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A Model for Collaborative Relationships Between Instructional Technology and Teacher Education Programs

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Public and government agencies in the United States are calling for increased accountability in all aspects of K-12 education and teacher preparation, demanding standards of performance and allocating funding to assist students and teachers to meet these standards. With the current influx of federally funded grants such as the *Preparing Tomorrow's Teachers To Use Technology*, many in instructional technology (IT) departments who serve teacher education programs wrestle once again with working outside the initial teacher certification areas. In light of new standards, not only in technology but also in all content areas, how can IT departments work with teacher education faculty and programs to ensure that novice teachers will be able to meet these standards? We propose that developing purposeful relationships of a cooperative nature between these two programs is a critical step toward preparing preservice educators to integrate technology.

This article explores the process and the outcomes of a partnership developed between the Instructional Technology unit and the Middle Childhood Education unit at Georgia State University (GSU; see Appendix A for a description). Current and future plans for the partnership are provided, as well as reflection on why this partnership worked and continues to grow. Finally, recommendations for establishing partnerships between IT units and initial certification units are provided.

Instructional Technology and Teacher Education

Computer technology has been available for use in educational settings for several decades. According to a survey of U.S. state-level technology officials (Trotter, 1999), 42 states require teacher preparation programs to include technology. One might think that by this time colleges of education are successfully preparing teachers to integrate technology into instructional practices. However, this has not necessarily been the case. In 1995, the U.S. Office of Technology Assessment (OTA) published a report on the status of teachers and technology. According to the OTA, teachers were not and did not feel adequately prepared to integrate technology into their teaching practices. One of the contributing factors cited was the lack of technology training available in teacher preparation programs at colleges of education. When technology instruction was provided, it involved teaching *about* technology not teaching *with*

technology. In most instances, college of education faculty did not model technology integration with their preservice students.

In a recent survey of 416 teacher preparation institutions commissioned by the Milken Exchange of Education Technology, most faculty members did not model the use of instructional technology skills in their teaching (Moursund & Bielefeldt, 1999). In several studies it appears that faculty who are not modeling are also not requiring students to use technology in their lessons or assignments (Lewallen, 1998; U.S. Congress, 1995; Wetzel, 1993).

However, a report produced by the U.S. Department of Education (2000) revealed refreshing news: less experienced teachers were more likely than experienced colleagues to indicate that college course work prepared them to use computers in their classrooms.

> Eighty-four percent of teachers with 3 or fewer years and 76 percent of teachers with 4 to 9 years of teaching experience reported that college/graduate work prepared them to use these technologies to any extent, compared with 44 percent of teachers with 10 to 19 years and 31 percent of teachers with 20 or more years of teaching experience. (p. 78)

While teacher education programs still face obstacles as they prepare preservice teachers, it is evident they are making progress.

Models of IT Instruction in Teacher Education Programs

This progress is occurring through stand-alone computer courses, as well as through integrated coverage across teacher education curriculum. While these efforts in isolation make some headway, students benefit more when teacher education programs combine both. In efforts to combat the historical failings of the stand-alone course in which teaching and technology are separated (Bennett & Daniel, 1999; Leh, 1999; Willis & Mehlinger, 1996), some colleges of education have reinvented the stand-alone course to make it more constructivist in nature, with a greater focus on technology integration. In addition, their teacher education faculty model technology integration in their content-area courses. In a follow-up study to the OTA report, Wetzel and Strudler (1999) looked at four colleges of education (Vanderbilt University, University of Virginia, University of Northern Iowa, and University of Wyoming) deemed exemplary in their approaches to prepare in-service teachers to use technology. The study indicated that each of these programs required an educational technology class for preservice teachers early in their program. In addition, each institution was part of a larger plan for preparing students to teach with technology. The Milken Exchange on Education Technology report (Moursund & Bielefeldt, 1999) called for increased use of technology in curriculum courses. It, too, indicated that a single course in instructional technology does not provide adequate training for preservice teachers. This model, the integrated approach along with a required 'technology for teachers' course, may be the best approach, particularly in light of the renewed focus on accountability in teacher education.

