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# Technology Academies

A Professional Development  
Model for Technology  
Integration Leaders

The Maryland Technology Academy Leadership Program was established to build technology integration leaders who could promote and support use of technology in schools throughout Maryland. Over four years of operation, the program provided an intensive professional development experience to more than 450 educators. Although the program was intended to build technical, technology integration, and leadership skills, at the core of the program was a commitment to strong and effective instruction. Therefore, a primary emphasis was on using technology in well-designed and meaningful lessons that addressed state standards. The program was developed with best practices in professional development in mind. Participants collaborated with colleagues, developed authentic products, received systematic follow-up support, and engaged in reflection on the teaching.

From 1999 to 2003, nearly 460 educators attended the summer Maryland Technology Academy (MTA) training. Most were school-based educators,



primarily teachers and media or technology specialists. Participants represented all grade levels and subject areas and came from all 24 districts in the state. At the conclusion of this four-year program, the initial goal had, to a great extent, been accomplished, and the state shifted its focus to other needs.

### Background

Through a series of events, leading educators in Maryland recognized the importance of increasing students' technology use and determined that a program to build a network of leaders would be instrumental in putting the Maryland Technology Plan into action. As a result, the MTA Leadership Program was launched in summer 1999. Funding for the program came from two sources—a budget allocation to the state department of education from the legislature and a Technology Innovation Challenge Grant (TICG) from the U.S. Department of Education to the Maryland Tech Consortium (MTC).

The MTA Leadership Program was jointly planned by faculty and staff of the Center for Technology in Education at The Johns Hopkins University, Towson University, and the Maryland State Department of Education. In this innovative partnership, planners combined their philosophies, perspectives, and experiences to develop and deliver the MTA Leadership Program. Each partner had a unique role. CTE focused on curriculum development, and Towson provided the facilities needed to implement the program. The Maryland Department of Education provided input on state standards and assessments and coordinated with local school systems, participants, and the other staff in the state department.

### Goals

The MTA Leadership Program was designed to simultaneously build the technical, technology integration, and leadership skills of the participants. The ultimate goal was to produce a network of technology leaders who would provide technical support and professional development to other educators and contribute to strategic planning related to technology initiatives in their schools and districts.

The program provided an intensive learning experience to K–12 educators from all 24 of the state's school districts. Each year, up to 120 educators (primarily classroom teachers and media specialists) were selected through a competitive process. They attended a three-week summer institute and participated in follow-up activities throughout the subsequent school year.

The summer institute followed a rigorous schedule of activities in classrooms, lecture halls, and computer labs. Participants were divided into five teams according to instructional level. This ensured that participants worked with colleagues who had similar student populations and curriculum requirements. Each team traveled together throughout the program day, and participants received support and assistance from an assigned team leader. Team leaders provided feedback to participants on their work and facilitated their learning through a reflection process that helped them apply what they were learning to their particular role and setting.

The curriculum of the MTA was built around three primary strands:

- Leadership
- Advanced technology skills
- Technology integration

**Leadership.** The leadership curriculum was designed to build capacity for collective learning that leads to constructive change using the recommendations from Linda Lambert's book *Building Leadership Capacity in Schools*. It included extensive coverage of various professional development models that were in accordance with National Staff Development Council Standards and principles of adult learning. Principles of the change process, as well as interpersonal and communication skills, were also addressed. In working through this strand, participants studied leadership roles and responsibilities related to the effective use of technology in instruction. They examined their individual school's needs and designed a change implementation plan. Participants also developed strategies and activities for building the technology and curriculum integration skills of their colleagues.

**Advanced Technology Skills.** This strand focused on providing participants with the skills needed to develop digital content. Participants learned to design and implement Web-based learning activities and advanced multimedia applications for classroom instruction. Another important aspect of this strand was the copyright and ethical uses associated with building digital content.

**Technology Integration.** The MTA curriculum applied a constructivist approach to teaching, learning, and authentic assessment. The curriculum emphasized the importance of using appropriate technology as a tool in differentiating instruction for all learners. Participants developed student learning activities that integrated technology in ways that supported academic achievement. The plans were individualized to account for the

technology resources available to each participant and school improvement priorities. Assistive technology and universal design for learning (UDL), developed by the Center for Applied Special Technology, were introduced to help teachers accommodate students with special needs.

