

## CLIMBING THE STAIRS: PRE-SERVICE SOCIAL STUDIES TEACHERS' PERCEPTIONS OF TECHNOLOGY INTEGRATION

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In a recent study of two San Francisco area high schools, education researcher Larry Cuban introduces readers to Alison Piro, an eleventh-grade humanities teacher with five years in the classroom, as an exemplar of technology use.<sup>1</sup> When Piro is first introduced, one of her students is using an overhead projector as a spotlight to draw attention to a dramatic speech from Frederick Douglass. Even though this use of technology is fairly typical by most standards, Cuban contends that this episode showed the heart of her teaching, “dramatic, diligently planned, and even innovative in its use of technology.”<sup>2</sup> Piro regularly integrated various computer technologies into her classroom, but recognized that technology was not always the best means by which to accomplish her objectives.

While Cuban acknowledges several other teachers with similar attributes, he contends that these examples were exceptions in the classroom and not the norm. Despite having access to computers and other technologies, the teachers he observed generally clung to more traditional, teacher-centered practices and did not attempt to enhance their teaching with technology.

Howard Mehlinger and Susan Powers emphasize the significance of schools of education in how future teachers learn to integrate technology into their teaching. First of all, they refer to technology as the “new electronic media, such as computers and video and the associated hardware, networks and software that enable them to function.”<sup>3</sup> While many schools of education concentrate on the productivity advantages that technology offers, Mehlinger and Powers argue that the proper focus should be on its ability to improve instruction. They acknowledge that a variety of factors limit the efforts of college faculty to integrate technology. These factors include lack of funding, of professional development opportunities, of support for experimentation, and no technology plan. Yet, they argue that it is a challenge worth pursuing. Mehlinger and Powers particularly draw attention to this challenge by arguing:

The need for teachers who can employ technology successfully in their classrooms has never been greater than it is today. The public expects SCDEs (schools, colleges and departments of education) to prepare teachers that the schools require; the schools are demanding teachers who can use technology. The challenge to teacher education institutions is great...but those that do meet the challenge will gain new respect from their colleagues within the college or university and from the schools they serve.<sup>4</sup>

Based on reports from teacher education programs and observations from schools across the country, Mehlinger and Powers conclude that while technology is having a positive impact in some classrooms, in many others it is having little influence.

Several recent reports note that colleges of education could do a better job in technology training.<sup>5</sup> With an already full slate of course offerings, most colleges of education have struggled to find ways not only to bring their instructors up to speed with advances in technology, but also to add more time for future teachers to observe the use of technology in meaningful ways. The most evident suggestions in these reports include more modeling of technology by instructors, as well as stronger and clearer technology standards by which to guide colleges of education, and more collaboration between colleges of education. But perhaps most apparent in all of these reports is the call for teachers to learn how to integrate technology into their instruction rather than just learning technology skills in isolation.

The proclaimed need to integrate technology is particularly evident in the social studies. Social studies educators are becoming increasingly aware of the concerns expressed in the national reports, and more college methods professors have begun to write about their experiences integrating technology into their courses.<sup>6</sup> Furthermore, Meyers argues that social studies educators must expose pre-service teachers to technology “in as many different settings as possible, and must provide connections from the methods classroom to the practical setting.”<sup>7</sup> If schools of education increasingly expose their students to technology in practical settings, Meyers and others believe that the initial transition into teaching will be much smoother.

To gain a deeper understanding of the integration of technology in the social studies, Mason, et al. have provided an excellent framework for preparing social studies teachers.<sup>8</sup> This framework presents five principles that should direct technology infusion in teacher education programs:

- Extend learning beyond what can be done without technology.
- Introduce technology in context.
- Include opportunities for students to study relationships among science, technology, and society.
- Foster the development of the skills, knowledge, and participation needed by citizens in a democratic society.
- Contribute to the research and evaluation of social studies and technology.

Although Mason et al. acknowledge that these five principles represent the “minimal platform for the use of technology in the social studies,” they argue that it is ultimately up to the individual instructor to truly reform social studies classrooms.<sup>9</sup> But even though this training in technology should begin in teacher education programs, the authors maintain that it is necessary to continue to do so throughout the professional life of the teacher if it is to make a real difference in social studies classrooms.

