GRAPHITE GIRLS IN A GIGABYTE WORLD: MANAGING THE WORLD WIDE WEB IN 700 SQUARE FEET

By

TAMRA OGLETREE *   **PENELOPE SAURINO ****   **CHRISTIE JOHNSON *****

* Assistant Professor, Department of Curriculum and instruction, University of West Georgia, Georgia.
** Western Carolina University, College of Education and Applied Professions, Elementary and Middle Grades Education, North Carolina.
*** Carroll County Schools, Assistant Superintendent of Administrative and Student Services, Carrollton, Georgia.

ABSTRACT

Our action research project examined the on-task and off-task behaviors of university-level student, use of wireless laptops in face-to-face classes in order to establish rules of wireless laptop etiquette in classroom settings. Participants in the case study of three university classrooms included undergraduate, graduate, and doctoral students. Students were encouraged to bring their laptops to class and use them as a part of the educational process. Preliminary results indicated significant off-task usage of the laptops, pre- and post-surveys, field notes, observations, and pre-and post interviews were conducted to examine the effective management of laptop usage in wireless classrooms. An action plan was implemented, reflected upon, and modified as needed until a final set of criteria demonstrated an increase in on-task time of students as well as effectively making use of the Internet and other resources through wireless laptop utilization.

Keywords: Technology, Classroom Research, Laptop Computers, Wireless Laptops, Laptops In the Classroom, Action Research, Collaborative Action Research.

INTRODUCTION

Our action research project studied the on-task and off-task behaviors of university-level students' use of wireless laptops in face to face classes in order to establish rules of wireless laptop netiquette(Kehoe, 1994; Shea, 1994) in university classroom settings. Action research methodology (Hendricks, 2008; Mills, 2006; Saurino, Saurino, & Crawford, 2005), grounded in symbolic interactionism (Blumer, 1969; 1980), was used throughout the process. Participants in the case study of three university classrooms were encouraged to bring their laptops to class. Pre- and post-surveys were conducted to establish behaviors, attitudes, and preferences before and after the study. Pre-and post interviews were conducted to examine possible rules of netiquette from the students' perspective, and to get responses to management techniques implemented during the study. Classroom observations and field notes were collected to support the effectiveness of the actions associated with the study. Data were triangulated through multiple sources and perspectives. On- and off-task behaviors of

students with laptops were observed and data shared. Questions were created and discussed among the researchers and with students as part of the classroom management phase of action implementation. The research question of interest for the study was, *"What strategies and techniques might improve the on-task time of our students and establish netiquette for effective utilization of wireless laptops in the classroom?"* The study addressed how to establish expected behaviors of students with laptops in a wireless setting and determined actions that might improve on-task time of students as well as to effectively make use of the Internet and other resources through wireless laptop utilization.

Background

As researchers, the authors recognized the need for developing etiquette expectations with wireless laptops during our 2nd Annual Summer Institute for the Cherokee Rose Writing Project, June 2008. Their theme for the Institute was *Writing: Beyond Place or Space*. Their first consideration was to develop places in our university classroom where participants in the project created their

own writing space complete with a laptop that had wireless Internet access. They thought it was important to expand their in-service teachers' writing abilities beyond paper and pencil by providing a technologically-rich atmosphere to increase their capabilities so they could share their knowledge with other teachers (Stubbs, 2008). The classroom furniture was rearranged into the shape of a 'U' to help develop a sense of community during our 4-week writing project. Students had their own table within the U to create their own space including lamps and pictures from home. Students were also told to bring their own laptop if they had one, and they provided one for those who did not own one. The authors anticipated that by integrating Internet resources into the various aspects of writing our students would be more engaged in the writing process. What they found instead was that some students:

- played solitaire or other games
- checked their email or wrote emails to friends
- worked on assignments from other classes
- did not attend to tasks at hand
- did not pay attention to guest speakers
- were distracted by the off-task behaviors of others

