-party essential service providers from Amazon Web Services to Google Analytics that monitor the app's performance. The essential third-party providers assist ClassDojo with "data storage, video encoding, photo uploading, server performance, data visualization, web analytics, performance metrics, A/B testing, and managing real-time communication data" (Williamson, 2017b, p. 68). ClassDojo promotes teachers' use of datafication for students' behavioral management.

Challenges from Datafication.

Research also supports potential challenges from the datafication of discipline by school-based SNSs (Krach et al., 2017; Williamson, 2017a; Williamson, 2017b; Manolev et al., 2019). For instance, Krach et al. (2016) compared teachers' behavior management charts between ClassDojo and paper-pencil methods. Results indicated ClassDojo yielded extensive amounts of positive and negative data that are more reliable than traditional methods (Krach et al., 2016). Nevertheless, the researchers did not recommend ClassDojo as a behavioral management system. According to Krach et al. (2016), teachers potentially violate students' protection and privacy rights under the Family Educational Rights and Privacy Act when displaying ClassDojo behavioral data or points (FERPA, 1974). Teachers should print out students' Dojo points to ensure student data is not shared on whiteboards or projectors (Krach et al., 2016).

ClassDojo also presents challenges about student surveillance data and control (Williamson, 2017b; Manolev et al., 2019). Williamson (2017b) completed a sociotechnical survey about ClassDojo's data use. Findings illustrate challenges with ClassDojo normalizing student surveillance in schools, penetrating state education systems from the private sector, data intensification from other platform operators, student privacy dilemmas, and ranking students beyond testing data (Williamson, 2017b). Expanding on Williamson's research (2017b), Manolev et al. (2019) claims ClassDojo's datafication of discipline "intensifies and normalizes the surveillance of students," which serves as a behavior control mechanism (p. 36). Consequently, numbers now govern teacher's decision-making using a "new and supposed efficient method," ClassDojo, that promotes a "data-driven performative culture" of discipline (Manolev et al., 2019, p. 47).

ClassDojo's can positively and negatively influence teachers' acceptance and use of ClassDojo based on massive datasets that monitor students' behaviors and interactions.

Teachers and SNSs in Education

Social media's rapid development in society continues to transform the way that people socialize, communicate, and learn (Mao, 2014). School leaders, teachers, students, and parents need to work together to transition education into the 21st century. School-based social networking sites (SNSs), like ClassDojo, illustrate a societal shift from state infrastructures to SNS platforms that have become a template "for how social and public life are arranged" (Williamson, 2017b, p. 61). Similar to other SNSs, ClassDojo uses platform capitalism as a business model to support areas often underfunded by the government (Williamson, 2017b), such as parent-teacher communication. Teachers integrate ClassDojo outside of state and local education control (Williamson, 2017b); therefore, it is essential to identify school policies and procedures that support teachers' integration of the platform. Specifically, teachers need support on how to effectively use ClassDojo while maintaining a high standard of safety and security to facilitate communication with all stakeholders. SNSs remains a double-edged sword for teachers in education that can cut both ways (Chromey et al., 2016). Teachers need support to integrate school-based SNSs in education through the development of a social media policy (Nathan et al., 2014; Manca & Ranieri, 2017; Pasquini & Evangelopoulos, 2017), proactive leadership support (Davis, 2010; Manca & Ranieri, 2017), teacher professional development (Wastiau et al., 2013; Manca & Ranieri, 2017), and equitable access to technology (Warschauer & Matuchniak, 2010; Howard, 2013; Williams & Cartledge; Hornby & Blackwell, 2018).

School Social Media Policy

Without a proper school policy, it becomes exceedingly challenging to integrate SNSs into school-based communication. School policies play a significant role in supporting the learning, creation, and development of SNSs in education. An in-school social media policy will diminish issues with cyber safety (Conn, 2008) and student privacy (Pasquini & Evangelopoulos, 2017). Schools implement social media policy and practice "to regulate online behavior and establish community standards for students, staff, and faculty" (Pasquini & Evangelopoulos, 2017, p. 218). In a social media policy, the guiding principles act as a safeguard for potential social media challenges or threats (Pasquini & Evangelopoulos, 2017). Nathan et al. (2014) proposes that a social media policy should be a "living document" that can be adapted based on technology innovation (p. 124). Adaptive design assures that the social media policy functions effectively under the complex conditions of social media in education (Nathan et al., 2014). School-based SNSs unique placement within both private and public institutions creates the necessity for clear and concise requirements for teachers' integration in public schools.

Social media policies provide teachers guidance on how to integrate school-based SNSs in the classroom. Nathan et al. (2014) outlined recommendations for developing an in-school social media policy. The procedures elicit a six-step process that includes: (1) positioning, (2) protocols, (3) requirements, (4) questions, (5) resources, and (6) timelines (Nathan et al., 2014). School policies should explain clear expectations and time requirements for teachers to integrate social networking tools in learning (Vardi, 2009). According to Manca and Ranieri (2017), it would be beneficial to have national guidelines and standards "to avoid fragmentation among institutions and ensure

homogenous consensus on innovative professional practices" (p. 620). National guidelines and standards for social networking use would initiate a powerful tool for educators and administrators across the board. Thus, the development and creation of a school social media policy would be necessary for mitigating issues with teachers' integration of school-based SNSs.

Proactive Leadership

Proactive leadership support will assist teachers' acceptance and use of school-based SNSs. Educational leaders need to provide students and teachers with sufficient technological devices and Internet access to incorporate school-based SNSs. According to Manca and Ranieri (2017), school leaders must offer "technical and pedagogical guidance" to teachers (p. 619). However, it is essential to remember that school leaders must confront issues with privacy and cyber security when opening access to social networking sites (Davis, 2010). Therefore, leadership must provide a social media policy, as well as support for teachers in its implementation. According to Ozmen, Akuzum, Zincirli, and Selcuk (2016), teachers reported that they do not have enough time to handle parental issues confidently. A lack of time is consistently identified as one of the most significant barriers to parent-teacher communication (Ozmen et al., 2016). Proactive leaders must create and find time for teachers to experiment and use school-based SNSs.

Professional Development

Educational professional development on SNSs for school-based communication is essential. Teachers believe that additional training and professional development to handle parents in difficult situations could be valuable (Caspe, 2003; Hornby & Blackwell, 2018). Wastiau et al. (2013) analyzed 190,000 questionnaires from students,

teachers, and leaders throughout Europe. According to Wastiau et al.'s (2013) study, "where we find digitally supportive schools, we also find digitally confident and supportive teachers" (p. 20). The results show that school policies need to support teachers by providing SNS professional development (Wastiau et al., 2013). As schools solidify more digitally confident teachers, it will allow for increased proficiency in using SNS tools in educational environments (Wastiau et al., 2013). Manca and Ranieri (2017) suggest embedding SNS tools in initial teacher training courses. Therefore, building educators' "self-efficacy, confidence, and capacity for taking benefit from digital technologies for learning with positive consequences" (Manca & Ranieri, 2017, p. 619). Educators need the opportunity to practice, use, and integrate school-based SNSs into the class while collaborating and learning with fellow instructors.

Equitable Access

Equitable access to technology and the Internet is imperative for diminishing challenges with teachers utilizing school-based SNSs in education. Warschauer and Matuchniak (2010) theorize that the "original" digital divide resolved when most youths obtained access to computers and the Internet. The modern digital divide relates to students' ability to "use new media to critically evaluate information, analyze, and interpret data, attack complex problems," and successfully communicate with various audiences (Warschauer & Matuchniak., 2010, p. 213). The term, "new media," identifies social media and social networking platforms. Krach et al. (2016) explains that low socio-economic schools could have parents that cannot access ClassDojo, because they lack Internet access or a computer. Therefore, if schools do not allow parents access to school-based SNSs, it causes a digital divide between families that can access the Internet

at home versus families that cannot access it (Howard, 2013). The ability for all teachers, students, and families to have equal access to the Internet, SNSs, and technology, creates an avenue for improving school-based communication.

The teacher's school can also be a barrier to parent-teacher communication if there are no clear school policies and plans to communicate with staff, stakeholders and parents (Hornby & Blackwell, 2018, p. 118). A plan and policy must be co-created between the parents, school, and community to ensure a successful outcome. Hornby and Blackwell (2018) stated that a "whole school approach" is essential for prosperous parental involvement (p. 118). Teachers, principals, and other support staff must use effective leadership to support parental engagement (Hornby & Blackwell, 2018). Teachers should use no 'educational jargon' in written communication (Ozmen et al., 2016). Any messages given to parents face-to-face or through technology should never exceed the parents' ability to understand the concept or idea (Williams & Cartledge, 1997). This study plans to synthesize information that influences teachers' integration of school-based SNSs, such as social media policies, proactive leadership, professional development, and equitable access to technology, to create an extended TAM for teachers.

Technology Acceptance Model (TAM)

The Technology Acceptance Model's foundation, extensions, and correlation to teachers' attitudes towards technology present as an excellent model to ground this study. Davis (1985) first developed TAM to establish "a theoretical model of the effect of system characteristics on user acceptance of computer-based information systems" (p. 7). TAM asserts a causal relationship with the two primary constructs perceived ease of use (PEOU) and perceived usefulness (PU), as well as attitude towards use (ATT), behavior

intention to use (BI), and actual use (AT) (Davis, 1989). This section will review the foundation of TAM (Fishbein & Ajzen, 1975; Davis, 1985; Davis, 1989; Davis et al., 1989), TAM extensions (Taylor & Todd, 1995; Gefen & Straub, 1997; Al-Gahtani & King, 1999; Venkatesh, 2000; Venkatesh & Davis, 2000; Venkatesh & Bala, 2008), TAM of SNSs (Curran & Lennon, 2011; Qin et al., 2011; Choi & Chung, 2013; Teo, 2016), and teachers' TAM of SNSs in education (Akbari et al., 2016; Akman & Turhan, 2017; Ursavas & Reisoglu, 2017; Yildiz Durak, 2019). An extensive understanding of the TAM's history will provide a foundation to develop an extended teachers' TAM of SNSs.

TAM Foundation

Davis' dissertation established the Technology Acceptance Model's (TAM's) foundation. TAM (Davis, 1985) is grounded in the Fishbein model that consists of three equations associated with psychology research in human behavior (Fishbein & Ajzen, 1975). Equation one explains an individual's behavior intention by analyzing the attitude towards a given behavior and the subjective norm regarding that behavior (Fishbein & Ajzen, 1975). Equation two states that an individual's attitude toward a specific behavior influences their belief of potential consequences from performing the behavior, multiplied by their evaluation of consequences (Fishbein & Ajzen, 1975). The third equation describes an individual's subjective norm by analyzing their expectations from a particular individual or group to perform the behavior, the number of referents, and the individual's motivation to comply with others (Fishbein & Ajzen, 1975). Following an extensive literature review and development of TAM, a survey of 112 organizational users of electronic mail and the XEDIT file editor tested and validated the measures and TAM's structure (Davis, 1985). A laboratory user acceptance experiment on 40 Masters

of Business Administration students that were "given video and hands-on demonstrations" of Pendraw and Chartmaster was used to further validate TAM (Davis, 1985, p. 128). Davis (1989) continued to expand his research on TAM by expanding perceived ease of use and perceived usefulness, as well as comparing TAM to other well-researched theories (Davis et al., 1989; Davis, 1989). This section reviews prior research on TAM's history by analyzing a comparison between TRA and TAM (Davis et al., 1989), and perceived ease of use and perceived usefulness (Davis, 1989).

TRA and TAM Comparison

Davis et al. (1989) analyzed the user acceptance of computer technology by comparing the Theory of Reasoned Action (TRA) and TAM. TRA is a general model that can predict a variety of human behaviors and intentions (Ajzen & Fishbein, 1980). Thus, it should apply to evaluate an individual's acceptance and usage of computer technology (Davis et al., 1989). TRA explains that "a person's performance of a specified behavior is determined by the person's attitude (A) and subjective norm (SN) concerning the behavior in question" (Davis et al., 1989, p. 983). Essentially, TRA was used as a "theoretical backdrop" for TAM, since TRA was supported and validated by numerous studies (Davis et al., 1989, p. 985). Davis et al. (1989) obtained data from 107 full-time MBA students at the beginning and end of their first semester in the program. WriteOne software, a word processing program, was used for the test application (Davis et al. (1989).

WriteOne allowed students to use the program voluntarily, and it applied to practicing managers in the workplace (Benson, 1983; Honan, 1986; Lee, 1986). Students were given a one-hour orientation on the WriteOne software at the beginning of the

semester, followed by a survey with measures from TRA and TAM (Davis et al., 1989). TAM results showed that perceived usefulness was a strong predictor for using new technology, specifically, WriteOne (Davis et al., 1989). Perceived ease of use had a minimal statistically significant effect on intentions, which slowly faded over the semester (Davis et al., 1989). TRA's subjective norms were shown to have "no effect on intentions" (Davis et al., 1989, p. 982). Overall, these results demonstrate the power that TAM has in identifying and analyzing user acceptance of new technology (Davis et al., 1989). After TAM's initial development (Davis, 1985) and validation (Davis, 1989; Davis et al., 1989), numerous studies came out that implemented or extended the model. Early TAM studies investigated prior experiences with IT usage (Taylor & Todd, 1995), gender and email (Gefen & Straub, 1997), and attitudes and factors that contribute to IT acceptance (Al-Gahtani & King, 1999).

Perceived Ease of Use and Perceived Usefulness

In September of 1989, Davis developed and validated new scales for perceived ease of use and perceived usefulness. Davis (1989) hypothesized that these two components are "fundamental determinants of user acceptance" of information technology (IT) (p. 319). A theoretical analysis of perceived ease of use and perceived usefulness discussed "expectancy theory; self-efficacy theory; behavioral decision theory; diffusion of innovations; marketing; and human-computer interaction" (Davis, 1989, p. 333). An initial 14-item scale was created based on the definitions of perceived ease of use and perceived usefulness (Davis, 1989). A small pilot study was used to pretest the items (Davis, 1989). It resulted in the elimination of 4 item scales; therefore, both constructs now had ten items (Davis, 1989). Davis (1989) used two studies, similar

(possibly the same data set) to his dissertation, to continually refine perceived ease of use and perceived usefulness. The results were six scale items for each construct that exhibit "high convergent, discriminant, and factorial validity" (Davis, 1989, p. 319).

The factor analysis showed that perceived usefulness scale items are: (1) work more quickly, (2) job performance, (3) increase productivity, (4) effectiveness, (5) makes the job easier, and (6) usefulness (Davis, 1989). Perceived ease of use scale items are (1) easy to learn, (2) controllable, (3) clear and understandable, (4) flexible, (5) easy to become skillful, and (6) easy to use (Davis, 1989). Regression analyses examined the relationship between the two new constructs and an individual's reported use of a technology (Davis, 1989). The findings suggest that perceived usefulness and perceived ease of use were both associated with current usage (Study 1) and self-predicted future use (Study 2) (Davis, 1989). Davis (1989) explains that usefulness had a statistically significant correlation to an individual's usage behavior; therefore, "perceived ease of use may actually be a causal antecedent to perceived usefulness" (p. 319). This study validates two essential TAM components, perceived ease of use and perceived usefulness (Davis, 1989).

TAM Extensions

Upon TAM's initial development (Davis, 1985) and validation (Davis, 1989; Davis et al., 1989), numerous studies came out that implemented or extended the model (Gefen & Straub, 1997; Al-Gahtani & King, 1999; Venkatesh, 2000; Venkatesh & Davis, 2000; Venkatesh & Bala, 2008; Fathema et al., 2015;). Dependent upon the study, prior research supports TAM extensions that include additional variables (Pikkarainen, Pikkarainen, Karjaluoto, & Pahnila, 2004; Kuo & Lee, 2009). This initial discussion

presents a brief overview of the different factors and variables within TAM, and how it correlates to users' behavioral intentions, and ultimately, adoption and use. Ultimately, the factors from these early extended TAM studies, combined with research from teachers' TAM of SNSs in education, will provide a thorough foundation to extend TAM. Therefore, this section analyzes the progression of extended TAM by focusing on studies prior to 2000 (Taylor & Todd, 1995; Gefen & Straub, 1997; Al-Gahtani & King, 1999), determinants of perceived ease of use (Venkatesh, 2000), TAM2 (Venkatesh & Davis, 2000), and TAM3 (Venkatesh & Bala, 2008).

Studies Prior to 2000

Early TAM extensions investigated prior experiences with IT usage (Taylor & Todd, 1995), gender and email (Gefen & Straub, 1997), and attitudes and factors that contribute to IT acceptance (Al-Gahtani & King, 1999). Taylor and Todd's (1995) study examined the role that TAM has in predicting the behavior of inexperienced users. Also, the study evaluated "whether the determinants of IT usage are the same for experienced and inexperienced users of a system" (Taylor & Todd, 1995, p. 561). Most prior research on TAM had been with experienced users; therefore, this study filled a void in research (Taylor & Todd, 1995). Taylor and Todd (1995) justified the incorporation for subject norm and perceived behavioral control into TAM to create a complete model. The study included "430 experienced and 356 inexperienced potential users" for a "student computing information resource center" (Taylor & Todd, 1995, p. 561). Results show that TAM is an applicable model to analyze IT usage by experienced and inexperienced users (Taylor & Todd, 1995). However, the findings showed that inexperienced users

focused mainly on perceived usefulness, and there was little emphasis on specific control factors (Taylor & Todd, 1995).

Building on earlier studies, Gefen and Straub (1997) extend TAM to explore gender differences in the perception and use of email. Straub (1994) supplements TAM by including perceived social presence (SP) and informational richness (IR) as TAM's first construct. The researchers used Straub's (1994) adaptation to TAM for their study (Gefen & Straub, 1997). A survey evaluated the email systems use of 392 males and females from the airline industry in Asian, Europe, and North American (Gefen & Straub, 1997). Results show that "women and men differ in their perceptions but not use of email" (Gefen & Straub, 1997). Research also continued to expand on TAM's determinants of perceived ease of use.

Determinants of Perceived Ease of Use

Venkatesh (2000) explains that minimal research examined how perceived ease of use "forms and changes over time" (p. 342). Therefore, Venkatesh (2000) included additional anchors into TAM, such as integrating control, intrinsic motivation, and emotion, to enhance and understand the formation of perceived ease of use in new technologies. The first anchor, control, refers to computer self-efficacy and the facilitating conditions (Venkatesh, 2000). Control involves the perceptions an individual has about the "availability of knowledge, resources, and opportunities required to perform the specific behavior" (Venkatesh, 2000, p. 346). Computer self-efficacy refers to an individual's perception about having to perform a specific task on a computer (Compeau & Higgins, 1995a; Compeau & Higgins, 1995b). Three studies were employed to assess employees and organizations.

The first study investigated 70 employees' adoption of an "interactive online help desk system" at a retail electronics store (Venkatesh, 2000, p. 352). The help desk would assist employees with responding to customer phone calls and questions (Venkatesh, 2000). Fifty-eight employees completed study one (Venkatesh, 2000). Study two investigated 160 employees at a real estate agency that was integrating a "new multi-media system of property management" (Venkatesh, 2000, p. 352). The system would allow employees to access information about properties for sale, properties sold previously, as well as answer client questions (Venkatesh, 2000). One hundred forty-five participants completed the study (Venkatesh, 2000). Lastly, study three analyzed 52 employees at a financial service firm that were changing from an IBM-mainframe to Windows 95 for payroll purposes (Venkatesh, 2000). In its entirety, 43 subjects completed the study.

Venkatesh (2000) concludes that both internal and external control are important factors with identifying an individual's perceived ease of use. Intrinsic motivation is the second anchor (Venkatesh, 2000) and refers to an individual's perception of the satisfaction they receive from performing a behavior (Vallerand, 1997). Venkatesh (2000) explains that new users lack an understanding of enjoyment from new technology; thus, an individual's "desire to explore and play with a new system, in general, is expected to influence her/his perceived ease of use" in the new system (p. 349). The final anchor, emotion, directly relates to individuals fear about using computers to complete a task (Venkatesh, 2000). Venkatesh (2000) suggests that the higher an individual's anxiety to use computers, the lower the individual's perceived ease of use. The research states

that “objective usability” should diminish computer anxiety and self-efficacy (Venkatesh, 2000).

After Venkatesh (2000) established clear theoretical support for the anchors and determinants, three longitudinal studies were implemented to evaluate the new model. The longitudinal studies evaluate information technology adoption by measuring three intervals relating to an individual’s initial training, one month of use, and three months of use (Venkatesh, 2000). According to Venkatesh (2000), all the participants had no knowledge of the new technologies before training, and the three trainers did not know about the research or its objectives. Results show that Venkatesh’s (2000) study “significantly expands our understanding of factors influencing user acceptance” (p. 356). Explicitly, the study confirms that the anchors' control, intrinsic motivation, and emotion influence an individual's perceived ease of use for new systems (Venkatesh, 2000).

