

Executive Summary
Year Three Final Report of the Project M³ -
Preparing Tomorrow's Teachers to Use Technology Grant
Prepared for
College of Education
Wichita State University

Project M³ Information

Project M³: Models, Mentors, and Mobility was funded for over \$1.1 million by a Preparing Tomorrow's Teachers to Use Technology (PT3) grant from the United States Department of Education. Over the past three years, Project M³ focused on building capacity among COE faculty and field based K-12 partner teachers to work directly with COE pre-service teacher education students in a way that will increase their capability to use technology in educational settings.

Project M³ was based on three basic beliefs. First, pre-service teachers must see COE faculty and partner teachers **Models** the effective integration of technology into instruction. Second, pre-service teachers need faculty or student **Mentors** who know and understand technology and who are already using technology effectively. Finally, technology must be more readily available to students in **Mobile** settings that promote authentic learning rather than moving whole groups of students into laboratory settings. An important part of the M³ grant was to encourage the use of mobile computing as a method of engaging students and teachers in innovative applications of technology in instruction.

Five K-12 partner schools were originally included in the grant. The K-12 partners include a comprehensive high school, an alternative high school, a middle magnet school, a parochial elementary school, and an inner-city elementary school. All public schools are a part of Unified School District 259, Wichita Public Schools, and the parochial school is a part of the Wichita Catholic Diocese. Partner schools were provided a mobile computer laboratory consisting of five to eight laptop computers, airports and carts. M³ provided hardware and software support necessary to get partner school mobile labs operational as well as inservice opportunities for staff to learn how to use the labs for classroom instructional purposes.

Overview of the Project M³ Grant Goals and Objectives and Evaluation Procedures

An overall Project M³ evaluation plan was developed based on the goals and objectives included in the original proposal. Evaluation questions developed for each goal were used to guide the project evaluation. At the beginning of each grant year, evaluation methods were reviewed in order to establish timelines and identify personnel responsible for overseeing data collection. Both qualitative and quantitative data collection methods were used to assess progress made over the three year grant period. Data collection methods included face- to- face interviews, use of a variety of surveys and questionnaires as well as document reviews. Where possible, evaluation results obtained during the third and final year of the grant were compared to baseline, first and second year data. The four Project M³ goals and 2002-2003 success indicators are outlined below.

Goal One: Models

Members of the WSU Teacher Education (TE) faculty, PreK-12 partner faculty, and Language Arts/Science (LAS) and Fine Arts (FA) faculty will effectively model the integration of technology into pre-service teacher education and content area coursework, by designing, implementing, and disseminating models of practice. (GPRA 1.1, 1.2, 1.4, 2.1, 3.1, 3.2)

Goal One Definition of Success

- 1.1 WSU teacher education faculty will increase their use of technology in classroom instruction.
- 1.2 Partner-school faculties will increase their use of technology in classroom instruction.
- 1.3 A high percentage of teacher education and partner-school faculties will participate in M³ sponsored professional development activities that support technology integration.
- 1.4 Teacher education faculty will increase their use of the COE Technology Center and technology resources.
- 1.5 Support the revision of the technology integration proposal (due to changing state standards).
- 1.6 Identify PreK-12 teachers who will increase the use of technology in their classrooms by designing, implementing, and disseminating models of practice. (e.g., TIPS)
- 1.7 Provide opportunities for PreK-12 teachers to increase the use of technology in Science, Technology, Engineering, and Mathematics (STEM) instruction. (e.g., Robotics)
- 1.8 Pre-service teachers will increase their knowledge, understanding and use of technology in preparation for teaching.

Goal Two: Mentors

The COE will coordinate the development of a broad-based network of mentors that will provide training and support for Teacher Education faculty, Liberal Arts and Fine Arts faculty, PreK-12 partners and pre-service teachers. (GPRA 1.1, 1.2, 1.4)

Goal Two Definition of Success

- 2.1 WSU student mentors will provide training and support for WSU faculty and grant partners based on identified needs.
- 2.2 Model practitioners (teachers) will be identified and used as mentors to provide training in the partner schools.
- 2.3 Mentors from professional and/or industry resources will be identified and used to provide training and support for the M³ staff and other faculty consistent with the goals of the grant.
- 2.4 In year three, Project M3 staff will make presentations to professional organizations on how to integrate technology into instruction.