#### The STAIRS Framework

In an effort to address recommendations and better respond to student needs, a large public university in the Southeastern United States implemented a graduate course designed for its secondary teacher education program entitled: “Integrating Technology into the Social Studies Classroom.” Based on experiences from the first two years of the course, relevant research, and the realities of middle schools and high schools around the state, the instructors formulated a framework by which to organize this particular course. Throughout the semester, this framework helped to guide classroom activities, individual assignments, and student presentations. This framework is best described by the acronym STAIRS:

- **S**ocial Studies Content
- **T**echnical Skills
- **A**ssessment
- **I**ntegration
- **R**eadiness
- **S**tandards

Throughout the semester, students in this course completed a number of assignments designed not only to improve confidence in their technical skills, but also to give them the ability to apply these skills in the various social studies subjects. Among the competencies students completed during the term were activities involving word processing, Web page design, *PowerPoint*, databases, spreadsheets, and Web publishing. At the end of the course, students completed a “technology-rich lesson” that served as part of a larger unit required in their methods class. Many of these competencies, along with other activities, were not only appropriate for fulfilling course objectives, but also could be included in an electronic portfolio, which was required prior to completing the program.

### *Social Studies Content*

The National Council for the Social Studies (NCSS) defines social studies as the multidisciplinary study of many subjects including, but not limited to, anthropology, archaeology, economics, geography, history, law, philosophy, political science, psychology, religion, and sociology.<sup>10</sup> In distinguishing the social studies from other disciplines, the organization emphasizes the unique nature of each of the disciplines that make up the social studies. Students, NCSS argues, should “begin to understand, appreciate, and apply knowledge, processes, and attitudes from academic disciplines.”<sup>11</sup> Using the NCSS publication *Surfing Social Studies: The Internet Book* as a guide, the course focused on individual subject areas to include history, geography, government, economics, and other disciplines within the social studies.<sup>12</sup>

### *Technical Skills*

While students moved through the various content areas in the course, they also developed a number of technical skills, including the creation of Web pages, *PowerPoint* presentations, and databases. These skills were developed in accordance with the International Society for Technology in Education’s (ISTE) *National Educational Technology Standards for Teachers*.<sup>13</sup> This publication lists six categories for teachers desiring to use technology in their classrooms:

- I. Technology Operations and Concepts
- II. Planning and Designing Learning Environments and Experiences
- III. Teaching, Learning and Curriculum
- IV. Assessment and Evaluation
- V. Productivity and Professional Practice
- VI. Social, Ethical, Legal, and Human Issues

While technology applications and concepts may apply most directly to the skills learned in this class, each of the other areas played an important role in helping students apply these skills to the social studies curriculum.

### *Assessment*

As suggested in the *National Educational Technology Standards for Teachers*, students in the course were challenged to use technology in more student-centered ways and take an active, inquiry-based approach to learning.<sup>14</sup> Since most pre-service teachers in the class had only experienced traditional assessment strategies, the STAIRS framework emphasized authentic and alternative assessment strategies.<sup>15</sup> As part of this approach to assessment, students were introduced to rubrics and created their own for several of the assignments in the course. In addition, the course instructor provided additional support in understanding rubrics by using them to grade technical competencies and other assignments. Consequently, these future teachers discussed the intricacies of grading technology assignments in a constructivist environment and compared these techniques with more traditional grading methods.<sup>16</sup>

### *Integration*

Integration refers to using technology as an essential part of the curriculum, not just as a supplement to existing teaching practices. Laurie Dias echoes the belief that technology is more than an add-on and argues that true integration takes place when, “it is used in a seamless manner to support and extend curriculum objectives and to engage students in meaningful learning.”<sup>17</sup> In discussing the best means by which to integrate technology in the classroom, students in this course were introduced to the five attributes of powerful social studies as proposed by NCSS: meaningful, integrative, value-based, challenging, and active.<sup>18</sup> Stephen Rose and Phyllis Fernlund apply these five characteristics to using technology in the social studies classroom, and reason that before using any technology-based product

such as software, the Internet, or other multimedia source, teachers should ask if the use of technology fulfills these objectives.<sup>19</sup>

### *Readiness*

One of the major goals of this course was for students to be given ample opportunities to teach with the technologies that they were learning so that they would be ready to use technology in their future classrooms. One important component of this category was that the instructor would model appropriate use of technology throughout the course. Rachel Vannatta and others have noted the importance of having “technology-rich instruction” modeled for teachers in their training with technology.<sup>20</sup> While students were given numerous occasions to use technology to teach to their peers, many took the opportunity to teach with technology in their field experience through such activities as *PowerPoint* lectures, Internet searches, and Web page design.