Findings suggest that as individuals have increased experience with a new system, the perception will adjust for objective usability, external control, and perceived enjoyment from the technology (Venkatesh, 2000). According to Venkatesh (2000), these are powerful results because it demonstrates that an individual's perceptions about ease of use correlate with past experiences using computers. Also, new technology systems can still be measured with no prior use (Venkatesh, 2000). Venkatesh (2000) states that there needs to be an “increased focus on individual difference variable” to improve both usage and user acceptance (p 360). Overall, Venkatesh (2000) produces a thorough investigation of the determinants of perceived ease of use, and how the determinants are related to “technology acceptance, adoption, and usage behavior” (p. 360).

TAM2

Venkatesh and Davis' (2000) extension of TAM, called TAM2, examines "perceived usefulness and usage intentions in terms of social influence and cognitive instrumental processes" (p. 119). Social influence processes include subjective norms, voluntariness, image, and focus on individual's decision to adopt or reject a technology (Venkatesh & Davis, 2000). Venkatesh and Davis (2000) explain that the "four cognitive instrumental determinants of perceived usefulness" are job relevance, output quality, result demonstrability, and perceived ease of use (p. 190). Job relevance refers to the ability of technology to be applicable and assist an individual in completing a job (Venkatesh & Davis, 2000). Output quality describes the degree to which an innovation completes a task well and matches an individual's job goals (Venkatesh & Davis, 2000). Result demonstrability is the ability for an individual to see tangible results from new technology (Venkatesh & Davis, 2000). Lastly, perceived ease of use, from TAM (Davis, 1985; Davis et al., 1989) is included to enhance perceived usefulness. Essentially, the "less effortful a system is to use, the more using it can increase job performance" (Venkatesh & Davis, 2000, p. 192).

Four longitudinal field studies analyzed the social influence processes and cognitive instrumental processes in correlation with TAM2 (Venkatesh & Davis, 2000). Each workplace had a variety of industries, organizations, and types of system implementations (Venkatesh & Davis, 2000). Participants filled out a questionnaire after their first system training, at one month of implementation, and three months of implementation (Venkatesh & Davis, 2000). A total of 156 participants completed the study as a result of pooling all four studies (Venkatesh & Davis, 2000). The results

showed that “TAM2 provides a detailed account of the key forces underlying judgements of perceived usefulness, explaining up to 60% of the variance” (Venkatesh & Davis, 2000, p. 198). Social influence processes and cognitive instrumental processes were shown to be “consistent with TAM2” and influence user acceptance (Venkatesh & Davis, 2000, p. 199). Venkatesh and Davis’ (2000) development and testing of TAM2 advances theory and understanding regarding user acceptance of new technologies, specifically in the workplace.

TAM 3

Venkatesh and Bala’s (2008) study combines TAM2 (Venkatesh & Davis, 2000) and “the model of the determinants of perceived ease of use” (Venkatesh, 2000, p. 352) to create an “integrated model of technology acceptance-TAM3” (p. 279). The researchers explain TAM3, test the model, and present potential pre- and post-implementation strategies to assist individuals with adopting and using informational technologies in the workplace. TAM3 shows a “nomological network” of determinants that are used to evaluate an individual's perceptions to adopt and use new technologies (Venkatesh & Bala, 2008, p. 301). According to Venkatesh and Bala (2008), there are three new relationships posited in TAM3 that were not previously studied. Experience is a primary factor between the new relationships (Venkatesh & Bala, 2008).

Longitudinal field studies were administered to obtain data from four organizations from different contexts and function areas (Venkatesh & Bala, 2008). The results show that “the development and validation of TAM3 was an important first step in understanding the role of interventions in IT adoption contexts” (Venkatesh & Bala, 2008, p. 291). The interventions could influence employees perceived usefulness and

perceived ease of use for new technologies (Venkatesh & Bala, 2008). Pre-implementation interventions consist of design characteristics, user participation, management support, and incentive alignment (Venkatesh & Bala, 2008). Post-implementation interventions refer to training, organizational support, and peer support. TAM3 core strengths are the comprehensiveness and "potential for actionable guidance" (Venkatesh & Bala, 2008, p. 301). TAM3 also advances TAM by providing necessary pre- and post-implementation interventions for technology acceptance and use among employees (Venkatesh & Bala, 2008).

Researchers continue to adapt and extend TAM to explain users' technology acceptable behaviors (Fathema et al., 2015). Fathema et al. (2015) studied how Learning Management Systems (LMSs) can assist faculty members in "teaching learning processes" (Fathema et al., 2015). Specifically, the researchers examined factors that influence faculty's use, attitudes, beliefs, and intentions of LMSs in higher education (Fathema et al., 2015). The results extend TAM into the educational sector by including "three proposed external variables: system quality; perceived self-efficacy and facilitating conditions were statistically significant predictors of faculty attitude towards LMSs" (Fathema et al., 2015, p. 210). Therefore, this study elicits another example of TAM's extensions to meet various organizations, industries, and environments technology acceptance needs and queries. As shown above, the development and creation of a model that predicts technology usage or acceptance is a comprehensive and time-consuming process.

TAM and SNSs in Education

This section will analyze initial TAM and SNSs studies in education (Shin & Kim, 2008; Curran & Lennon, 2011; Qin et al., 2011; Choi & Chung, 2013; Rauniar et al., 2014; Teo, 2016). SNSs are "one of the most popular and rapidly emerging social media technologies" (Weerasinghe & Hindagolla, 2018, p. 143). The majority of SNS research in education focuses on teaching and learning (Greenhow & Askari, 2017; Manca & Ranieri, 2017). Teachers have challenges when integrating social media into teaching and learning because SNSs were not explicitly designed for educational purposes (Halverson, 2011; Manca & Ranieri, 2017). TAM research primarily focuses on students' acceptance and use of SNSs (Lau & Woods, 2009; Curran & Lennon, 2011; Hashim, 2011; Chen et al., 2013; Rauniar et al., 2014; Harmon, 2015; Akbari et al., 2016; Akman & Turhan, 2017; Almaiah, 2018; Dixit & Prakash, 2018), instead of teachers' adoption of SNSs. Integrating SNSs into education is a multi-faceted process that needs continual improvement and renovation (Yildiz Durak, 2019). Therefore, this section reviews prior research of TAM's association to SNSs (Shin & Kim, 2008; Rauniar et al., 2014) and university students' TAM of SNSs in education (Curran & Lennon, 2011; Qin et al., 2011; Choi & Chung, 2013; Teo, 2016).

TAM provides an avenue to assess users' acceptance and use of SNSs (Shin & Kim, 2008; Rauniar et al., 2014). Shin and Kim (2008) investigated Cyworld, a popular Korean SNS, to assess users' attitudes and behavior patterns. TAM was enhanced by including the constructs "perceived synchronicity, perceived involvement and user flow experience" (Shin & Kim, 2008, p. 379). A survey collected data from 352 Cyworld users (Shin & Kim, 2008). Results were mixed, as perceived synchronicity and perceived

involvement were not statistically significant; however, perceived usefulness did have a positive influence on perceived attitude (Shin & Kim, 2008). The researchers claim that the TAM model successfully explained user's behavior intentions to use Cyworld (Shin & Kim, 2008). Rauniar et al. (2014) studied users' adoption behavior of Facebook by incorporating additional factors into TAM. The researchers included factors such as perceived playfulness, trustworthiness, SNS capability, and critical mass (Rauniar et al., 2014). A web-based survey of 398 Facebook users found that Rauniar et al.'s (2014) model fit well and explained Facebook usage and attitudes. Additionally, Rauniar et al. (2014) established evidence that perceived ease of use and perceived usefulness are still viable factors from original TAM constructs.

Building on TAM and SNS research, several researchers began to assess university students' acceptance and use of SNSs (Curran & Lennon, 2011; Qin et al., 2011; Choi & Chung, 2013; Teo, 2016). Curran and Lennon (2011) used TAM to analyze university students' attitudes and perceptions about SNSs use. The researchers' model included five additional antecedent beliefs, which were enjoyment, social influence, usefulness, ease of use, and drama (Curran & Lennon, 2011). An empirical study was used to evaluate the model by collecting survey data from 495 students (Curran & Lennon, 2011). Results demonstrated that enjoyment was considered the most statistically significant determinant for attitude (Curran & Lennon, 2011). In a similar study, Qin et al. (2011) used TAM to investigate the factors influencing university student's acceptance of online social networks. TAM was extended to include social influence, which contained the two variables critical mass and subjective norm (Qin et al., 2011). Findings showed that social influence had a statistically significant influence

on perceived use (Qin et al., 2011). The authors suggest future research in SNSs and business organizations (Qin et al., 2011).

Choi and Chung (2013) studied 179 graduate students' "underlying factors and causal relationships that affect behavioral intention to use SNS" (p. 619). Subjective norm and perceived social capital were included in TAM, along with the traditional constructs perceived ease of use, perceived usefulness, and intend to use, to predict SNSs use and acceptance (Choi & Chung, 2013). Findings supported that perceived usefulness and perceived ease of use had "robust effects on the user's intention to use SNS" (p. 625). Choi and Chung (2013) advance TAM literature by demonstrating that subjective norm and perceived social capital were also important constructs to users' technology acceptance. Teo (2016) investigated TAM determinants associated with college students joining Facebook. Teo (2016) extends TAM by including emotional attachment (EA) in the model. Findings showed that emotional attachment had a statistically significant influence on users' Facebook use (Teo, 2016).

Extending TAM to Teachers and SNSs

Teachers' SNSs use in education has become a necessity (Yildiz Durak, 2019). Teachers integrate SNSs in education for training and professional development opportunities (Gustafson, 2017; Manca & Ranieri, 2017; Tour, 2017), increasing student engagement (Junco, Heibergert, & Loken, 2011; Veira, Leacock, & Warrican, 2014; Northey, Bucic, Chylinski, & Govind, 2015), students' informal learning opportunities (Greenhow & Askari, 2017; Mao, 2014), classroom instruction (Ajjan & Hartshorne, 2008; Greenhow & Askari, 2017; Manca & Ranieri, 2017), and school-based communication (McHugh, 2016; Robacker et al., 2016; Williamson, 2017b; Manolev et

al., 2019). TAM is a model that can identify and predict teachers' SNS adoption (Akbari et al., 2016; Akman & Turhan, 2017; Ursavas & Reisoglu, 2017; Yildiz Durak, 2019), and researchers identify TAM as "the prevailing theoretical approach regarding users' adoption of social media" (Wirtz & Gottel, 2016, p. 145). TAM research supports teachers' integration of Edmodo (Ursavas & Reisoglu, 2017; Yildiz Durak, 2019), Facebook, LinkedIn, Google Plus+, Twitter, Hyves (Akbari et al., 2016), and SNSs as a whole entity (Akman & Turhan, 2017). Therefore, this section will analyze TAM studies focusing on SNSs adoption and use by pre-service teachers (Ursavas & Reisoglu, 2017; Yildiz Durak, 2019), as well as a combination of teachers and students (Akbari et al., 2016; Akman & Turhan, 2017).

Several research studies have used TAM to examine factors of teachers' and students' acceptance and adoption of SNSs in education (Akbari et al., 2016; Akman & Turhan, 2017). For instance, Akbari et al. (2016) investigated teachers' and students' attitudes for using online social networks to facilitate formal learning. The TAM structure was extended using the external variables: gender, role (teacher/student), number of accounts, and age (Akbari et al., 2016). Positive attitudes were indicated for both teachers and students on TAM's four primary constructs (Akbari et al., 2016). Students perceived SNSs as more useful compared to teachers (Akbari et al., 2016). Results illustrate that role (student vs. teacher), the number of accounts, and age are statistically significant predictors of participants' perceived usefulness (PU) of SNSs (Akbari et al., 2016). Also, the number of accounts, perceived usefulness, and attitude predicted both groups' behavior intentions to use SNSs (Akbari et al., 2016). Akbari et al. (2016) identified

attitude toward using SNS as “the best predictor of behavior intention to use social networks in formal learning” (p. 101).

In a related study, Akman and Turhan (2017) investigated university faculty and students’ acceptance of social media in higher education. The researchers developed a TAM model that includes the four antecedent beliefs: perceived usefulness (PU), perceived ease of use (PEOU), security awareness (SA), and ethical awareness (EA) (Akman &Turhan, 2017). Survey research investigated 142 faculty members and university students from an International Engineering Education Conference (Akman & Turhan, 2017). Results displayed that all TAM’s core and external constructs, except perceived ease of use, were statistically significant predictors of users’ “actual behavior towards using social media for learning” (Akman & Turhan, 2017, p. 229). Findings indicated that security awareness had an adverse influence on actual use, and ethical awareness had a statistically significant influence on social media use for learning (Akman & Turhan, 2017). Therefore, users that are aware of security risks from social media and learning have a higher chance to find the platform dishonest and not use it (Akman & Turhan, 2017). On the other hand, users’ knowledge of ethical awareness had a positive influence on the use of SNS for learning (Akman & Turhan, 2017).

Similar to the above studies, some researchers have attempted to use TAM to investigate pre-service teachers’ adoption and acceptance of the SNS Edmodo (Ursavas & Reisoglu, 2017; Yildiz Durak, 2019). Edmodo is closely related to ClassDojo as a school-based SNSs. Edmodo allows teachers, students, and parents to register to a course group using a code (Yildiz Durak, 2019) that establishes a cooperative and secure learning environment (Trust, 2015). Following registration, the users can communicate

with the class or teacher using messages, notifications, survey tools, and file uploads (Yildiz Durak, 2019). Edmodo functions similarly to the Facebook interface (Dere, Avci Yucel, & Yalcinalp, 2016), which provides users a simple and easy experience that enhances behavior intention to use (Liaw, Hatala, & Huang, 2010). Ursavas and Reisoglu (2017) investigated the influence of pre-service teachers' cognitive styles on Edmodo to explore the validity of an extended TAM. The authors enhanced TAM by including the constructs technological complexity (TC), subjective norm (SN), computer self-efficacy (CSE), and facilitating conditions (FC) (Ursavas & Reisoglu, 2017). Survey research collected data from 129 pre-service teachers (Ursavas & Reisoglu, 2017). Results stipulated that the extended TAM is a parsimonious model identifying 75 percent of pre-service teachers' behavior intention to use (Ursavas & Reisoglu, 2017). The variables facilitating conditions and technological complexity "influence BI to use indirectly through PU and PEU" (Ursavas & Reisoglu, 2017, p. 31). Computer self-efficacy had a "medium positive influence" on pre-service teachers' behavioral intentions, while technological complexity had a negative influence on behavior intentions to use Edmodo (Ursavas & Reisoglu, 2017, p. 45).

In line with building on the above study, Yildiz Durak (2019) examined the acceptance and use of SNSs by pre-service teachers within the framework of the Unified Theory of Acceptance and Use of Technology (UTAUT). Venkatesh, Morris, Davis, and Davis (2003) established UTAUT as an extension to TAM that considers large variable numbers for technology use and acceptance. Comparing TAM and UTAUT, the most apparent distinction is that the factors directly influence behavioral intention, instead of focusing on perceived ease of use and perceived usefulness. The model extension

included the factors performance expectancy, effort expectancy, and social influence, as well as a multitude of moderators (Yildiz Durak, 2019). Survey research was used to collect data from 274 pre-service teachers in Turkey (Yildiz Durak, 2019). The findings suggest that social influence has the most statistically significant influence on pre-service teachers' use of SNS for educational reasons (Yildiz Durak, 2019). Performance expectations and effort expectations also have an effect on pre-service teachers' behavioral intentions for using SNSs (Yildiz Durak, 2019). Additional findings suggest that "academic self-efficacy, self-directed learning readiness, and motivation are important predictors in the acceptance and use of SNSs" (Yildiz Durak, 2019, p. 201). The studies presented in this section provide potential TAM extensions and variables to establish a teacher TAM for SNSs. Consequently, literature for the core TAM constructs perceived ease of use and perceived usefulness must support teachers' acceptance and use of SNSs in education. In conclusion, this section explored previous TAM structures and variables that focus on teachers' acceptance and use of SNSs to facilitate the development of a new and extended TAM.

Teachers' TAM of SNSs (T-TAMS)

The teachers' Technology Acceptance Model (TAM) of social network sites (SNSs) (T-TAMS) is a theoretical framework that analyzes teachers' attitudes toward using SNSs, in particular, school-based SNSs. This extended TAM synthesized information from studies on TAM's foundations (Fishbein & Ajzen, 1975; Davis, 1985; Davis, 1989; Davis et al., 1989), TAM extensions (Taylor & Todd, 1995; Gefen & Straub, 1997; Al-Gahtani & King, 1999; Venkatesh, 2000; Venkatesh & Davis, 2000; Venkatesh & Bala, 2008), TAM of SNSs (Curran & Lennon, 2011; Qin et al., 2011; Choi & Chung, 2013; Teo, 2016), and teachers' TAM of SNSs in education (Ursavas &

Reisoglu, 2017; Yildiz Durak, 2019; Akbari et al., 2016; Akman & Turhan, 2017). T-TAMS examined teachers' acceptance of ClassDojo using the determinants: perceived ease of use (PEOU) (Teo, 2009a; Teo, 2009b; Akbari et al., 2016; Ursavas & Reisoglu, 2017; Sanchez-Prieto et al., 2017; Siyam, 2019), perceived usefulness (PU) (Teo et al., 2012; Akbari et al., 2016; Teo, 2016; Akman & Turhan, 2017; Ursavas & Reisoglu, 2017; Siyam, 2019), attitude towards use (ATT) (Curran & Lennon, 2011; Ursavas et al., 2014; Akbari et al., 2016; Elkaseh et al., 2016; Ursavas & Reisoglu, 2017; Dixit & Prakash, 2018; Siyam, 2019), intentions to use (ITU) (Teo, 2009; Teo et al., 2012; Chen et al., 2013; Ursavas & Reisoglu, 2017; Dixit & Prakash, 2018), security awareness (SA) (Arpaci et al., 2015; Akman & Turhan, 2017; Almaiah, 2018), and subjective norm (SN) (Venkatesh & Davis, 2000; Yuen & Ma, 2008; Teo, 2009b; Tarcan et al., 2010; Kriederman, 2017; Ursavas & Reisoglu, 2017). The proposed TAM extension advanced research as one of the first TAMs focusing on teachers and school-based SNS acceptance (see Figure 3).

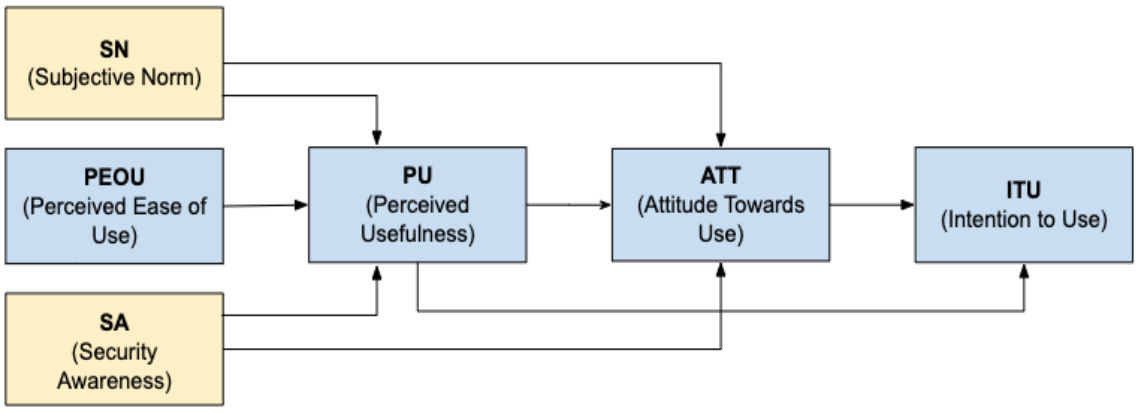


Figure 3 Initial Teachers' TAM of SNSs (T-TAMS)

Perceived Ease of Use and Perceived Usefulness

TAM describes factors that can identify teachers' behavior intentions to use technology in education. Perceived ease of use (PEOU) and perceived usefulness (PU) are "core variables of user motivation" (Scherer et al., 2019, p. 15) in TAM that can directly or indirectly influence a users' attitudes (ATT), behavior intentions (BI), and actual use (AU) (Marangunic & Granic, 2015). In the context of this study, PU refers to the degree to which a teacher believes that ClassDojo improves their job performance (Davis, 1985). PEOU describes the degree to which teachers believe that using ClassDojo is free of physical and mental effort (Davis, 1985). According to Davis (1985), PEOU directly influences PU; therefore, new technologies that are easy to use for teachers will be more beneficial and useful. To facilitate TAM extensions, PEOU and PU can be accompanied with (Teo, 2009a; Teo et al., 2012; Akbari et al., 2016; Sanchez-Prieto et al., 2017; Ursavas & Reisoglu, 2017; Scherer et al., 2019; Siyam, 2019) or without external variables (Akman & Turhan, 2017). Researchers have used TAM to analyze teachers' PU and PEOU; however, variations in teacher samples have caused mixed statistically significant findings (Scherer & Teo, 2019). Therefore, a literature review of all TAM studies involving teachers, SNSs, and education will support including PEOU (Teo, 2009a; Teo, 2009b; Akbari et al., 2016; Sanchez-Prieto et al., 2017; Ursavas & Reisoglu, 2017; Siyam, 2019) and PU (Teo et al., 2012; Akbari et al., 2016; Teo, 2016; Akman & Turhan, 2017; Ursavas & Reisoglu, 2017; Siyam, 2019) into the extended TAM.