Accountability in Teacher Preparation

In the United States, there is a national movement toward accountability in all areas of preparation in teacher education programs. New technology standards for teachers along with revised accreditation requirements will require teacher preparation programs to more closely examine the ability of their new teacher candidates to teach with technology. Recently published National Education Technology Standards for Teachers (NETS-T) (International Society for Technology in Education [ISTE], 2000) reflect this movement. Along with the standards, ISTE has created 'professional preparation performance profiles.' These profiles provide scenarios for the types of activities teacher preparation programs can expect from their students at four phases of professional development from general preparation through their first year of teaching. This publication is timely and comes on the heel of a call-to-action to the colleges of education by the National Council for Accreditation of Teacher Education (NCATE).

In 1997, NCATE concluded that a majority of teacher education programs were not doing what needed to be done in terms of preparing teachers to teach in 21st-century classrooms. NCATE recommended that its accreditation body recognize technology education for teachers as central to the teacher preparation process. As a result, NCATE raised the bar. Aligned with Interstate New Teacher Assessment and Support Consortium (INTASC) standards, the newest NCATE (2000) unit standards now require teacher candidates to be able to 'appropriately and effectively integrate technology and information literacy in instruction to support student learning' (p. 8).

At the state level, departments of education are also calling for accountability. In Georgia, the Board of Regents of the University System of Georgia has adopted *Guiding Principles on Teacher Preparation* (University System of Georgia, April 8, 1998). This policy "guarantees' the performance of P-12 teachers prepared through [the university system's] teacher education programs for teachers who are teaching within the fields for which they have been prepared' (p. 1). Under the guarantee principle,

> the University System will "take back" any teacher within the first two years after graduation from a System institution when a school district in Georgia determines the teacher's performance is less that effective in helping students make satisfactory progress....If taken back, a teacher will receive additional preparation at no cost to the teacher or to the school district. (University System of Georgia, March 11, 1998, p. 1)

In addition, Georgia Governor Roy Barnes appointed an Education Reform Study Commission to look at ways to improve Georgia's schools. The results of the study created the A Plus Education Reform Act of 2000, (Georgia Legislature, 2000) passed into law earlier this year. Out of the act came two technology-related initiatives that impact teachers and teacher preparation programs. First, the act mandates that renewable teaching certificates would not be granted unless the candidate demonstrated 'satisfactory proficiency on a test of oral and written communication skills, *a test of computer skill competency*, [italics added] and an assessment to demonstrate satisfactory on-the-job performance appropriate to the applicant's field of certification' (p. 65). Second, the act holds teacher preparation programs at universities and colleges responsible for their graduates' technology competencies. The act says that universities and colleges

> shall require students in such programs to be proficient in computer and other instructional technology applications and skills including understanding desktop

> computers, their applications, integration with teaching and curriculum, and their utilization for individualized instruction and classroom management. There shall be a test to assess the proficiency of students enrolled in teacher preparation programs in computer and other instructional technology applications and skills. (p. 68)

An Alternative Approach: Cooperative Faculty Partnerships

In considering how to best address these accountability issues, GSU explored alternative approaches to technology instruction, as well as ways IT faculty might be involved in preservice programs. The development of this alternative approach was made possible by a collaborative partnership established between the IT unit and the Middle Childhood Education unit. This partnership was developed in an effort to redesign the initial certification programs at GSU to meet changing course offering calendars, as well as to respond to the call for increased accountability in teacher education by professional associations and accrediting agencies.

Other universities have also examined the potential of collaborative partnerships between IT and initial certification programs. Duffield's (1997) account of an instructional technology'teacher education partnership at University of Colorado-Denver chronicled a 4-year journey, in which Duffield served as an IT consultant to the elementary education methods team. What is telling is that more partnerships have not been cited. Perhaps the answer to this can be found in examining how colleges of education are typically structured. IT programs teach to a more diverse audience than do initial certification programs, and as such, often have difficulty fitting in to the typical college of education structure. Historically, IT programs have developed from two theoretical foundations, audio-visual/media, and corporate training, design, and development; programs focusing on a broader than K-12 audience. Because of this diverse, non-K-12 heritage, many universities have difficulty placing IT programs within their departmental structure. The simple solution is to establish the IT unit as its own department. While this solution allows the IT unit autonomy, it has its drawbacks, particularly when everyone else in the college has a K-12 focus. Barriers can go up quickly, and what ensues is a lack of coordination and cooperation between IT and initial preparation programs.