The writing project was an overall success, but the distractions were a frustrating experience. Their next consideration was to turn off the computers (Adams, 2006; Hunt, 2007), but that would not have accomplished our desire for a technologically-rich environment (Barak, Lipson & Lerman, 2006; Finn & Inman, 2005) or addressed the multiple literacy (multiliteracy) needs of teaching and learning in the 21st century (Kalantzis & Cope, 2008; Kist, 2005; Smith & Wilhelm, 2002; Wilhelm & Friedman, 1998). A recent position statement from the National Council for Teachers of English (NCTE, 2008), stated that 21st century readers and writers should be able to manage multiple streams of information, work collaboratively for a variety of purposes, and ethically attend to complex environments. The researchers wanted to meet these goals with their in-service teachers, so they decided to re-create a similar situation in our regular university classrooms and develop wireless laptop classroom *netiquette,* defined as Internet usage etiquette as explained below, and other ways to make laptop use more productive (Kehoe, 1994; Shea, 1994). The first step was a review of the literature.

Review of the Literature

The review of the literature for laptop netiquette in classroom settings showed us that others had experienced similar situations with similar results. Although technology was valued as a classroom teaching tool, it seemed that many instructors were finding they could not compete with students having the world at their fingertips (Adams, 2006; Hunt, 2007). The *Sesame Street Syndrome* (LeShan, 1972) is a phenomenon describing how children are taught that thinking is not necessary because adults are willing to find answers for them. Facts are valued, but questions are readily answered and true critical thinking becomes irrelevant. Children who grew up in that manner now have the Internet which continues the phenomenon of facts and information readily available to them within seconds. Most students prefer to be entertained as they learn (Bugeja, 2007). Even though today's young adults can multitask and make quick decisions about what they wish to focus their attention on, they only focus on only one task at a time. According to Bugeja, when faced with an activity that they do not want to participate in, these students focus their attention on something else instead of working through the task at hand. Web-surfing, playing games, and text-messaging are rampant distracters from learning and participating in college classrooms. Syllabi are now including warnings about in-class use of cell phones and laptops. The University of Wisconsin at Madison (The Board of Regents of the University of Wisconsin System, 2008) provides faculty with a website to link to on their syllabi that instructs students about classroom technology etiquette. The term for this form of network etiquette is netiquette (Kehoe, 1994; Shea, 1994).

Students Becoming Digital

Today's students are online: emails, Internet and Internet surfing, classroom blogs, UTube, laptops in class, MySpace, Ipods and other music devices, Facebook, cell phones, and all these devices are used in and out of school. Schools have responded traditionally with

restrictive rules of governance while teachers vigorously have meted out enforcement, whether they believe in the rules or not. Meanwhile, students are engaged with the media blitzes regardless of rules and regardless of potential harm to their equipment, software, or their own sense of ethics. Weir (2008) states that,

> *"But there's no one out in cyberspace to make sure they wash behind their digital ears and refuse cookies from online strangers. Given this potentially dangerous void, schools will increasingly extend their supervisory reach, giving lessons at every grade level on netiquette call it Online Manners and Ethics 101."* (p. 34)

The author further states that students need not only instruction in the use of technology but also the expectant behavior in the use of that technology. Educational efforts to inform students have been disjointed and cumbersome, non-systematic, and non-communicative in connecting with students and their sensibilities to having grown up with the technologies. Simply stated, students do not know how to behave in their techno-world. Universal guidelines would help in student assimilation of the cohesive use of technology and provide a broad base of consideration for others in whatever system or media being used.