Perceived Ease of Use

Teachers' PEOU of ClassDojo focuses on the platform's alignment with Facebook's user interface (Williamson, 2017b; Manolev et al., 2019), accessibility using a mobile application (Burger, 2015), and influencing student behavior with the behavior management system (Chiarelli et al., 2015; da Rocha Seixas et al., 2016; Williamson, 2017a; Homer et al., 2018). Therefore, teachers with prior experiences using SNSs and smartphones have advantages for easily integrating ClassDojo in their classrooms. Davis (1989) explains that PEOU indirectly influences users' intentions to adopt and use technology through PU. The extended TAM suggests that PEOU will have a direct positive influence on PU and ATT. For instance, research investigating pre-service teachers' attitudes and acceptance of computers (Teo, 2009b), Edmodo (Ursavas & Reisoglu, 2017), and mobile learning (Sanchez-Prieto et al., 2017) illustrated PEOU had a statistically significant influence on PU. Also, university students' TAM of SNSs in education support PEOU having a statistically significant influence on PU in Facebook (Rauniar et al., 2014) and SNSs in general (Dixit & Prakash, 2018).

Akbari et al. (2016) explored teachers' and university students' attitudes for using online social networks in formal learning. Results displayed that PEOU was also a statistically significant determinant of PU (Akbari et al., 2016). In a study focusing on special education teachers, Siyam (2019) explored the teachers' acceptance and use of technologies such as social media for learning. Similar to the above studies, results detailed that PEOU had a statistically significant influence on PU (Siyam, 2019). In contrast to these results, researchers have found PEOU does not have a statistically significant influence on PU when analyzing students and higher education faculty

members' acceptance of social learning systems (Akman & Turhan, 2017). Nevertheless, these findings confirm that PEOU is a crucial component to establishing a teacher TAM that includes support from prior research on university students and pre-service teachers.

Perceived Usefulness

Teachers' PU for ClassDojo will have a statistically significant influence on ATT and ITU. TAM and SNSs research in education supports that PU has a statistically significant influence on ATT (Teo et al., 2012; Akbari et al., 2016; Teo, 2016; Akman & Turhan, 2017; Ursavas & Reisoglu, 2017; Siyam, 2019) and ITU (Teo et al., 2012; Teo, 2016; Akman & Turhan, 2017; Ursavas & Reisoglu, 2017; Siyam, 2019). While using ClassDojo, teachers can integrate useful tools into their classroom such as the school-based SNS (Williamson, 2017b; Manolev et al., 2019) and behavior management systems (Chiarelli et al., 2015; da Rocha Seixas et al., 2016; Robacker et al., 2016; Lynne et al., 2017; Williamson, 2017a; Homer et al., 2018; Lipscomb et al., 2018). In the extended TAM, PEOU and subjective norm will have a statistically significant influence on PU. Ultimately, PU will determine teachers' attitudes toward ClassDojo; therefore, teachers' attitudes will lead to intentions and finally, actual ClassDojo use (Elkaseh et al., 2016). Research is scant on teachers' TAM of SNSs; therefore, this section provides support for PU and ATT and ITU with literature on university students, higher education faculty, pre-service teachers, and special education teachers' acceptance and use of SNSs and web tools for learning.

Several studies have identified that PU has a statistically significant influence on pre-service teachers' ATT and ITU technologies such as SNSs (Teo et al., 2012) and Edmodo (Ursavas & Reisoglu, 2017). Additionally, Akman and Turhan (2017) and

Akbari et al. (2016) investigated university students and faculty members' integration of SNSs for learning. Results confirmed that students and faculty's PU of SNSs had a statistically significant impact on ATT (Akbari et al., 2016; Akman & Turhan, 2017), as well as ITU (Akman & Turhan, 2017). Similar to the previous studies, Elkaseh et al. (2015) extended TAM to show that university students' and teachers' PU of social media has a statistically significant influence on users' ATT toward e-learning in higher education. Teo (2016) extended the TAM to explore emotional attachments in SNSs among university students in Thailand that also illustrates PU has a statistically significant influence on ATT and AU. Lastly, Siyam (2019) extended TAM for special education teachers' acceptance and use of technologies, including SNSs, into education. Findings were significant and support PU as having a statistically significant influence on teachers' ATT and AU (Siyam, 2019). Overall, research supports that PU has a statistically significant impact on teachers' ATT and ITU ClassDojo.

Attitudes and Intentions to Use SNSs

This study targets teachers' attitudes toward accepting and using ClassDojo. Attitude is a viable construct for TAM and users' adoption and usage of SNSs (Lin, 2006; Willis, 2008; Zhou, 2011; Dixit & Prakash, 2018), because teachers are voluntarily using ClassDojo. An understanding of teachers' attitudes towards integrating SNSs and technology is essential to creating an effective TAM. In traditional TAM constructs, ATT has a statistically significant influence on BI; in turn, BI has a statistically significant impact on AU of the technology (Davis, 1989). BI is an individual's formulated and conscious plan to use or not use a technology in the future (Davis, 1989). Actual use (AU) refers to teachers that have the intention to use ClassDojo, and they use it (Fathema

et al., 2015). Similar to Dixit and Prakash (2018) TAM investigation of users' intention to use SNSs, this extended model will exclude Davis' (1985) suggested behavioral intention to use (BI) and actual system use (AU). Instead, Dixit and Prakash (2018) only include behavioral intention to use SNSs (ITU). Therefore, the extended TAM will include users' attitude (ATT) and intention to use (ITU) SNSs. According to Scherer et al. (2019), TAM commonly consists of "at least one outcome variable: behavioral intention (BI) and/or technology use (USE)" (p. 15). Literature supports including teachers' ATT (Curran & Lennon, 2011; Ursavas et al., 2014; Akbari et al., 2016; Elkaseh et al., 2016; Ursavas & Reisoglu, 2017; Siyam, 2019) and ITU SNSs (Teo, 2009; Teo et al., 2012; Chen et al., 2013; Ursavas & Reisoglu, 2017; Dixit & Prakash, 2018) within the extended TAM.

Attitude Toward Using SNSs

Teachers' attitudes to incorporate SNSs into education to support school-based communication and learning is limited. Teachers' attitudes to accept technology are influenced by enjoyment, social influence, drama (Curran & Lennon, 2011), subjective norm (Ursavas & Reisoglu, 2017), number of SNS accounts (Akbari et al., 2016), and social media usage (Elkaseh et al., 2016). Research primarily focuses on learning and teaching with SNSs in education. Teachers are often uncertain about how to integrate SNS into education in a meaningful way, as well as assess its impacts (Crook, 2012). According to Siyam (2019), positive attitudes towards technology use has the potential to increase actual technology use. Relating to teachers TAM, Ursavas et al. (2014) investigated technology acceptance measures for teachers that include ATT as a statistically significant factor for teachers' technology use. Building on Ursavas et al.'s

(2014) results, Akbari et al. (2016) compared teachers' and students' attitudes towards using a SNS for formal learning. Findings show that PEOU and PU were favorable towards ATT; therefore, this increased teachers' usage intention of SNSs (Akbari et al., 2016). Results explain how teachers "widely" use SNSs outside of education and are willing to use SNSs for formal learning as well (Akbari et al., 2016, p. 117). ATT was the most statistically significant predictor of teachers' use for SNSs in formal learning (Akbari et al., 2016). Overall, teachers' attitudes about new technology, such as ClassDojo, influence their willingness to adopt and use it (Liu, Lin, & Zhang, 2017).

Intentions to use SNSs

TAM studies support teachers' ATT has a positive statistically significant influence on teachers' ITU SNSs (Teo, 2009; Teo et al., 2012; Chen et al., 2013; Ursavas & Reisoglu, 2017). For instance, Ursavas and Reisoglu (2017) implemented a multi-group analysis to analyze the effects of cognitive style on pre-service teachers' attitudes for integrating Edmodo. Findings displayed that teachers' ATT has a statistically significant impact on BI (Ursavas & Reisoglu, 2017). Teo (2009) investigated subjective norm and facilitating conditions impact on pre-service teachers' attitudes for using computers. Similar to Ursavas and Reisoglu (2017), the pre-service teachers ATT had a positive statistically significant influence on BI (Teo, 2009). In addition, Teo et al. (2012) extended TAM to analyze pre-service teachers' technology acceptance in Turkey. Results also showed ATT had a statistically significant influence on BI (Teo et al., 2012). Chen et al. (2013) studied users' acceptance of Blackboard's mobile learning applications. The findings identified users' ATT had a statistically significant impact on BI (Chen et al., 2013). Overall, literature supports including teachers' attitudes (Curran & Lennon, 2011;

Ursavas et al., 2014; Akbari et al., 2016; Elkaseh et al., 2016; Ursavas & Reisoglu, 2017; Siyam, 2019) and intentions to use (Teo, 2009; Teo et al., 2012; Chen et al., 2013; Ursavas & Reisoglu, 2017) SNSs in the extended TAM.

Security Awareness

The extended TAM proposes that teachers' security awareness of ClassDojo will have a statistically significant influence on PU and ATT. Security awareness refers to the level of procedures in a technology to secure users' data from outside attacks or threats (Almaiah, 2018). SNS procedures can ensure a system is secure through integrity and confidentiality (Almaiah, 2018). Integrity is the "protection of personal data from unauthorized modification, deletion, or fabrication" (Almaiah, 2018, p. 1881). Confidentiality is the process of not allowing data access to unauthorized users (Almaiah, 2018). In this study, security awareness refers to the degree to which teachers perceive the level of procedures in ClassDojo for securing educational data from threats or harm. As shown earlier, Williamson (2017b) raises potential security issues with ClassDojo acting as a "commercial platform for tracking students' behavior data in classrooms and a social media network for connecting teachers, students, and parents" (p. 59). Tracking data refers to SNSs access to users' location, age, interests, and pictures, as well as all the content created by the user including texts, videos, and images (Rauniar et al., 2014).

Teachers need to trust ClassDojo to maintain the privacy of their posts related to students' photographs, videos, parent interactions, and other sensitive information. According to Rauniar et al. (2014), the only way a user can freely participate within an SNS is to be "free from worries related to privacy and safety concerns" (p. 15). Privacy concerns are especially important for teachers when dealing with children. Teachers must

trust ClassDojo "to keep information confidential" (Rauniar et al., 2014, p. 15). Therefore, ClassDojo needs to provide a safe, private, and interactive platform if parents and teachers are going to trust using it communicate about children and students. Williamson (2017b) presented potential concerns with combining for-profit platforms and non-profit public schools. Teachers need to trust that parents' and students' information, posts, profiles, and messaging are secure (Rauniar et al., 2014); thus, influencing teachers' ATT and PU ClassDojo.

An analysis of prior literature will assess teachers' security awareness towards technologies such as mobile phones and SNSs. Focusing on teachers and students, Akman and Turhan (2017) extended TAM with ethical and security awareness to assess user acceptance of social learning systems in higher education. Interestingly, findings conveyed that security awareness had a statistically significant adverse effect on teachers' and students' AU of social learning systems in higher education (Akman & Turhan, 2017). Therefore, teachers that know about security risks are less likely to use SNSs for learning (Akman & Turhan, 2017). Nevertheless, additional studies have supported the influence of security awareness on intention to use smartphones (Arpaci et al., 2015; Almaiah, 2018). For instance, early studies on security awareness focused on the impact of organizational adoption of smartphones (Arpaci et al., 2015). Results indicated that security awareness had a statistically significant influence on the organizational adoption of smartphones (Arpaci et al., 2015). Building on Arpaci et al.'s (2015) study, Almaiah (2018) expanded TAM to the Mobile Services Acceptance Model (MSAM) by exploring university student's acceptance and use of mobile information systems. The TAM extension also showed a statistically significant correlation between security awareness

and BI to use mobile information systems. Therefore, empirical studies support that teachers' security awareness of ClassDojo will have a statistically significant favorable influence on their PU and ATT.

Subjective Norm

Prior literature supports the inclusion of subjective norm as a primary determinant for PU and ATT. TAM research on teachers' acceptance of new technology, especially computers and e-learning (Yuen & Ma, 2008), has a strong focus on subjective norm as a determinant of PU and ATT. Subjective norm refers to an individual's "perception that most people who are important to him or her think he should or should not perform the behavior in question" (Teo, 2009b, p. 93). The theory of planned behavior (TPB) (Ajzen, 1991) and the unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003) hypothesized that subject norm would directly impact PU and BI. The theory of planned behavior (TPB) states that a users' beliefs establish the basis for their attitudes and perceptions toward performing behaviors (Ajzen, 1991). Several meta-analyses support the theory of planned behavior's (TPB) ability to predict both intentions and behaviors through various behavioral domains (Armitage & Conner, 2001; Overstreet, Cegielski, & Hall, 2013; Steinmetz et al., 2016). According to the theory of planned behavior, subjective norm captures the individual's perceived social pressures to perform the target behavior (Steinmetz et al., 2016). Therefore, these normative beliefs established by important other people create expectations the user must decide to follow or not follow (Steinmetz et al., 2016). To the sample in this study, subjective norm represents the degree to which a teacher perceives the demands of other important people to adopt and use ClassDojo (Teo, 2009b, p. 93).

Within the theory of planned behavior (TPB), subjective norm involves normative beliefs that referent groups create to establish specific criteria expectations for particular behaviors (Kreijns, Vermeulen, Kirschner, Buuren & Van Acker, 2013). The referent group, or important people, that influence teachers' decision to use and adopt ClassDojo include teachers, students, families, administrators, school boards, and the community. Therefore, teachers' behaviors are influenced by important individuals' opinions regarding their ClassDojo use and acceptance. Depending on teachers' motivations to use ClassDojo, a teacher's decision will rely on their willingness to comply with the referent group's expectations. Thus, if a teacher notices that a co-worker thinks ClassDojo is useful, the teacher is more likely to have a positive attitude toward integrating the program in their classroom. In turn, subjective norm correlates outside pressure to perform a task to the motivation an individual has to perform the intended behavior (Fishbein & Ajzen, 1975). According to Yuen and Ma (2008), individuals are more likely to perform a behavior if the individual perceives it is as important to others around them.

While including subjective norm in TAM, research on teachers and students in education supports that subjective norm has a positive statistically significant influence on PU and ATT using technology. For example, Venkatesh and Davis (2000) analyzed four longitudinal studies on instructor's adoption of e-learning systems in Palestine resulted in subjective norm having a statistically significant relationship with PU and ITU. Relating to teachers, Kriederman (2017) explored how subjective norm positively influenced teachers' PU and acceptance of digital badges. Yuen and Ma (2008) researched teachers' acceptance of e-learning technology to show subject norm had a statistically significant influence on PU; however, subjective norm was not a statistically

significant predictor of ITU. According to Tarcan et al. (2010), teachers' acceptance of information technologies in Turkey also has a positive statistically significant impact on subjective norm and PU, as well as subjective norm and ITU.

Expanding to pre-service teachers, Teo (2009b) examined pre-service teachers' attitudes toward using computers extended TAM by illustrating subjective norm positively impacted PU and ATT (Teo, 2009b). Similarly, Ursavas and Reisoglu (2017) used an extended TAM to analyze the effects of pre-service teachers' cognitive style on Edmodo users' behaviors. They found evidence that supports subjective norms direct effect on ATT (Ursavas & Reisoglu, 2017). Teo and Milutinovic (2015) extended TAM to explore pre-service teachers' intention to use technology for teaching math. Relating to Yuen and Ma's (2008) findings, the results indicated that subjective norm directly influenced PU, but subjective norm did not influence BI. The next chapter further describes the methodology implemented to complete this research study.

CHAPTER THREE: METHODOLOGY

This chapter provided a comprehensive overview of the research methodology and procedures to determine if the TAM extension can appropriately identify factors that have a statistically significant influence on teachers' end-user attitudes toward adopting ClassDojo. The factors in the TAM extension included perceived ease of use (PEOU), perceived usefulness (PU), attitude towards use (ATT), intentions to use (ITU), security awareness (SA), and subjective norm (SN). TAM research traditionally relies on obtaining self-reported data from participants through a survey. Literature supported using survey research in TAM studies on teachers (Teo, 2009a; Teo, 2009b; Holden & Rada, 2011; Teo et al., 2012; Huntington & Worrell, 2013; Kung-Teck, Osman, Choo, & Rahmat, 2013; Quadri, 2014; Akbari et al., 2016; Venkatesh & Davis, 2016; Ursavas & Reisoglu, 2017) and SNSs (Curran & Lennon, 2011; Qin et al., 2011; Choi & Chung, 2013; Rauniar et al., 2014; Elkaseh et al., 2016; Teo, 2016; Akman & Turhan, 2017; Dumpit & Fernandez, 2017; Hussein & Hassan, 2017; Dixit & Prakash, 2018). Therefore, this survey-research obtained data from teachers in United States K-8 schools to perform a path analysis that investigated and explored teachers' end-user attitudes towards adopting ClassDojo. Also, qualitative data from one question provided additional information on the constructs within the TAM. This section reviews the research questions and hypotheses, research design, instrumentation, data management and collection, data analysis and procedures, validity and reliability, ethical considerations, and the researcher's role in addressing biases.

Research Question and Hypotheses

Research Question

As discussed earlier, factors that positively influence K-8 teachers' end-user attitudes to adopt ClassDojo are unclear and need to be studied. Numerous researchers reported that ClassDojo positively influences students' behavior in the classroom (McHugh, 2016; Robacker et al., 2016; Sherin, 2016; Ford, 2017; Lynne et al., 2017; Wachendorf, 2017; Lipscomb et al., 2018; Homer et al., 2018; Cravalho, 2019; Dillon, et al., 2019). However, researchers focus primarily on ClassDojo's impact on students (McHugh, 2016; Robacker et al., 2016; Sherin, 2016; Ford, 2017; Lynne et al., 2017; Wachendorf, 2017; Lipscomb et al., 2018; Homer et al., 2018; Cravalho, 2019; Dillon, et al., 2019) rather than on teachers (Burger, 2015). Over 3 million teachers use ClassDojo as a behavior management system and school communication platform (Williamson, 2017a); nevertheless, research on teachers' attitudes and perceptions to use ClassDojo in education are scant. Therefore, this study filled a void in research by addressing the following research questions:

RQ1: What are the perceptions among K-8 teachers in the United States toward the factors affecting the use of ClassDojo?

RQ2: What are the relationships between the latent variables in the proposed TAM for this study?

Hypotheses

To solve the research question, this study synthesized an extended TAM to analyze factors that influence teachers' end-user attitudes towards acceptance and use of ClassDojo. The TAM extension included relationships for the original TAM constructs (Davis, 1985; Davis, 1989) that focused on perceived ease of use (PEOU), perceived

usefulness (PU), attitude toward using SNSs (ATT), and intention to use SNSs (ITU). An extension of TAM is grounded in teacher, TAM, and SNSs research provided determinants to understand teachers' ClassDojo acceptance (see Figure 2). This section reviewed potential significant relationships in the TAM extension, and how it correlated to teachers' attitudes toward using SNSs, and ultimately, intention to use SNSs. The following eight hypotheses will guide this study:

H1: Teachers' attitude toward using (ATT) ClassDojo have a statistically significant positive effect on their intention to use (ITU) ClassDojo.

H2: Perceived usefulness (PU) has a statistically significant positive effect on teachers' intention to use (ITU) ClassDojo.

H3: Teachers' perceived usefulness (PU) of ClassDojo has a statistically significant positive effect on their attitude toward ClassDojo use (ATT).

H4: Teachers' security awareness (SA) of ClassDojo has a statistically significant positive effect on their attitude toward ClassDojo use (ATT).

H5: Subjective Norm (SN) of ClassDojo has a statistically significant positive effect on teachers' attitudes toward using (ATT) ClassDojo.

H6: Subjective Norm (SN) of ClassDojo has a statistically significant positive effect on teachers' perceived usefulness (PU) ClassDojo.

H7: Perceived ease of use (PEOU) has a statistically significant positive effect on teachers' perceived usefulness (PU) of ClassDojo.

H8: Security awareness (SA) has a statistically significant positive effect on teachers' perceived usefulness (PU) of ClassDojo.