Goal Three: Mobility

Project M³ participants will expand student access to technology in classrooms and authentic learning environments by using laptops, wireless networks and on-line instruction. (GPRA 1.4, 2.1, 3.2)

Goal Three Definition of Success

- 3.1 Support the development of on-line instruction for WSU faculty and grant partners.
- 3.2 Provide instructional support for integrating handheld technology into Pre-K-20 classes.

Goal Four: Momentum

Secure alternative methods of support for current grant activities considered essential or beneficial for infusing technology into College of Education programs.

Goal Four Definition of Success

4.1 Develop and implement a plan to provide the means needed to sustain technology integration from internal sources (i.e., Depts., COE, University).

4.2 Identify and develop proposals to compete for externally available funds (state, Federal, private).

Summary of Key Findings, Conclusions and Recommendation

Key Findings for Goal One

Members of the WSU Teacher Education (TE) faculty, PreK-12 partner faculty, and Liberal Arts/Science (LAS) and Fine Arts (FA) faculty will effectively model the integration of technology into pre-service teacher education and content area coursework, by designing, implementing, and disseminating models of practice (GPR 1.1, 1.2, 1.4, 2.1, 3.1, 3.2)

- Overall findings related to Goal One support that many of the WSU COE Teacher Education faculty members have made a considerable commitment over the past three years to a long-term policy for increasing the integration of technology in preparing pre-service teachers for their roles as future instructors.
- There is overwhelming evidence that the M³ Grant served as a springboard for involving many COE faculty members to embrace the use of technology who had used more traditional methods in the past. However, based on feedback obtained on the Technology Adoption scale and from pre-service teacher suggestions, there are still a number of faculty members who could benefit from more training and support in how to more effectively integrate technology into instruction.
- Although more instructors outside of the Curriculum and Instruction department became involved in the use of technology over the course of the three year grant, fewer instructors in LAS and other related fields appeared to have taken advantage of the opportunities for becoming involved in technology related activities provided through the M³ Grant.
- In each successive year of the grant, a greater percentage of WSU Faculty members responding to the Stages of Adoption item on the M³ survey chose the three highest adoption levels on scale, indicating an ability to use computers to perform specific tasks and apply technology in new context that involved students in innovative ways. The percentage of faculty selecting these levels increased from 43% between the first year of the grant to 91% in year three, marking a 48% increase over baseline rankings. Increased levels of use of technology among COE faculty was also corroborated by feedback from WSU faculty who participated in interviews as well as responses from pre-services teachers responding to an open ended on-line questionnaire.

- The percentage of partner teachers indicating an ability to use computers to perform specific tasks and apply technology in new context that involved students in innovative ways (Levels 4, 5 or 6 on a Stages of Adoption scale) remained virtually unchanged over the course of the grant at about 60%. However, inconsistencies in response patterns from partner-school participants to M³ surveys and interviews made it difficult to generalize findings to the five schools originally designated at partner schools at the beginning of the grant.
- Feedback received from a majority of WSU faculty on the M³ technology questionnaire and during interviews conducted in the spring of 2003 also supported the idea that many teachers involved in the M³ Project not only increased their use of technology but also increased their ability to apply its use at much higher levels of integration into the curriculum.
- The use of mobile laptops in classrooms along with BlackBoard, PowerPoint, e-mail and other software not discussed in the initial interviews conducted with WSU Faculty and some partner-school teachers became the norm by the end of the third year of the project.
- Interviews with partner-school teachers involved in the project resulted in greater variance in the levels of use and the types of use being made of technology. Some of the teachers interviewed provided evidence of very high levels of technology integration in their courses while others still did not feel the need to use much technology or felt they were still at the ‘learning’ or ‘application of skill’ levels. Technology access was another critical issue at some of the Partner Schools.
- Feedback from the pre-service teachers’ technology surveys provide considerable positive evidence WSU Faculty are requiring pre-service teachers to use more technology as a tool for learning about teaching content in their courses.
- The COE Technology Integration Plan, developed in the spring of 2002, has been used to provide guidance in developing course outlines that include ISTE based technology standards.
- Feedback from pre-service teachers indicates that most Block instructors set requirements for using technology in preparing units of instruction. Seventy-three percent (73%) of the pre-service teachers reported instructors had involved them in the use of a wireless laptop computer, and 67% indicated they were required to demonstrate proficiency in its use.
- Seventy-three percent (73%) of the 2002-2003 pre-service teachers also reported they had been provided adequate preparation for the use of technology through the WSU teacher education program. However, a few students continued to report they felt some of the instructors needed to increase modeling the use of technology in the same way that they expected their students to use it in student teaching. In many cases, more time for practice and application of the use of technologies was also suggested as a way of improving the levels of competency among future pre-service teachers.
- Three years of trend data based on pre-service teachers’ self-ratings on the Technology Adoption Scale also indicated pre-service teachers in each successive

