Teaching Social Studies with Technology: New Research on Collaborative Approaches

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Meeting the demands of teaching in the digital age requires the identification of effective types of educational technology and ways of encouraging its use, and that was the aim of a “Preparing Tomorrow’s Teachers to use Technology (PT3)” grant to the University of Michigan-Dearborn, from the United States Department of Education. This grant funded a four-year program involving not only public school teachers in the Detroit area, but also the faculty in the education and social sciences departments of the university. Dubbed “The MITTEN Program,” it explored how the planned integration of new forms of technology affects instruction in social studies in elementary, middle, and high schools. What follows is a report on the outcomes of that project.

Between September 1, 2001 and April 30, 2005, a total of 257 educators in all of the core academic subject areas participated in seven cohort groups. In social studies, twenty-five full-time public school teachers, twenty-five pre-service teachers, five faculty members, and three field supervisors of student teachers were involved. The data presented in this study were gathered from surveys administered before and after people participated in the program, journal entries, reflections articulated in electronic portfolios and at meetings, and technology projects. The first half of the survey asked nine questions designed to measure the partici-
pant’s level of technological literacy. All thirteen of the items in the second half dealt with the integration of technology into teaching and learning. Two Likert-type scales were used, one measuring the confidence of participants and the other their competence (frequency of use). A t test for paired samples was conducted to compare the means for the variables measured at the two different points in time.

The educators participated in eight-month cycles. Taught by specialists in instructional technology in the university’s School of Education, they learned during the first four months how to use a variety of programs, software, and hardware, including Hyper Studio, Inspiration, Front Page, Microsoft Excel, PowerPoint, and scanners. Workshops were held on digital video and photo editing using WebQuests, and KidPix. In meetings of Networked Learning Circles (NLCs) during the second half of the program, the participants set goals for student learning in accordance with the state’s standards for social studies. They then considered how to meaningfully integrate technology into their lessons. The circles met three times to design lessons, to revise them, and finally to evaluate the lessons after their implementation. The majority of the social studies educators prepared history lessons. Some designed assignments in economics, civics, and geography.

Student Achievement

The positive effects which the use of computers has on student achievement in history have been documented by the United States Department of Education. The more frequently eighth- and twelfth-grade students reported using CD-ROMs or the Internet for research projects, the higher their scores were on the National Assessment of Educational Progress (NAEP) in United States history in 2001. The students who reported that they used computers to write reports “to a moderate or large extent” had higher scores on the same test than did those students who used computers for that purpose “not at all” or to “a small extent.” The qualitative data collected during the MITTEN project helps to explain why student achievement in history increases when technology is used. Educators reported that their students had a greater interest in doing research after exploring electronic sources. One practicing teacher wrote, “we created five lessons designed to excite students’ interests and improve student outcomes. They enhanced our curriculum, and students were eager to do more online investigations and create products that reflected their newly gained understanding in a specific area of study.” After completing the MITTEN program, most social studies teachers indicated on a survey that they were using technology more often to maximize student learning.
Student Engagement and Pedagogy

In a survey of over 1,400 adults in the United States which was conducted by researchers at the University of Indiana, the most common adjective used to describe history classes in schools was boring. The respondents recalled instructional practices which were overly focused on the reading of textbooks and the memorization of facts. When asked how connected to the past a variety of activities made them feel, they indicated that they felt the least connected to the past while studying history in school. Their responses point to the need to move from a predominantly didactic to a constructivist approach to teaching, a shift which, in effect, was called for over a decade ago by the National Council on History Education. The MITTEN findings show that inquiry in the classroom can be facilitated by the use of appropriate technologies. After the program, there was a statistically significant increase in the reported confidence of social studies teachers in their abilities “to utilize technology-enriched instructional strategies in which learning is highly interactive and responsive to student needs.” Not surprisingly, teachers also reported using such strategies more frequently.

Several veteran teachers altered and improved existing lesson plans, making them more engaging for young students who have been raised with technology. One educator noted that when he first started teaching, high-tech “consisted of a typewriter, mimeograph machine, and possibly a carousel slide projector.” He concluded that a research project which he had assigned for years had been notably improved by requiring students to use the Internet. After completing the MITTEN program, another experienced teacher stated, “...I feel rejuvenated as a veteran teacher with fifteen years experience and plan to continue to create or borrow lessons that incorporate technology into my classroom on a regular basis.”