The other popular solution, housing IT with other broader than K-12 programs (such as curriculum and instruction, educational psychology, or educational leadership departments), has also not been conducive to fostering partnerships with programs offering initial K-12 teacher certification. It is possible that this division, however convenient it might be for the IT training persona, might be partially responsible for the lag in technology integration in the schools and in our preservice programs. At GSU, initial certification programs fall under the jurisdiction of the Professional Education Faculty, a combination of faculty of the College of Education and the College of Arts and Sciences. The IT unit was moved several years ago to the comfortable umbrella of the largest department in the College of Education, Middle/Secondary Education and Instructional Technology (MSIT). The MSIT department prepares teachers in a variety of traditional and alternative programs for certification in Middle Childhood Education (grades 4-8) and Secondary Education (grades 9-12). Although the IT unit was housed within an initial preparation department, for several years the IT unit continued to address the broad IT audience and until 1997, approximately 80% of the IT graduates entered the corporate world. At this same time several factors were developing to force a change not only in the focus of the IT unit, but

also in the MSIT department.

Program Performance Analysis and Formative Evaluation

In the mid- and late-1990s, several national organizations introduced and promoted standards for preservice teachers and their programs; for example, INTASC Principles (Council of Chief State School Officers, 1999), ISTE Technology Standards for All Teachers (ISTE, 2000), as well as content specific standards. At the same time, the University System of Georgia (USG) Board of Regents determined that all institutions would move from a quarter to semester calendar beginning with the 1998-99 academic year. The USG Board of Regents guarantee mentioned earlier, as well as pending NCATE and university-wide Academic Programs and Continuing Education self-study reviews, precipitated the entire MSIT department's participation in a program performance analysis and formative evaluation. In examining all programs, a culture of cooperation between the IT unit and the teacher preparation programs was established.

With an opportunity to revamp the entire Middle Childhood Education program, a Middle Childhood Committee (MCC) was formed. The chair of the MSIT department appointed representatives from each content area: language and literacy, mathematics, science, social studies, reading, and instructional technology. With 1 year to prepare for semester conversion, the MCC, under the direction of the unit coordinator for the middle childhood undergraduate program, met several times each month to determine a course for the program for the coming years. The goal of the committee was simple and broad: convert the program to a semester calendar and make the program 'exemplary.' Few restrictions were placed on the committee other than limiting the total credit hours to 120, as well as ensuring that state and national standards were met. Each meeting addressed a single issue; some issues were carried on from one meeting to the next. Meetings were frequently held during the lunch break between classes so all faculty members could attend and participate.

The MCC examined all required guidelines for initial preparation programs at the state and national levels. Input from faculty and student evaluations and surveys were also incorporated into the analysis. All components of the middle childhood undergraduate program were analyzed: program admissions and exit criteria, course offerings, course experiences, field experiences, scheduling of classes, scheduling of student-cohort groups, and faculty teams. As a result, major program changes were proposed, approved by the entire department, and implemented. This paper focuses on two outcomes of this cooperative relationship, which affected the way in which the IT unit prepared and advised preservice teachers and interacted with the initial preparation programs: the redesign of the stand-alone technology course to a technology-methods course and the establishment of a standards-based alternative assessment process for all prospective middle grades teachers at GSU that built upon the content and methods introduced in the technology-methods course.

Technology-Methods Course Development

As indicated earlier, many teacher education programs focused on either a stand-alone course, or on a model of technology infused throughout all teacher preparation courses. Some schools, including GSU, have opted to do both. Kovalchick (1997) offered,

> An approach that I have found useful is to blend elements from both competency based models and integrative models into a reflexive approach in which students use technology as both learner and teacher. In this way, preservice teacher education students are challenged through direct experience to generate personally relevant conceptions of technology. (p. 31)

Smaldino and Muffoletto (1997) also promoted a combination approach.

