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An Examination of Social Studies Educators to Facilitate Preservice Teacher Development of Technology Integration

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This study sought to develop an understanding of current practices by professionals in the field to best prepare future social studies educators in the usage of technology. A quantitative investigation examined the usage and perceptions of educational technology by 398 grades 6–12 social studies teachers from across a Mid-Atlantic state. A researcher-designed survey instrument explored teacher adoption of technology, sources of acquired skills, usage frequencies, perceived effectiveness, and barriers to integration. The study revealed personal trial and error as the most likely way to acquire new knowledge. Document creation applications such as Google Docs were the most commonly used Internet-based technology and were perceived as most effective. By better understanding educators' use of technology in the field, teacher preparation programs may design more effective curricula. It is recommended that future research be conducted on a multistate basis to investigate technology integration in social studies classrooms at each grade level to best prepare future teachers for when they have a classroom of their own.

Educational technologies provide social studies teachers an ability to create a student-centered learning environment and promote 21st-century skills. Social studies classrooms that employ high-usage frequencies of technology demonstrate superior levels of critical thinking, problem solving, and communication skills (Chai & Kong, 2017). The U.S. Department of Education (2010) stated that “technology is at the core of virtually every aspect of our daily lives and work, and we must leverage it to provide engaging and powerful learning experiences and content” (p. ix).

Technology may lessen common issues faced during instruction, such as damaged resources, outdated content, and lack of accessibility. Well-planned learning activities that incorporate technology allow teachers to foster collaboration and move away from traditional delivery styles such as worksheets and lecture (Spencer, 2017).

The quantitative study reported in this paper sought to provide a better understanding of usage, perceptions, and acquisition of technology among social studies teachers, along with barriers to implementing technology. Previous studies (Babatunde, Benedict, & Adu, 2017; Heafner, 2013) have focused on the concept of perceived technology integration in social studies teaching but not usage frequencies or perceptions of specific technologies. Furthermore, although researchers have examined barriers to technology integration within other subject areas (Coley, Warner, Stair, Flowers, & Croom, 2015; Kraft & Papay, 2014), there is little research related to barriers social studies teachers encounter.

With the rapid pace of technology development, it is important for teacher educators to recognize specific technologies to equip students with effective resources. In addition, teacher educators should make students aware of the most common obstacles and ways to overcome them encountered in the professional environment.

Current trends related to technology in other subject areas necessitate the continued incorporation of innovative technology in social studies. In the science classroom, augmented and virtual realities have become popular. These allow students to experience a virtual layer on top of the real world to learn about topics in a student-centered environment. However, virtual reality technology features a time-to-adoption lag of two to three years (Avwiri, 2016). Therefore, it is important that social studies teachers begin to incorporate this technology immediately.

With an ever-increasing demand to learn English, the market for language learning and development technologies has increased. Mobile applications such as dictionaries and gamification — using games for a task to promote learning — benefit teachers and students to promote fluency and retention (Zazulak, 2016). On average, social studies teachers utilize these two technologies less than teachers in nearly every other subject area (Hong, 2016).

For this study, usage was operationally defined as the frequency in which a teacher implements a specific web-based educational technology into curriculum design and implementation inside and outside of the physical classroom. Perception was defined as the way in which a teacher regards, understands, and interprets the effectiveness of educational technology within the framework of teaching and learning.

Literature Review

Access to Technology in American Schools

Educational technologies have become commonplace in social studies classrooms of all grade levels regardless of location. In 2012–2013, American schools purchased \$8.4 billion of educational technology, which was a 6% increase from the previous year, and budgets are predicted to expand through 2020 (Chen, 2015). A 2016 study revealed that 97% of U.S. public school teachers had at least one computer in the classroom and 84% had a projector. Teachers most commonly used technology for word processing, presentation software, Internet access, grade maintenance, and attendance records (Herold, 2016).

Kraft and Papay's (2014) study of 9,000 teachers from 174 schools found educational technology fulfills multiple roles, such as instructional preparation and instructional delivery. Professional use of technology includes instructional preparation, such as material gathering, locating digital resources, and creating interactive activities. When used for content delivery, teachers may present via projectors or online platforms using computer-assisted learning applications, such as animated tutorials and real-time document creation (Chai & Kong, 2017).

A 2016 study of social studies teachers in Colorado revealed significant usage of technology as an assessment tool (Hong, 2016). The incorporation of assessment technologies such as Socrative allow for real-time student feedback, while others like TurnItIn help promote student accountability and discourage plagiarism (Yentes & Gaskill, 2015). For the purpose of this study, technology integration is composed of any of these uses to support classroom instruction.

Adoption of Technology

Technology use can ameliorate a variety of challenges through improved accessibility, increased understanding of scope, availability of resources, and more opportunities for writing and communication (Coley et al., 2015). In relation to social studies, schools have made advances in the use of technology to support learning. With more resources available, in addition to Bring Your Own Device (BYOD) policies, social studies teachers should leverage technology to personalize learning.