Most of the educators who participated in MITTEN stated that the use of technology in history lessons increased their students’ motivation and involvement. One pre-service teacher who taught a remedial-level history course noted that many of his students were initially drawn to his history lessons because they involved technology. When students are motivated and excited about learning, their strategic thinking improves, according to the findings of researchers who evaluated the impact of technology on students in K-12 schools in Vermont. The use of technology therefore has the potential to positively affect both achievement on standardized tests and metacognition.

According to the MITTEN teachers, cooperation and student participation increased in their classrooms, not only because of the use of group
projects, but also because students with strong computer skills were enlisted to assist their peers. As the research of David and Roger Johnson of the University of Minnesota has demonstrated, cooperative learning environments facilitate learning and positive relationships among students. After participating in the MITTEN project, social studies educators indicated that they found themselves working with students more often to create a classroom environment in which the use of technology was a shared responsibility.

The teachers also found that the assignments which incorporated technology appealed to students with diverse learning styles. Such assignments also leveled the playing field for some students with learning disabilities. Students who could not write well were aided by the option of typing their work and by word processing tools such as the spell check. In a narrative of her project, one teacher wrote, "We acknowledge that students learn in different ways so through these strategies, we were able to meet the needs..."

**Activities and Projects**

The types of projects which were created by the MITTEN teachers were determined in part by the availability of software, equipment, and technical support at their school sites. At the start of each cycle, the MITTEN participants evaluated the resources at their schools using the School Technology and Readiness (STaR) charts developed by the CEO Forum on Education and Technology. Computer resources varied significantly between schools and districts. Although the funding of schools in Michigan is not derived from property taxes, discrepancies in technological and other resources between low- and high-income school districts exist. All of the schools which participated in the project had computer labs or media centers, but schools located within affluent communities often had better equipment and software. The rate at which schools in the Detroit metropolitan area have incorporated technology has depended not only on the availability of funds, but also on the individual initiative of teachers and administrators. In making training in the latest technology accessible to educators, the MITTEN project was a catalyst for its increased use. Educators were inspired to pursue the acquisition of equipment and software. A number of teachers applied for small grants in order to purchase digital cameras and LCD projectors for their classrooms.

A wide variety of projects were designed. For example, for a unit on the 1920s in a United States history course, students created newspapers in the muckraking style using Publisher. In the same course, they found photographs online of trench warfare during World War I, and then they
used the photograph analysis worksheets available from the National Archives to evaluate the pictures. They also completed a WebQuest on imperialism. In a world history course, students at another school constructed their own web pages on Ancient Greece.

In addition to using multimedia themselves, including video streaming, a number of educators required their students to create and present PowerPoint presentations on a variety of topics. After completing the MITTEN program, most teachers reported an increased level of confidence in their ability to "develop and help students develop skills in creating multimedia presentations and products that support engaged learning." They also indicated in the post-project survey that they were developing and encouraging the development of such products more often in their classes.

Through the Internet, access to the primary sources of archives and institutions has increased enormously. The use of primary sources in instruction has been correlated with student achievement on the NAEP in United States history. On the NAEP in 2001, the eighth-grade students of teachers who used primary sources in class once or twice per week outperformed their peers whose teachers used them less often. The voices and images of the past which students experience using primary sources bring history alive. As the MITTEN teachers became more knowledgeable about and proficient in their use of electronic resources, many of them enriched their history lessons by incorporating the many pictures, documents, maps, and other primary source materials which are available online. They also encouraged their students to find and analyze electronic sources for reports and projects. After concluding their participation in the MITTEN program, educators reported that they were helping students to become skilled in using search tools more frequently. Reflecting on the effects which the integration of technology had had on her students' study of the Russian Revolution, one high school teacher wrote,

Students were exposed to a variety of primary sources they would never have experienced without the use of technology...students investigated the lives of Nicholas Romanov II and his family along with causes and effects of the Russian Revolution. They were exposed to actual photographs and documents of the era, and several students were so intrigued they continued their investigations at home. Now, that is independent learning going above and beyond what is expected of the required classroom assignments!

This is only one example showing how the vast selection of historic photographs and images available on the Internet also made the creation of unique student projects like "museum exhibits" possible. Some stu-
dents benefited from going on virtual field trips to Colonial Williamsburg and other sites. Using Inspiration, they created concept maps and graphic representations of hierarchical systems.