Computer Eras

According to Weiser (1998), "We are about to enter the third wave of the computing revolution. University campuses have been at the forefront of each of these technology revolutions." (p. 41) Weiser explained that the first era of computing was the mainframe with universities building large rooms to house computations on the mainframe with outlying instrumentation. The second era, in which academia is deeply rooted, is the personal computing era. The relationships with computers are understood, and with all their eccentricities, dependent reliance continues to be the norm in business, education, and personal usage. In education, students and faculty attest to the PC era as everyday work is dependent upon them. The author speaks about the third era breaking into the computing world, the era of ubiquitous computing. He says,

"Inevitably these computers will become more pervasive, will talk to one another, and will form the invisible computational infrastructure of our lives. Our relationship to computers in the ubiquitous era will be the inverse of the mainframe era: computers will be common and inexpensive, and they will service us" (p. 42).

The driving force or factor will be the Web because of the vast exponential expansion of information available to each computing center connected to it and the students connected to the computing center.

A new world was developing in 1994 that required a new multimodal literacy with technical knowledge needing technical language. The term multiliteracies was created with a defined pedagogy in view. Today's learned person needs to be multiskilled, more flexible, able to take on a wide range of tasks, and able to move from one task to another as the need arises. Cope and Kalantzis (2008) stated, "Indeed, technology is now very much a relationship between tools and the knowledge of these tools in peoples heads. Wealth increasingly has a human-skills rather than a fixed-capital basis" (p. 200). The term literacy expands to supplement and teach students to interpret multiple forms of textual signs and symbols that require interpretation of the communication in diverse settings.

Computer Usage in Academia

In their survey, Finn and Inman (2004) reviewed alumni who participated in a laptop initiative. To make technology and the internet universally available to all its students, Grove City College provided a laptop to all incoming Freshmen. The surveys were conducted in 1997, 1998, and 2000 to determine if the program resulted in digital unity as opposed to digital divide. Digital unity is defined as having seamless universal access to computers. Digital unity is contrasted against the term digital divide: the ability to gain computer access dependent on wealth. The goals of the Grove City College study included "providing an acceptable level of convenience for students, integrating computer technology into courses, and preparing students for their

professions" (pp. 301-302). Results from the survey demonstrated that students relied on friends and other classmates for computer help which the authors determined a positive result of digital unity. For effects on courses, survey results indicated that course content lagged behind the technological innovations. Even though the survey results indicated digital unity was acquired on campus, they also indicate that there was not a great technological revolution in teaching and learning.

Barak, Lipson and Lerman (2006) introduced wireless laptops into a large engineering class to observe the improvement in the learning environment and to facilitate active learning in a constructivist environment which might eliminate the need for specially designed computer labs. The study was conducted through the use of an online survey and classroom observations. The survey revealed that students had very positive reactions to the inclusion of laptops, but were not as positive about being active in class with those laptops. The researchers deduced that one reason students did not like being active in class is that active learning was not what students traditionally experienced in school and that it was easier for the students to be non-participating members in a lecture hall. However, "central to the effective use of technology in class is the importance of having students engaged in active learning and problem solving, whereby they not only learn theoretical concepts but also practice hands-on learning" (p. 256). Classroom observations revealed that laptops could be a form of distraction when used for social purposes during class such as checking email or surfing the internet, and laptops needed to be used specifically for active learning through problem solving, exploration of phenomenon, and sharing ideas.

In the Urban School of San Francisco, Levin (2004) implemented a student laptop program. Identical wireless laptops were provided to students and faculty "to fully integrate computer use throughout the curriculum to enhance communication, collaboration, organization, and production (writing and project creation)" (p. 7). According to the author, ubiquitous computing and

equity of access was achieved seamlessly through the laptop program. Since all machines were identical, teachers could assign work requiring the computers both at home and at school. Skills based instruction on computer use was not encouraged in the classroom since students were able to problem solve more quickly and efficiently. Mini-lessons were the norm. When students were asked who they would turn to for help, 87% said that they would figure the problem out themselves, 96% asked a friend or classmate, and 60% listed that they would ask tech support staff. Communication and organization was enhanced through course conferences, class notes, bulletin boards, and public forums. This small high school is reported to become a tighter community since everyone in the school has simultaneous Internet access.