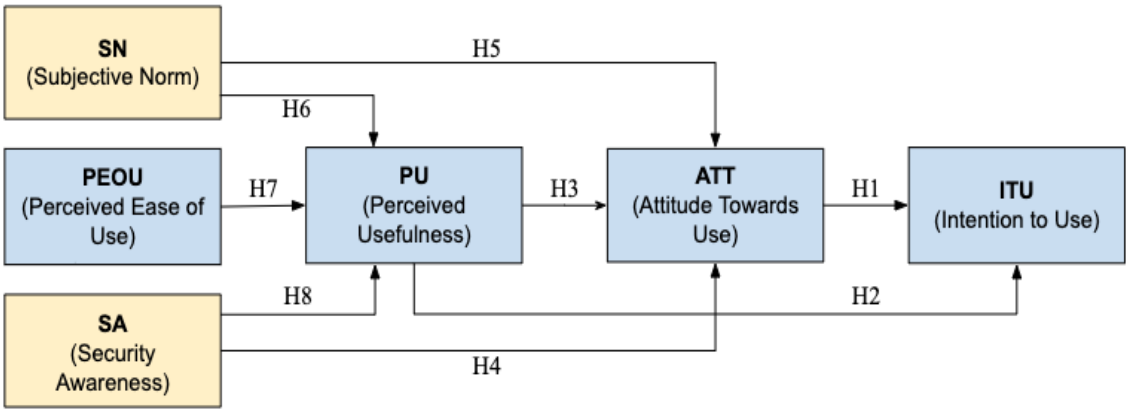


Figure 4 Hypothesis in Teachers' TAM of SNSs (T-TAMS)

Research Design

The main purpose of this survey research was to analyze teachers' end-user attitudes and perceptions towards ClassDojo integration and adoption. A survey questionnaire gathered data using questions focusing on the following: (1) multiple items for each TAM construct in the model, (2) school information, and (3) participant demographics. This study employed the path analysis approach to develop a model by analyzing the relationships of the six TAM constructs: perceived ease of use (PEOU), perceived usefulness (PU), attitude toward using SNSs (ATT), intention to use SNSs (ITU), security awareness (SA), and subjective norm (SN). SEM analysis followed standard procedures in this study (Teo et al., 2012). Also, qualitative data from an open-ended question allowed participants to provide any additional relevant information. These responses were correlated with the extended TAM model to highlight pieces from the quantitative process.

School-Based SNSs

This study used ClassDojo as the School-Based SNS. ClassDojo was selected based on its popularity with teachers (Williamson, 2017b). Teachers use ClassDojo to communicate with families about students' progress using the behavior management

tools (Chiarelli et al., 2015; da Rocha Seixas et al., 2016; Robacker et al., 2016; Lynne et al., 2017; Williamson, 2017a; Homer et al., 2018; Lipscomb et al., 2018), instant messaging (Hammonds et al., 2013; Burger, 2015; Robacker et al., 2016; Williamson, 2017a; Williamson, 2017b; Wilson, 2017), and the class newsfeed.

Data Description

This study had six TAM constructs explicitly designed for teachers' attitudes towards accepting and using school-based SNSs. Perceived usefulness (PU) referred to the degree to which a teacher believes that ClassDojo improves their job performance (Davis, 1985). Perceived ease of use described the degree to which teachers believe that using ClassDojo is free of physical and mental effort (Davis, 1985). Security awareness referred to the degree to which teachers perceive the level of procedures in ClassDojo for securing educational data from threats or harm. Subjective norm represented the degree to which a teacher perceives the demands of other influential people to adopt and use ClassDojo (Teo, 2009b, p. 93). Attitude towards use is the degree to which teachers have positive or negative feelings to use ClassDojo (Davis, 1985). Intention to use is the extent to which a teacher plans to use ClassDojo (Davis, 1985). There was one open ended question that provided teachers the opportunity to include any additional relevant information. This provided qualitative data that can highlight the quantitative data findings and process. Data was also collected about the school and teacher's demographics.

Population and Sample

This study used nonrandom convenience sampling. The participants were teachers from K-8 elementary and middle schools throughout the United States that use

ClassDojo. The ClassDojo platform provided information on specific schools that use ClassDojo and the number of teachers registered on the platform. The researcher identified ten schools from each state, for a total of 500 schools (50 states x 10 schools) and 17,750 potential teacher participants, that integrate ClassDojo. Next, the researcher searched for each school website to find teachers' email addresses. Only schools that displayed teacher emails online were selected for this study. Since the researcher did not have access to specific teacher names that used ClassDojo, the researcher copied all teachers' emails from the school websites and each teacher was classified as a "potential" participant. Out of the 17,750 potential participants identified on the ClassDojo platform, the researcher acquired a total of 17,152 teacher emails from school websites. Therefore, the sample consisted of 17,152 teachers from 500 schools that were identified as registered users of ClassDojo. Each K-8 school in the sample had an average of 34 teachers that were registered users on ClassDojo. The researcher then sent out surveys via email to the 17,152 teachers. Participants were prompted only to fill out the survey if they use ClassDojo. The researcher sent out surveys from December 5, 2019, to December 19, 2019. The researcher received a total of 264 survey responses from K-8 teachers. Upon completing the TAM study, relevant data was available to the researcher to evaluate the proposed TAM extension.

Instrumentation

This quantitative study used survey research to collect data about teachers' end-user attitudes toward ClassDojo (Ruel, Wagner, & Gillespie, 2015). A self-reported questionnaire was designed to examine the six constructs within the research model (see appendix B, Research Survey Instrument). The online survey consisted of sixteen total questions. The instrument contained three sections: the extended TAM constructs, school

information, and teacher demographics. The six TAM constructs had four measures per questions for participants to answer. Participants were required to respond to all the measures in the extended TAM construct section; however, the remaining survey questions were optionable for completion. Within the extended TAM section, the survey instrument had six sets of measures: perceived ease of use (Venkatesh & Davis, 2000; Yuen & Ma, 2008; Rauniar et al., 2014; Dixit & Prakash, 2018), perceived usefulness (Rauniar et al., 2014; Chiarelli et al., 2015; Fathema et al., 2015; da Rocha Seixas et al., 2016; Lynne et al., 2017; Robacker et al., 2016; Williamson, 2017a; Homer et al., 2018; Lipscomb et al., 2018), attitude towards use (Chen et al. (2013), intentions to use (Dixit & Prakash, 2018), security awareness (Rauniar et al., 2014), and subjective norm (Venkatesh & Bala, 2008; Teo, 2009b; Qin et al., 2011). The school information section had four questions, and the demographic section had five questions. Multiple published sources support the survey items for each TAM construct.

Extended TAM Constructs

First, participants responded to 24 items, specifically, perceived ease of use (4 items), perceived usefulness (4 items), attitude towards use (4 items), intentions to use (4 items), security awareness (4 items), and subjective norm (4 items). Each statement was measured using the following five-point Likert scale: (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, and (5) strongly agree. Based on the extensive literature review on teachers, SNSs, and TAM, survey research measures facilitated the development of this study's survey instrument.

Security Awareness

Security awareness consisted of the following four measures: (1) I trust ClassDojo with student and parent information, (2) ClassDojo provides security for my postings, (3) ClassDojo provides security for my profile, and (4) I feel safe in my interactions on ClassDojo (Rauniar et al., 2014).

Subjective Norm

The subjective norm measures were: (1) People who are important to me think I should use ClassDojo (Venkatesh & Bala, 2008), (2) People whose opinion I value will encourage me to use ClassDojo (Teo, 2009b), (3) People I am influenced by think I should use ClassDojo (Qin et al., 2011), and (4) People who influence my behavior think that I should use ClassDojo (Venkatesh & Bala, 2008).

Perceived Usefulness

Perceived usefulness (PU) measures were: (1) ClassDojo is useful for school-based communication, (2) ClassDojo is useful for student behavior management (Chiarelli et al., 2015; da Rocha Seixas et al., 2016; Robacker et al., 2016; Lynne et al., 2017; Williamson, 2017a; Homer et al., 2018; Lipscomb et al., 2018), (3) I find ClassDojo to be useful (Fathema et al., 2015), and (4) ClassDojo is useful for me in my job (Fathema et al., 2015).

Perceived Ease of Use

Perceived ease of use measures were: (1) I find ClassDojo easy to use (Venkatesh & Davis, 2000; Yuen & Ma, 2008), (2) I find it easy to get ClassDojo to do what I want to do (Rauniar et al., 2014), (3) My interactions on ClassDojo are clear and

understandable (Venkatesh & Davis, 2000; Dixit & Prakash, 2018), and (4) It is easy to interact on ClassDojo (Rauniar et al., 2014).

Attitude towards Use

The measures for attitude toward (ATT) using ClassDojo were adopted from Chen et al. (2013) and Fathema et al. (2015). The measures are listed as follows: (1) It is beneficial to use ClassDojo, (2) my experiences with ClassDojo are good, (3) I have a generally favorable attitude toward using ClassDojo (Fathema et al., 2015), and (4) I like using ClassDojo (Fathema et al., 2015).

Intention to Use

The measures for intention to use (ITU) were: (1) I will continue to use ClassDojo in the future (Davis, 1989; Davis et al., 1989), (2) I will use ClassDojo for parent communication, (3) I'm willing to use ClassDojo (Dixit & Prakash, 2018), and (4) I plan to use ClassDojo (Dixit & Prakash, 2018). This study will expand TAM by creating additional constructs and relationships to analyze ClassDojo.

Qualitative Measure

The next survey question provided participants the opportunity to include any additional relevant information to the study. The question asked, "Is there anything else you would like to add?" Participants are provided an area to write out a response.

School Information

Participants answered four questions about the school they work at. First, participants were asked, "What state is your school located in?" Participants wrote in the state where their school was located in a free response section. Next, participants selected all that apply for the question, "What is the current communication methods used at your

school?" Participants could select from the following: (1) bulletin boards, (2) ClassDojo, (3) email, (4) Facebook, (5) flyers, (6) Instagram, (7) Twitter, (8) learning management systems (ex: Blackboard), (9) newsletters, (10) other social media platforms, (11) phone calls, (12) school website, (13) text messages, and (14) other. The next question asked, "How many students received free/reduced lunch?" Participants could select from the following: (1) 0-10%, (2) 11-20%, (3) 21-30%, (4) 31-40%, (5) 41-50%, (6) 51-60%, (7) 61-70%, (8) 71%-80%, (9) 81-90%, (10) 91-100%, (11) I don't know, and (12) other. The final school information questions stated, "My principal supports ClassDojo usage." Participants could select from (1) strongly disagree to (5) strongly agree.

Demographics

Demographic questions consisted of five questions that analyzed users' grade they teach, years teaching, age, gender, and ethnicity. The first question asked, "What grade do you teach? If you work with multiple grade levels, please select the one you work with most frequently." Participants could select from the following: (1) SDC/SBC, (2) Categorical Resource, (3) RSP, (4) TK, (5) kindergarten, (6) 1st grade, (7) 2nd grade, (8) 3rd grade, (9) 4th grade, (10) 5th grade, (11) 6th grade, (12) 7th grade, (13) 8th grade, (14) 9th grade, (15) 10th grade, (16) 11th grade, and (17) 12th grade. The next question asked, "How many years have you been teaching?" Participant could select a response starting at 1 year, and the measures continued to increase by 1 year until it reached 50 years total. After, participants identified their age. The measures started at 18 years old, and the measures continually increased by 1 year until it reaches 85 years old. Then participants selected their gender, as either male or female. Lastly, participants selected their race from the following measures: (1) White, (2) Hispanic or Latino, (3) Black or

African American, (4) American Indian or Alaskan Native, (5) Asian, (6) Native Hawaiian or other Pacific Islander, and (7) from multiple races.

Pilot Study

A pilot study was run from November 6, 2019 to November 14, 2019 to further validate the survey instrument. The researcher sent out invitations to 1,038 teachers that use ClassDojo. There was a total of 20 responses. The findings illustrated that all the extended TAM latent constructs were generally favorable towards ClassDojo use. However, there appeared to be some inconsistencies with the subjective norm latent construct. Therefore, the researcher made several modifications to clarify subjective norm's influence on teachers' end-user attitudes. Also, the school location question consisted of a drop-down menu. Several participants selected states that I did not send emails to; thus, I knew that the drop-down menu was skewing participants' responses. On the final survey, the respondents had to write in the state where they currently live to improve the participants reliability and validity. Overall, the pilot study provided validation for the latent constructs and helped solidify the TAM survey instrument.

Data Management and Collection

A survey in Google Forms collected data from K-8 schools throughout the United States. The researcher contacted each teacher directly via email. Therefore, teachers received a hyperlink to the surveys via email. This provided quick and immediate access for teachers to complete the survey. The surveys were completed within a two-week timeframe. All the participants agreed to a consent form that reviewed the anonymity of their participation, as well as the benefits and risks. Participants must approve that they read the consent form, are 18 years old, and agree to participate voluntarily. After data collection, the researcher managed the data in SPSS.

Data Analysis and Procedures

Data analysis procedures consisted of path analysis with latent factors (Hatcher, 2013) and thematic analysis (Braun & Clarke, 2006). Specifically, path analysis examined the relationships between any of the two latent factors in the T-TAMS that influenced teachers' end-user attitudes toward adopting ClassDojo (Anderson & Gerbing, 1988; Hatcher, 2013). Latent factors are hypothetical constructs that researchers are not able to measure directly; therefore, several manifest variables, usually consisting of two or more measures, compose a latent factor (Hatcher, 2013). The latent factors in this study are as follows: (1) intentions to use, (2) attitude towards use, (3) perceived usefulness, (4) perceived ease of use, (5) subjective norm, and (6) security awareness. Prior literature showed statistically significant results from using path analysis to examine the TAM for teachers (Teo, 2009a; Teo, 2009b; Teo et al., 2012; Ursavas & Reisoglu, 2017; Scherer et al., 2019). For instance, Kung-Teck et al. (2013) identified the latent factors perceived ease of use, perceived usefulness, attitude toward use, and behavioral intentions. Once the measurement model is acceptable, the researcher starts to evaluate latent factors' relationships with path analysis (Hatcher, 2013).

Path analysis was an appropriate procedure for exploring TAM data since it analyzes the relationships between variables. Path analysis utilizes multiple regressions to assess the direct and indirect influences of variables within a model (Hatcher, 2013). In particular, the use of multiple measures for each latent factor in path analysis provides more accurate relationships and estimates between variables and the criterion (McCoach, Black, & O'Connell, 2007). According to Hatcher (2013), researchers use path analysis with latent factors to establish a latent-factor path model (Hatcher, 2013). Specifically, a latent-factor path model refers to "a causal model that predicts that some of the latent

factors have causal effects on other latent factors" (Hatcher, 2013, p. 484). Based on the path model, the path analysis can analyze the integrated relationships within all variables (Tomarken & Waller, 2005). Also, the path analysis will identify, estimate, and correct biases associated with variables construct-irrelevant variance and random error (Tomarken & Waller, 2005). Statistical Package for the Social Sciences (SPSS) was used to manage, store, and analyze the data utilizing path analysis.

Thematic analysis was utilized to identify, analyze, and report the patterns, or themes, from the open-ended survey question (Braun & Clarke, 2006). The qualitative data was analyzed through the six phases of thematic analysis: (1) "familiarizing yourself with your data," (2) "generating initial codes," (3) "searching for themes," (4) "reviewing themes," (5) "defining and naming themes," and (6) "producing the report" (Braun & Clarke, 2006, p. 87). According to Braun and Clarke (2006), thematic analysis can be a flexible method; therefore, the six phases establish a clear and explicit qualitive process. This study also plans to ensure the thematic analysis was completed correctly by utilizing Braun and Clarke's (2006) 15-point criteria checklist. Ultimately, the qualitative data from the open-ended survey question was separated into themes to provide further support the validation for the extended TAM model. Specifically, the qualitative categories and direct quotes provided a first-hand account of what teachers were saying related to their end-user attitudes toward ClassDojo. Overall, the thematic analysis findings provided support for the extended TAM path analysis.

Validity and Reliability

Reliability and validity closely align within literature (Ruel et al., 2015). Validity refers to the degree to which measurements truly represent the concept being studied (Ruel et al., 2015). Reliability is the extent to which repeating a measure multiple times

will lead to consistent results (Ruel et al., 2015). A critical step to addressing validity and reliability is basing the survey on prior literature about TAM, teachers, education, and SNSs (Ruel et al., 2015). Scholarly literature influenced the inclusion of the factors perceived ease of use (PEOU) (Teo, 2009a; Teo, 2009b; Akbari et al., 2016; Sanchez-Prieto et al., 2017; Ursavas & Reisoglu, 2017; Siyam, 2019), perceived usefulness (PU) (Teo et al., 2012; Akbari et al., 2016; Teo, 2016; Akman & Turhan, 2017; Ursavas & Reisoglu, 2017; Siyam, 2019), attitude towards use (ATT) (Lin, 2006; Willis, 2008; Zhou, 2011; Dixit & Prakash, 2018), and intentions to use (ITU). In addition, the literature supported extending the TAM with the determinants security awareness (Arpaci et al., 2015; Akman & Turhan, 2017; Almaiah, 2018) and subjective norm (Venkatesh & Davis, 2000; Yuen & Ma, 2008; Teo, 2009b; Tarcan et al., 2010; Kriederman, 2017; Ursavas & Reisoglu, 2017). The proposed TAM extension advanced research as the first TAM focusing on teachers and SNS acceptance. To improve the research model reliability and validity, the researcher screened for missing values and outliers, tested assumptions for multivariate and univariate normality, as well as established convergent and discriminant validity (Ursavas & Reisoglu, 2017). Hatcher et al. (2013) suggests analyzing data-driven models by (1) using a large sample, (2) randomly making a calibration and validation sample, (3) assess the model with calibration sample to make modification, and (4) lastly, determine if the revised sample is an acceptable fit using the validation sample (p. 493). Depending on response rates, this is a reasonable procedure to improve the model's validity and reliability.

Ethical Considerations

It is important to consider ethics when completing survey research with human subjects (Ruel et al., 2015). Ethics begins with documentation; this means the researcher

must be transparent about “each step, process, decision, and outcome of the collection process, data entry process, cleaning process, and analysis process” (Ruel et al., 2015, p. 206). First, the researcher is completing this study in partial fulfilment for a Doctor of Education program, and there is no direct association with the ClassDojo platform. To further clarify, ClassDojo did not fund or employ the researcher to complete this study. Next, the research proposal provided an outline to ensure that participants are safe and avoid potential risks. Boise State University’s IRB guidelines were followed to protect the human subjects in the study (see appendix B). After approval from Boise State University’s IRB, the researcher contacted teachers throughout the United States to complete the survey. Lastly, the participants completed the consent form to illustrate to them their rights relating to the study.

Role of the Researcher and Addressing Biases

Researchers must address biases with environments, questionnaire development, sampling, systematic error, and unconscious biases (Hatcher, 2013). The researcher in this study followed “the ethical principles of beneficence nonmaleficence, justice, autonomy, and fidelity” while completing the study (Tsang, 2019, p. 61). In return, the biases presented above will be slightly mitigated. Additionally, the researcher made some selective decisions that could have influenced the outcome of the study. Specifically, the researcher decided to survey teachers throughout the United States versus one school district because it was an opportunity to increase the sample size. Prior scholarly literature was the foundation for this extended TAM.

CHAPTER FOUR: DATA ANALYSIS AND RESULTS

This study's purpose was to identify and explore factors that positively influenced K-8 teachers' end-user attitudes to adopt school-based SNSs in the United States. The factors in the TAM extension included perceived ease of use (PEOU), perceived usefulness (PU), attitude towards use (ATT), intentions to use (ITU), security awareness (SA), and subjective norm (SN). The chapter was separated into multiple sections: (1) data collection and analysis, (2) demographic information, (3) research question one, (4) qualitative findings, (5) research question two, and (6) a summary of the results. Cronbach's Alpha's and p-values supported the survey instrument's reliability. The Data collection and analysis section identified the data collection timeframe, the total number of participants, response rates, and SPSS usage to answer the research questions. Demographic information provided participants' age, gender, ethnicity, teaching experience, grade level taught, and school location. Research question one provided descriptive statistics of K-8 teachers' end-user perceptions and attitudes towards ClassDojo with regards to the six latent variables within the research model. Thematic analysis was implemented to identify themes from the open-ended survey question which was used to further support the path analysis findings. Research question two analyzed the path analysis between the latent variables and hypotheses results. Overall, this chapter's purpose was to analyze and report the results from the data collected via a self-administered survey from K-8 teachers in the United States to evaluate the extended TAM.