While designing their lessons at Networked Learning Circle (NCL) meetings, teachers exchanged the addresses of useful web sites, such as <http://www.unitedstreaming.com> that allows educators access to videos of historic speeches and events. To facilitate the creation of rubrics, many teachers recommended <http://rubistar.4teachers.org>. Using <http://blackboard.com>, several educators set up online discussion boards for their students. The NLC meetings also provided teachers with the opportunity to share strategies on classroom management within computer laboratories. One teacher suggested giving green, yellow, and red papers or cups to students with which they could indicate the urgency of their need for assistance with their assignments.

All of the lessons designed by the MITTEN educators were showcased at the end of each cycle. At the showcases, people from different fields presented to one another in small groups. Since the cycles in the MITTEN program were designed to overlap, newcomers to the program were also in attendance. The exchange of ideas between the participants led to a greater understanding of how technology can and is impacting education at all grade levels and in all subject areas. The richness of the exchanges inspired the directors of the MITTEN program to make the development of interdisciplinary instructional materials the focus of the final cycle in 2004-05.

**Problems and Challenges**

“If I had to pick out something that I would do differently, I would teach the students about plagiarism right away,” said one pre-service teacher. Not surprisingly, plagiarism by students was one of the primary challenges faced by teachers in the MITTEN project. The use of electronic technologies has facilitated plagiarism by students at all levels. The teachers responded by giving lessons on how to cite electronic sources. In related lessons on conducting research online, they taught students how to evaluate the authority and reliability of different types of web sites. Many used Kathy Schrock’s guides for evaluating web sites.

A common obstacle to the implementation of lessons involving technology was the absence of computers in the homes of some students in each class. Teachers found that they had to give assignments which could be reasonably completed at the school site, either during class time or after school. Teachers also noted that they needed to have back-up lesson plans because the servers at their schools occasionally crashed.
Understanding Social and Ethical Issues

In addition to attending skill-building workshops and NLC meetings, the educators who were involved in the MITTEN project benefited from the expertise of specialists in the field of educational technology who spoke at seminars sponsored by the program. During each cycle, seminars were held on topics such as plagiarism, the digital divide, and assistive technology. The seminars raised the awareness of social and ethical issues among educators. After completing the MITTEN program, there is some indication that educators were more aware of the “controversial aspects of technology” and the ethical issues regarding its use. In an electronic portfolio, one student teacher wrote,

During the MITTEN project, I took the utmost care in teaching and modeling ethical and legal practices in the use of technology. I discussed openly with students issues such as plagiarism, copyright, and exploitation through the Internet via pornography, gambling, and so forth. I also discussed with students that the Internet is a public forum where freedom comes along with great responsibility.

Assessments and Accountability

With the increased emphasis on accountability and standardized testing today, it is not surprising that teachers explored computer-based assessment tools. Although No Child Left Behind does not call for testing in social studies, students in the state of Michigan are tested in the subject in elementary, middle, and high school. The participants in the MITTEN program found that technology lends itself well to diverse types of assessment. Web sites like http://school.discovery.com allow educators to create online quizzes and review questions in formats which model those of standardized tests. Students may respond to the questions either in class or after school. The tool allows teachers to decide whether or not students may view the correct answers to a quiz once they have completed it. As shown, technology also offers the possibility of creating many types of authentic assessments with real-life applications.

University-Level Methods Courses

While most students in teacher education programs today do learn how to use various programs and types of software in educational technology courses, they are often unclear as to how to integrate the technology in their specific disciplines. Technology integration in methods courses is therefore vital. As a result of their involvement in the MITTEN program,
the methods professors at the University of Michigan-Dearborn revised their syllabi in order to include additional lessons on applying technology. In both elementary and secondary social studies methods, Geographic Information Systems (GIS), a mapping tool, and Timeliner 5.0 were introduced. The field supervisors of student teachers began requiring students to give at least one lesson which incorporates technology. Mentoring with respect to the use of technology also increased among the faculty in the School of Education. Social studies and science methods professors began exploring together the applications of GIS, and they began sharing information about conferences and workshops on technologies with interdisciplinary applications.