Based on the literature that supported our original observations, the authors set out to generate an action research plan that developed rules of netiquette for wireless laptop use in classrooms. A discussion of this study methodology follows.

Methodology

Each of the university professors involved in the project had prior experience with qualitative case study research (Merriam, 1988) and Collaborative Group Action Research (Hendricks, 2008; Mills, 2006; Saurino, Saurino, & Crawford, 2005), so the researchers chose to reexamine how they would conduct action research together as opposed to choosing one style. The result was a collaborative effort that utilized aspects from several research models. Collaborative Group Action Research is a subset of action research. The overarching concept of action research came from the work of Lewin (1947) in his study of "group dynamics". In Lewin's work (see also Noffke, 1995; Stenhouse, 1979; Rudduck & Hopkins, 1985), a change or action, an attempt to solve a problem existing in the group, was introduced by the group facilitator, and the impact of the change was noted. The process was described as cyclical, involving a recursive, nonlinear pattern of planning, acting, observing, and reflecting on changes in social situations observed by the facilitator. For the purpose of this study, they used Lewin's concept of action research as the basis for our Collaborative Group

Action Research. The addition of the word collaborative denotes their own group of university professors and pre-service/in-service teachers actively working together in an attempt to find answers for the questions that might help to improve the current situation with wireless laptops. Many forms of action research stop when an "action plan" is developed, yet the study included the implementation of their action plan, and the results of our interventive actions. In addition, the researchers see their action research as a case study in three classrooms. They utilized Merriam's (1988) qualitative case study methodology, a process of conducting research using a particular sequence of research strategies and theoretical perspectives, to collect, categorize, code, analyze, discuss, and reflect upon their data. Questions were created and discussed among the researchers and with students as part of the classroom netiquette management phase of action implementation. The research question of interest for the study was:

What strategies and techniques might improve the on-task time of our students and establish netiquette for effective utilization of wireless laptops in the classroom?

The researchers goal through action research was to look at and perhaps develop strategies and techniques to establish expected behaviors of students with laptops in a wireless setting and determine actions that might improve on-task time of students as well as to effectively make use of the Internet and other resources through wireless laptop utilization. Throughout the project participants' reflections and responses in regard to laptop use were documented. The research cycle is outlined in the Figure 1.

The authors chose to use Collaborative Group Action Research (CGAR) as their methodology because it provided a thick rich description of our research and had the flexibility to include quantitative support for subjective conclusions (Hendricks, 2008; Mills, 2006; Saurino, Saurino, & Crawford, 2005). The CGAR method followed a prescribed cycle that was designed specifically for working instructors and included a minimum of cumbersome strategies allowing us to concentrate on answering our research question. The recursive steps in the cycle of CGAR used in the study included a planning
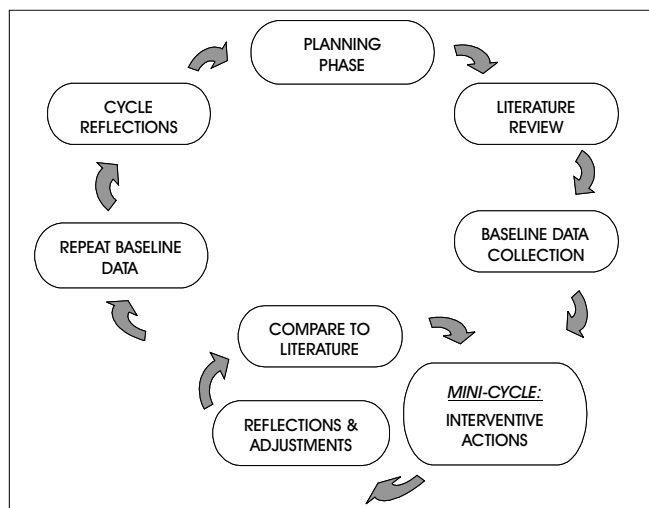

Figure 1. Cycle of Collaborative Group Action Research

phase, literature review, baseline data collection, interventive actions, reflection & adjustment of interventions, comparison to the literature, repeat of baseline data collection, and cycle reflection phases (Figure 1).