### *Standards*

A final piece of the framework that played a key role in the learning process was the importance of both social studies and technology standards. In the course, students regularly examined both the NCSS curriculum standards and state content standards to guide them through assignments and eventually in the creation of a thorough unit plan.<sup>21</sup> In this process, students also explored the ISTE standards for students and teachers.<sup>22</sup> As part of the comprehensive unit required by their methods class, the students in this study emphasized both content and technology standards.

## Methodology

### *Setting and Participants*

Since this study sought to address the issue of how pre-service teachers in a graduate social studies teacher preparation program perceive the usefulness of the STAIRS model to help them learn how to integrate technology into their instruction, we chose to use a case study approach. Advocates of such an approach argue that this method is especially appropriate when a contemporary phenomenon is being studied in a real setting.<sup>23</sup>

The setting of this case study was a course within a large university’s teacher preparation program entitled “Integrating Technology Into the Social Studies Classroom.” Simultaneous with this course, the students in this study also received instruction in effective teaching strategies, social studies methods, and completed two field experiences in local secondary schools. In the semester following this course, students were required to complete their ten-week student teaching internship. The college course in this study included fifteen pre-service teachers, from a variety of backgrounds and with a wide range of technological expertise (see Table 1). These broad categories were developed to provide a general insight into the technological expertise of the participants in this study. For many of these students, this was their first exposure to technology as applied to classroom use. While only three class members had previously taken a technology course, no one in the class considered himself or herself to be an expert. The course took place in the college’s computer lab, which contained a master teaching unit as well as sufficient networked computers for each student.

Table 1  
Technology Background of Class Members

<b>Skill</b>	<b>Expert</b>	<b>Intermediate</b>	<b>Beginner</b>	<b>No Experience</b>
Email	6	8	1	0
Word processing and attachments	2	11	2	0
Web search	3	12	0	0

Creating a Web page	0	3	6	6
Scanning/changing images	0	4	7	4
Spreadsheets	0	1	12	2
PowerPoint	0	3	7	5
Downloading files (e.g., mp3)	1	5	8	1
Desktop publishing	0	5	10	0
Overall technology proficiency	0	5	10	0

### *Data Sources*

Data sources consisted of documents, observations, the instructor’s journal, and taped interviews. A wide variety of student work contributed to the findings, including technical competencies such as the creation of Web pages or databases, written reflections on technology growth taken at the beginning, middle, and end of the course, and responses to three online threaded discussions. In addition, the instructor maintained a journal of classroom observations not only to reflect upon the quality of various class activities, but also to address individual components of the STAIRS framework. Finally, at the end of the semester, interviews were conducted with selected students of varying technology ability levels. These interviews were recorded, transcribed and then erased to protect the identity of the participants

### *Data Analysis*

Data analysis was conducted following Nancy Dana and Diane Silva’s four-step process for teacher inquirers.<sup>24</sup> First of all, the researchers read through all of the interviews, documents, journals, and bulletin boards in order to form a detailed *description* of the class and the various components of the inquiry. Second, we began to ask deeper questions about our data and began the *sense-making* process in which we developed a number of categories that fit patterns in the study. In this step, the instructor’s journal was particularly helpful for exploring themes and patterns. Next, based on our major categories, we undertook an *interpretation* of the data that showed more directly how the participants viewed the various components of the STAIRS model and the class as a whole. Finally, we looked at the *implications* of our study for practice and how social studies educators might be able to use this model in their own settings. These implications were condensed and are included in Conclusions and Recommendations section of this article.