> Our model attempts to blend the contents of the existing single course with the need to nurture technology applications within methods and other courses. Thus, students first gain an understanding of the applications of technology in education in the broad sense, with an in-depth examination of how technology supports learning in specific content areas. (p. 37)

Prior to 1997, the technology course at GSU was a stand-alone, skills-based course focusing on the use of technology as a teacher tool. Content included such technology usage as word processing, mail merging a letter home to parents, and using a spreadsheet program to calculate grades. Little to no learning theory or instructional methods were included in the lab-based course. In addition, the technologies covered were basic in nature ' telecommunications coverage consisted of e-mail and in later years the Internet as a database of lesson plans. As pedagogy played virtually no role in the course, students were allowed to substitute a passing grade on a pencil and paper competency test.

In 1997, at the request of the Middle Childhood Committee, the standard skills-based preservice technology course underwent a major redesign. In the first year, the course refocused from teacher-resource-based, skills-based to a technology-integration-into-the-curriculum approach. This refocus was in part to address a potential cause of low technology adoption in preservice teachers: deficiencies in technology-integration methods (Leggett & Persichitte, 1998).

In fall semester 1998, the IT unit worked with the MCC to redesign the course to further situate the course content in teaching methods. Students entering the MCE programs came from traditional and nontraditional educational backgrounds of varied technology competency. To address technology integration, students first needed to know something about teaching methods. The MCC felt strongly, however, that students needed to master technology skills early in their program, so they could build upon these skills throughout their program of study. As one of the few restrictions placed on the MCC was to limit total credit hours, the IT representative on the MCC proposed a course outline that introduced teaching methods early in the course and then added technology skills and methods grounded in the technology-integration-into-the-curriculum model. The MCC agreed to this course proposal.

Description of the Course

After the course content was proposed and agreed upon by the MCC committee, the course format evolved over several semesters. Initially, a single section of the five-quarter-hour Technology in the Middle Grades Classroom fulfilled enrollment needs. Students met in a laboratory to learn and practice technology skills and traveled during two class meetings to technology-using middle schools to observe teachers in action. However, semester conversion brought about a surge in enrollment, as the course was offered only three times each year instead of the four offerings under the quarter system. In addition, the course was adopted as a required course by the secondary education unit and as an elective course for students studying early

childhood education, as well for those studying for teaching careers in foreign languages, arts, music, kinesiology, and health. To modify the course to meet a variety of grade and content instruction and to meet increasing enrollment needs, it was determined course content would have to move to a more general teaching methods approach (non-grade specific) and that students would require access to an abundance of resources that address teaching and technology in their area of study.

The current three credit hour course, Teachers and Technology, maintains a lecture/lab approach while also including a web-based, resource-based learning environment (RBLE) (Hill, 1999; Shoffner, 1999). Multiple sections are offered every semester and are taught by the Instructional Technology faculty and graduate students. The course and its related resource laden web site incorporate a problem-centered, activity-based approach. Computer applications are anchored in authentic and familiar contexts in which teaching and learning occurs (as recommended by Cognition and Technology Group at Vanderbilt, 1991; Vygotsky, 1978). This approach is based on the view of an open learning environment, in which learners have direct input on the direction of the course based on their needs (Hannafin, 1999; Hannafin, Hall, Land, & Hill, 1994). As students progress through the course, they learn to integrate a variety of cognitive tools, such as desktop publishing, concept mapping, data management, and Internet tools, in order to solve instructional and curriculum problems. Students demonstrate their proficiency levels through individual work samples for each cognitive tool. In these work samples, students pose a problem, develop an instructional solution that relies on a particular computer tool, and reflect on the process.

The capstone project is a learning environment portfolio. Preservice students generate a portfolio documenting the design and development of a technology-supported instructional environment that facilitates student learning through student-centered learning activities. Working individually or in small groups of two to three, students describe a learning environment in which they might be teaching. They develop a unit plan and several lesson plans, along with the necessary materials demonstrating their ability to appropriately integrate technology into their selected curriculum. This final course project may be presented either in paper or digital form. The use of portfolio development and assessment continues throughout the remainder of the Middle Childhood Education program of study. It provides both a sense of continuity for faculty and students and a means to reinforce technology integration skills.