Data Collection and Analysis

Data collection via surveys occurred from December 5, 2019, to December 19, 2019. A population sample of 17,152 teachers in K-8 schools were sent survey questionnaires via email. A total of 265 participants completed the survey, and one respondent did not approve of the consent form. Therefore, this resulted in a total sample of 264 participants. SPSS was utilized to analyze the self-administered survey data. Descriptive statistics presented the teachers' age, gender, ethnicity, location, teaching experience, and schools' socioeconomic status. Also, survey responses provided descriptive data to analyze teachers' perceptions of the latent variables, including the mean and standard deviation scores. Next, path analysis utilizing multiple regressions (Hatcher, 2013) assessed the direct and indirect influences of the latent variables: (1) perceived usefulness (PU), (2) perceived ease of use (PEOU), (3) security awareness (SA), (4) subjective norm (SN), (5) attitude towards use (ATT), and (6) intentions to use (ITU). Lastly, the extended TAM was analyzed to identify factors that positively influenced K-8 teachers' end-user attitudes to adopt school-based SNSs.

Demographic Information

Participants

The participants demographic information includes participants' age, gender, ethnicity, teaching experience, and grade level taught (see Table 1). Data collected via survey indicates that of the 264 respondents, 23 (9.1%) were male, and 231 (90.9%) were female with 10 non-respondents (see appendix A Table A1). The age of the population ranged from 22 to 64 years old (see appendix A Table A2). Although the range was wide, 50.8% of the sample was 42 or younger, with the other half being 42 or older. The mean of the sample was 42.33 years old. Of the 252 respondents, the participants' ethnicity

indicates 209 (82.9%) white, 13 (5.2%) Hispanic or Latino, 13 (5.2%) black or African American, 3 (1.2%) Asian, 2 (0.8%) American Indian or Alaskan Native, 2 (0.8%) Native Hawaiian or other Pacific Islander, and 10 (4.0%) from multiple races with 12 non-respondents (see appendix A Table A3).

The years of teaching experience ranged from 1 to 37 years (see appendix A Table A4). Similar to age, even though the range was wide, 50.2% of the sample has taught for 14 years or less, with the other half teaching 14 years or more. The mean years of teaching experience for the sample was 15.29 years. In addition, survey data indicate that participants taught from transitional kindergarten to eighth-grade, as well as positions within special education and other teaching positions (see appendix A Table A5). For instance, of the 264 respondents, there were 7 (2.7%) transitional kindergarten teachers, 29 (11%) kindergarten teachers, 34 (12.9%) first-grade teachers, 39 (14.8%) second-grade teachers, 40 (15.2%) third-grade teachers, 38 (14.4%) fourth-grade teachers, 35 (13.3%) fifth-grade teachers, 4 (1.5%) sixth-grade teachers, 5 (1.9%) eighth-grade teachers, 9 (3.4%) special education teachers, 12 (4.6%) other teachers with 12 non-respondents.

Table 1 Demographics Summary

Demographics		N	Percentage (%)
Gender	Male	23	9.1
	Female	231	90.9
	Total (N)	254	100
Age	22-29 years	43	17.0
	30-39 years	66	26.2
	40-49 years	68	27.0
	50-59 years	65	25.8
	60-65 years	10	4.0
	Total (N)	252	100
Ethnicity	White	209	82.9
	Hispanic/Latino	13	5.2
	Black/African American	13	5.2
	Other Races	17	6.7
	Total (N)	252	100
Teaching Experience	1-9 years	85	32.5
	10-19 years	88	33.7
	20-29 years	72	27.5
	30-37 years	16	6.1
	Total (N)	261	100
Grade Level Taught	Kindergarten	36	14.3
	First Grade	34	13.5
	Second Grade	39	15.5
	Third Grade	40	15.9
	Fourth Grade	38	15.1
	Fifth Grade	35	13.9
	Sixth Grade	4	1.6
	Seventh Grade	0	0
	Eighth Grade	5	2.0
	Special Education	9	3.5
	Other Teachers	12	4.7
	Total (N)	252	100

Note (1): N = 264 total respondents

Lastly, teachers reported their communication methods in a check all that apply question. Out of 264 respondents, teachers use the following methods for school-based communication: 125 use bulletin boards (47.3%), 231 use ClassDojo (87.5%), 231 use email (87.5%), 105 use Facebook (38.8%), 187 use flyers (70.8%), 41 use Twitter (15.5%), 28 use Instagram (10.6%), 23 use learning management systems (8.7%), 165 use newsletters (62.5%), 13 use other social media platforms (4.9%), 43 other communication apps (16.3%), 230 use phone calls (87.1%), 177 use the school website (67%), 93 use text messages (35.2%), 2 use Remind (0.8%), and 12 use other (4.5%) (see appendix A Table A6). These findings identify how teachers are implementing school-based communication.

K-8 Schools

School demographic information consisted of the school's location, administrator's support for ClassDojo, and the school's socioeconomic status (see appendix A, Tables A7-A9). Data collected via survey indicates that of the 264 respondents, there were participants from 45 out of 50 states throughout the United States with 14 non-respondents (see appendix A Table A7). The states with the highest frequency of responses include 11 (4.2%) Utah participants, 11 (4.2%) Arkansas participants, 11 (4.2%) Idaho participants, 13 (4.9%) Michigan participants, 14 (5.3%) Illinois participants, and 17 (6.4%) Nevada participants. The five states potentially absent from the study are Maine, Mississippi, North Dakota, South Dakota, and Vermont. The mean respondents for the remaining 45 states were 5.56 respondents per state.

Map 1 Location of Participants

Furthermore, survey data presents the number of students that receive free/reduced lunch at each school to provide information on students' socioeconomic status (see Table 2). Of the 264 respondents, participants reported the percentage of students that receive free or reduced lunch are 4 schools with 0-10% of students (1.5%), 7 schools with 11-20% of students (2.7%), 11 schools with 21-30% of students (4.2%), 13 schools with 31-40% of students (4.9%), 13 schools with 41-50% of students (4.9%), 14 schools with 51-60% of students (5.3%), 21 schools with 61-70% of students (8.0%), 41 schools with 71-80% of students (15.6%), 20 schools with 81-90% of students (7.6%), and 91 schools with 91-100% of students (34.6%) received free or reduced lunch with 28 non-respondents. The majority of teachers (79%) work at a school with more than half the student population receiving a free/reduced lunch at school. Lastly, respondents identified their administrators' support for ClassDojo usage (see Table 2). Survey results

indicate that 221 (84%) respondents agree or strongly agree with the statement their principal supports ClassDojo usage. There were 27 (10.3%) of respondents that were neutral, 5 (1.9%) of the respondents disagree, and 10 (3.8%) of the respondents strongly disagree with the statement. Therefore, the majority of principals throughout the United States support ClassDojo's use.

Table 2 K-8 School Demographics

School Demographics		N	Percentage (%)
Administrations' Support of ClassDojo	Strongly Agree	170	64.6
	Agree	51	19.4
	Neutral	27	10.3
	Disagree	5	1.9
	Strongly Disagree	10	3.8
	Total (N)	263	100
Percentage of Students that Received Free or Reduced Lunch	0-10%	4	1.5
	11-20%	7	2.7
	21-30%	11	4.2
	31-40%	13	4.9
	41-50%	13	4.9
	51-60%	14	5.3
	61-70%	21	8.0
	71-80%	41	15.6
	81-90%	20	7.6
	91-100%	91	34.6
	Unknown	28	10.6
	Total (N)	263	100

Note (1): N = 264 total respondents

Research Question One

RQ1: What are the perceptions among K-8 teachers in the United States toward the factors affecting the use of ClassDojo?

This section provides a description of K-8 teachers' end-user perceptions and attitudes towards ClassDojo with regards to the six latent variables within the research model: (1) perceived usefulness (PU), (2) perceived ease of use (PEOU), (3) security awareness (SA), (4) subjective norm (SN), (5) attitude towards use (ATT), and (6) intentions to use (ITU). Table 3 provides a list of Cronbach's Alpha's results for the six latent variables. This study retained all four measures for each latent construct. The Cronbach's Alpha's were all above 0.8, and five out of six were above 0.9. These results support using the four measures for each latent variable. The section below analyzes teachers' responses associated with each latent construct.

Table 3 Cronbach's Alpha's Results

Scale	Number of items	Cronbach's Alpha (α)
Perceived Usefulness (PU)	4	.814
Perceived Ease of Use (PEOU)	4	.918
Security Awareness (SA)	4	.926
Subjective Norm (SN)	4	.921
Attitude Towards Use (ATT)	4	.974
Intention to Use (ITU)	4	.940

Perceived Usefulness

Survey results from the perceived usefulness scale identified that the majority of participants agree that ClassDojo is useful (M = 4.31, SD = .70). The mean for the perceived usefulness scale items ranged in size from 3.91 to 4.41 (see appendix A Table A11). The Cronbach's alpha for perceived usefulness was .814 (see Table 3).

Perceived Ease of Use

Survey results from the perceived ease of use scale identified that the majority of participants agree that ClassDojo is easy to use (M = 4.44, SD = .68). The mean for the perceived usefulness scale items ranged in size from 4.29 to 4.56 (see appendix A Table A13). The Cronbach's alpha for perceived ease of use was .918 (see Table 3).

Security Awareness

Survey results from the security awareness scale identified that the majority of participants agree that ClassDojo is secure (M = 4.15, SD = .74). The mean for the perceived usefulness scale items ranged in size from 4.00 to 4.40 (see appendix A Table A15). The Cronbach's alpha for security awareness was .926 (see Table 3).

Subjective Norm

Survey results from the subjective norm scale identified that about half the participants agree that others influence their use of ClassDojo in their school (M = 3.68, SD = 1.03). The mean for the perceived usefulness scale items ranged in size from 3.54 to 3.82 (see appendix A Table A17). The Cronbach's alpha for subjective norm was .921 (see Table 3).

Attitude Towards Use

Survey results from the attitude scale identified that the majority of participants had a positive attitude toward using ClassDojo (M = 4.38, SD = .87). The mean for the perceived usefulness scale items ranged in size from 4.37 to 4.38 (see appendix A Table A19). The Cronbach's alpha for attitude toward using was .974 (see Table 3).

Intention to Use

Survey results from the perceived usefulness scale identified that the majority of participants had positive intentions to use ClassDojo (M = 4.37, SD = .93). The mean for the perceived usefulness scale items ranged in size from 4.28 to 4.46 (see appendix A Table A21). The Cronbach's alpha for intention to use was .940 (see Table 3).

Table 4 Descriptive Statistics for the Six Latent Variables

N	Constructs	Number of Items	Low	High	M	SD
1	Perceived Usefulness	4	1.50	5.000	4.314	.699
2	Perceived Ease of Use	4	1.00	5.000	4.442	.679
3	Intention to Use	4	1.00	5.000	4.365	.930
4	Attitude Toward Using	4	1.00	5.000	4.376	.874
5	Subjective Norm	4	1.00	5.000	3.678	1.030
6	Security Awareness	4	1.00	5.000	4.151	.739

Note (1): M = Mean, SD = Standard Deviation
Note (2): Rating based on five-point scale: 1 = Strongly Disagree, 5 = Strongly Agree

Qualitative Measure

The survey instrument had one voluntary qualitative question that provided an additional in-depth analysis of participants' end-user attitudes toward ClassDojo. The question came after all the TAM constructs, and the question asked, "Is there anything else you would like to add?" Out of the 264 respondents, there were 86 participant responses to the question, and the remaining participants left the question blank or put no comment. Utilizing the six phases of thematic analysis, the researcher generated initial codes based on the six latent constructs, searched for themes, reviewed those themes,

defined the correlation to the six latent constructs, (Braun & Clarke, 2006) and lastly, calculated the percentages that each teacher commented about the latent constructs in the extended TAM.

Based on the initial coding, some comments exhibited multiple variables and were placed in all the latent constructs that were applicable. The percentage of responses for each variable was calculated by dividing the total comments relating to the variable by 86 total responses. For instance, there were 56 responses about perceived usefulness; therefore, 56 divided by 86 equals a 65% response rate regarding perceived usefulness. It is important to note that perceived usefulness can be both a negative or positive comment, and the percentages only cover the total amount of comments about each construct. The following provides participants' response rates for comments associated with the extended TAM variables: perceived usefulness (65%), perceived ease of use (47%), security awareness (9%), subjective norm (23%), attitude towards use (24%), and intentions to use (28%). In the following section, teacher comments are presented to illustrate the general content for each latent construct theme. This section provided an overview of teachers' comments, and it only illustrates a few quotes per category rather than using all the responses.

Perceived Usefulness

The participants' responses below provide comments associated with the extended TAM variables. Teachers described ClassDojo's perceived usefulness by explaining, "ClassDojo is vital to my classroom management and communication with parents." A kindergarten teacher explained, "I like the tools like the timer and grouping of students to earn points as a team." On the other hand, a second-grade teacher stated,

"Dojo is ineffective unless it is constantly on screen" and it can be disruptive during class.

Perceived Ease of Use

Next, teachers describe ClassDojo's perceived ease of use. "I love the format: It is simple, user-friendly, cute (that goes a long way with kids)," stated a special education teacher. Teachers also explained needs to make ClassDojo easier by allowing "more than one picture upload at a time" and an option to "turn responses from parents off."

Security Awareness

Security awareness comments focused on teacher concerns about student data and private information. According to a first-grade teacher, "I have read up on the privacy policy, and I have had zero parents worried about the data collected on this app." Furthermore, a first-grade teacher explained, "I love that the messaging tool is private between parent and adult giving the messages." Nevertheless, several teachers mentioned school districts banning ClassDojo use, because "it is a 3rd party app and the district is not able to see the interactions between teachers and parents and they are unaware how "private" the information shared really is."

Subjective Norm

Teachers' subjective norm towards ClassDojo consisted of comments about schools using "Dojo school wide." According to a second-grade teacher, "I love ClassDojo; unfortunately, our district does not want us to use this app anymore as of 12/20/19." Also, several teachers described district mandates to use ClassDojo. For instance, a special education teacher said, "My school mandates that we use ClassDojo. I absolutely hate ClassDojo!" Additionally, some school administrators expect teachers "to

use an app or other means to regularly send messages and classroom photos to students' families, which is why" they use ClassDojo.

Attitudes Towards Use

Next, teachers' attitudes towards ClassDojo consisted of it "is a wonderful tool," "I love all of the features," and "I enjoy it." However, some teachers' attitudes were negatively associated with the app. For instance, this teacher describes ClassDojo as "creating a society of student who need instant gratification or what do I get if I do this." Essentially, the teacher is worried that "we are enabling them to continue their issues." Furthermore, a fifth-grade teacher stated, "The extrinsic rewards foundation that ClassDojo encourages undermines all that I do in the classroom."

Intentions to Use

Lastly, teachers' intentions to use explained, "I have used it for many years." Also, "ClassDojo is perfect for my first-grade classroom." On the other hand, "After much research, I have chosen to discontinue my use of Dojo. It's still a public shaming tool, and I have found more appropriate ways to deal with behavior." Also, a fourth-grade teacher stated, "I will NOT use the Dojo again next year" if the platform doesn't fix the point allocations in the behavior management system. Multiple teachers presented concerns about not using the app next year, because the district mandates, they cannot use it.

Themes from Teachers' Comments

This analysis allowed the researcher to look beyond the latent constructs in the extended TAM to identify pertinent themes that also influence teachers' end-user attitudes and perceptions towards ClassDojo use. Thematic analysis was also

incorporated, without referencing the latent constructs, to identify overall themes and patterns from teachers' responses. The thematic analysis consisted of generating initial codes for each response (Braun & Clarke, 2006). This allowed the researcher to look outside the latent constructs towards frequent patterns in the teachers' comments. After coding the responses, themes and patterns were identified within all the codes (Braun & Clarke, 2006). Then the themes were reviewed to check if the "themes work in relation to the coded extracts" (Braun & Clarke, 2006, p. 87). Lastly, the themes are named and defined (Braun & Clarke, 2006). The ten themes from the comments focused on the following: (1) positive attitudes toward ClassDojo use, (2) required ClassDojo use, (3) positives about school-based communication, (4) positives about behavior management system, (5) challenges with ClassDojo features, (6), negative attitudes toward school-based communication, (7) negative attitudes toward the behavior management system, (8) challenges with teaching multiple classrooms, (9) district/administrator banning ClassDojo use, and (10) plans to discontinue use.

It is essential to both name and define the patterns in a thematic analysis (Braun & Clarke, 2006). Therefore, this paragraph will provide a specific definition for each theme established above. First, teachers' positive attitudes towards ClassDojo use were primarily associated with participants that stated, "I love ClassDojo." Teachers required ClassDojo use identified teachers that were mandated to use ClassDojo by school administrators or the school district. Positives about school-based communication had the second highest frequency out of all the themes, and it was based on teachers that identified ClassDojo as an effective component of their school-based communication. Positive comments about behavior management identified teachers that find the behavior

management system effective and useful. The theme related to challenges with ClassDojo features clarified teachers' issues with parents signing up, sharing posts, randomly changing formats, picture printing, and picture uploads.

Teachers negative comments about the behavior management system had the highest frequency out of all the themes. The majority of teachers explained, "I only use Dojo for parent communication, not points for behavior." Teachers challenges with using ClassDojo in multiple classrooms discussed how traveling teachers, or teachers that share students cannot access students already registered to another classroom. Teachers' presented frustrations about administrators and school districts banning ClassDojo. For instance, teachers stated how they are "sad" and "bummed" that they aren't allowed to use ClassDojo anymore. School districts and administrators are banning the app because of privacy issues or expectations to integrate another communication platform. Lastly, teachers that plan to discontinue use are either forced by the school district/administration, or they presented concerns about negatively influencing the classroom environment and privacy challenges. These ten themes illustrate the multitude of additional perceptions, attitudes, and experiences that respondents have with the ClassDojo platform.

Research Question Two

RQ2: What are the relationships between the latent variables in the proposed TAM for this study?

A series of stepwise multiple regression analyses were utilized to test the hypotheses in the extended TAM. In particular, each construct had a factor leading's average for all the related items used. Stepwise multiple regression allows for analysis between the predictor variables and the dependent variable. Following standard practice

in Social Science research (Creswell, 2014), the statistical significance level of 0.05 (5%) was adopted to be the benchmark for accepting or rejecting the null hypothesis. Also, the standardized β coefficient weight was analyzed to understand the path analysis strength between the latent variables better. Based on the series of stepwise multiple regression analyses, Table 4 provided a summary analysis for all eight hypotheses testing results. Seven of the eight path analyses were statistically significant ($p < .05$). Unfortunately, there was not a statistically significant relationship between teachers' (a) subjective norm (SN) and (b) attitude toward using (ATT) ClassDojo. The section below provides a detailed analysis of each hypothesis within the extended TAM path analysis.

Table 5 Hypothesis Results

Hypothesis (H)	Path	Standardized Coefficients Beta	P-value	Results
H1	ATT → ITU	.714	$p < .001$	Supported
H2	PU → ITU	.124	$p < .036$	Supported
H3	PU → ATT	.635	$p < .001$	Supported
H4	SA→ ATT	.231	$p < .001$	Supported
H5	SN → ATT	.240	$p < .240$	Not Supported
H6	SN → PU	.109	$p < .026$	Supported
H7	PEOU → PU	.413	$p < .001$	Supported
H8	SA → PU	.311	$p < .001$	Supported

N = 264, Significant level at 0.05 (5%) confidence level

H1: Relationship Between ATT and ITU

The multiple regression analysis showed that there was a statistically significant relationship ($p < .001$) between teachers' (a) attitude towards use (ATT) and (b) intentions to use (ITU) ClassDojo (see appendix A Tables, A22-A24). Attitude towards use (ATT) had a direct positive impact ($\beta = .714$) on K-8 teachers' intentions to use

(ITU) ClassDojo. The standardized β coefficient (β = .714) was considered large because it was greater than .25 (Keith, 2006). Overall, hypothesis one (H1) was supported.

H2: Relationship Between PU and ITU

The multiple regression analysis showed that there was a statistically significant relationship ($p < .036$) between teachers' (a) perceived usefulness (PU) and (b) intentions to use (ITU) ClassDojo (see appendix A Tables, A22-A24). Perceived usefulness (PU) had a direct positive impact (β = .124) on K-8 teachers' intentions toward using (ITU) ClassDojo. The standardized β coefficient (β = .124) was considered moderate because it was greater than .10 (Keith, 2006). Overall, hypothesis two (H2) was supported.

H3: Relationship Between PU and ATT

The multiple regression analysis showed that there was a statistically significant relationship ($p < .001$) between teachers' (a) perceived usefulness (PU) and attitude towards using (ATT) ClassDojo (see appendix A Tables, A25-A27). Perceived usefulness (PU) had a direct positive impact (β = .635) on K-8 teachers' attitudes toward using (ATT) ClassDojo. The standardized β coefficient (β = .635) was considered large because it was greater than .25 (Keith, 2006). Overall, hypothesis three (H3) was supported.