Conclusions

During each year of the MITTEN program, the University of Michigan-Dearborn had the highest number of recipients of awards from the Consortium for Outstanding Achievement in Teaching with Technology (COATT) in the state of Michigan. Eight awards were given to student teachers in the field of social studies. Fundamental to MITTEN's success as a program were its provision for training in emerging technologies for educators and its facilitation of collaboration between people in different fields. The program provided educators with the opportunity to share resources and learn together. The planned integration of technology positively affected student learning in K-12 classrooms by increasing the level of student interest. The use of electronic resources also improved the quality of the research conducted by both students and teachers. After completing the program, educators reported that they felt better able to use technology to enhance teaching and research.23 The findings of research on the MITTEN project show that collaborative approaches to teaching social studies with technology can produce optimal results.

Notes

1. For the MITTEN Technology Survey, see the appendix to this article.
2. Incomplete data sets were analyzed separately.
3. For a list of the MITTEN workshops held in 2004, see http://www.umd.umich.edu/mitten/workshops.htm.


7. MITTEN Technology Survey, part II, question 12 (use).


10. Rosenzweig, 265.

11. MITTEN Technology Survey, part II, question 7 (comfort).

12. MITTEN Technology Survey, part II, question 7 (use).


15. MITTEN Technology Survey, part II, question 9 (use).


17. MITTEN Technology Survey, part II, question 5 (use).


20. The projects may be viewed on the MITTEN web site: http://www.umd.umich.edu/mitten/bysubject.htm#SS.


22. MITTEN Technology Survey, part I, question 9 (comfort).

Appendix I:
Lesson Materials

1. Lesson plan on the use of Publisher software in the creation of newspapers in the muckraking style
   A. This lesson plan was created by Anthony DeMarco, teacher, and Joseph Motowski, student teacher, at Churchill High School in Livonia, Michigan. For an electronic copy of the lesson plan, please see: <http://www.umd.umich.edu/mitten/ademarco/exhibits/newsles.html>.
B. The handout which was given to students for the above lesson plan can be found at:

You will have 4 days to create a short newspaper written in the style of Progressive Era "Muckrakers". You will be working in groups of 3 or 4. You will be writing on topics of the Progressive Era, or you may choose to write about current issues in the muckraking style. You will have 4 days in the computer lab to complete this project. You will most likely have to use out-of-school time to finish the project by the due date.

You will need to include the following items in your newspaper:
* 4 articles focusing on issues related to Progressivism - corruption, moral issues, social issues, etc.
* 1 article written as a "bio" piece on an important figure of the Progressive Era
* 1 editorial essay written on an appropriate Progressive topic
* if your group has 4 members, you will need to include 1 additional "bio" article and 1 additional editorial or issue article
* you will need to create a name and format for your paper (the format must be consistent throughout your paper: font, spacing, etc.)
* include at least 1 photo, chart or diagram for each article

You should make your paper as neat and professional as possible. You will be graded on your portion of the newspaper, however a portion of the professionalism grade will reflect the whole group's work.

The paper is DUE Wednesday, November 20 at the beginning of the hour.
Grading:
content 25
neatness 20
creativity 15
professionalism 20
Total 80
C. A sample of a student's work can be found at: <http://www.umd.umich.edu/mitten/ademarco/exhibits/newspage.html>.
2. Lesson plan for a unit on Colonial America using Kidspiration by David Bates, teacher, and Vivian Gniewek, student teacher, at Long Elementary School in Dearborn, Michigan


### Colonial America Social Studies Research Project

#### Lesson 4

**Subject:** Social Studies  
**Grade:** 5

**OBJECTIVES:**  
The students will use Kidspiration® software in order to organize and outline his or her research information.

**STANDARDS AND BENCHMARKS:**

**NETS for Students:**
1. Basic operations and concepts  
   Students are proficient in the use of technology.
2. Social, ethical and human issues  
   Students practice responsible use of technology systems, information and software.
3. Technology productivity tools  
   Students use technology tools to enhance learning, increase productivity and promote creativity.  
   Students use productivity tools to collaborate in constructing technology-enhanced models, preparing publications and producing other creative works.

**Michigan Social Studies Standards and Benchmarks:**

**Inquiry Content Standard 1:** All students will acquire information from books, maps, newspapers, data sets and other sources, organize and present the information in maps, graphs, charts and timelines, interpret the meaning and significance of information and use a variety of electronic technologies to assist in accessing and managing information.

**Later Elementary Benchmark 1:** Locate information about local, state and national communities using a variety of traditional sources, electronic technologies and direct observation.