graduating class showed increases in the percentages of students who self rated their adoption of technology at the three highest levels on the scale. Percentages increased from 64% in the baseline year to 80% in the final year of the grant. These increases suggest, over the time the grant was being implemented, a greater percentage of pre-service teachers felt more confident about their use of adapting and or applying technology as a tool for instruction. However, several students suggested more stringent requirements should be set for pre-service teachers to demonstrate competencies in the use of technology as a part of meeting course requirements.

- The development of TIPS expanded from Science and Health in the first year of the grant into Social Studies in year two followed by TIPS for Early Childhood in year three.
- The Robotics program has expanded exponentially over the life of the grant. Literally hundreds of 4th – 8th grade students and their teachers representing a considerable number of area schools have taken part in the Lego Mindstorm Challenges offered in the spring of each year. The Lego Mindstorm Challenge is co-sponsored by M³ and the WSU Engineering Council. M³ Staff and College of Engineering students have also volunteered in a number of area schools to provide assistance to students and teachers on their projects.
- M³ has assumed an ever-increasing role in providing training and support for “Handheld” devices at WSU and in PreK-12 schools, particularly over the past two years of the grant. In partnership with the Wichita Public Schools, eight PreK-12 schools became involved in Project H.E.L.P., which provided workshops and training in the use of handheld devices in instruction.

Key Findings for Goal Two

The COE will coordinate the development of a broad-based network of mentors that will provide training and support for Teacher Education faculty, Liberal Arts/Science and Fine Arts faculty, PreK-12 partners and pre-service teachers. (GPRA 1.1, 1.2, 1.4)

- The support and expertise provided through the M³ student mentors continued, through out the grant period, to be the primary means for sustaining the efforts of WSU COE, LAS/FA faculty to maintain in their efforts to implement more technology into instruction.
- Engineering students from the WSU College of Engineering served as mentors in providing support through the Mindstorms robotics program. Apple Computer and Boeing Charitable Trust also provided support for M³ activities during the grant; however, grant facilitators reported the identification of a broad based group of mentors capable of providing active support to grant participants over the life of the grant was more difficult to attain than originally envisioned.
- There is little doubt that the mentoring support provided through the M³ student mentors resulted in measurable increases in the use of technology in instruction in COE courses provided at WSU. There is also evidence to support that over the three-year period, the training and support provided by the M³ Student mentors

probably provided the most effective means of impacting how pre-service teachers were exposed to and became involved with different ways technology could be integrated into the curriculum content areas.

- Levels of satisfaction regarding training and support provided by the M³ Grant were extremely high among respondents from WSU COE Faculty on the final M³ COE Faculty and Partner-teacher questionnaire. Feedback on the M³ Technology Questionnaire indicates a substantial majority of WSU faculty were ‘Very Satisfied’ (91%) and a smaller percentage, (9%) were ‘Somewhat Satisfied’ with the training and support they had received.
- Results received from partner-teachers on the 2003 questionnaire reflected less amounts of satisfaction regarding the training and support provided through the grant. Only 12% of the partner-school teachers responding said they were ‘Very Satisfied’, while a majority (68%), indicated they were ‘Somewhat Satisfied’ with the training and support provided. The remainder of the partner-school teachers (21%) expressed some level of dissatisfaction, or had no opinion, about the training or support provided by M³.