Technology permits students to choose appropriate ways to demonstrate mastery of social studies content (Johnson, Adams Becker, Estrada, & Freeman, 2015). Preservice teachers are especially in need of proper technology training. The Council for Accreditation of Educator Preparation (CAEP) has identified three broad strands of skills students should be able to demonstrate in the classroom related to technology. One CAEP indicator specifies that preservice teachers should model instruction capable of enhancing learning with technology, including classroom management and assessment of student learning.

Successful technology adoption and integration is a slow and complex process with many moving parts. Factors originating from teachers or their school setting, such as beliefs and attitudes, demographic characteristics of teachers and students, access to computers and the Internet, and school support structure, may all affect technology use (National Center for Educational Statistics [NCES], 2016a, 2016b; Spencer, 2017).

Prior research has shown that disappointing outcomes are associated with teachers who lack necessary skills to integrate technology effectively (Doolittle & Hicks, 2003; Januszewski & Molenda, 2013). Teachers supported by an array of sources such as peers, administrators, technology coordinators, and professional development report higher levels of motivation and effectiveness. In addition, they are more likely to explore new technologies and strengthen those currently used (Falloon & Khoo, 2014). A 2014 study by the NCES revealed that only 30% of teachers felt confident in their technology integration skills. Yet, only approximately 20% of states require technology training or professional development for recertification.

Social Studies Technology Integration

Increased availability of technology has brought potential to revolutionize social studies teaching and learning. The National Council for the Social Studies (NCSS, 2018) recognized the important role of technology with the creation of content-specific technology

standards. The goal is for teachers to utilize common applied techniques to diffuse and integrate technological concepts into the curriculum. Technology integration within social studies has been a relatively slow process. Nearly every other subject area has adopted more technology for instruction and done so at a faster rate (Karchmer-Klein, Mouza, Shinas, & Park, 2017). The current era of high-stakes testing has impacted authentic social studies instruction. A focus on test scores has increased rote memorization of facts and concepts at the expense of technology usage (Manfra, Friedman, Hammond, & Lee, 2009).

Another challenge social studies teachers encounter is the rapid pace of technology development. However, diffusion and adoption of technology is relatively slow by comparison and is often not focused on student learning (Bolick, 2017). In addition, there is a void of consistent theory and practice in the social studies classroom (Hicks et al., 2014).

Despite the sluggish start, technology can help students in a number of ways. Previous studies have indicated that social studies teachers' technology usage could help motivate student engagement, increase subject appeal, and enhance research skills (Berson, 1996; Gulbahar & Guven, 2008; Hong, 2016). Successful completion of technology-based tasks also raises student self-efficacy and self-confidence levels (Heafner, 2004). Educational technologies provide teachers an opportunity to prepare students for a global world and create digital citizens.

Numerous educational technologies have been developed and implemented to enhance social studies learning. Since the 1990s, teachers can find an ever-expanding amount of historical content online. Increased access to materials such as primary sources and artifacts has positively affected the teaching and learning of social studies (Friedman, 2014). History classes have employed web-based historical resources and databases to enhance student historical thinking and inquiry skills (Friedman, 2006).

Other teachers have incorporated historical simulations and digital games into their curriculum, though less frequently than in other subject areas (Lee & Probert, 2010). Geospatial technologies such as Google Earth may provide students an interactive visual experience to illustrate geographic concepts in a multimedia environment. Also, geospatial technologies promote student spatial thinking and geographic reasoning skills (Falloon & Khoo, 2014; Goldstein & Alibrandi, 2013).

Students can collaborate with others in real time to produce class materials and learning tools. For the social studies classroom, this innovation has led to a more interactive and student-centered learning environment (Friedman, 2014). An increasing quantity of smartphone and tablet mobile apps for teaching and learning in a social studies context is another method of implementation. Incorporation of mobile technologies into the curriculum has elicited higher levels of student engagement (Mouza & Barrett-Greenly, 2015).

Technology integration has increased in popularity among social studies teachers. Since 2009, teachers have reported higher levels of technology incorporation into classroom instruction each year (Partnership for 21st Century Learning, 2016). For this trend to continue, it is essential that preservice social studies teachers receive adequate technology training.

Social Studies Teacher Training in Technology

Prior research uncovered numerous positive effects of technology integration in the social studies classroom. However, new social studies teachers with limited experience and unfamiliarity with technology often hesitate to seek and find new technology for their classroom. Those who lack knowledge and skills related to technology integration are more likely to feel burned out, hindering consistent adoption of technology in social studies instruction (Doolittle & Hicks, 2003; Hong, 2016; Shriner, Clark, Nail, Schlee, & Libler, 2010). To prevent this, it is important to develop knowledge and skills to enhance preservice teacher confidence and abilities through necessary training (Lanahan & Yeager, 2008).

Teacher development is useful when participants receive training with ready-to-use classroom materials or technologies that match their curriculum and teaching style. Rather than teaching basic skills of technology, curriculum-based training is much more effective and less time-consuming (Karchmer-Klein et al., 2017).