In navigating through the environment and tackling challenges, it is proposed that students will also develop self-directed learning skills, which will serve them well as they enter the teaching profession. Along with confidence in using the technology, self-directed learning skills have been identified as a characteristic of successful technology-using teachers (Shoffner, 1996). A site map of the most current version of the online learning environment is provided in Figure 1. The RBLE can be accessed at http://msit.gsu.edu/IT/3210/index.html

At the same time, the course serves as an introductory teaching methods course, introducing preservice students to such concepts as instructional objectives, lesson planning, evaluation, and assessment. The course offers more than teaching the basic ADDIE instructional design model (analyze, design, develop, implement, and evaluate) as a way to develop lesson plans, while teaching about technology integration skills. In the Technology for Teachers course at GSU, the technology is immersed in learning about what being a teacher entails ' briefly, planning, learning theory, instructional strategies, classroom management, and assessment. Our hope is that by introducing the technology and the methods together early in the program (a) students will forever forward view technology as natural to the learning process as the textbook and the

pencil, and (b) both the technology *and* the methods will be reinforced throughout their other courses at GSU.

Course Evaluation Studies and Ensuing Modifications to the Course

The course continues to evolve. A variety of formal and informal evaluation studies, as well as student feedback, have helped faculty coordinators modify and improve the course each time it is offered. Course instructors participate in a formal meeting prior to the beginning of each semester and informal meetings throughout the semester. Decisions are made as to what aspects of the course are working and which need attention and modification.

Initially, the course operated as a strictly face-to-face course supplemented with web-based resources. Instructor feedback noted that students were too heavily focused on their technology skills and were not participating in class discussions. A study was conducted to see how students might fare in content discussions away from the classroom (Cook, 2000). After participating in online instruction and discussion, students made significant positive gains in attitude, confidence, value, and achievement regarding Internet-based learning resources. As a result, online content and online bulletin board discussion were added to the course.

Evaluation studies have also been performed to explore the effectiveness of the course. Shoffner (1999) examined multiple sections of the course across two semesters to determine if students perceived any change in their technology comfort and expertise. Using a locally developed self-report instrument, students rated their perceptions of their technology skills and their attitudes toward technology use at the beginning and the end of the course. Student reports showed an increase (although not significant) in the areas or comfort, perceived expertise, and perceived software proficiency. As student reflection papers indicated students felt they had gained considerable skills since beginning the course, it is suspected that study data might have been skewed by a ceiling effect. A ceiling effect makes data analysis difficult because it reduces the amount of variation in a variable (Vogt, 1999). The high scores self-reported in the pretest gave reason to suspect that students had optimistically overestimated what they knew and felt about technology prior to beginning the course. In other words, the students did not know what they did or did not know at the time of the pretest. This ceiling effect was later confirmed in Cook's (2000)study, mentioned previously. The technology comfort and expertise study will be repeated in the 2001-2002 academic year, making use of a retrospective posttest, which asks students to reflect on where they may have been on the scale prior to the course and where they are after the course.

A second study was conducted in the 1998-1999 academic year to determine if the use of the RBLE led to an increase in the student self-directedness (Shoffner, 2000). Pre- and posttest versions of Guglielmino's (1977) Self-Directed Learner Readiness Scale (SDLRS) were administered to 80 IT 3210 students. Comparison of pre- and posttest scores on the SDLRS showed no significant difference. In fact, the scores decreased slightly, indicating a potential decrease in self-directedness. This is possibly due to student frustration with the amount of ambiguity in the course. Student commentary on self-directness gleaned from the reflection papers was mixed. Again, a ceiling effect was suspected. The decrease in perceived self-directedness led course designers to add software help-sheets (software tutorials) and additional resources to the online environment to give students a feeling of comfort. Course instructors also developed scaffolding strategies to model the use of the RBLE early in the

semester. The self-directedness study will also be repeated in the 2001-2002 academic year using a retrospective SDLRS posttest.

A third study is currently in the analysis phase. Dias, Shoffner, and Atkinson (2001) surveyed and interviewed graduates of the GSU middle childhood education program near the end of their first year of teaching to determine the effectiveness of the IT 3210 course on their teaching. Initial review of the interview data indicates that although the first-year teachers felt comfortable in their technology skills, their ability to actively use them in their classroom was highly dependent on their access to technology in their school environments. Teachers who had access to technology indicated they felt well prepared by the IT 3210 course to integrate it into their teaching.