Key Findings for Goal Three

Project M³ participants will expand student access to technology in classrooms and authentic learning environments by using laptops, wireless networks and on-line instruction. (GPRA 1.4, 2.1, 3.2)

- There is strong evidence indicating the use of the wireless-mobile labs did increase the use of technology among a majority of WSU COE Faculty and among some teachers in partner schools. Most of the teachers interviewed discussed advantages of how the mobile labs allowed for more authentic learning situations by having technology in the regular classroom settings rather than in labs. Several teachers interviewed commented that having the mobile labs allowed them more flexibility in how technology was used.
- Several WSU COE faculty members interviewed over the three-year period commented on their initial lack of knowledge or understanding of how technology would benefit them. By the end of the third year, most reported using technology as an integral part of their daily routine. Many had begun to use BlackBoard to manage information and communicate with students in their classes.
- The introduction of wireless-mobile units for use in the WSU COE gained momentum after the first year of the project and resulted in the purchase of additional classroom sets.
- Partner-school teachers and staffs reported the wireless-mobile labs provided through the grant were appreciated and did provide an introduction to wireless computing in their schools. However, the limited number of units available made it difficult to involve large numbers of teachers, or students in their use.
- Feedback from pre-service teachers obtained through the on-line technology use surveys indicated that all students involved in their last year of pre-service coursework and in the student teaching block had an opportunity to work with the

mobile laptop computers. However, only a small percentage reported using the computers to present instruction during the time they were student teaching due to the lack of equipment in the schools where they were assigned.

- Data gathered from pre-service teachers over the course of the three years of the grant indicate pre-service teachers continued to gain higher levels of confidence in their ability to effectively use technology as a tool in instruction. By the end of the third year of the grant, the percentages of pre-service teachers who reported gaining a sense of confidence in using computers and other forms of technology to involve students in instruction, or the ability to adapt and apply its use to new contexts, increased from 64% at the end of the first year to 80% at the end of the third year of the grant.
- Feedback to open ended items included on the pre-service teacher use survey indicated many of the students involved in their student teaching blocks were providing leadership and mentoring for their cooperating teachers in the use of technology in instruction.
- Seventy-three percent (73%) of the 2002-2003 pre-service teachers indicated at the end of their student teaching experience, they were provided adequate preparation for the use of technology through the WSU teacher education program. However, some pre-service teachers were discouraged by the lack of available technology in classrooms or schools where they were assigned as a student teacher.

Key Findings for Goal Four

Secure alternative methods of support for current grant activities considered essential or beneficial for infusing technology into College of Education programs.
(GPRA)

- The M³ Staff has attempted to obtain support for sustaining the momentum for the use of technology developed through the grant through applying for additional grant funding from a variety of sources. Efforts were also made to make maintain technology positions initially funded through the grant through reallocation of budgeted staff positions. In addition, several changes regarding the use of technology in pre-service teacher instruction has been made to course requirements based on ISTE standards.
- To date, about \$125,000 has been received in additional grant funding for various technology-related projects in the COE. Additional grant funding has been sought to support the training and support of cooperating teachers in using technology as a part of the pre-service teacher training program in a number of schools. Due to budget shortfalls at the state level, additional budgeting authority for expansion of staff, hardware, and software for technology has been curtailed. However, the COE administration and staff appear dedicated to continuing to identify ways to maintain and or increase their efforts to integrate technology into the teacher education curriculum.

Overall M³ Goal Status Summary

The table below contains the M³ project evaluator's final status designation for each of the four Project M³ goals. These ratings were determined by analyzing data and feedback obtained during face-to-face interviews, from paper and pencil questionnaires, on-line questionnaires, workshop survey forms, mentor logs and document reviews of products created as a result M³ activities.

Overall Status Goals One, Two, Three and Four 2000-2003

Goal	Indicator	Status		
		00-01	01-02	02-03
	Grant Year			
One	Members of the WSU Teacher Education (TE) faculty, PreK-12 partner faculty, and Liberal Arts/Science (LAS) and Fine Arts (FA) faculty will effectively model the integration of technology into pre-service teacher education and content area coursework, by designing, implementing, and disseminating models of practice. (GPRA 1.1, 1.2, 1.4, 2.1, 3.1, 3.2)	S	S	S
Two	The COE will coordinate the development of a broad-based network of mentors that will provide training and support for Teacher Education faculty, Liberal Arts and Fine Arts faculty, PreK-12 partners and pre-service teachers. (GPRA 1.1, 1.2, 1.4)	S	S	S
Three	Project M ³ participants will expand student access to technology in classrooms and authentic learning environments by using laptops, wireless networks and on-line instruction. (GPRA 1.4, 2.1, 3.2)	S	S	S
Four	Secure alternative methods of support for current grant activities considered essential or beneficial for infusing technology into College of Education programs.	N/A	N/A	S