The study was conducted collaboratively and written from the perspective of the instructors. The following process was required to complete the research:

Planning Phase

During the planning phase they developed the researchers question that was of interest to us as the instructors with the concurrence of the students. Also, a timeline was established for completing the cycle including interventions, data collections, and reflections.

Review of the Literature

The researchers conducted a review of the research literature related to their research topic for two purposes. First they wanted to find out whether others were trying to use laptops in their classrooms and how effective their applications were related to effective use of the laptops as a tool for learning. In addition, they wanted to find actions or netiquette that might be effective and specific research related to the actions they wanted to try in their classrooms

Baseline Data Collection

During the baseline data phase, they looked at and documented the current situation in their classrooms.

Students were not properly utilizing their laptops, especially in terms of staying on-task related to the topics of the writing project and its assignments. They gathered specific data and summarized the current situation at the beginning of the study

Mini-Cycle: Interventive Actions-Reflections & Adjustments-Comparison to the Literature-Repeat

The majority of the time was spent in the mini-cycle of implementing the actions the researchers took to answer their research question. First they would implement an action like the pre-survey, interview, laptop simulation, netiquette implementation, post-survey, etc. Then they reflected on the action, the authors were implementing and made adjustments based on their reflections, re-implement the adjusted action, and reflected again. Finally, when they were satisfied with the action they implemented, compared their data and results to the research literature to see if we supported the literature, added to it, or perhaps missed something. Then we moved on to the next action implemented to answer our research question.

Repeat Baseline Data

After implementing all the actions in an attempt to answer the research question they repeated the baseline data phase and again gathered data to describe the current situation relative to our research question. They summarized how the implemented actions affected on-task use of laptops and how effective laptop netiquette was in our classrooms.

Cycle Reflection

At the end of the cycle the researchers compared and contrasted the baseline data summaries from the beginning and end of the cycle and discussed and reflected upon what they had learned. They then summarized the conclusions of their study and reflected on what they had accomplished including the establishment of some basic guidelines of laptop netiquette in answer to their research question. The reflections concluded with a discussion of what they had learned and what their might study in the next cycle of their action research.

Data Analysis and Results

Our project studied the on-task and off-task behaviors of university-level student use of laptops and wireless in face to face classes in order to establish rules of wireless laptop netiquette in university classroom settings. Pre- and post-surveys were conducted to establish behaviors, attitudes, and preferences before and after the study. Pre-and post interviews were conducted to examine possible rules of netiquette from the students' perspective, and to get responses to netiquette management techniques implemented in the study. Classroom observations and field notes were collected to support the effectiveness of the actions associated with the study. Data were triangulated through multiple sources and perspectives. On- and off-task behaviors of students with laptops were observed and data shared. Laptop simulations, netiquette discussions and implementation in the study addressed how to establish expected behaviors of students with laptops in a wireless setting and determined actions that might improve on-task time of students as well as to effectively make use of the Internet and other resources through wireless laptop utilization. As researchers they were interested in a deeper, richer understanding of the topic of research, and reflection was an important ingredient to better define what was learned during the research process and more fully understand its implications.

Student Surveys and Interviews

After observing the on-task/off-task behaviors of the students using laptops in classrooms, they were interested in gaining more information about laptop use among our students. The researchers surveyed and interviewed 73 students from 3 university classes at the undergraduate, masters, and doctoral levels. From those surveys they found that all but four of the students owned laptops so they can assume that the students are not only familiar with laptop behavior issues in university classrooms, they understand the capabilities and unique qualities of laptop ownership.

According to this surveys and interviews, the advantages of bringing a laptop to class include "ease of taking clear

notes that are easy to read without wasting paper," "following along with the professor's PowerPoint with personal notations inserted," and "access to the Internet." Our students provided additional responses: "I have access to information about topic(s) being discussed online. I also like that I can pull up WebCT and follow along making sure I am on top of assignments so I can address questions to the professor face to face." "It is nice to have access to extra information available to answer questions as they arise." "Accessible anywhere. Especially access to wireless."