MCE Standards Based Portfolio Development and Technology Integration

A second outcome of the MCC was the establishment of a continuous process of portfolio development and assessment for all students. This was a key process for integrating technology across the program and into the content of every course. In response to the Board of Regents guarantee principle, increasing accountability in teacher preparation programs, and the Middle Childhood Committee's recommendation to strengthen the preservice teachers' overall professional development, the committee recommended that the program include an exit assessment examining the students' ability to apply what they learned in all their courses in some cohesive manner. After examining several assessment models, both traditional and alternative, a portfolio development process with benchmarks throughout the program and final submission as an exit requirement was adopted.

Although most skills and concepts are developed in individual courses, it is important that preservice teachers have command of these concepts and skills with knowledge of how to integrate these concepts and skills into all aspects of teaching. Therefore, a major goal of the portfolio requirement was to develop the preservice students' ability to integrate several components of the program across all courses and to develop knowledge and skills in applying these components in all aspects of teaching. Among key skills and concepts under discussion were integrating technology into learning, developing and implementing lesson plans and assessment strategies, developing and implementing a classroom management plan, working with diverse learners, developing as reflective practitioners, and so on. After a review, the committee agreed that the principles of INTASC encompassed and addressed all major components of the middle childhood program and could be used to facilitate the development of the preservice teachers. Thus the committee established portfolio guidelines focusing on the 10 principles of INTASC. The INTASC Principles are reproduced in Appendix B.

Through the continuous collaboration of the middle childhood committee, guidelines for portfolio development were documented, benchmarks were established, implementation procedures were outlined, and an assessment instrument and procedures were designed. The committee reviewed course syllabi for all MCE undergraduate education courses to determine which INTASC principles were met in each course. The principles were aligned with the program's schedule of course sequence and experiences to establish which principles the preservice students would be able to address at established intervals. These intervals serve as benchmarks to assess the students' portfolios. Portfolio development is introduced in the

Teachers and Technology course in the form of the learning environment portfolio. Subsequent submissions are based on the INTASC principles and occur at the end of the first year of professional studies, prior to student teaching, and at the close of student teaching. More information about the alternative assessment process in place at GSU can be viewed in Appendix C.

The Middle Childhood Committee Today

The process of evaluating and revising a teacher education program is iterative and continuous. As GSU enters its 4th year on the semester calendar, the MCC still meets monthly. The membership has changed slightly due to retirement and new hires and includes the appointment of a second representative from the IT unit. Issues to be addressed in the 2001-2002 academic year include the review of all program syllabi to determine in what courses each of the NETS-T performance indicators are addressed.

Collaboration and Cooperation: Contributing Factors at GSU

The authors would be remiss if we did not reflect on our case study to determine what factors may have contributed to our success and from that reflection make suggestions on how IT units at other colleges of education might do the same. Our reflection produced three core factors that contributed to the success of our collaboration: the nature of middle grades, a committed faculty, and a culture of mutual respect within the committee, the department, the college, and the professional education faculty.

It is the nature of those who teach at the middle school level to be cognizant of multiple disciplines as well as to be flexible. Middle schools typically employ a teaming approach to instruction, in which students are assigned to a team of teachers who cover the core subjects. To operate successfully in the team structure, middle school teachers must be flexible and cooperative. This flexibility and cooperativeness must also be present in those who prepare middle school teachers. Furthermore, teacher licensure at the middle grades level is across all content areas. Although preservice teachers prepare in a major and a minor content field, they are licensed to teach all fields, and must be ready to teach in any of the four core content areas and reading. Although it is possible to receive an advanced graduate degree in Middle Childhood Education, most faculty members teaching in our program are from a specialty content area (mathematics, language and literacy, reading, science, social studies, or instructional technology). It is imperative that those who prepare middle grades teachers work together to facilitate this broad multidisciplinary preparation.

A second factor contributing to the success of the partnership at GSU is the nature of the faculty. Although the faculty differed in their fields of specialty and their experience in the K-12 and college level, all of the faculty involved in the Middle Childhood Committee were committed to making this program work. GSU has a long history of preparing outstanding middle school educators, and the faculty was and is committed to continuing this tradition. The committee met regularly, at times weekly, to plan the program, the technology methods course, and the portfolio assessment process. One reason for the MCC's commitment level was that they were given ownership of the program by a supportive department administration. Committee members

continue to give their time to meet and review portfolio submissions each semester.