It is also important for teacher education programs to implement one-on-one mentoring. Personalized instruction, along with substantial follow-up support focused on improved skills, makes preservice teachers more likely to adopt technology (Shriner et al., 2010). Professional development benefits teacher educators and students. Effective teacher training creates a positive impact on teacher knowledge and capabilities along with student learning (Falloon & Khoo, 2014).

Methodology

The descriptive study reported here employed survey research methodology to examine teacher acquisition of technological skills, frequency of use, perception of effectiveness, and barriers to technology integration. Respondents consisted of Grades 6-12 social studies teachers from across a mid-Atlantic state during the 2017-2018 academic year. The researcher-developed survey included items from prior research and instruments developed by Kotrlik and Redmann (2009) and Coley et al. (2015).

The initial part of the survey included 20 questions related to teacher integration of technology, acquisition of technological skills, usage of technological equipment, and barriers to technology integration. The final part consisted of demographic questions, including gender, age, years of teaching experience, and education level. An expert panel of social studies teachers from across the state established content validity. A pilot study was performed using 26 social studies teachers in another state. Based upon feedback, I added one answer option related to perceived effectiveness. Because survey items were considered mutually exclusive, instrument reliability could not be established by internal consistency.

Contact information was obtained from an email list provided by the State Department of Education for each K-12 public school principal. Qualtrics, an online survey platform, was used to contact principals individually with a request to forward the survey to their social studies faculty. The email included the informed consent, description of purpose, and hyperlink to the survey. Fourteen days later, each principal received a follow-up email with a second request to forward the survey to faculty as a reminder to participate. The survey remained open for 28 days.

Results

Participants

The survey generated 398 volunteer responses from Grades 6-12 social studies teachers during the 2017-2018 academic year. Of 368 respondents who shared their gender, females ($n = 242$; 66%) comprised the majority of participants, while males comprised 34% ($n = 126$). The mean age was 43 with 14 years' experience as a full-time teacher. Participants self-identified whether their school building was located in an urban, rural, or suburban setting. The majority of respondents ($n = 240$; 60%) reported teaching in a suburban school, followed by rural ($n = 120$; 31%) and urban ($n = 38$; 9%). The majority of participants had attained a master's degree ($n = 258$; 65%), followed by bachelor's ($n = 92$; 23%), doctoral ($n = 7$; 4%) and associate's ($n = 3$; 2%).

Research Areas

Research Area 1. The first research area explored the usage frequencies of technology for instructional purposes. Results indicated that teachers utilized web-based technologies to conduct class nearly as much as technology in general. This finding may be attributed to the ever-increasing number of online applications available for students and educators.

As an example, Google Drive applications (i.e., Docs, Sheets, and Slides) require an online connection while Microsoft Word, Excel, or PowerPoint do not. Although these programs are available outside of school, teachers rarely utilized educational technology to assign out-of-class work. A large number of respondents ($n = 152$; 39%) indicated that they never assigned work online to be completed during nonclass hours. Teachers were more likely to communicate with parents of students outside of school hours than with students.

In a typical week, 35% ($n = 140$) communicated with a parent at least three times, compared to only 26% ($n = 106$) with students. Responses revealed that 34% ($n = 134$) never used technology to communicate with students, but only 10% ($n = 37$) did not utilize it to communicate with parents (Table 1).

Table 1
Comparison of Teacher Usage Frequency of Technology

Item	N	M	SD
Incorporate technology into lesson plans	379	2.99	0.97
Access web-based technologies to conduct class	375	2.98	0.98
Require students to access Internet in classroom	376	2.54	0.99
Communicate with parents of students outside school hours	378	2.44	0.92
Assign classwork that requires web-based technologies	377	2.42	0.91
Communicate with students outside school hours	379	2.06	1.02
Assign out-of-class work on web-based technologies	377	1.74	1.02

Notes: 1 = never, 2 = 1–2 times a week, 3 = 3–4 times a week, 4 = daily.

Research Area 2. The second research area examined the sources of social studies teachers' acquisition of information and skills related to technology. The majority ($n = 230$; 61%) of respondents acquired new skills through personal trial and error. Faculty and staff

($n = 117$; 30%) were most likely to always be a source, followed by personal trial and error ($n = 114$; 29%) and Internet searches ($n = 91$; 24%). These results may indicate potential effectiveness of departmental level adoption of technology usage.

Teachers were more likely to never or rarely develop new knowledge at an in-service workshop ($n = 96$; 26%) than from their students ($n = 67$; 18%). Online training modules ($n = 323$; 59%) and social media communities ($n = 181$; 48%) were most likely to either rarely or never be used for knowledge acquisition (Table 2). The research indicated low usage of online professional development communities via social media such as Google Hangouts and Facebook. Most respondents ($n = 231$; 58%) never participated in online communities, compared to 18% ($n = 68$) who did so often or always.