Distractions or negative aspects to laptops include that a laptop is heavy and cumbersome to lug around, some students feel they are more engaged when they take notes by hand, but a large portion of students from all levels find that laptops in the university classroom can be a distraction. "If I'm extremely bored, I have something to do." "I can multitask to keep from getting bored." "Access to email, Facebook, Myspace, and surf the web." "If a student in front of me goes off task then I tend to pay attention to their computer screen instead of the teacher." The surveys found little difference among the distractions. The undergraduates discussed options to paying attention in class in more detail than the graduate students.

The researchers asked their students to tell them the kinds of activities they engaged in when they were in class which resulted in a range of responses. One doctoral student responded by saying that she "did not understand the question," while many undergraduates listed multiple options such as check syllabus, class web page, look up answers, fact check questionable teacher answers (have proved teacher wrong a few times), doing assignments, on Webct, Vista, Blackboard, online games, news sites, comics, work, email, bill pay, IM, looking at wedding cakes, Ebay, Craigs list, KOL, half.com, CNN, and the weather. Finally, two undergraduates confessed, "I am too ADD to stay focused with so many potential distractions. I would probably be surfing the web or doing things for other classes; I am easily distracted."

While it is clear that the students enjoy using laptops, it is also clear that they are using them for multiple purposes in class. The off task students were causing themselves and others to become distracted by multiple online and off line activities. Since the researchers goal was to effectively integrate wireless laptops in the university classroom, they decided that it was important to address the issue of classroom management in the classroom. One of the actions they implemented was a series of simulations that addressed how they might keep students on-task by establishing netiquette that were developed with the cooperation and input from the students. They began by implementing the following simulations.

Wireless Laptop Simulations

Other actions the authors as the professors implemented were scenarios to gain student feedback on classroom management techniques that attempted to make wireless laptop use a productive option in the classroom instead of a distraction and to establish netiquette. The following simulations were implemented in three different classes at three different levels: undergraduate, masters, and doctoral levels. Each of the authors implemented the simulation in one of the classes.

While teaching a section of classroom management, students were given the following simulation:

The year is 2015 and wireless technology in the schools has increased. The administration noticed abuse of wireless laptops in classrooms. You are a member of a technology steering committee to solve the problem.

It is your task to generate solutions.

Each class was divided into groups (technology steering committees), and they were told to brainstorm expectations of students and teachers in the following areas of laptop use:

- Time management
- Transitions
- Procedures
- Distracters
- Room arrangement
- Disruptive students
- Issues of Ethics

The following questions framed their discussions:

- How will your school approach a technology friendly environment in a democratic classroom?

- What are the implications for future classrooms if wireless laptop usage is banned during the school day?

- If in-service and pre-service teachers at UWG are abusing technology in the university classrooms, what are the potential implications for their future students?

The simulations demonstrated interesting results from the three different groups. Issues of transitions and time management were closely linked together in that effective time management resulted in easier transitions between lessons and subjects. Undergraduate and masters students discussed time management in terms of establishing preconceived deadlines such as, "We should establish a deadline through a program on the computer that cuts students off at a certain time," "students can use the computer only at a certain time during the day," and "devise a computer use contract." Some doctoral students included in their discussions the importance of careful preplanning, "allot enough time spent on task for kids (not too little or too much) to complete their projects." Transitions from one class or one activity to another can be problematic in any classroom setting. Our masters and doctoral level students viewed transitions from a time management perspective with comments such as, "changing classrooms with computers could be a problem because of logging-in numerous times daily" and "allocate time to transition from one subject to the next." However, our undergraduates suggested that "teachers should transition from class to class instead of students" which would be one solution to having students log in and out of computers over and over again None of our groups brought up the mobility aspect of laptops which was surprising to us.