H4: Relationship Between SA and ATT

The multiple regression analysis showed that there was a statistically significant relationship ($p < .001$) between teachers' (a) security awareness (SA) and attitude towards using (ATT) ClassDojo (see appendix A Tables, A25-A27). Security awareness (SA) had a direct positive impact (β = .231) on K-8 teachers' attitudes toward using (ATT) ClassDojo. The standardized β coefficient (β = .231) was considered moderate

because it was greater than .10 (Keith, 2006). Overall, hypothesis three (H3) was supported.

H5: Relationship Between SN and ATT

Contrary to expectations, the multiple regression analysis showed that there was not a statistically significant relationship ($p < .240$) between teachers' (a) subjective norm (SN) and attitude towards using (ATT) ClassDojo (see appendix A Tables, A25-A27). The standardized β coefficient ($\beta = .047$) was considered too small to be meaningful because it was lower than .05 (Keith, 2006). Overall, hypothesis five (H5) was not supported.

H6: Relationship Between SN and PU

The multiple regression analysis showed that there was a statistically significant relationship ($p < .026$) between teachers' (a) subjective norm (SN) and perceived usefulness (PU) of ClassDojo (see appendix A Tables, A28-A30). Subjective norm (SN) had a direct positive impact ($\beta = .109$) on K-8 teachers' perceived usefulness (PU) of ClassDojo. The standardized β coefficient ($\beta = .109$) was considered moderate because it was greater than .10 (Keith, 2006). Overall, hypothesis six (H6) was supported.

H7: Relationship Between PEOU and PU

The multiple regression analysis showed that there was a statistically significant relationship ($p < .001$) between teachers' (a) perceived ease of use (PEOU) and perceived usefulness (PU) of ClassDojo (see appendix A Tables, A28-A30). Perceived ease of use (PEOU) had a direct positive impact ($\beta = .413$) on K-8 teachers' perceived usefulness (PU) of ClassDojo. The standardized β coefficient ($\beta = .413$) was considered large

because it was greater than .25 (Keith, 2006). Overall, hypothesis seven (H7) was supported.

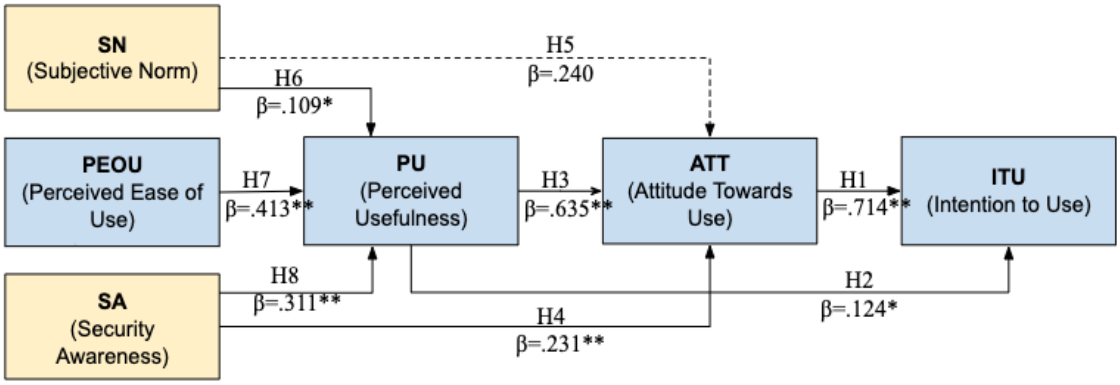
H8: Relationship Between SA and PU

The multiple regression analysis showed that there was a statistically significant relationship ($p < .001$) between teachers' (a) security awareness (SA) and perceived usefulness (PU) of ClassDojo (see appendix A Tables, A28-A30). Security awareness (SA) had a direct positive impact ($\beta = .311$) on K-8 teachers' perceived usefulness (PU) of ClassDojo. The standardized β coefficient ($\beta = .311$) was considered large because it was greater than .25 (Keith, 2006). Overall, hypothesis eight (H8) was supported.

Summary of Data Analysis and Results

The extended TAM factors' descriptive statistics show that teachers had an overall positive attitude towards ClassDojo. The latent variable statistics and qualitative data supported the extended TAM hypotheses from this study. K-8 teachers had a variety of experiences and anecdotal comments to share about their experiences with ClassDojo. Teachers' responses ranged from complete support of ClassDojo to wanting never to use the app again. The participant responses are utilized to provide additional support and information in the discussion section. Overall, the majority of extended TAM factors positively influenced teachers' end-user attitudes toward ClassDojo use. The next section provided information on the relationships between the latent variable in the proposed TAM for this study. Within the extended TAM, seven of the eight hypotheses were shown to be statistically significant. Figure 6 displayed the extended TAM hypotheses results related to the significance level and the standardized beta coefficients. The extended TAM shows the successful paths between each latent variable and the potential strength of each path. Overall, the Teacher's TAM of SNSs (T-TAMS) was proven to

identify teachers' end-user attitudes towards ClassDojo use. The discussion section provides an extensive analysis that evaluates and expands on the research findings from this chapter.



Note (1): p<.01**, p<.05*

Note (2): dashed line = not significant (p>.05)

Figure 5 Teachers' TAM of SNSs (T-TAMS) Hypothesis Results

CHAPTER FIVE: DISCUSSION AND CONCLUSION

This study identified and explored factors that positively influence K-8 teachers' end-user attitudes to adopt school-based SNSs in the United States. This chapter evaluates and expands on the research findings from the previous chapter. First, this chapter presents the findings of the users' demographics and school information. Next, it summarizes the results from research question one about K-8 teachers' perceptions toward factors affecting the use of ClassDojo. In summary, a majority of K-8 teachers had a generally favorable attitude towards using ClassDojo in general. The mean scores for each latent construct support these findings by being above 3.68 (5-point Likert scale), and the mean average score for all six latent constructs was 4.22. Then, research question two discusses the relationships between the latent variables in the extended TAM. The extended TAM model was reliable and illustrated that seven out of the eight path analyses were statistically significant. The extended TAM identified statistically significant relationships between the following constructs: (1) the influence of perceived usefulness (PU) and attitude towards use (ATT) on intentions to use (ITU), (2) the influence of perceived usefulness (PU) and security awareness (SA) on attitude towards use (ATT), and (3) the influence of subjective norm (SN), perceived ease of use (PEOU), and security awareness (SA) on perceived usefulness (PU).

The following section addresses the study's implications for teachers' technology acceptance and parent-teacher communication. The Technology Acceptance Model (TAM) was extended to explore teachers' beliefs, attitudes, and intentions to use

ClassDojo. This study advanced research on teachers' TAM of SNSs, teachers' end-user attitudes toward ClassDojo, and school-based communication. Lastly, this study also presents limitations and future research. Overall, this chapter will analyze and discuss user demographics, research question one, research question two, implications for K-8 teachers' technology acceptance, implications for parent-teacher communication, limitations and future research, and the implication of the results. The research questions this study focused on are as follows:

RQ1: What are the perceptions among K-8 teachers in the United States toward the factors affecting the use of ClassDojo?

RQ2: What are the relationships between the latent variables in the proposed TAM for this study?

Population and Sample

The participants in this study consisted of a population of kindergarten to eighth-grade teachers (n = 264) throughout the United States that used ClassDojo. After obtaining approval from the Boise State University IRB to conduct the study (see Appendix B, IRB Approval Certification), all the teachers were sent an email requesting their participation in this study. The email invitation (see Appendix B, Email Participation Request) to participate in the study included the study's purpose and assurances that all participant data is collected voluntarily, as well as kept secure and confidential. Participants were provided a survey link at the end of the email to a Google Form created through Boise State University's G Suite to collect the data. Participants reported teaching in 45 out of the 50 states. Survey results showed that the mean response rate was 5.56 respondents per state. This helps to increase the generalizability of the data collected via survey research.

Results illustrated that 90.9% of respondents were female and 9.1% were male. According to the National Center for Education Statistics, elementary school teachers consist of 89% women and 11% men (2018). This shows that the percentage of female to male ratio was relatively similar for nationwide statistics. Furthermore, survey results indicated that the respondents' ethnicity was 82.9% white. Research supports that 80% of elementary school teachers are white (NCES, 2018). Therefore, the random survey distribution through email to teachers from all 50 states throughout the United States provided a similar sample to the average elementary school teacher's demographics. However, a larger sample could still have created more reliable results.

Also, the demographic information about schools identified that 79% of schools had 50% or more students that received a free/reduced school lunch. Therefore, teachers and parents at low-income schools have equitable access to technology to communicate via school-based SNSs. Teachers reported that 84% of principals agree or strongly agree that they support ClassDojo usage. This illustrates that teachers perceive administrators as identifying the potential benefits of using ClassDojo to interact and engage parents in their child's education. Lastly, according to teachers reported communication methods, the majority of teachers use ClassDojo, email, and phone calls to communicate with parents. Respectively, flyers, the school website, and newsletters were reported as the next most frequent communication methods. Thus, advancing research about school-based communication on how teachers promote communication with parents (Thompson, 2008; Thompson et al., 2015).

Research Question One

RQ1: What are the perceptions among K-8 teachers in the United States toward the factors affecting the use of ClassDojo?

The majority of K-8 teachers had a favorable attitude towards using ClassDojo. Results indicated that all six latent constructs' mean scores were at or above 3.68, and the mean average score for all six latent constructs was 4.22 (on a 5-point Likert scale). This study analyzed K-8 teachers' end-user attitudes towards ClassDojo with regards to the six latent variables within the research model: (1) perceived usefulness (PU), (2) perceived ease of use (PEOU), (3) security awareness (SA), (4) subjective norm (SN), (5) attitude towards use (ATT), and (6) intentions to use (ITU). Teachers' attitudes toward technology and SNSs have a direct statistically significant influence on how new technologies are successfully adopted (Lin, 2006; Willis, 2008; Zhou, 2011; Dixit & Prakash, 2018). The six latent constructs' Cronbach's Alpha's supported the use of these measures. The section below analyzes the six latent factors that influenced teachers' school-based SNSs use. The results indicated that a majority of teachers had positive perceptions of the extended TAM factors that influence end-user attitudes towards ClassDojo use.

Perceived usefulness (PU) referred to the degree to which teachers believe that ClassDojo improves their job performance (Davis, 1985). Specifically, the perceived usefulness (PU) scale assessed teachers' perceptions about ClassDojo's effectiveness and efficiency relating to the student behavior management system, usefulness in their jobs, and school-based communication. Survey results report that the majority of participants agree that ClassDojo is useful (M=4.31). Teachers' felt strongest about ClassDojo's use for school-based communication, with 87.1% that agree and strongly agree with the statement. These findings support the researcher's claim that ClassDojo is a school-based social network focused on enhancing communication between key stakeholders. Also,

prior literature identified ClassDojo's usefulness for parent instant messaging (Hammonds et al., 2013; Burger, 2015; Robacker et al., 2016; Williamson, 2017a, Williamson, 2017b; Wilson, 2017). Consequently, teachers' perceptions toward the behavior management system were the lowest out of the four measures at 70.2% of participants that agree and strongly agree with the statement. These results were surprising since the majority of research focuses on ClassDojo's behavior management tools (Chiarelli et al., 2015; da Rocha Seixas et al., 2016; Robacker et al., 2016; Lynne et al., 2017; Homer et al., 2018; Lipscomb et al., 2018; Williamson, 2017a). Data from the perceived usefulness (PU) scale suggests that K-8 teachers perceive ClassDojo as a useful technology tool; therefore, these findings support adoption from teachers.

Perceived ease of use (PEOU) described the degree to which teachers believed that using ClassDojo was free of physical and mental effort (Davis, 1985). The perceived ease of use (PEOU) scale analyzed teachers' perceptions about ClassDojo's ease of use, including ease to get the program to do what they want, clear and understandable interactions, easy program interactions, and lastly, overall easiness to use. Survey results report that the majority of participants agree that ClassDojo is easy to use (M=4.44). In addition, the perceived ease of use (PEOU) latent variable had the highest mean score out of all six latent variables. Therefore, the findings support that ClassDojo's layout and navigation is easy for teachers. ClassDojo's resemblance to larger networking sites such as Facebook could enhance ClassDojo's perceived ease of use (PEOU) among participants (Williamson, 2017b). Data from the perceived ease of use scale suggests that K-8 teachers perceive ClassDojo as an easy to use technology tool; therefore, these results support adoption from teachers.

Security awareness refers to the degree to which teachers perceive the level of procedures in ClassDojo for securing educational data from threats. The security awareness scale analyzed teachers' perceptions about ClassDojo's interaction safety, security for personal data, trust with student and parent information, and security for teacher's online interactions. Survey results report that the majority of participants agree that ClassDojo is secure from threats (M=4.15). ClassDojo's communication platform (McHugh, 2016; Robacker et al., 2016 and digital token economy (Robacker et al., 2016; Sherin, 2016; Ford, 2017; Wachendorf, 2017; Homer et al., 2018; Cravalho, 2019) convert teachers, students, and families interactions into quantifiable data to track and monitor students' real-time behavior (Krach et al., 2017; Williamson, 2017a, Williamson, 2017b; Manolev et al., 2019). Research supports the datafication of education both positively (Robacker et al., 2016; Sherin, 2016; Wachendorf, 2017; Homer et al., 2018; Cravalho, 2019) and negatively (Krach et al., 2017; Williamson, 2017a; Williamson, 2017b; Manolev et al., 2019) influences teachers' attitudes toward ClassDojo. However, these results show that K-8 teachers have an overall positive perception toward their security awareness while using ClassDojo. Therefore, these findings support adoption from teachers.

Subjective norm (SN) represents the degree to which a teacher perceives the demands of other important people to adopt and use ClassDojo (Teo, 2009b). According to the theory of planned behavior, subjective norm captures the individual's perceived social pressures to perform the target behavior (Steinmetz et al., 2016). The subjective norm (SN) scale analyzed teachers' perceptions about other people's beliefs that they should use ClassDojo, including valuing their opinion or influence to use the platform.

Survey results report that some participants agree that subjective norm influences their use of ClassDojo (M=3.68). Subjective norm (SN) had the lowest mean score out of all six latent variables. Following the pilot study, the subjective norm (SN) measures were altered slightly; however, there still appeared to be some confusion on the measures for some teachers. For instance, a fourth-grade teacher explained, "I do not have anyone in my life who influences me strongly enough that those questions make sense (frankly, the idea that someone else has power over me like that is insulting) unless you mean my bosses, which should be more clear if that's what you mean." Findings were inconsistent about teachers' behaviors being influenced by important people, such as teachers, students, families, administrators, school boards, and the community. Research supports that individuals are more likely to perform a behavior, such as use ClassDojo if the individual perceives it as necessary to others around them (Yuen & Ma, 2008). Therefore, the subjective norm latent construct explained that teachers somewhat believe there is social pressure to use ClassDojo; therefore, these findings partially support adoption from teachers.

Attitude towards use (ATT) represents a teacher's end-user attitudes toward ClassDojo use. The attitude towards use (ATT) scale included teachers' perceptions about the benefits of using ClassDojo, positive experiences with ClassDojo, and having a generally favorable attitude toward ClassDojo use. Survey results report that the majority of participants have a positive end-user attitude towards ClassDojo (M=4.38). Also, the attitude towards use (ATT) latent variable had the second highest mean score out of all six latent variables. Literature supports that teachers' attitudes highly influence the success of adopting new technologies (Teo, 2009; Curran & Lennon, 2011; Teo et al.,

2012; Akbari et al., 2016; Elkaseh et al., 2016; Ursavas & Reisoglu, 2017; Siyam, 2019). Consequently, a positive attitude towards specific new technologies, such as ClassDojo, has the potential to increase the actual technology use (Siyam, 2019). Therefore, teachers generally have an overall positive attitude toward using the behavior management tools, parent instant messaging, student portfolios, and class/school newsfeed. Data from the attitude towards use (ATT) scale suggests that K-8 teachers have a positive attitude toward ClassDojo as a technology tool; therefore, these results support adoption from teachers.

Intentions to use (ITU) refers to the degree to which teachers have the intention to use ClassDojo in the future. The intention to use (ITU) scale included teachers' perceptions about using ClassDojo in the future, using it for school-based communication, and willingness and plans to use ClassDojo. Survey results report that the majority of participants have intentions to use (ITU) ClassDojo (M=4.37). These findings help explain the over 3 million teachers that currently use ClassDojo throughout the world (Williamson, 2017a). Also, teachers' intentions to use are likely influenced by their attitudes about the platform (Teo et al., 2008), which were shown as positive from the previous latent variable. These results support advancements in technology, specifically the Internet and smartphones, that are influencing and changing how teachers' socialize and communicate with students, parents, and families (Barrett-Greenly, 2013; Ho et al., 2013; Can, 2016; Thompson et al., 2015; "Mobile fact sheet," 2018). Research now suggests that teachers have the intention to use school-based social networking sites, such as ClassDojo, to communicate with parents and key stakeholders. Data from the intentions to use scale suggests that K-8 teachers have a positive intention

to use ClassDojo as a technology tool; therefore, these findings support adoption from teachers.

Teachers' end-user attitudes towards adopting school-based SNSs, such as ClassDojo, were unclear and needed to be studied. This study indicated that teachers had an overall positive end-user attitude towards ClassDojo use. According to research, ClassDojo is "actively used in 95% of all K-8 schools in the U.S. and 180 countries" ("About Us," 2019), there are over three million teachers and 35 million students that use ClassDojo (Williamson, 2017a), approximately 270,000 messages translated per week ("About Us," 2019), and one in six families that have children under 14 use ClassDojo daily in the United States ("About Us," 2019). Research from this study supported that 88% of teachers in the sample use ClassDojo. Therefore, teachers are actively integrating ClassDojo for school-based communication with parents and students. Before this study, literature primarily focused on ClassDojo's influence on students' classroom behavior (McHugh, 2016; Robacker et al., 2016; Sherin, 2016; Ford, 2017; Lynne et al., 2017; Wachendorf, 2017; Lipscomb et al., 2018; Homer et al., 2018; Cravalho, 2019; Dillon et al., 2019) rather than on teachers' attitudes to accept and use the platform. This study acquired teachers' perceptions of ClassDojo, and this information is crucial since teachers are ultimately responsible for integrating new technology into their classroom (Brown et al., 2011; Nadelson et al., 2012; Quadri, 2014). The extended TAM was analyzed next to identify significant relationships between the latent constructs.

Research Question Two

RQ2: What are the relationships between the latent variables in the proposed TAM for this study?

This study synthesized additional TAM variables to establish an extended model, the Teacher Technology Acceptance Model of Social Networking Sites (T-TAMS), to investigate and explore factors that have a statistically significant influence on K-8 teachers' end-user attitudes to adopt ClassDojo. To the researcher's best knowledge, the T-TAMS is the first model to analyze K-8 teachers' end-user attitudes of SNSs, in particular, school-based SNSs, such as ClassDojo. T-TAMS examined teachers' acceptance of ClassDojo by integrating the external variables security awareness (SA) and subjective norm (SN). The relationship between the latent variables in the TAM model were reliable and illustrated that seven out of the eight path analyses were statistically significant. First, the extended TAM constructs of subjective norm (SN), security awareness (SA), and perceived ease of use (PEOU) positively influenced teachers' perceived usefulness (PU) of ClassDojo. In turn, teachers' perceptions of ClassDojo's security awareness (SA) and perceived usefulness (PU) had a statistically significant impact on teachers' attitudes towards use (ATT) of ClassDojo. Ultimately, leading to teachers' perceived usefulness (PU) and attitude toward use (ATT) having a statistically significant positive influence on teachers' intentions to use (ITU) ClassDojo. Overall, K-8 teachers were found to have positive attitudes towards ClassDojo use. This study significantly addressed the factors that influence teachers' adoption and use of school-based SNSs. This section will discuss and identify the relationships and significance between the latent constructs.

Attitude towards use (ATT) had a statistically significant favorable influence on K-8 teachers' intentions to use (ITU) ClassDojo. The results are consistent with previous findings on teachers' (Teo, 2009; Hashim, 2011; Teo et al., 2012; Akbari et al., 2016; Ursavas & Reisoglu, 2017; Akbari et al., 2016; Siyam, 2019) and SNS users' (Chen et al., 2013; Teo, 2016) technology acceptance. Teachers' anecdotal responses support the relationship between these latent variables. For instance, a fifth-grade teacher stated, "I have used it many years. It is wonderful for my classroom. I have the whole school using it." Similar to Akbari et al.'s (2016) study, attitude towards use was the most statistically significant predictor of teachers' intention to use technology. Teachers' positive attitudes toward technologies increases the potential for users to integrate the platform (Siyam, 2019). Since ClassDojo is usually voluntarily integrated by teachers, it is essential to understand how their attitude influences their intentions to use the platform. These findings fill a void in research that supports teachers' end-user attitudes (ATT) have a statistically significant influence on teachers' intentions to use (ITU) ClassDojo.