Table 2
Sources of Personal Technology Acquisition

Source	<i>N</i>	<i>M</i>	<i>SD</i>
Personal trial and error	378	3.43	1.09
Other faculty/staff	376	3.26	1.18
Internet searches	372	3.04	1.09
In-services or workshops	377	2.23	1.12
Students	376	2.19	1.24
Undergraduate/Graduate coursework	377	1.78	1.17
Online training modules	375	1.75	1.03
Social media communities/groups	372	1.57	1.31

Notes. 1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always.

Research Area 3. The third research area measured usage frequencies of specific instructional technologies. Document creation ($n = 208$; 52%) was most likely to be used at least once per week, then class websites ($n = 168$; 43%) and classroom management ($n = 142$; 36%). Teachers indicated usage of technology for assessment purposes less than a few times a semester. The majority of teachers ($n = 310$; 79%) utilized programs such as Socrative or Google Forms a few times a year or less. However, a notable number of teachers ($n = 98$; 25%) utilized assessment tools on at least a weekly basis.

Geospatial programs such as Google Earth and asynchronous communication (e.g., Remind) were the only other technologies employed at least a few times a semester. Microblogging ($n = 316$; 80%) was the least likely to be used at all, followed by role play/simulation ($n = 310$; 79%).

The majority of teachers incorporated video sharing ($n = 182$; 48%) on at least a monthly basis, while 26% ($n = 104$) never utilized the technology. Also, teachers infrequently utilized animated tutorials, as the majority of participants ($n = 266$; 72%) never utilized the technology (Table 3).

Table 3
Comparison of Teacher Usage Frequency of Technology

Technology Type	N	M	SD
Create/edit/share documents	372	4.23	1.70
Class/teacher website	372	3.56	1.99
Video sharing	370	3.23	1.70
Classroom management	371	3.08	2.09
Formative or summative assessment	371	2.99	1.78
Geospatial programs	371	2.88	1.43
Asynchronous communication	372	2.86	1.93
Social networks	371	1.79	1.43
Photo sharing	370	1.78	1.31
Animated tutorials	370	1.58	1.21
Podcasts	370	1.54	1.09
Role play/simulation	371	1.52	1.05
Microblogging	370	1.50	1.08

Notes. 1 = never, 2 = a few times a year, 3 = a few times a semester, 4 = monthly, 5 = weekly, 6 = daily.

Social studies teachers may consider increased usage of animated tutorials to encourage student learning outside of the classroom. If students learn a new technology through an online tutorial outside of class, less class time may be required to teach the technology itself. As a result, class time for the utilization of technology would be maximized and the teacher may help individual students throughout the lesson.

Research Area 4. Research Area 4 examined perceived effectiveness of the same selected technologies. Document creation was viewed most positively, as the majority of respondents labeled it moderately effective ($n = 108$; 27%) or extremely effective ($n = 184$; 46%). In addition, over half of respondents ($n = 214$; 59%) perceived assessment tools, learning and classroom management ($n = 202$; 51%), and asynchronous communication ($n = 198$; 52%) technologies to be effective (Table 4).

Teachers indicated class websites were very beneficial for class use. A teacher's ability to communicate related information to an entire class may be of large benefit. For example, a teacher may be able to post all assignments, readings, and outside resources, such as hyperlinks, embedded videos, online textbooks, and study guides. A well-executed website may also provide a calendar along with all course resources for the entire year. The majority of respondents considered social media to be either not at all ($n = 152$; 38%) or slightly ($n = 86$; 20%) effective. Teachers also indicated a low perception of podcasts. Most respondents felt they were not effective ($n = 204$, 51%) and only 30% ($n = 107$) felt they were either moderately or extremely effective.

Table 4
Comparison of Teacher Perceived Effectiveness of Technologies

Technology Type	N	M	SD
Create/edit/share documents	371	4.15	1.10
Class/teacher website	372	3.76	1.24
Formative or summative assessment	370	3.69	1.22
Classroom management	371	3.47	1.32
Video sharing	370	3.40	1.27
Asynchronous communication	371	3.36	1.33
Geospatial programs	371	3.32	1.26
Role play/simulation	369	2.98	1.18
Animated tutorials	369	2.89	1.16
Photo sharing	371	2.79	1.18
Microblogging	372	2.71	1.20
Podcasts	370	2.77	1.40
Social networks	371	2.47	1.37

Notes. 1 = not at all, 2 = slightly, 3 = neutral, 4 = moderately, 5 = extremely.

Research Area 5. The fifth research area described teacher usage frequency of instructional software programs. As the amount of available online tools for learning has increased, along with it has come a need for Internet access. Most respondents reported utilizing an Internet browser on either a weekly ($n = 104$; 26%) or daily ($n = 218$; 55%) basis. Other software used at least once a week by a majority of respondents were learning management systems ($n = 276$; 70%), word processors ($n = 266$; 68%), and presentation programs ($n = 210$; 53%). Learning management systems had the highest standard deviation of any variable as 28% ($n = 106$) never used the software. This gap may be attributed to a school district's financial resources or professional development programs. Video editing ($n = 270$; 68%) and photo editing ($n = 244$; 61%) were both likely to never be used or used only a few times a year. Table 5 lists specific types of software programs and descriptive statistics regarding their frequencies of use.