## Findings

### *Social Studies Content*

Overall, pre-service teachers found this model to be very effective for preparing them to use technology in the social studies classroom. In their initial reflections for the class, they asserted their confidence with social studies content knowledge. All fifteen students in the class expressed a sincere desire to use the knowledge they had gained as history majors, and, with the exception of economics, most of them said that they could teach any other area of the social studies as well. One student, Greg, noted, “All together, I feel most confident with my knowledge of historical content but feel it is important to be flexible and know that if I had to teach the other subjects, I most certainly could.”

The first threaded discussion that students participated in asked what social studies content area was best suited for technology. Several students said that most social studies subjects had a strong technological component, but most felt that history was the area best represented through technology. Interestingly, Matt took the question to an extreme and responded, “The field of history is truly blessed by the advent of the technological classroom. It allows us to share our research, expand our learning, and broaden our horizons.” He added that because most of his fellow students were history majors, it might just be the most important area because it is for so many people a “true passion.”

Because most of the pre-service teachers were undergraduate history majors, they appreciated the exposure to other subject areas. James added,

I don't know if it would have made a difference in my learning, but it forced me to not just do history. It forced me to do sociology, to do economics, geography. But otherwise I would have stuck to just World and American History because those are the subjects that I was the most familiar with.

While students were able to examine any social studies content they desired on several assignments such as a significant links page and the final technology-rich lesson, the overall focus on a variety of content areas was well received by the class.

### *Technical Skills*

When discussing the technology backgrounds of the students in this course (see Table 1), it is apparent that most of them were comfortable with email, word processing, and Web searches, but had little to no experience with *PowerPoint*, Web page authoring, spreadsheets, or any of the other competencies to be mastered in the course. While students improved their proficiency in using technical skills, they nonetheless expressed a lot of frustration along the way. One student for example, Marla, who possessed limited technology skills at the beginning of the course, had an interesting experience during a class activity on spreadsheets at the beginning of the semester. For some reason, every time she tried to type a y, the letter z appeared on the keyboard and vice versa. After ten to fifteen minutes of frustration, she announced to the class that “the computer gods are out to get me” and stopped trying to work. Even with this initial trepidation, Marla noted in her final written reflection that “Except for that y’s making z’s and z’s making y’s fiasco, I learned a great deal and can now work with computers with some level of competency.”

At the end of the course, when students were asked to reflect on their level of confidence with technology, they brought their technical skills to the forefront. While several mentioned that they could now evaluate resources more effectively or come up with more authentic assessments, *technical skills* was the component they most frequently cited. In their final interviews, several of these future teachers mentioned their excitement about learning to integrate databases, Web publishing, and Internet search strategies into their social studies instruction. They felt especially proud of having learned how to create effective Web pages focused on social studies content during the course of the semester. When asked in what area of technology they had grown the most, all of the interviewees quickly said Web pages. A typical comment came from James who boasted, “Undoubtedly Web programming, making Web pages. Between doing the competencies for the class and playing with it on my own, I feel pretty confident now.” As a result, four students even took the initiative to design Web pages to use during their student teaching the following semester and incorporated skills they had learned during the class into this experience.

### *Assessment*

While assessment was not emphasized as much as social studies content or technical skills in the course, the students in this study still perceived it as an important part of learning how to use technology. When discussing how to best assess student learning through technology, these pre-service teachers generally held that while technology skills were important for their students to possess, they would place a greater emphasis on social studies content. Many also felt that technology projects provided a viable alternative to traditional means of evaluation.

In a threaded discussion concerning the role of the teacher in integrating technology, Stephanie argued, “I would much rather assess a project where my students’ creativity and individuality is evidently displayed than grade a five-page paper that essentially regurgitates the encyclopedia.” Many pre-service teachers also noted that even though assignments using technology would be harder to assess than traditional tests and quizzes, they would still be willing to put forth the effort to evaluate more resourceful student work.

The final technical competency for the course was for partners to create a travel brochure, which included a short reflection commenting on how to best assess this type of assignment. Most students argued that accuracy in content information would be the most important attribute they would look for in a project, but they also mentioned neatness, grammar, creativity, and organization as being important in assessing what their own students had done. Some reflections included a detailed rubric by which to grade students on the brochure. Overall, the students in this study came to understand that assessment is a logical extension of using technology to present the content, and they saw this as an important part of what their role would be as teacher.