**MATERIALS:**
- Student Resource Sheet: Organize your Information
- Computers with Kidspiration software for each student group
- Teacher computer station and projector to assist and demonstrate when necessary

**PROCEDURE:**
1. When the students consider the information they gathered is sufficient they are ready to move to the next phase of the project. As the students work in groups, the teacher circulates and assists where needed. This is also an excellent time for small group conferences. The teacher may suggest that further research is necessary or confirm that the group is ready for creating a web or outline.
2. When the students go to the computer lab, instruct them to log in, go to the dock and select the Kidspiration software. Because the students have prior experience using the software, this phase may be completed in a shorter time frame.

3. Once they have selected and opened the software program have students select the new document icon. The main idea of the project will be typed in the center of the web.

4. When the students are adding information in the Kidspiration bubbles, I suggest that they wait to connect or link the information until all of the data is entered. I have also explained to the students that they have completed the typing and the linking they may, if they have additional time, work on formatting the web by adding color, changing the bubbles or adding pictures. I have discovered that if they start formatting right away, they do not have enough time to complete the assignment. This offers the students who finish early an opportunity to explore the software and make changes.

5. As the students are working the teacher circulates and assists as needed. Adding links between the information often poses the most difficulty.

6. For students who have completed the web early, this is an excellent time for mini lessons on formatting. It provides the opportunity for small group instruction while the rest of the students are working on entering information.

7. When the students have completed the web, they will need to print one for each group member. Although they have completed the webs together, each student will need a copy for the writing aspect of the project.

8. After the webs are printed, instruct the students to click on the writing icon in the toolbar. Explain that this looks like an index card. When they do they will see that the information they entered and linked becomes an outline that they will use for a writing assignment.

9. Instruct the students to print an outline for each group member as well.

10. The students are now ready to proceed to the planning phase of the PowerPoint slide show.

ASSESSMENT OF OBJECTIVES/EVALUATION
The teacher will be able to assess the students' proficiency with the Kidspiration software by reviewing the completed web and outline. It is also possible to assess by observing and conferencing while the students complete the independent practice.

Organize your information. This part is due: ___________ points

Project Team Members

Name: __________________________

Name: __________________________

Before you try to complete this page think about these questions:

1. Have you investigated enough to put your information into your own words?
2. Could you tell someone information about your topic?
3. Have you answered your questions?
4. Do you really know several new and interesting things about your topic?

If you answered no to any of these questions, it's not time for you to organize your information yet, keep reading and researching about your topic until you can say yes with confidence to each of these questions.

Once you have gathered information, organize your information:

1. Read all of your notes from your fact-finding sheets.
2. Organize the information into categories.
3. Create a Kidspiration Web and outline
   a. Each group creates a web and outline using all of the information gathered.
   b. Your webs and outlines should be the same because you did the research together.
   c. You will work together to create the web and outline but everyone must have a copy of the web for the writing portion of the project.
Appendix II:  
Mitten Technology Survey

I. Technology Literacy

Each question requires two answers. First, indicate how you feel about the technology competency in question. To what degree is this competency within your “comfort zone”? Please use the following scale of 1-5:
1 = very anxious or even afraid of
2 = reluctant
3 = ambivalent
4 = comfortable
5 = eager

Secondly, indicate the frequency or degree to which you employ or use or do this competency or tool or task. Please use the following scale of 1-5:
1 = never
2 = seldom or monthly
3 = occasionally or weekly
4 = often
5 = daily

1. Use computer for the “ordinary” purposes: word processing; opening, modifying, printing documents; record keeping.
   How do you feel, to what degree is this competency in your comfort zone (1-5)? ____
   With what frequency do you do this, or employ this competency (1-5)? ____

2. Use computer and appropriate software to use or create databases and spreadsheets.
   How do you feel, to what degree is this competency in your comfort zone (1-5)? ____
   With what frequency do you do this, or employ this competency (1-5)? ____

3. Use computer for the most “common” purposes of connectivity: sending and receiving e-mail including attachments; using URL’s and search engines on the internet; retrieving, saving and using electronic information.
   How do you feel, to what degree is this competency in your comfort zone (1-5)? ____
   With what frequency do you do this, or employ this competency (1-5)? ____

4. Create multimedia presentations including sound, graphics, or animations in an application such as Appleworks, HyperStudio, PowerPoint, KidPix, Avid Cinema.
   How do you feel, to what degree is this competency in your comfort zone (1-5)? ____
   With what frequency do you do this, or employ this competency (1-5)? ____

5. Use more “advanced” computer functions such as chat rooms; QuickTime movies; video input, manipulation and output; large-group presentations connecting computer and projection devices.
   How do you feel, to what degree is this competency in your comfort zone (1-5)? ____
   With what frequency do you do this, or employ this competency (1-5)? ____

6. Use graphics to create professional looking documents, newsletters, publications; these might include such programs as PrintShop or Corel Draw, clip art from disks or the
Internet, or the use of a scanner or digital camera.