The third factor contributing to the partnership's success was the establishment of a culture of mutual respect among the committee members. As committee members come from a variety of disciplines, each had something to bring to the table. Early on, the IT faculty members on the committee were able to establish their credibility as educators. All content areas, including instructional technology, were considered equally important to the preparation of new teachers.

Suggestions for Establishing Partnerships

Although the IT unit at GSU is strategically placed to facilitate such collaborative partnerships, some steps can be taken to nurture such partnerships, even when the IT unit is housed outside the initial preparation programs. We offer the following suggestions to establish cooperative partnerships with teacher education program units.

First, instructional technology faculty members who wish to work with teacher education programs must become familiar with current issues in teacher education preparation and in K-12 schools. As it is possible or even likely that an IT faculty member may not be a certified K-12 teacher, other steps may be taken to develop an understanding of schools. IT faculty members can volunteer to collaborate with a K-12 teacher, designing and team teaching a unit of study. Serving on school technology committees is yet another way IT faculty can develop an understanding of the K-12 school culture.

Second, the IT unit should ideally find a single teacher preparation unit or team willing to work with an IT consultant. Many in IT would argue that the integration of technology should take place in a systemic fashion. However, an incremental approach is more likely to be successful, and in this instance, success will likely breed more success. In short, pick a single program with whom to establish a rapport, and then work on establishing a relationship.

To nurture this budding relationship, it is essential that the IT faculty member(s) attend teacher education department or unit meetings. At these formal meetings, the IT faculty members can establish their credibility as educators by providing information on technology integration strategies, while also garnering information about the certifying program. Duffield (1997) concurred,

> Probably the most important element of the second year was the time I spent planning and working with the elementary methods team. I was able to become familiar with the content and methods they used and begin discussions about how technology could be integrated into the courses. I also served as an advocate for technology, keeping it part of every discussion. (p. 24)

In order to serve as an advocate for technology, IT faculty must stay current with research and methods in instructional technology integration strategies.

Conclusions

Accountability directives for new teacher preparedness are not likely to go away any time soon. Indeed, in his first month in office, United States President Bush proposed that education initiatives to increase teacher accountability similar to those in place in the state of Georgia be

implemented nationwide. Instructional technology preparation will likely continue to be a critical issue in teacher education for many years to come. Instructional technology units can no longer teach only to their corporate training design and development roots. For colleges of education to successfully prepare teachers for the 21st century, instructional technology will need to be more cohesively included in teacher preparation programs. It is imperative that more cooperative partnerships be established between instructional technology units and initial preparation programs. IT units should initiate and nurture these partnerships, making possible more innovative approaches to this important field of study.

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Appendix A

The Middle Childhood Education Program at Georgia State University

Georgia State University, a large research university located in Atlanta, Georgia, is a leading producer of new teachers in the southeastern United States. At Georgia State University (GSU), the Instructional Technology unit has been working closely with the Middle Childhood Education (teacher preparation for grades 5-8, or ages 10-14) unit for the past 4 years to develop just such a cooperative relationship. Working together, the units have redesigned the stand-alone technology course into an innovative, alternative approach to technology in teacher education, in which introductory teaching methods are taught in a technology'rich learning environment. In

addition, a multisubmission portfolio assessment plan for all Middle Childhood Education students was instituted to ensure that all students meet multiple national teacher standards prior to graduation.

Appendix B

Interstate New Teacher Assessment and Support Consortium Principles (Council of Chief State School Officers, 1999)

Principle 1	The teacher understands the central concepts, tools of inquiry, and structure of the discipline(s) he or she teaches and can create learning experiences that make these aspects of subject matter meaningful for students.
Principle 2	The teacher understands how children learn and develop and can provide learning opportunities that support their intellectual, social, and personal development.
Principle 3	The teacher understands how students differ in their approaches to learning and creates instructional opportunities that are adapted to diverse learners.
Principle 4	The teacher understands and uses a variety of instructional strategies to encourage students' development of critical thinking, problem solving, and performance skills.
Principle 5	The teacher uses an understanding of individual and group motivation and behavior to create a learning environment that encourages positive social interaction, active engagement in learning, and self-motivation.
Principle 6	The teacher uses knowledge of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.
Principle 7	The teacher plans instruction based on knowledge of subject matter, students, the community, and curriculum goals.
Principle 8	The teacher understands and uses formal and informal assessment strategies to ensure the continuous intellectual, social, and physical development of the learner.
Principle 9	The teacher is a reflective practitioner who continually evaluates the effects of his or her choices and actions on others (students, parents, and other professionals in the learning community), and who actively seeks out opportunities to grow professionally.
Principle 10	The teacher fosters relationships with school colleagues, parents, and agencies in the larger community to support students' learning and well-being.