### *Integration*

In the process of learning how to integrate technology seamlessly into social studies lessons, these pre-service teachers clearly believed that technology should not permeate all aspects of every lesson. In a notable response from a threaded discussion, Greg supported this point and added, “I think that teachers should integrate technology into their lesson, not let the technology rule their lesson.” While acquiring these competencies may have forced students to use technology in ways that might not seem natural or comfortable, it did push them to think about technology’s role in the social studies curriculum.

In planning a technology-rich lesson for this course as part of a larger unit plan, the pre-service teachers experienced the difficulties of trying to make technology fit into a larger design while still meeting other curricular objectives. Responses in the final interviews were generally favorable towards integrating technology into a social studies unit or lesson, although James found the process to be artificial. He added, “My experience is that it tends to be sort of forced. It tends to be, well, we have to do a Web page to do what we could do just by talking about it for five minutes.” James concluded that integrating technology in a forced way was not only ineffective but also a waste of class time that could be used to engage in other meaningful activities.

Most of the other students in this course held more positive dispositions towards integrating technology into their social studies classes. These students emphasized such positives as technology’s ability to engage students in learning, and the Internet’s vast resources in helping students to find valuable information. Sally even said “Right now there’s almost always some technology in every lesson that I do” and that it helped to develop routines in her classes.

One issue that emerged in all of the interviews about integrating technology in the social studies was the perceived disparity between access to technology at the university and access in local public schools. While having individual networked computers, a projection unit, and laser printers provided an excellent atmosphere in which to teach at the university, such a setting did not conform to what the students saw in their field experience placements. Nevertheless, most of these students recognized the need to prepare themselves as much as possible for using the technology available to them. In one threaded discussion, Sally asserted,

We cannot ever stop being students of technology ourselves. One day the school systems will catch up and we will be able to use our knowledge of technology. But there are advancements being made everyday, and we must continue to educate ourselves so that the schools and the students do not pass us by.

Because schools have seen tremendous improvement in access to technology in the past five to ten years, according to *Technology Counts 2003*, it is important to provide pre-service teachers with experiences that show them not only the current state of technology in the schools, but also its future potential in terms of integration in social studies classrooms.<sup>25</sup>

### *Readiness*

In their initial reflections completed during the first week of the course, students expressed much trepidation about actually using technology in the classroom. While most said they felt confident standing in front of a group of adolescents, fewer said that they felt comfortable using technology in such situations. Marla even remarked that the only technology she needed was “an overhead projector, a TV/VCR combo, and maybe a record player.” Although this initial sentiment was consistent among the

students in this course, their comfort levels with technology increased throughout the semester as they were given more opportunities to demonstrate their use of technology in front of their own peers.

Using technology in front of their peers was one thing; however, the two field experiences during the same semester in the public schools gave some students the opportunity to use technology with secondary students and experience their reactions. Each pre-service teacher spent three weeks in a middle school social studies classroom and the same amount of time in a high school class, and in many cases was able to use technology. Celene, who initially said that she was very confident with technology, later remarked on how much she had learned during her middle school field experience:

During my (field) experiences, I have had several opportunities to utilize technology. For the first (field experience), I created a web-based activity about Mexico that the students spent three days on. They enjoyed it and were able to learn about Mexico for themselves. (Before taking this class I might have been compelled to show a video about Mexico.) I had a couple of reality checks when working with the web activity, however. I had some students who didn't know how to navigate a web site. I had others who couldn't go back in the browser. I also had several computers freeze while the students were on them and still others not loading the web pages. These events helped me overcome my fear of using technology in the classroom. They showed me that things can go wrong, and you've got to just go with what you have. I have always had a difficult time changing my plans around, but these experiences are helping me overcome my inflexibilities.

While teaching one's peers can provide some useful practice for developing pedagogical skills, as D. Mark Meyers has contended, the real learning comes when teaching in a classroom with actual students.<sup>26</sup> Fortunately, most of the pre-service teachers in this course, such as Celene, had the opportunity to teach with technology in either their middle school or high school field experience.