Table 5
Comparison of Teacher Usage Frequency of Software Programs

Technology Type	N	M	SD
Internet browser	376	5.22	1.27
Word processing	377	4.81	1.51
Learning management systems	375	4.63	1.96
Presentation programs	374	4.25	1.69
Video/audio player	376	3.18	1.77
Spreadsheets	376	3.06	1.73
Photo editing	376	2.20	1.43
Video editing	375	2.03	1.29

Notes. 1 = never, 2 = a few times a year, 3 = a few times a semester, 4 = monthly, 5 = weekly, 6 = daily.

Research Area 6. Research Area 6 explored teacher perceptions of software program effectiveness. Internet browser ($n = 342$; 87%), word processing ($n = 318$; 80%), presentation ($n = 310$; 78%) and learning management systems ($n = 281$; 70%) were reported to have the highest levels of moderate or extreme effectiveness. These findings suggested that these types of software programs were the most used and best perceived technologies in the teaching of social studies. Respondents perceived learning management systems as a moderately effective educational technology.

The vast majority of teachers ($n = 266$; 68%) perceived the technology as either moderately or extremely effective. Only 12% ($n = 51$) of respondents perceived learning management systems as “not at all” effective. Photo and video editing reported the lowest usage frequencies and perception averages. While many respondents viewed photo ($n = 144$; 36%) and video editing ($n = 132$; 33%) as not at all or slightly effective, 53% ($n = 212$) indicated audio/video players were moderately or extremely effective. Table 6 lists types of software measured for effectiveness.

Table 6
Comparison of Teacher Perceived Effectiveness of Software Programs

Technology Type	<i>N</i>	<i>M</i>	<i>SD</i>
Internet browser	376	4.50	0.74
Word processing	375	4.27	0.99
Presentation programs	374	4.23	1.11
Learning management systems	374	4.18	1.17
Video/audio player	373	3.42	1.32
Spreadsheets	374	3.21	1.32
Video editing	375	2.93	1.24
Photo editing	376	2.81	1.21

Notes. 1 = not at all, 2 = slightly, 3 = neutral, 4 = moderately, 5 = extremely.

Research Area 7. The final research area examined barriers to technology integration. Financial cost was identified as being either a moderate ($n = 142$; 35%) or extreme barrier ($n = 98$; 22%) by most participants. A minority ($n = 56$; 13%) viewed it as not a barrier at all. The majority of respondents indicated student knowledge of technology as a moderate or extreme barrier ($n = 248$; 63%). This result may indicate that students are not receiving appropriate instruction on the usage of educational technology.

Participants identified appropriate preparation time related to technology integration, along with student access to technology and the Internet at home, as additional significant barriers. The findings revealed student interest in technology as the smallest barrier. In particular, 71% ($n = 251$) perceived student interest in technology as no barrier at all. This finding would suggest that teachers properly train students on proper usage of technology. With appropriate levels of interest and knowledge, students are more likely to use technology during the learning process in an effective manner. Teacher knowledge, access, and interest in technology were seen as minimal barriers to technology inclusion (Table 7).

Table 7
Teacher Perceptions of Barriers to Technology Integration

Barrier	N	M	SD
Financial cost	369	2.83	1.02
Student knowledge of technology	371	2.79	1.18
Time to incorporate technologies into lesson plan	370	2.74	0.95
Student access to technology at home	367	2.53	0.95
Student access to Internet at home	365	2.53	0.95
Class time for students to utilize technology	368	2.40	1.02
Student access to technology at school	367	2.19	1.04
My interest in technology	368	1.95	0.97
Teacher access to technology	370	1.92	0.90
My knowledge of technology	369	1.61	0.84
Student interest in technology	369	1.54	0.80

Notes. 1 = not a barrier, 2 = somewhat of a barrier, 3 = moderate barrier, 4 = extreme barrier.

Discussion

The research described herein aimed to provide current insight into social studies teachers' usage and perceptions related to technology integration. Findings from this survey extended the literature related to technology acquisition, usage, and perceptions of effectiveness. By better understanding technology usage in the field, educators may begin to address gaps within teacher education programs and current practice. A second extension of the literature is recognition of the largest challenges social studies teachers face related to technology. In particular, it provides an opportunity for discussion of the negative impact of financial resources and student knowledge of technology. A focus on social studies teachers rather than educators as a whole provided a clearer picture of technology usage within the subject area.

Survey responses implied that social studies teachers most often acquired new skills and adopted technologies based upon interactions with peers. Over half of respondents often or always acquired new proficiency from other faculty or staff. Prior research found that teachers who exchange ideas related to technology with coworkers have higher levels of motivation and effectiveness (Johnson et al., 2015). To promote in-school practice, teachers may designate a shared planning period (i.e., a professional learning community) to discuss and model various technologies.

Teacher educators may choose to designate class time for discussion related to technology adoption as a class or with subject-specific classmates. A second option may be online discussion boards for preservice students to share new technologies and discuss theory with peers.