S= Substantially accomplished, P= Partially accomplished, N= Not accomplished, NA=Not addressed I = Insufficient evidence to assess progress

Although each of the M³ goals received overall ratings that indicate substantial progress has been made to this point in grant implementation, results obtained relating to some of the sub-indicators used to assess progress, suggest a potential for improvement. These areas are included in the recommendation section following the brief discussion section included below.

Discussion

Overall, the M³ staff substantially accomplished each of the goals established for the grant. A high percentage of COE staff increased their use of technology in classroom instruction as indicated by pre- and post-questionnaires, responses on the levels of technology adoption scale, through interviews and through feedback from pre-service teachers. Pre-service teachers also expressed increased levels of confidence in their abilities to use technology in preparing and presenting instruction as a result of activities and learning experiences provided in courses included in their teacher preparation block during grant implementation. There is substantial evidence to support increased uses of technology among WSU COE Curriculum and Instruction faculty and to a lesser extent among some Liberal Arts and Science faculty. However, efforts to identify and train

large numbers of technology proficient teachers in partner schools and providing field based experiences for pre-service teachers in those classrooms were less successful.

The M³ staff was also successful in developing and disseminating several models of practice in content area coursework through projects like TIPS, Robotics and H.E.L.P. A number of WSU faculty also developed technology based units related to their content areas, which were incorporated into instruction. In addition, during year two of the grant, the COE adopted a new technology plan that required inclusion of technology based on ISTE standards in each course design.

Based on feedback from the COE faculty, the M³ Student Mentoring program was highly successful in providing the direct hands on support necessary for many of the WSU faculty members to gain proficiency in integrating the use of technology into instruction. Most faculty interviewed felt they made their greatest gains through the M³ Student Mentoring program. There was less evidence to support that an effective mentoring program was developed and implemented in the partner schools.

WSU COE faculty reported increased uses of mobile technology over the course of the grant. Use of mobile computer labs increased in buildings where airports were available. There was also increased use of mobile computer labs in some of the partner schools, particularly at North High School. However, the lack of full classroom sets of mobile computers at most partner schools was a deterrent for some teachers to incorporate them into classroom instruction.

Some attempts to develop, disseminate and support on-line instruction were made by the M³ staff over the three-year grant period. Some of these on-line instruction projects are ongoing. Support was also provided to a number of COE faculty members in developing on-line capability for the use remote video conferencing and in the development of communication interfaces via BlackBoard. Many of the COE faculty gained the ability to use BlackBoard as a means of communicating with students regarding course requirements, assignments, e-mail, submission of papers, site-links, etc.

COE administration and M³ Grant personnel attempted throughout the grant to address how they would be able to sustain the efforts made by the M³ Project in continuing the integration of technology in instruction among faculty, pre-service teachers and PreK-12 practitioners. Additional efforts for sustaining technology integration have been, for the most part, promoted through application for additional grants from a variety of sources as well as attempting to shift key technology related positions into the COE budget. However, budget shortfalls at the state level have adversely affected the COE administrations ability to fund the expansion of training, technology staff and equipment at this time.

Recommendations

- WSU COE administration, faculty and staff should utilize findings reported in the M³ Project Evaluation to identify and sustain successful practices that promoted the integration of technology into instructional practices.
- WSU COE administration, faculty and staff should continue to incorporate technology into teacher education course requirements as courses are added or revised.

- WSU COE administration, faculty and staff should continue to offer, promote and support an ongoing professional development program that will encourage all faculty members to increase their knowledge and ability to effectively model the use of technology in classroom instruction.
- Course designs should allow pre-service teachers ample opportunities to practice using technology as a tool for involving students in instruction.
- Attempts should continue to be made to identify model technology proficient practitioners in PreK-12 schools for the purpose of placing pre-service teachers for field based teaching experiences.