### *Standards*

The final step in the STAIRS framework, *standards*, was the area that appeared to be lacking in terms of the overall impact of the course. Although pre-service teachers learned about ISTE's *National Educational Technology Standards for Students* and related them to their technology rich lessons, they generally felt that the NCSS and state standards were more important in their own teaching than the technology standards.<sup>27</sup> James categorized the ISTE standards as "a little bit broad and a little bit bland," and he added that they had little impact on his approach to lesson planning. Most students in the course argued that the social studies standards that were emphasized in their methods class and in the schools where they were completing their field experience were very important, but technology standards rarely came into play.

In their interview responses, the major concern these students expressed, related to technology and standards, was time. While the pre-service teachers generally sought to integrate technology into their teaching, many expressed concerns that the state-mandated curriculum might restrict possible applications. For example, Sally recognized this problem and contended,

I think the only way that standards might affect my students is with time constraints. Like if I'm trying to get through the Revolutionary War by next week, in four days and they have a quiz. I'm not going to be able to do this great WebQuest activity because it takes too much time. That's the only thing I see with standards is that if we have to do these things like trying to get to WWII by the end of the year, you're not going to be able to spend two or three days doing a WebQuest on the Revolutionary War or have some leeway with what I am supposed to cover.

Marla reacted similarly,

As far as social studies time is concerned, if time is cut, you will not be able to use as much technology. You are going to have to get *x* amount of information out to meet our standards and not worry about technology. It could also be a nice break for students, apart from the drills they would be doing for state test.

Even among the pre-service teachers who had become the most proficient with technology, most realized that creating innovative lessons takes time. Although they had not begun to teach, they still recognized the time constraints that are put on educators. As a result, while these students acknowledged the importance of technology standards in social studies classrooms, many did not see how technology could fit into their lesson planning and class preparation.

## Summary

When asked to respond to the class as a whole, interviewees generally found that the STAIRS model prepared them well for the challenges they might encounter in the classroom. Stephanie shared her appreciation that the course was not just an exercise in computer savvy and added, “It taught me how to use technology in the classroom. Had it been just showing me how to use a word processor, I would have been disappointed, but it did show me as a teacher, how I could use it effectively.”

The final reflections the students wrote as part of their final examination also revealed an appreciation for the knowledge they had gained during the course. Much of this sentiment was based on how to effectively integrate technical competencies. Greg, who began the course with few technological skills, outlined his progress in using technology in the content area:

I stated in the original reflection that the technological devices I had a real confidence in using were the TV and VCR. I can now say that things have changed for me. My confidence has improved tenfold since I wrote that original reflection back in September. I always knew that I wanted to use technology to improve my social studies lessons and to motivate my students to learn, but before I took this class I didn't have the know-how to accomplish that goal [or here: in the social studies classroom; just to spruce it up a little and drive home the point a little stronger].

These future social studies teachers listed Internet searching skills, creating Web pages and making *PowerPoint* presentations as among the most valuable skills. However, in these same reflections, the students also indicated that they learned much more than technology skills in the course. Specifically, two themes emerged from the students' responses that have a direct impact on how they perceived the STAIRS model as a whole. First was the notion that using technology involves a great deal of flexibility on the part of the teacher. In talking about her initial attempts at using technology, Bonnie related the following recommendation:

First of all, as a teacher, I should be trained to be flexible. If everything goes right all the time in the classroom, the first time anything went wrong, it might put me in a tailspin. But if things fail every once in a while I'll be able to hone the skill of flexibility. Second, having my students see the teacher fail at something will cultivate the attitude within my classroom that failing at something is OK. If we want our lessons to be meaningful and have every student participate and voice their opinion, then we must have a classroom that is very tolerant. When the teacher fails, laughs it off, and tries something else the students will see that failing at one thing is simply an obstacle to be overcome on the way to a goal.

Several students related that experiences from their university courses and from their field experiences, when technology did not work as expected, had taught them they needed to have a backup plan. While some were well prepared, others learned the hard way about what happens when technology does not work.