Perceived usefulness (PU) had a statistically significant positive influence (β = .124) on K-8 teachers' intentions toward using (ITU) ClassDojo. The result are consistent with previous findings on teachers (Teo, 2009; Teo et al., 2012; Akman & Turhan, 2017; Gyamfi, 2017; Ursavas & Reisoglu, 2017; Siyam, 2019) and SNS users' (Arpaci et al., 2015; Lau & Woods, 2009; Qin et al., 2011; Teo, 2016; Akman & Turhan, 2017; Svendsen, Johnsen, Almas-Sorensen, & Vitterso, 2017; Almaiah, 2018) technology acceptance. Teachers' anecdotal responses support the relationship between these latent variables. According to one fifth-grade teacher, "ClassDojo is great for parent communication as well. I love that I can set office hours and respond once I am back at

school." Also, a kindergarten teacher explained, "I love ClassDojo. I send pictures every day to my parents so they can see their child's life at school during different activities." Essentially, the perceived usefulness of ClassDojo's behavior management system and communication platform were shown to be crucial components to influence intentions to use. Teachers perceive that ClassDojo improves their overall job performance, which, in turn, influences teachers' intentions to use ClassDojo.

Perceived usefulness (PU) had a statistically significant positive influence (β = .635) on K-8 teachers' attitudes toward using (ATT) ClassDojo. The results are consistent with previous research on teachers (Teo, 2009; Teo et al., 2012; Akbari et al., 2016; Gyamfi, 2016; Siyam, 2019) and SNS users' (Teo, 2016; Akman & Turhan, 2017; Dixit & Prakash, 2018) technology acceptance. Teachers' anecdotal responses support the relationship between these latent variables. For example, one survey respondent said, "I love the positive attitude I have when using it. I also love the check on myself when students lose points and being able to find something positive that they are doing." This supports teachers' use of ClassDojo as a behavior management system that integrates a digital token economy (Robacker et al., 2016; Sherin, 2016; Ford, 2017; Wachendorf, 2017; Homer et al., 2018; Storti, 2018; Cravalho, 2019). A special education teacher explained, "I love the translation feature that ClassDojo has. I am able to communicate with parents who have Chinese, German, and Spanish languages with ease through ClassDojo, which has been very beneficial to me as an educator." Furthermore, Manolev et al. (2019) explained how ClassDojo could translate messages into over 35 different languages. Therefore, teachers' perceived usefulness of ClassDojo's school-based communication influenced their end-user attitude (ATT).

Security awareness (SA) had a statistically significant positive influence (β = .231) on K-8 teachers' attitudes toward using (ATT) ClassDojo. This result provides new research on teachers' and SNS users' technology acceptance by incorporating, security awareness, an external variable to the original TAM. Teachers' anecdotal responses support the relationship between these latent variables. For instance, a first-grade teacher stated, "I have read up on the privacy policy, and I have had zero parents worried about that data collected on this app." Thus, research supports that both teachers and parents are not concerned about ClassDojo's datafication challenges. Additionally, research supports the positive influence that datafication can have on students through digital token economies (Robacker et al., 2016; Sherin, 2016; Ford, 2017; Wachendorf, 2017; Homer et al., 2018; Cravalho, 2019) and the communication tools (Burger, 2015). One second-grade teacher clarified that they "don't want private info about a student revealed to class. Between student, teacher, and parent only." ClassDojo's ability to keep information secure created a positive end-user attitude toward the teacher's ClassDojo use.

Contrary to expectations, there was not a statistically significant relationship ($p <$ .240) between teachers' (a) subjective norm (SN) and attitude towards using (ATT) ClassDojo. This result is contradictory to previous research on teachers' technology acceptance (Teo, 2009b; Ursavas & Reisoglu, 2017). The theory of planned behavior states that subjective norm identifies the individual's perceived social pressures to perform a target behavior (Steinmetz et al., 2016). Therefore, teachers perceived social pressure to use ClassDojo, created by referent groups that include administrators and principals, do not influence teachers' end-user attitudes toward ClassDojo (Kreijns et al., 2013). According to teachers' responses, multiple school districts throughout the United

States are banning ClassDojo. For example, “My school district is forcing us to stop using ClassDojo, and we are very upset about it at my school.” A second-grade teacher explained, “I love ClassDojo; unfortunately, our district does not want us to use this app anymore as of 12/20/19. This makes me very sad!” Clearly, there are challenges with administrative leaders supporting social networking sites, specifically, school-based SNSs. Since there are no clear school policies and plans to communicate with staff, stakeholders, and parents, it can create potential barriers between teachers’ beliefs and attitudes towards use (Hornby & Blackwell, 2018). Therefore, teachers’ subjective norm of ClassDojo did not significantly influence their end-user attitude.

Subjective norm (SN) had a statistically significant positive influence ($\beta = .109$) on K-8 teachers’ perceived usefulness (PU) of ClassDojo. The results are consistent with previous research on teachers (Yuen & Ma, 2008; Tarcan et al., 2010; Kriederman, 2017; Ursavas & Reisoglu, 2017) and extends research on SNS users’ technology acceptance. Teachers’ anecdotal responses support the relationship between these latent variables. According to a second-grade teacher, “ClassDojo is vital to my classroom management and communication with parents. Parents love the photos of the students work and the students love posting in their portfolios.” Also, a third-grade teacher said, “I am the ClassDojo Mentor at my site, so I was the one to influence others to use the program and hold trainings.” These teacher responses support how subjective norm correlates to teachers’ outside pressure to perform a specific task (Fishbein & Ajzen, 1975) to meet parents, teachers, and students’ expectations. In turn, these findings support TAM and the theory of planned behavior since teachers perceived social pressures to integrate the platform were influenced by referent groups’ perceived usefulness of ClassDojo. Overall,

teachers' subjective norm of ClassDojo is influenced by the platform's perceived usefulness.

Perceived ease of use (PEOU) had a statistically significant positive influence (β = .413) on K-8 teachers' perceived usefulness (PU) of ClassDojo. The results are consistent with previous research on teachers' (Teo, 2009a; Teo, 2009b; Akbari et al., 2016; Sanchez-Prieto et al., 2017; Ursavas & Reisoglu, 2017; Siyam, 2019) and SNS users' (Rauniar et al., 2014; Almaiah, 2018; Dixit & Prakash, 2018) technology acceptance. Teachers' anecdotal responses support the relationship between these latent variables. According to a special education teacher, "I love the format: It is simple, user-friendly, cute (that goes a long way with kids) and the added features of the videos and parent engagement are bar-none superior to the other platforms that I have seen." In addition, a third-grade teacher stated, "For parent communication, ClassDojo is great and makes it very efficient." These teacher responses illustrate how teachers perceive ClassDojo's ease of use has a positive impact on the platform's usefulness. Research supports that teachers' perceived ease of use of technologies has a positive influence on the perceived usefulness (Teo, 2009b; Ursavas & Reisoglu, 2017; Sanchez-Prieto et al., 2017; Rauniar et al., 2014; Dixit & Prakash, 2018). Overall, K-8 teachers' perceived ease of use had a statistically significant influence on ClassDojo's perceived usefulness.

Security awareness (SA) had a statistically significant positive influence (β = .311) on K-8 teachers' perceived usefulness (PU) of ClassDojo. The results provide new findings on users' technology acceptance. Teachers' anecdotal responses support the relationship between these latent variables. According to a second-grade teacher, "I don't 100% trust any school-related app security. I haven't had an issue with it, but especially

the free ones, there has to be some kind of cost-benefit to the app for people to provide it." Therefore, ClassDojo was able to ensure that the system had some form of integrity and confidentiality to influence teachers' attitudes towards use. "It helps teachers tell the story through pictures and videos. I love that the messaging tool is private between parent and adult giving the message," stated a first-grade teacher. Therefore, the perceived usefulness of ClassDojo through school-based communication provided teachers a sense of security between their interactions. Overall, the research question two findings indicated that seven out of eight hypotheses had statistically significant relationships. These findings provide a multitude of implications from the results.

Implications of the Results

The permeation of the Internet and social network sites (SNSs) (Olmstead, 2013; Williamson, 2017b; Manolev et al., 2019) into education have created a paradigm shift in school-based communication (Thompson et al., 2015). Survey results illustrated that teachers use ClassDojo, email, and phone calls most frequently to communicate with parents and guardians. Therefore, a clear technological shift is encouraging teachers to incorporate school-based SNSs, as well as traditional communication forms, such as email and phone calls. This study evaluated K-8 teachers' end-user attitudes towards ClassDojo with regards to the six latent variables' descriptive statistics and path analyses relationships within the extended TAM model. The six latent variables that influenced teachers' end-user attitudes are as follows: (1) perceived usefulness (PU), (2) perceived ease of use (PEOU), (3) security awareness (SA), (4) subjective norm (SN), (5) attitude toward using SNSs (ATT), and (6) intention to use SNSs (ITU). Research supports that teachers' attitudes toward technology and SNSs have a statistically significant influence on the success of new technologies (Lin, 2006; Willis, 2008; Zhou, 2011; Dixit &

Prakash, 2018). Therefore, these findings support that teachers' positive attitudes toward ClassDojo have a statistically significant influence on teachers' intentions to use ClassDojo. The findings from this study have a multitude of implications for practice, policy, and future research in education.

First, these findings can be used to boost ClassDojo's adoption rates among K-8 schools in the United States. In practice, teachers and administrators can use these findings to implement and support school-based SNSs in their classrooms. Contradictory to traditional technology initiatives (McGill & Klobas, 2009), ClassDojo utilizes a bottom to top approach that promotes teachers adopting the platform, because there is minimal oversight from school districts and administrators (Williamson, 2017b). Teachers' perceptions and attitudes toward ClassDojo use provide school administrators with meaningful information to establish future technology initiatives and focus on professional development decisions (Teo et al., 2008). Therefore, teachers' attitudes and perceptions about using school-based SNSs provide crucial first-hand knowledge about the implementation of SNSs for parent-teacher communication. The findings can be used to boost teachers' adoption rates of school-based SNSs, like ClassDojo.

As mentioned in the literature review, school policies need to support teachers' integration of SNSs through a social media policy, proactive leadership, and professional development. Teachers' anecdotal comments reported that school districts are banning the use of ClassDojo, which is upsetting to many respondents. Teachers' perceptions of ClassDojo's security awareness had direct positive influences on attitude towards use and perceived usefulness; therefore, teachers' attitudes towards ClassDojo safeguarding their data, as well as students' and parents' information, is not a challenge. However, teachers

reported that school districts' primary reason teachers must discontinue use is because there are challenges with tracking interactions between teachers, parents, and students. Thus, school districts need to align specific social media policies to provide teachers support and guidance while integrating school-based SNSs. According to Pasquini and Evangelopoulos (2017), social media policies can act as guiding principles and safeguards for potential social media challenges or threats. Furthermore, proactive leadership needs to offer "technical and pedagogical guidance" to teachers (Manca & Ranieri, 2017, p. 619). These leaders can integrate professional development to create more digitally confident teachers (Wastiau et al., 2103), which will positively influence teachers' end-user attitudes to use SNS tools in educational environments. Overall, teachers' end-user attitudes have a significant influence on their intentions to use technology.

Also, this study's implications indicated that teachers use ClassDojo for both school-based communication and behavior management. This is contradictory to most scholarly studies that focus primarily on ClassDojo as a behavior management system (Chiarelli et al., 2015; da Rocha Seixas et al., 2016; Robacker et al., 2016; Lynne et al., 2017; Williamson, 2017a; Homer et al., 2018; Lipscomb et al., 2018). Teacher's ability to engage and communicate with parents is essential for students' academic and behavioral success (Dearing, Kreider, Simpkins, & Weiss, 2006; Thijs & Eilbracht, 2012); therefore, results illustrate that teachers have positive end-user attitudes towards ClassDojo use to manage parent-teacher interactions and communication. Multiple teachers' anecdotal comments reported challenges with integrating ClassDojo for behavior management, which included potential issues with student data tracking and negatively influencing

classroom environments. In addition, the perceived usefulness of the behavior management system had the lowest mean score; on the other hand, ClassDojo's usefulness as a school-based communication platform scored the highest. These findings illustrate that school-based SNSs could provide more benefits for school-based communication than classroom behavior management.

Lastly, results indicated that teachers use school-based SNSs, such as ClassDojo, to communicate with parents and family members about students' behavior and academic progress (Williamson, 2017b; Manolev et al., 2019). This study established a theoretical definition for school-based SNSs, such as ClassDojo, that are being integrated into elementary education schools. School-based SNSs are a web-based system that enables administrators and teachers to (Robacker et al., 2016; Dillion et al., 2017; Williamson, 2017b; Manolev et al., 2019) (1) create or join a semi-public online school community within a bounded system (Williamson, 2017b; Manolev et al., 2019), (2) construct a virtual classroom with individual student profiles, or avatars (Williamson, 2017b; Homer et al., 2018; Manolev et al., 2019), (3) invite parents and guardians to create a profile and link with their child's profile (Chiarelli et al., 2015; Robacker et al., 2016; Krach et al., 2017; Williamson, 2017a; Williamson, 2017b; Homer et al., 2018; Lipscomb et al., 2018; Manolev et al., 2019), and (4) communicate with students, parents, and guardians about students' school experiences (Williamson, 2017b; Manolev et al., 2019) through the classroom management (Chiarelli et al., 2015; da Rocha Seixas et al., 2016; Homer et al., 2018; Lipscomb et al., 2018; Lynne et al., 2017; Robacker et al., 2016; Williamson, 2017a) and communication platform (Burger, 2015; Robacker et al., 2016; Hammonds et

al., 2013; Williamson, 2017a; Williamson, 2017b; Wilson, 2017). The next section presents future research and limitations for this study.

Limitations

Despite the positive findings of teachers' end-user attitudes towards ClassDojo, this study still contains limitations. Limitations refer to factors that a researcher is not capable of controlling that can potentially influence a study (Sampson, 2012). First, a significant limitation in this study includes a relatively small sample size and limited demographic representation of ClassDojo users (N=264). Also, the study lacked a diverse gender and ethnic representation because there was a high percentage of females and individuals of white ethnicity. Furthermore, Scott (2013) stated that teachers' attitudes toward adopting social networking sites in education could be influenced by gender, age, and previous experiences. Overall, these findings are only "generalizable to a population exactly like the research population" (Avilez, 2017, p. 16). Therefore, the development of a larger and more diverse sample could have positively influenced the study's generalizability to the United States and individuals throughout the world.

The second limitation is that there was a small response rate from the email invitation; thus, this study potentially missed a large percentage of teachers' end-user attitudes towards ClassDojo use. Third, the subjective norm survey measures were unclear and could have used, "principal or administrator," instead of vaguely saying "people" to identify leadership and those of influence in education. Fourth, school selection should have correlated to the state's populations; instead, of equally distributing ten schools per state. This would have created a more realistic sample size of schools and participants within the United States. For instance, California only had 3 participants, even though it is the most populous state in America. Fifth, this study only tests one

extended TAM model on teachers' end-user attitudes towards ClassDojo. The incorporation of additional models and testing would enhance the validity and reliability of the TAM. Overall, a multitude of limitations has the ability to influence the study's outcome.

Future Research

This study's focus was on ClassDojo, which is only one of the school-based SNSs utilized for educational purposes. For example, Bloomz (Peck, 2018), Remind (Chang & Pearman, 2018), Edmodo for Parents, Appletree, and ClassFlow Moments ("Apps," 2016) are other school-based SNSs. Therefore, these school-based SNSs could have different impacts on K-8 teachers' end-user attitudes and perceptions than ClassDojo. Future studies should analyze teachers' end-user attitudes towards other school-based SNSs. Next, future research on school-based SNSs should include a larger sample to allow the results to be more generalized as a whole. Also, since technology continues to advance and develop quickly, a replication of this study can be periodically conducted to examine school-based SNSs trends to update research, as well as provide K-8 teachers with further skills and knowledge to integrate these platforms into their classroom. In addition, further research studies can analyze the influence of teachers' gender, age, and experience on ClassDojo use. Lastly, this study only represented K-8 teachers in the United States. According to the ClassDojo website, teachers in 180 countries integrate and use ClassDojo ("About us," 2019). Research supports that different countries have a variety of factors that can influences technology acceptance based on the country and culture (Sharma, Joshi, & Sharma, 2016). Therefore, to further scholarly research, multiple users, such as administrators, families, parents, and students, should participate in school-based SNSs TAM studies.

Conclusion

These findings can be used to boost teachers' adoption rates of school-based SNSs, like ClassDojo, in K-8 school systems throughout the United States. Chromey et al. (2016) identified SNSs as powerful web-based tools that revolutionize the way individuals learn and communicate. A primary implication of this study is that ClassDojo is widely accepted and used by K-8 teachers in the United States. Thus, the integration of school-based SNSs into K-8 school systems could increase teachers' engagement with both parents and students; in turn, positively influencing their performance and academic success. In this study, the TAM was extended to include subjective norm (SN) and security awareness (SA). The results show statistically significant relationships of intentions towards use (ITU), attitude toward use (ATT), perceived usefulness (PU), perceived ease of use (PEOU), subjective norm (SN), and security awareness (SA) towards K-8 teachers' end-user attitudes for ClassDojo use. This means, except for a relationship between subjective norm and attitude toward use, the extended TAM promotes teachers' use of school-based SNSs.

School-based SNSs can be integrated into elementary and middle school classrooms to establish a secure community where teachers are able to share information to parents about students' behavior, academics, learning materials, announcements to the class, and overall, school-based communication. ClassDojo's perceived usefulness and perceived ease of use give teachers an effective and efficient way to communicate with parents that is not bounded by physical time and space thereby improving parents access to information about their child's education. Furthermore, teachers' school-based SNS use should follow a school's specific social media policy to provide teachers with support. Overall, specific steps taken by administrators and teachers need to minimize

risks and raise awareness about the actual usage of SNSs with parents for school-based communication. Many teachers still require additional support and encouragement to integrate SNSs into education (Greenhow & Askari, 2017). Similar to any technology integration, teachers need time to learn, comprehend, and implement unfamiliar instructional practices, in a safe and supportive learning environment, that focuses on students' academic and social-emotional success. Ultimately, teachers end-user attitudes towards ClassDojo are primarily positive and assert a statistically significant relationship to use the platform.