Appendix C

Portfolio Development and Alternative Assessment at GSU

The MCC at GSU decided that the preservice students would write a narrative for each principle and provide artifacts to substantiate their knowledge, growth, and experiences in the program. In the narrative, students are required to discuss personal accounts that address all concepts within the principle. In that the student is required to address all concepts of the principle in the narrative, it was clear that a specific artifact might address only one or two concepts within a principle. Therefore, the students are required to explain within the narrative how the artifact addresses a specific concept.

The committee established benchmarks based on experiences acquired within the prescribed course sequence. Students are expected to complete all content courses prior to the senior year in the program. The University System of Georgia Board of Regents requires within a 120-hour semester program that middle childhood education (MCE) majors have two content areas of concentration—12 semester hours in a major area and nine semester hours as a minor area. During the junior and senior years the preservice teachers are immersed in teacher education courses that include field experience components. The INTASC principles and benchmarks were aligned with the Professional Studies and Student Teaching coursework: introduction to middle schools, instructional technology, teaching reading block, topics courses in the content areas, methods block, diversity course and student teaching. The committee established the following schedule as benchmarks for assessing student growth and development in the program. Upon completion of the Professional Studies courses (at the end of the junior year), the MCE students are assessed for meeting INTASC Principles, 1, 2, 6, 7, 8, and 9. Prior to entrance to student teaching (midway in the senior year), MCE students submit portfolios demonstrating competency for all 10 principles. Next the committee established a system for portfolio evaluation, introducing the students to the process through seminars and coursework, and assigning faculty advisors to assist students.

Students are guided through the portfolio process. Early in the semester in which students begin Professional Studies course, seminars are delivered by the MCC to introduce the portfolio process to the preservice students. The *MSIT Middle Childhood Education Program Portfolio Evaluation Guide* (Many et al., 1998) introduces students to the INTASC principles, and explains the portfolio assembly and evaluation process. The *Converting Your IT 3210 Learning Environment Portfolio To The Junior-Year MCE Program Portfolio Guide* (Shoffner et al., 1998) presents strategies for reformatting the Learning Environment Portfolio produced in the Technology for Teachers course to the Professional Studies Portfolio.

The portfolio is accepted in a variety of formats. Students may submit an electronic portfolio (on compact disc), a website, or a notebook for faculty review. (The majority of students in program continue to favor the notebook version.) Upon portfolio submission, the MCC meets and collaboratively assesses each portfolio. A simple rubric is used to assess competency in regard to INTASC Principles. Faculty reviewers indicate whether each principle was 'not met,' 'met,' or 'met in an exceptional manner' and give feedback on the documentation of each principle. Students receiving a score of 'not met' on any principle are required to meet with a faculty advisor to discuss what must be accomplished to achieve successful experiences and

documentation for the principle.

The portfolio review process was implemented in the fall 1998 semester. Due to the iterative nature of the assessment process, all students met all principles prior to graduation. The portfolios generated by students at the close of their coursework consistently demonstrated a clear understanding of the theoretical underpinnings and application of teaching and learning knowledge. Student narratives provided rich and reflective insight into how each preservice teacher was able to apply what was learned in the college classroom to the middle grades classroom. While students were initially resistant to the added work of compiling the portfolio, by the end of their program, they enthusiastically espoused the benefits of the portfolio process in allowing them to compose a holistic vision of their preparation and educational philosophy, as well as the ability to articulate this vision. Many students commented on the benefits of the portfolio process in preparing them to successfully interview for permanent employment.

Students in the first cohort to complete the portfolio process are now certified educators employed in the schools. Several research-based initiatives are underway to examine their preparedness as in-service teachers. In addition, a study is in progress that will examine the INTASC portfolios for the demonstration of technology competencies (NETS-T Profiles). The MCC committee continues to formatively evaluate their program in light of national and state directives, as well as student needs.