A second theme that emerged from the final reflections was that learning about technology is going to be a continuous challenge throughout their professional career. Several pre-service teachers discussed the need for being lifelong learners themselves and to always look for ways to engage their students. James noted that the approach many teachers take to technology, trying to learn everything at once, is ineffective and he advocated taking “baby steps” in order to feel more comfortable about using it in the classroom. Greg similarly noted that he did not want to be a “dinosaur teacher” with regard to technology use and said that “thanks to this class I have a foundation that is solid enough that I don't think that I will ever have to worry about that problem.”

## Conclusions and Recommendations

One of the most difficult issues in trying to develop any type of course that involves technology is dealing with the different ability levels among students. Some of the students in the course had already taken technology classes in their undergraduate careers, while others came into the program with little to no technical expertise. An important question that we asked students early in the course was to assess their confidence in using technology. One of the most important attributes of this model is that it is rooted in the content area and the technology flows out of that content base. Students are able to move collectively through the integration process, and those students who were more technologically able

assisted in bringing novice technology users along at a greater speed than if the technology had been taught in isolation.

A critical component of teacher education programs advocating technology use is modeling effective instruction. In a threaded discussion, Stephanie clearly brought out this position:

The teacher as facilitator is one of the themes that we see over and over in this program and when considering technology, our vision should be no different. If we expect our students to communicate through a new medium such as technology, the most effective way to teach them is to use the resources ourselves. Modeling is the best way to show students just how important technology is.

In their final reflections, pre-service teachers noted an eagerness and excitement about using technology in their future social studies classrooms, but at the same time they acknowledged that keeping up with the latest technology innovations would require a constant commitment.

Although this study provides an important glimpse into how pre-service teachers view technology integration in the social studies, much remains to be learned about this on-going process. Following these pre-service teachers into their initial years of teaching is an important first step to see how effective this model can be in serving the needs of these students. Frans Doppen, one of the authors of this article, has begun this area of study with a case study of four first-year history teachers; however, much more needs to be done to understand the choices beginning social studies teachers make with regard to technology use.<sup>28</sup>

It is also important to recognize that this approach is only one model that has been found to be effective in a particular setting. As other models of technology integration may prove to be useful in different settings as well, we encourage similar studies of pre-service teachers emphasizing different parts of our model, or comparing it to different models all together.

A final area that also deserves additional attention is the need for an entire course based on integrating technology into a specific content area. While some colleges of education continue to require a separate technology course in their program with a focus on technical skills rather than a course grounded in the content area, many teacher education programs are moving towards an integrative approach in which technology is integrated into various components of an entire program.<sup>29</sup> In many of these programs, students are able to demonstrate what they have learned through an electronic portfolio or similar demonstration of technical and pedagogical competence. However, the biggest concern in such programs is that many professors do not include technology in their courses and that students do not have models on which to base their teaching. We found the “Integrating Technology into the Social Studies Classroom” course to be a good compromise between approaches, but deciding which of these approaches is best for pre-service social studies teachers should be a significant area for future research.

When asked about his overall experience in learning about integrating technology into the social studies classroom, James referred to the question of whether technology enables us to do something we couldn’t do before, or do better than before.<sup>30</sup>

While the STAIRS framework provides a solid foundation upon which to build technology integration for pre-service social studies teachers, it does not hold all of the answers for when and how to best use it in the classroom. Our discussion of the STAIRS framework demonstrates that the process of reaching towards technology integration is difficult and requires collaboration, cooperation, and reflection. It is an uphill battle, and teachers require constant support with each step they take if they are to achieve their goals for meaningful integration. We hope that this framework will not only encourage pre-service social studies teachers to reach these goals for technology integration, but also to challenge social studies teacher educators to reflect critically on the role technology plays not only in their courses but in their entire teacher preparation program as well.

## NOTES

1. Larry Cuban, *Oversold and Underused: Computers in the Classroom* (Cambridge, Mass.: Harvard University Press, 2001).
2. *Ibid.*, 68.

3. Howard D. Mehlinger and Susan M. Powers, *Technology and Teacher Education: A Guide for Educators and Policymakers* (Boston, Mass.: Houghton Mifflin, 2002), 10.
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