Workshops or peer-to-peer training sessions led by professional teachers to introduce new technologies and pedagogy may be an effective tool within teacher preparation programs. These activities may help students discover and learn technology in a more relaxed and comfortable environment. Additionally, the creation and maintenance of a student-generated technology resource bank may reduce time searching for technologies. This information can help teacher educators design class assignments and encourage to seek out grade-level or subject area technologies.

Document creation, class websites, and assessment were perceived as the most effective uses of technology. Compared to a nationwide study of public school teachers (Gray, Thomas, & Lewis, 2010), respondents utilized these technologies on a more frequent basis. This finding should encourage teacher training programs to focus on technologies such as Google Docs and Slides to offer a variety of formats to demonstrate understanding and knowledge in a medium of the student's choice (van Lieshout, Egyedi, & Bjiker, 2018).

Although respondents indicated high levels of usage, social studies teachers still incorporate this technology less than in other subject areas. In order to address the disparity, professionals in the field should take it upon themselves to learn new technologies. This recommendation also applies to social studies teacher preparation programs, which may seek to collaborate with various subject areas to provide more cross-curricular opportunities for students.

Preservice social studies teachers, particularly those who seek to work in rural and urban learning communities, should be trained in the incorporation of various educational technologies. As a result, teacher educators must identify specific technologies to address the needs of these student populations. Examples may include the incorporation of social media or mobile applications in an educational setting. Though used infrequently, they provide students, especially those in urban schools, an ability to communicate with teachers and classmates that they may not have in a physical classroom (Karchmer-Klein et al., 2017).

The effective incorporation of video within the social studies classroom is another topic that may hold value within teacher educator programs. Typically, these schools feature higher percentages of students with learning disabilities and language difficulties who could benefit greatly from visual learning (Yentes & Gaskill, 2015).

Limitations

Research participants were limited to Grades 6-12 social studies teachers in a mid-Atlantic state public school during the 2017-2018 academic year. As a result, the sample omitted teachers from private schools. In addition, responses hailed from only one geographic region of the country. Social studies teachers in different locations may utilize and perceive technologies differently than do those from the participating state.

A second limitation was the indirect contact with participants. An email was sent to school principals with a request to forward the message to each of their social studies faculty members. As a result, it is unlikely the survey reached each member of the population. In addition, I received multiple inaccurate email addresses from the State Department of Education. In total, 483 (14%) emails were returned due to incorrect or no longer existent email addresses. Therefore, the survey did not reach each principal in the state.

A third limitation was limited access to particular school buildings or districts due to district-wide policies. School policy prohibited a small minority of principals to disseminate the survey to their faculty. Such districts cited policy which required prior approval by a school district superintendent. As a result, the possible sample size was reduced by schools unable to participate because of school policy.

Due to these limitations, the findings of this study are not generalizable. A final limitation is repetition analysis of an identical sample may result in alpha slippage. Family-wise alpha scores may have been reduced.

Conclusion

The findings provide multiple implications that may contribute to future research and practice. An analysis of social studies teachers' technology usage based upon geographic setting or socioeconomic level may lead to changes in education policy. Identification of learning and technology gaps within these schools may lead to policy focused on the advancement of teacher technology skills at the secondary level. As an example, the U.S. Departments of Education and Health and Human Services developed the *Early Learning and Educational Technology Policy Brief* (Lee, 2016) to promote appropriate use of technology in early learning settings. The program called for collaboration between researchers and media and app developers. In addition, the policy encouraged the development of research-based products for children up to 8 years of age. Secondary teachers may benefit from such a policy as a way to learn about new technologies and implementation strategies for their specific student population.

Another potential benefit of this research is to promote best practices at the district, state, or national level. In schools, department alignment may provide consistency for both teachers and students. In addition, this research may serve as a foundation for subject-specific workshops and seminars in an effort to promote consistent and effective tools and strategies.

If teachers assist curriculum delivery with technology used by students in their daily life, it can have a positive impact on instruction. This research revealed multiple effective technologies for instruction of social studies content. As a result, best practices should include the incorporation of various technologies to demonstrate mastery.

Teachers indicated financial cost as the largest barrier to usage. To best prepare students, teacher preparation programs should make students aware of free or low-cost education software or mobile apps for use on laptops, smartphones, and tablets. If teacher education programs utilize subscription-based technologies, their students may find them unavailable within the district.

In addition, many school districts may not provide stipends for technology. This situation emphasizes the need for teacher educators to incorporate technology that allow anyone — including students, teachers, and parents — to use free of charge. This option may be of significant value in schools that feature a large population from a low socioeconomic background.

A quantitative study of those who teach future educators may examine schools of teacher preparation. An analysis of student preparation and assessment of technology usage may identify gaps in training. In addition, an investigation of technological resources within teacher preparation programs may indicate a lack of relevant technology and training.

A qualitative research in the form of volunteer interviews within K–12 and higher education may provide a deeper look into personal expectations of technology usage. Participants may articulate how and why they select and employ specific technologies along with perceived benefits and limitations.