Classroom procedures established how to deal with disruptive and distracted students. Masters and doctoral students as a whole framed their responses around more traditional classroom management responses. "For students using wireless laptops include allowing students time to explore/use, set time to sign on/ sign off, appropriate/approved websites, and make sure they know their passwords and username." "Teachers should have access to reports showing everything the students did on the computer that day (work completed, sites visited, games played, etc.)." "Establish parameters for students to send homework to teachers via email (going green). Clear, concise student expectations should be posted." A doctoral student commented, "Establish a consistent protocol."

The undergraduates came up with ways to use the technology to the benefit of students who tend to be disruptive or distracted. Comments included, "Do anything to get them (students) to get up and help with the Smart Board. Students (should always be) working towards something meaningful." "Install a program on the main computer that allows the instructor to see all screens. When a student is off task, the teacher can send a pop up to get the student to get on task."

Of all the room arrangements our students created, there were three that were the most common. The first is a "U" or arena shape, with students facing a Smart Board. Student screens are visible from the teacher's main computer and students can also share ideas face to face within this arrangement. The second arrangement has students in quads around the teacher computer. The teacher has easy access to student screens and students can talk easily in groups, but whole class discussions are difficult. The third room arrangement has all of the students working with their backs to the teacher with tables in the middle of the room for group work. Over 90% of our students mentioned the importance of multiple outlets that are easily accessible. "Students should be in groups close to outlets. Batteries only last 3 hours at first then, quickly go down to minutes."

The issue of ethics when using wireless laptops was a most interesting topic. Several students mentioned that using laptops is environmentally friendly or "green" since the need for paper production no longer exists. All agreed that it is important to exclude inappropriate internet sites, yet the undergraduates mentioned that it is "okay to block certain sites, but be careful not to block everything. We

loose the value of wireless when most of what students need to access is unavailable because of the system's firewall." Plagiarism was also a big issue among most of our students. They suggested using a website such as www.turnitin.com to turn in all papers. "If a paper has over 20% plagiarized than the paper should probably score a zero." We asked our students how we get beyond rules and regulations so that students are self monitoring their own ethics. How can we help them to gain a since of right and wrong with wireless laptop use? One student responded:

" Begin with an orientation to learn the netiquette of online ethics. They will have a basic laptop to learn how to do research in the right way. It is okay to copy and paste as long as they cite it. When you talk about ethics, it reaches so many things. You need to have some type of basic ethics, a standard for the school or the county to go by."

While the simulation provided our students with a chance to consider the future of wireless laptop use in their own classrooms, it also gave us a window into their own perspectives of wireless laptop use in our university instruction.

Conclusion

The research continues as the model of collaborative action research includes ongoing recursive sequences or *cycles* of research. The first cycle developed a basic set of rules for wireless laptop classroom netiquette, yet required modifications for each classroom. Modifications were based on teaching style, the diversity of students present, the content being taught, and the length of class period. Descriptions of the process and a final set of modification criteria demonstrated an increase in on-task time of students as well as effectively making use of the Internet and other resources through wireless laptop utilization. By working collaboratively, the researchers exchanged ideas with each other and with their students as the cycle progressed. They co-created the implementation of their research with the students in each of the three classes, and then compiled their findings into one research model. The compilation of results were used to construct an action research model that supports wireless laptop use in the university classroom while honoring the Socratic

traditions of academia. Their research model will be replicated in future studies of wireless laptop use in University classrooms at the graduate and undergraduate levels.

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ABOUT THE AUTHOR

Tamra Ogletree graduated with a PhD from the University of Georgia in 2006 and has been teaching at the University of West Georgia since 1998. Some of the many positions she has filled at West Georgia include Professional Development School Director, Director of the Child Development Center, and is currently the Co-Director of the Cherokee Rose Writing Project. Her professional interests include literacy, writing, learning styles, and social justice. She can be reached at togletre@westga.edu.