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APPENDIX A

Demographic Analysis Tables

Table A1 Gender

		Frequency	Valid Percent	Cumulative Percent
Valid	Male	23	9.1	9.1
	Female	231	90.9	100.0
	Total	254	100.0	
Missing	System	744		
Total		998		

Table A2 Participant Age

	Age	Frequency	Valid Percent	Cumulative Percent
Valid	22.00	1	.4	.4
	23.00	4	1.6	2.0
	24.00	2	.8	2.8
	25.00	9	3.6	6.3
	26.00	3	1.2	7.5
	27.00	2	.8	8.3
	28.00	10	4.0	12.3
	29.00	12	4.8	17.1
	30.00	9	3.6	20.6
	31.00	2	.8	21.4
	32.00	9	3.6	25.0
	33.00	2	.8	25.8
	34.00	9	3.6	29.4
	35.00	6	2.4	31.7
	36.00	2	.8	32.5
	37.00	10	4.0	36.5
	38.00	6	2.4	38.9
	39.00	11	4.4	43.3
	40.00	9	3.6	46.8
	41.00	5	2.0	48.8
	42.00	5	2.0	50.8
	43.00	4	1.6	52.4
	44.00	4	1.6	54.0
	45.00	5	2.0	56.0
	46.00	9	3.6	59.5
	47.00	7	2.8	62.3
	48.00	9	3.6	65.9
	49.00	11	4.4	70.2
	50.00	7	2.8	73.0
	51.00	6	2.4	75.4
	52.00	8	3.2	78.6
	53.00	8	3.2	81.7
	54.00	8	3.2	84.9
	55.00	3	1.2	86.1
	56.00	7	2.8	88.9

	57.00	6	2.4	91.3
	58.00	6	2.4	93.7
	59.00	6	2.4	96.0
	60.00	2	.8	96.8
	61.00	2	.8	97.6
	63.00	1	.4	98.0
	64.00	2	.8	98.8
	65.00	3	1.2	100.0
	Total	252	100.0	
Missing	System	746		
Total		998		

Table A3 Ethnicity

	Ethnicity	Frequency	Valid Percent	Cumulative Percent
Valid	White	209	82.9	82.9
	Hispanic or Latino	13	5.2	88.1
	Black or African-American	13	5.2	93.3
	American Indian or Alaskan Native	2	.8	94.0
	Asian	3	1.2	95.2
	Native Hawaiian or other Pacific Islander	2	.8	96.0
	From multiple races	10	4.0	100.0
	Total	252	100.0	
Missing	System	746		
Total		998		

Table A4 Teaching Experience by Number of Years

	Years	Frequency	Valid Percent	Cumulative Percent
Valid	1.00	5	1.9	1.9
	2.00	7	2.7	4.6
	3.00	7	2.7	7.3
	4.00	4	1.5	8.8
	5.00	15	5.7	14.6
	6.00	15	5.7	20.3
	7.00	17	6.5	26.8
	8.00	7	2.7	29.5
	9.00	8	3.1	32.6
	10.00	11	4.2	36.8
	11.00	7	2.7	39.5
	12.00	9	3.4	42.9
	13.00	11	4.2	47.1
	14.00	8	3.1	50.2
	15.00	8	3.1	53.3
	16.00	8	3.1	56.3
	17.00	5	1.9	58.2
	18.00	9	3.4	61.7
	19.00	12	4.6	66.3
	20.00	13	5.0	71.3
	21.00	6	2.3	73.6
	22.00	5	1.9	75.5
	23.00	11	4.2	79.7
	24.00	8	3.1	82.8
	25.00	4	1.5	84.3
	26.00	6	2.3	86.6
	27.00	8	3.1	89.7
	28.00	6	2.3	92.0
	29.00	5	1.9	93.9
	30.00	5	1.9	95.8
	31.00	1	.4	96.2
	32.00	2	.8	96.9
	33.00	1	.4	97.3
	34.00	4	1.5	98.9
	35.00	1	.4	99.2

	37.00	2	.8	100.0
	Total	261	100.0	
Missing	System	737		
Total		998		

Table A5 Grade Level Participants Teach

	Grade Level	Frequency	Valid Percent	Cumulative Percent
Valid	TK	7	2.7	2.7
	Kindergarten	29	11.0	13.6
	1st	34	12.9	26.5
	2nd	39	14.8	41.3
	3rd	40	15.2	56.4
	4th	38	14.4	70.8
	5th	35	13.3	84.1
	6th	4	1.5	85.6
	8th	5	1.9	87.5
	Special Education	9	3.4	90.9
	Resource Teacher	1	.4	91.3
	Other	11	4.2	95.5
	Unknown	12	4.5	100.0
	Total	264	100.0	
Missing	System	734		
Total		998		

Table A6 Teacher Communication Methods

Communication Method	Responses		Percent of
	N	Total	Cases
Bulletin Boards	125	264	47.3%
ClassDojo	231	264	87.5%
Email	231	264	87.5%
Facebook	105	264	39.8%
Flyers	187	264	70.8%
Twitter	41	264	15.5%
Instagram	28	264	10.6%
Learning Management Systems	23	264	8.7%
Newsletters	165	264	62.5%
Other Social Media Platforms	13	264	4.9%
Other Communication Apps	43	264	16.3%
Phone Calls	230	264	87.1%
School Website	177	264	67.0%
Text Messages	93	264	35.2%
Remind	2	264	0.8%
Other	12	264	4.5%
Total	1706		646.0%

Table A7 State that the Participants' Schools are Located

	State	Frequency	Valid Percent	Cumulative Percent
Valid	AL	5	1.9	1.9
	AK	3	1.1	3.0
	AZ	9	3.4	6.4
	AR	11	4.2	10.6
	CA	3	1.1	11.7
	CO	8	3.0	14.8
	CT	8	3.0	17.8
	DE	6	2.3	20.1
	FL	5	1.9	22.0
	GA	3	1.1	23.1
	HI	7	2.7	25.8
	ID	11	4.2	29.9
	IL	14	5.3	35.2
	IN	2	.8	36.0
	IA	5	1.9	37.9
	KS	4	1.5	39.4
	KY	7	2.7	42.0
	LA	4	1.5	43.6
	MD	6	2.3	45.8
	MA	2	.8	46.6
	MI	13	4.9	51.5
	MN	4	1.5	53.0
	MO	6	2.3	55.3
	MT	2	.8	56.1
	NE	1	.4	56.4
	NV	17	6.4	62.9
	NH	1	.4	63.3
	NJ	6	2.3	65.5
	NM	2	.8	66.3
	NY	4	1.5	67.8
	NC	8	3.0	70.8
	OH	4	1.5	72.3
	OK	4	1.5	73.9
	OR	1	.4	74.2
	PA	1	.4	74.6

	RI	6	2.3	76.9
	SC	5	1.9	78.8
	TN	6	2.3	81.1
	TX	3	1.1	82.2
	UT	11	4.2	86.4
	VA	1	.4	86.7
	WA	8	3.0	89.8
	WV	5	1.9	91.7
	WI	7	2.7	94.3
	WY	1	.4	94.7
	Unknown	14	5.3	100.0
	Total	264	100.0	
Missing	System	734		
Total		998		

Table A8 Percentage of Students that Receive Free/Reduced Lunch

		Frequency	Valid Percent	Cumulative Percent
Valid	0-10%	4	1.5	1.5
	11-20%	7	2.7	4.2
	21-30%	11	4.2	8.4
	31-40%	13	4.9	13.3
	41-50%	13	4.9	18.3
	51-60%	14	5.3	23.6
	61-70%	21	8.0	31.6
	71-80%	41	15.6	47.1
	81-90%	20	7.6	54.8
	91-100%	91	34.6	89.4
	Unknown	28	10.6	100.0
	Total	263	100.0	
Missing	System	735		
Total		998		

Table A9 Principal Support for ClassDojo

		Frequency	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	10	3.8	3.8
	Disagree	5	1.9	5.7
	Neutral	27	10.3	16.0
	Agree	51	19.4	35.4
	Strongly Agree	170	64.6	100.0
	Total	263	100.0	
Missing	System	735		
Total		998		

Latent Variables Descriptive Tables

Table A10 Percentages for the PU Scale

N	Perceived Usefulness Scale	Percent (%)				
		SD	D	N	A	SA
1	I find ClassDojo to be useful.	0.8	2.3	4.6	31.7	60.7
2	ClassDojo is useful for student behavior management.	3.1	6.5	20.2	36.6	33.6
3	ClassDojo is useful for me in my job.	1.1	3.8	7.6	34.2	53.2
4	ClassDojo is useful for school-based communication.	0.4	3.8	8.7	21.6	65.5

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

Table A11 Distribution of Mean and Standard Deviation Scores on PU Scale

N	Perceived Usefulness Scale	M	SD
1	I find ClassDojo to be useful	4.49	.757
2	ClassDojo is useful for student behavior management	3.91	1.03
3	ClassDojo is useful for me in my job	4.35	.864
4	ClassDojo is useful for school-based communication	4.48	.836

Note: M = Mean, SD = Standard Deviation

Table A12 Percentages for the PEOU Scale

N	Perceived Ease of Use	Percent (%)				
		SD	D	N	A	SA
1	I find ClassDojo easy to use.	0.4	3.0	3.0	27.4	66.2
2	I find it easy to get ClassDojo to do what I want to do.	0.4	3.8	7.6	43.3	44.9
3	My interactions on ClassDojo are clear and understandable.	0.4	1.5	6.1	36.4	55.7
4	It is easy to interact on ClassDojo.	1.1	2.3	4.2	32.3	60.1

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

Table A13 Distribution of Mean and Standard Deviation Scores for PEOU Scale

N	Perceived Ease of Use Scale	M	SD
1	I find ClassDojo easy to use.	4.56	.733
2	I find it easy to get ClassDojo to do what I want to do.	4.29	.795
3	My interactions on ClassDojo are clear and understandable.	4.45	.712
4	It is easy to interact on ClassDojo.	4.48	.781

Note: M = Mean, SD = Standard Deviation

Table A14 Percentages for the SA Scale

N	Security Awareness	Percent (%)				
		SD	D	N	A	SA
1	I feel safe in my interactions on ClassDojo.	0.4	1.5	6.8	40.3	51.0
2	ClassDojo provides security for my personal data.	0.4	1.5	29.4	34.7	34.0

3	I trust ClassDojo with student and parent information.	0.4	4.3	14.8	41.7	39.8
4	ClassDojo provides security for my online interactions.	0.4	1.9	26.5	35.2	36.0

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

Table A15 Distribution of Mean and Standard Deviation for the SA Scale

N	Security Awareness Scale	M	SD
1	I feel safe in my interactions on ClassDojo.	4.40	.718
2	ClassDojo provides security for my personal data.	4.00	.855
3	I trust ClassDojo with student and parent information.	4.17	.830
4	ClassDojo provides security for my online interactions.	4.05	.858

Note: M = Mean, SD = Standard Deviation

Table A16 Percentages for the SN Scale

N	Subjective Norm	Percent (%)				
		SD	D	N	A	SA
1	People who are important to me at my school think I should use ClassDojo.	3.8	3.4	31.3	30.2	31.3
2	People I am influenced by think I should use ClassDojo.	4.2	4.2	35.9	24.4	31.3
3	Many of the people that I know at my school expect me to use ClassDojo.	9.2	12.2	26.7	19.5	32.4
4	People whose opinion I value will encourage me to use ClassDojo.	6.5	6.5	31.3	28.6	27.1

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

Table A17 Distribution of Mean and Standard Deviation for the SN Scale

N	Subjective Norm Scale	M	SD
1	People who are important to me at my school think I should use ClassDojo.	3.82	1.04
2	People I am influenced by think I should use ClassDojo.	3.74	1.08
3	Many of the people that I know at my school expect me to use ClassDojo.	3.54	1.30
4	People whose opinions I value will encourage me to use ClassDojo.	3.63	1.14

Note: M = Mean, SD = Standard Deviation

Table A18 Percentages for the ATT Scale

N	Attitude Towards Use	Percent (%)				
		SD	D	N	A	SA
1	It is beneficial to use ClassDojo.	1.9	3.4	5.3	33.1	56.3
2	My experiences with ClassDojo are good.	1.9	3.1	4.6	35.9	54.6
3	I like using ClassDojo.	2.3	3.9	6.6	29.1	58.1
4	I have a generally favorable attitude toward using ClassDojo.	1.9	5.0	4.2	31.3	57.6

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

Table A19 Distribution of Mean and Standard Deviation for the ATT Scale

N	Attitude Towards Use Scale	M	SD
1	It is beneficial to use ClassDojo.	4.38	.883
2	My experiences with ClassDojo are good.	4.38	.862
3	I like using ClassDojo.	4.37	.938
4	I have a generally favorable attitude toward using ClassDojo.	4.38	.921

Note: M = Mean, SD = Standard Deviation

Table A20 Percentages for the ITU Scale

N	Intentions to Use	Percent (%)				
		SD	D	N	A	SA
1	I will continue to use ClassDojo in the future.	3.8	2.7	8.4	26.2	58.9
2	I will use ClassDojo for school-based communication.	4.6	4.9	8.4	22.1	60.1
3	I'm willing to use ClassDojo.	2.7	2.7	4.6	26.0	64.1
4	I plan to use ClassDojo.	4.2	2.3	6.5	24.1	62.8

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

Table A21 Distribution of Mean and Standard Deviation for the ITU Scale

N	Perceived Usefulness Scale	M	SD
1	I will continue to use ClassDojo in the future.	4.34	1.01
2	I will use ClassDojo for school-based communication.	4.28	1.10
3	I'm willing to use ClassDojo.	4.46	.908

4 I plan to use ClassDojo.	4.39	1.01

Note: M = Mean, SD = Standard Deviation

Path Analysis Tables

Table A22 ATT, PU, and ITU Correlations

		ITU	PU	ATT
ITU	Pearson Correlation	1	.679**	.810**
	Sig. (2-tailed)		.000	.000
	N	261	259	253
PU	Pearson Correlation	.679**	1	.782**
	Sig. (2-tailed)	.000		.000
	N	259	261	253
ATT	Pearson Correlation	.810**	.782**	1
	Sig. (2-tailed)	.000	.000	
	N	253	253	256

**. Correlation is significant at the 0.01 level (2-tailed).

Table A23 ATT and PU → ITU Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.815[a]	.664	.662	.54870

a. Predictors: (Constant), ATT, PU

Table A24 ATT and PU → ITU Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.291	.215		1.350	.178
	PU	.166	.079	.124	2.105	.036
	ATT	.767	.063	.714	12.127	.000

a. Dependent Variable: ITU

b. Independent Variable: (Constant), PU, ATT

Table A25 PU, SA, SN, and ATT Correlations

		PU	SA	SN	ATT
PU	Pearson Correlation	1	.572**	.262**	.782**
	Sig. (2-tailed)		.000	.000	.000
	N	261	258	257	253
SA	Pearson Correlation	.572**	1	.265**	.605**
	Sig. (2-tailed)	.000		.000	.000
	N	258	261	256	253
SN	Pearson Correlation	.262**	.265**	1	.267**
	Sig. (2-tailed)	.000	.000		.000
	N	257	256	259	251
ATT	Pearson Correlation	.782**	.605**	.267**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	253	253	251	256

**. Correlation is significant at the 0.01 level (2-tailed).

Table A26 PU, SA and SN → ATT Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.806[a]	.649	.645	.52738

a. Predictors: (Constant), SN, SA, PU

Table A27 PU, SA, SN → ATT Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.320	.231		-1.387	.167
	PU	.793	.059	.635	13.495	.000
	SA	.273	.055	.231	4.925	.000
	SN	.040	.034	.047	1.178	.240

a. Dependent Variable: ATT

b. Independent Variable: (Constant), PU, SA, SN

Table A28 SN, PEOU, SA, and PU Correlations

		SN	PEOU	SA	PU
SN	Pearson Correlation	1	.182**	.265**	.262**
	Sig. (2-tailed)		.004	.000	.000
	N	259	256	256	257
PEOU	Pearson Correlation	.182**	1	.559**	.607**
	Sig. (2-tailed)	.004		.000	.000
	N	256	261	258	259
SA	Pearson Correlation	.265**	.559**	1	.572**
	Sig. (2-tailed)	.000	.000		.000
	N	256	258	261	258
PU	Pearson Correlation	.262**	.607**	.572**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	257	259	258	261

**. Correlation is significant at the 0.01 level (2-tailed).

Table A29 SN, PEOU, and SA → PU Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.677[a]	.458	.452	.52170

Predictors: (Constant), SA, SN, PEOU

Table A30 SN, PEOU, and SA → PU Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.925	.238		3.894	.000
	SN	.074	.033	.109	2.243	.026
	PEOU	.424	.058	.413	7.301	.000
	SA	.294	.055	.311	5.386	.000

a. Dependent Variable: PU

b. Independent Variable: (Constant), SN, PEOU, SA

APPENDIX B

Research Survey Instrument

ClassDojo Survey

Teachers' End-User Attitudes Toward the Integration of ClassDojo

Barak D. Stanley, a graduate student at Boise State University, is conducting a research study to evaluate teachers' end-user attitudes toward integrating ClassDojo. You are being asked to complete this survey because you are at a school site that uses ClassDojo. If you don't use ClassDojo, please disregard this survey.

Participation is voluntary. The survey will take approximately 10 minutes or less to complete. You must be at least 18 years old to take this survey.

This study involves no foreseeable serious risks. We ask that you try to answer all questions; however, if there are any items that make you uncomfortable or that you would prefer to skip, please leave the answer blank. Your responses are anonymous.

If you have any questions or concerns feel free to contact Barak or his faculty advisor:

Barak D. Stanley, graduate student
Educational Technology
(208) 515-7452
barakstanley@u.boisestate.edu

Dr. Andy Hung, Professor
Educational Technology
(208) 426-5542
andyhung@boisestate.edu

If you have questions about your rights as a research participant, you may contact the Boise State University Institutional Review Board (IRB), which is concerned with the protection of volunteers in research projects. You may reach the board office between 8:00 AM and 5:00 PM, Monday through Friday, by calling (208) 426-5401 or by writing: Institutional Review Board, Office of Research Compliance, Boise State University, 1910 University Dr., Boise, ID 83725-1138.

If you would prefer not to participate, please do not fill out a survey.

If you consent to participate, please complete the survey.

- ◯ Yes, I agree to the consent form.
- ◯ No, I don't agree to the consent form.

NEXT

ClassDojo Survey

ClassDojo

Please complete the ClassDojo survey. Thank you for your time and consideration! 😃

Perceived Usefulness

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I find ClassDojo to be useful	○	○	○	○	○
ClassDojo is useful for student behavior management	○	○	○	○	○
ClassDojo is useful for me in my job	○	○	○	○	○
ClassDojo is useful for school-based communication	○	○	○	○	○

Perceived Ease of Use

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I find ClassDojo easy to use.	○	○	○	○	○
I find it easy to get ClassDojo to do what I want to do.	○	○	○	○	○
My interaction with ClassDojo are clear and understandable.	○	○	○	○	○
It is easy to interact on ClassDojo	○	○	○	○	○

Intentions to Use

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I will continue to use ClassDojo in the future.	○	○	○	○	○
I will use ClassDojo for school-based communication	○	○	○	○	○
I'm willing to use ClassDojo	○	○	○	○	○
I plan to use ClassDojo	○	○	○	○	○

Attitude Toward Using

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
It is beneficial to use ClassDojo.	○	○	○	○	○
My experiences with ClassDojo are good.	○	○	○	○	○
I like using ClassDojo	○	○	○	○	○
I have a generally favorable attitude toward using ClassDojo	○	○	○	○	○

Subjective Norm

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
People who are important to me at my school think I should use ClassDojo	○	○	○	○	○
People I am influenced by think I should use ClassDojo	○	○	○	○	○
Many of the people that I know at my school expect me to use ClassDojo	○	○	○	○	○
People whose opinion I value will encourage me to use ClassDojo	○	○	○	○	○

Security Awareness

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I feel safe in my interactions on ClassDojo	○	○	○	○	○
ClassDojo provides security for my personal data	○	○	○	○	○
I trust ClassDojo with student and parent information	○	○	○	○	○
ClassDojo provides security for my online interactions	○	○	○	○	○

Is there anything else you would like to add?

Your answer

BACK NEXT

ClassDojo Survey

School Information

Please complete the questions below about your school. 🤔

What state is your school located in?

Your answer

What communication methods do you use at your school? Select all that apply.

- [ ] Bulletin Boards
- [ ] ClassDojo
- [ ] Email
- [ ] Facebook
- [ ] Flyers
- [ ] Twitter
- [ ] Instagram
- [ ] Learning management system (ex: Blackboard)
- [ ] Newsletters
- [ ] Other social media platforms
- [ ] Other School Communication Apps (ex: Bloomz, etc.)
- [ ] Phone Calls
- [ ] School website
- [ ] Text messages
- [ ] Other: _____

How many students receive free/reduced lunch?

- ○ 0-10%
- ○ 11-20%
- ○ 21-30%
- ○ 31-40%
- ○ 41-50%
- ○ 51-60%
- ○ 61-70%
- ○ 71-80%
- ○ 81-90%
- ○ 91-100%
- ○ I don't know
- ○ Other: _____

My principal supports ClassDojo usage.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

BACK NEXT

ClassDojo Survey

Demographic Questions

Please complete the questions below about your teaching experience and demographics.

What grade do you teach? If you work with multiple grade levels, please select the one you work with most frequently.

Choose

How many years have you been teaching?

Choose

What is your age?

Choose

What is your gender?

Choose

What is your race?

- ○ White
- ○ Hispanic or Latino
- ○ Black or African-American
- ○ American Indian or Alaskan Native
- ○ Asian
- ○ Native Hawaiian or other Pacific Islander
- ○ From multiple races
- ○ Other: _____

BACK SUBMIT

Consent Form

Survey Consent Form

Teachers' End-User Attitudes Toward the Integration of ClassDojo

Barak D. Stanley, a graduate student at Boise State University, is conducting a research study to evaluate teachers' end-user attitudes toward integrating ClassDojo. You are being asked to complete this survey because you are at a school site that uses ClassDojo. If you don't use ClassDojo, please disregard this survey.

Participation is voluntary. The survey will take approximately 10 minutes or less to complete. You must be at least 18 years old to take this survey.

This study involves no foreseeable serious risks. We ask that you try to answer all questions; however, if there are any items that make you uncomfortable or that you would prefer to skip, please leave the answer blank. Your responses are anonymous.

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If you would prefer not to participate, please do not fill out a survey.

If you consent to participate, please complete the survey.

Email Participation Request

Greetings!

My name is Barak D. Stanley, and I am a doctoral student working with Dr. Andy Hung at Boise State University. We are conducting a research study about teachers' end-user attitudes toward ClassDojo. I am emailing to ask if you would like to take about 10 minutes to complete a survey for this research project. Participation is completely voluntary and your answers will be anonymous.

If you are interested, please click on the link for the survey and additional information: Click here for the ClassDojo Survey.

If you have any questions, please do not hesitate to contact me (barakstanley@u.boisestate.edu) or Dr. Andy Hung (andyhung@boisestate.edu).

Please disregard this email if you don't currently use ClassDojo.

Thank you for your time and consideration.

Sincerely,

Barak D. Stanley

Doctoral Student

Boise State University

www.barakstanley.com

IRB Approval Certification

This study was approved by the Institutional Review Board, Boise State University, IRB #101-SB19-231 on 10/30/2019.