Teacher education programs are responsible for the preparation of professionals knowledgeable and confident in their ability to incorporate technology. In order to train preservice educators in technology, curriculum and assignments must reflect current practice. Because universities often have access to the latest research, teacher educators should model effective integration strategies via content delivery, communication, and

assignments. Finally, preservice students should utilize various technologies and differentiated teaching activities to develop a specific plan for usage in their first classroom.

References

Avwiri, H. E. (2016). Emerging trends in science education in a dynamic academic environment. *Journal of Education and Practice*, 7(2), 31–38.

Babatunde, D. A., Benedict, T. A., & Adu, E. O. (2016). Social studies teachers' perception of concept of integration in social studies curriculum. *International Journal of Educational Sciences*, 14, 1-6. doi: [10.1080/09751122.2016.11890472](https://doi.org/10.1080/09751122.2016.11890472)

Berson, M. J. (1996). Effectiveness of computer technology in the social studies: A review of the literature. *Journal of Research on Computing in Education*, 28, 486–499. doi: [10.1080/08886504.1996.10782179](https://doi.org/10.1080/08886504.1996.10782179)

Bolick, C. M. (2017). The diffusion of technology into the social studies. In M. M. Manfra & C. M. Bolick (Eds.), *The Wiley handbook of social studies research* (pp. 499–517). doi: [10.1002/9781118768747.ch22](https://doi.org/10.1002/9781118768747.ch22)

Chai, C. S., & Kong, S.-C. (2017). Professional learning for 21st century education. *Journal of Computers in Education*, 4, 1–4. doi: [10.1007/s40692-016-0069-y](https://doi.org/10.1007/s40692-016-0069-y)

Chen, A. (2015, November 6). The ever-growing ed-tech market. *The Atlantic*. Retrieved from <https://www.theatlantic.com/education/archive/2015/11/quantifying-classroom-tech-market/414244/>

Coley, M. D., Warner, W. J., Stair, K. S., Flowers, J. L., & Croom, D. B. (2015). Technology usage of Tennessee agriculture teachers. *Journal of Agricultural Education*, 56(3), 35–51. doi: [10.5032/jae.2015.03035](https://doi.org/10.5032/jae.2015.03035)

Doolittle, P. E., & Hicks, D. (2003). Constructivism as a theoretical foundation for the use of technology in social studies. *Theory & Research in Social Education*, 31, 72–104. doi: [10.1080/00933104.2003.10473216](https://doi.org/10.1080/00933104.2003.10473216)

Falloon, G., & Khoo, E. (2014). Exploring young students' talk in iPad-supported collaborative learning environments. *Computers & Education*, 77, 13–28. doi: [10.1016/j.compedu.2014.04.008](https://doi.org/10.1016/j.compedu.2014.04.008)

Friedman, A. M. (2006). The Internet's potential to affect social studies and democracy. *International Journal of Social Education*, 21, 44-58.

Friedman, A. M. (2014). "Computer as data gatherer" for a new generation: Martorella's predictions, the past, the present, and the future of technology in social studies. *Contemporary Issues in Technology and Teacher Education*, 14(1), 10-24. Retrieved from <https://www.citejournal.org/volume-14/issue-1-14/social-studies/computer-as-data-gatherer-for-a-new-generation-martorellas-predictions-the-past-the-present-and-the-future-of-technology-in-social-studies>

Goldstein, D., & Alibrandi, M. (2013). Integrating GIS in the middle school curriculum: Impacts on diverse students' standardized test scores. *Journal of Geography*, 112, 68-74. doi: [10.1080/00221341.2012.692703](https://doi.org/10.1080/00221341.2012.692703)

Gray, L., Thomas, N., & Lewis, L. (2010, May). Teachers' use of educational technology in U.S. public schools: 2009. Retrieved from <https://files.eric.ed.gov/fulltext/ED509514.pdf>

Gulbahar, Y., & Guven, I. (2008). A survey on ICT usage and the perceptions of social studies teachers in Turkey. *Educational Technology & Society*, 11(3), 37-51.

Heafner, T. L. (2004). Using technology to motivate students to learn social studies. *Contemporary Issues in Technology and Teacher Education*, 4(1), 42-53. Retrieved from <https://www.citejournal.org/volume-4/issue-1-04/social-studies/using-technology-to-motivate-students-to-learn-social-studies>

Heafner, T. L. (2013). Secondary social studies teachers' perceptions of effective technology practice. *International Journal of Computer and Information Technology*, 2, 270-278.

Herold, B. (2016, July 5). Teachers in high-poverty schools less confident in ed-tech skills, survey finds. *EdWeek Market Brief*. Retrieved from <https://marketbrief.edweek.org/marketplace-k-12/teachers-in-high-poverty-schools-less-confident-in-ed-tech-skills-survey-finds/>

Hicks, D., Lee, J. K., Berson, M., Bolick, C., & Diem, R. (2014). Guidelines for using technology to prepare social studies teachers. *Contemporary Issues in Technology and Teacher Education*, 14(4), 433-450. Retrieved from <https://www.citejournal.org/volume-14/issue-4-14/social-studies/guidelines-for-using-technology-to-prepare-social-studies-teachers>

Hong, J. E. (2016). Social studies teachers' views of ICT integration. *Review of International Geographical Education Online*, 6, 32-48.