How do you feel, to what degree is this competency in your comfort zone (1-5)? ___
With what frequency do you do this, or employ this competency (1-5)? ___

7. Create and modify a personal or professional web page.
How do you feel, to what degree is this competency in your comfort zone (1-5)? ___
With what frequency do you do this, or employ this competency (1-5)? ___

8. Employ technology in assessment (e.g. electronic portfolios or grade books)
How do you feel, to what degree is this competency in your comfort zone (1-5)? ___
With what frequency do you do this, or employ this competency (1-5)? ___

9. I am aware of controversial aspects of technology use including data privacy, equitable access, free speech issues; understand ethical use issues and know the differences among freeware, shareware and commercial software; understand university or school district’s policies related to these issues.
How do you feel, to what degree is this competency in your comfort zone (1-5)? ___
With what frequency do you do this, or employ this competency (1-5)? ___

II. Integration of Technology into Teaching and Learning

1. Help students to operate a variety of hardware tools (e.g., computers, LCD projector, scanner).
How do you feel, to what degree is this competency in your comfort zone (1-5)? ___
With what frequency do you do this, or employ this competency (1-5)? ___

2. Help students use video hardware and software in engaging and constructive ways rather than for passive viewing.
How do you feel, to what degree is this competency in your comfort zone (1-5)? ___
With what frequency do you do this, or employ this competency (1-5)? ___

3. Help students use sophisticated and content specific applications as well as develop their abilities to learn applications outside of formal training.
How do you feel, to what degree is this competency in your comfort zone (1-5)? ___
With what frequency do you do this, or employ this competency (1-5)? ___

4. Help students become proficient in using search tools and evaluating and using results of searches.
How do you feel, to what degree is this competency in your comfort zone (1-5)? ___
With what frequency do you do this, or employ this competency (1-5)? ___

5. Develop and help students develop skills in creating multimedia presentations and products that support engaged learning.
How do you feel, to what degree is this competency in your comfort zone (1-5)? ___
With what frequency do you do this, or employ this competency (1-5)? ___

6. Help students become skilled at developing technology-enriched learning activities that are authentic, multidisciplinary, and connected to district, state, and national standards.
How do you feel, to what degree is this competency in your comfort zone (1-5)? ___
With what *frequency* do you do this, or employ this competency (1-5)?

7. Help students to utilize technology-enriched instructional strategies in which learning is highly interactive and responsive to student needs.
   How do you *feel*, to what degree is this competency in your comfort zone (1-5)?
   With what *frequency* do you do this, or employ this competency (1-5)?

8. Help students use technology to support authentic, performance-based, ongoing assessment including portfolios.
   How do you *feel*, to what degree is this competency in your comfort zone (1-5)?
   With what *frequency* do you do this, or employ this competency (1-5)?

9. Help students understand how to create a classroom environment in which technology is a shared responsibility between teachers and students, and where its use is transparent and in need of limited teacher direction.
   How do you *feel*, to what degree is this competency in your comfort zone (1-5)?
   With what *frequency* do you do this, or employ this competency (1-5)?

10. Use tailored (to the individual or to small groups) editable learning modules (interactive electronic tutorials to teach specific lessons or material to specific students or groups of students).
   How do you *feel*, to what degree is this competency in your comfort zone (1-5)?
   With what *frequency* do you do this, or employ this competency (1-5)?

11. Generally understand and use technology to enhance teaching and research.
    How do you *feel*, to what degree is this competency in your comfort zone (1-5)?
    With what *frequency* do you do this, or employ this competency (1-5)?

12. Generally understand and use technology to maximize student learning.
    How do you *feel*, to what degree is this competency in your comfort zone (1-5)?
    With what *frequency* do you do this, or employ this competency (1-5)?

13. Mentor professional colleagues in using technology to improve teaching and learning.
    How do you *feel*, to what degree is this competency in your comfort zone (1-5)?
    With what *frequency* do you do this, or employ this competency (1-5)?
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