Januszewski, A., & Molenda, M. (Eds.). (2013). *Educational technology: A definition with commentary* (2nd ed.). New York, NY: Taylor & Francis.

Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2015). *NMC horizon report: 2015 K-12 edition*. Austin, TX: The New Media Consortium.

Karchmer-Klein, R., Mouza, C., Shinas, V. H., & Park, S. (2017). Patterns in teachers' instructional design when integrating apps in middle school content-area teaching. *Journal of Digital Learning in Teacher Education*, 33, 91-102. doi: [10.1080/21532974.2017.1305305](https://doi.org/10.1080/21532974.2017.1305305)

Kotrlik, J. W., & Redmann, D. H. (2009). Analysis of teachers' adoption of technology for use in instruction in seven career and technical education programs. *Career and Technical Education Research*, 34, 47-77. doi: [10.5328/CTER34.1.47](https://doi.org/10.5328/CTER34.1.47)

Kraft, M. A., & Papay, J. P. (2014). Can professional environments in schools promote teacher development? Explaining heterogeneity in returns to teaching experience. *Educational Evaluation and Policy Analysis*, 36, 476-500. doi: [10.3102/O162373713519496](https://doi.org/10.3102/O162373713519496)

Lanahan, B. K., & Yeager, E. A. (2008). Practicing teachers as elementary social studies methods instructors: Issues in preparing preservice elementary teachers. *Social Studies Research and Practice Journal*, 3, 10-27.

Lee, J. (2016). *Early learning and educational technology policy brief*. Washington, DC: Office of Educational Technology, US Department of Education.

Lee, J. K., & Probert, J. (2010). Civilization III and whole-class play in high school social studies. *Journal of Social Studies Research*, 34, 1-28.

Manfra, M., Friedman, A., Hammond, T., & Lee, J. (2009, March 2). Peering behind the curtain: Digital history, historiography, and secondary social studies methods. In I. Gibson, R. Weber, K. McFerrin, R. Carlsen, & D. A. Willis (Eds.), *Proceedings of SITE 2009: Society for Information Technology & Teacher Education International Conference* (pp. 3908–3916). Chesapeake, VA: Association for the Advancement of Computing in Education.

Mouza, C., & Barrett-Greenly, T. (2015). Bridging the *app gap*: An examination of a professional development initiative on mobile learning in urban schools. *Computers & Education*, 88, 1–14. doi: [10.1016/j.compedu.2015.04.009](https://doi.org/10.1016/j.compedu.2015.04.009)

National Center for Education Statistics. (2016). Fast facts. Retrieved from <https://nces.ed.gov/fastfacts/display.asp?id=96>

National Center for Education Statistics. (2016). *Digest of education statistics*. Retrieved from https://nces.ed.gov/programs/digest/d14/tables/dt14_218.20.asp

National Council for the Social Studies. (2018). *National curriculum standards for social studies: Chapter 2—The themes of social studies*. Retrieved from <https://www.socialstudies.org/standards/strands>

Partnership for 21st Century Learning. (2016, January). *Framework for 21st century learning*. Retrieved from <http://www.p21.org/our-work/p21-framework>

Shriner, M., Clark, D. A., Nail, M., Schlee, B. M., & Libler, R. (2010). Social studies instruction: Changing teacher confidence in classrooms enhanced by technology. *The Social Studies*, 101, 37-45. doi: [10.1080/00377990903283999](https://doi.org/10.1080/00377990903283999)

Song, S. Y., & Samimy, K. (2015). The beliefs of secondary content teachers of English language learners regarding language learning and teaching. *International Journal of TESOL and Learning*, 4(1), 3-19.

Spencer, K. (2017). *The psychology of educational technology and instructional media* (e-book). London, England: Routledge. (Original work published 1988)

United States Department of Education. (2010). *Transforming American education: Learning powered by technology*. Retrieved from <https://www.ed.gov/sites/default/files/netp2010.pdf>

van Lieshout, M., Egyedi, T. M., & Bijker, W. E. (2018). *Social learning technologies: The introduction of multimedia in education*. London, England: Routledge. (Original work published 2001)

Yentes, J., & Gaskill, M. (2015, March 2). Technology use in rural and urban schools: Challenges and opportunities in the Midwest. In P. Albion, G. Bull, L. Bell, L. Liu, & D. Gibson (Eds.), *Proceedings of SITE 2009: Society for Information Technology & Teacher Education International Conference* (pp. 1415–1423). Chesapeake, VA: Association for the Advancement of Computing in Education.

Zazulak, S. (2016, September 15). Technology trends in English language learning and teaching (weblog). *Pearson English*. Retrieved from <https://www.english.com/blog/technology-trends-in-english/>

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