### Elements of the Model

The Maryland Tech Consortium, which provided much of the funding for the program, was focused on developing, testing, and evaluating a model for effective professional development. The consortium's model for professional development included eight key elements. These elements are based on research on effective instruction, professional development, technology in education, and leadership. All of the elements discussed below were incorporated into the MTA Leadership Program.

The program was designed with recommended best practices in staff development in mind. The National Staff Development Council standards provided strong guidance for curriculum development and instructional delivery. It was particularly important to model high-quality professional development in this program, as participants were expected to provide professional development in their own schools and districts.

Another major influence on program design was ISTE's NETS for Teachers. These standards define the fundamental concepts, knowledge, skills, and attitudes teachers should possess to effectively apply technology in educational settings.

In their book *Student Achievement through Staff Development*, Bruce Joyce and Beverly Showers recommend that intensive professional development programs should include opportunities to build knowledge of theory and rationale, to observe demonstrations and modeling that facilitate learning, to practice targeted skills, and to engage in collaborative

work with peers. The MTA Leadership Program was designed to provide participants with extensive opportunities to engage in all of these activities.

The summer institute operated for three weeks each summer, and sessions were scheduled for four full days each week. Participants were informed in advance to expect a very demanding program and were given assigned reading to be completed before the beginning of the institute. Because of the rigorous schedule and high expectations of the program, many participants and some staff were resident on campus at Towson University during the institute. The schedule was very tight and was strictly adhered to. Benchmark requirements and deadlines set for product development added to the level of intensity, and many participants worked additional hours outside the scheduled day in order to complete their assignments. Computer lab hours were extended, and MTA staff provided needed support to participants during the extended hours.

The typical day included lectures by nationally and regionally recognized experts, strand sessions, team discussions, and independent work time. Participants rotated through sessions in each of the three instructional strands. All sessions were conducted in computer labs so that participants had ample time for hands-on work with the technology. All of this effort was geared to ensuring that participants completed their assignments and were prepared to make a presentation of their work during a culminating gallery walk event. Which was attended by guests from local school districts, the state department, and other state agencies.

### Community of Learners

An important aspect of the MTA Leadership Program was to build and sustain a sense of community among the participants. This was particularly

important for this program because the goal was to build a network of technology integration leaders across the state. During the summer institute, considerable time was allocated for team-building activities. This included time for building group identity and for reflecting and sharing within teams, large-group spirit-building activities (e.g., prize drawings, skits) within the program day, and after-hours recreational activities (e.g., ice cream socials, baseball games). The residential nature of the program contributed to building a strong sense of community among those participants who stayed on campus.

Continuous contact and communication have been determined to be critical to educators' success in changing their practice as they face inevitable challenges of the work environment. To support ongoing communication and to sustain a strong learning culture, MTA staff established an electronic learning community (ELC). Participants were introduced to and used the ELC, developed by Johns Hopkins University Center for Technology in Education, throughout the summer institute and used it regularly throughout the subsequent school year for continued collaboration and participation with MTA colleagues in other districts and other parts of the state. The ELC functioned as a Web-based communication tool, including space for announcements, an online calendar to learn about and post upcoming events, listings of contact information for other participants and staff, threaded discussions, real-time communication using instant messaging and chat features, and space accessible by all participants to store and retrieve electronic resources. The ELC was a lifeline for sustaining the interaction and opportunities for ongoing collaboration.

### Follow-up Support

During the academic year after the summer institute, participants were

required to perform several follow-up activities. First, as described in the previous section, they were expected to participate regularly in the ELC and to attend the Maryland Instructional Computer Coordinator Association (MICCA) Conference.

In addition, several follow-up sessions were scheduled on special topics related to implementing the knowledge and skills learned in the summer institute. Distance learning technology was used to conduct some of these regional follow-up sessions. These sessions provided an opportunity for participants to share their successes and challenges in their home school. Several were given new job responsibilities that allowed them more opportunities to support technology integration and provide professional development.

### Authentic Products

The primary emphasis of the summer institute was to develop the skills that participants needed to create a comprehensive Change Implementation Plan (ChIP) tailored to their specific instructional setting. Every fellow developed a ChIP, which was essentially a detailed plan for using technology for effective instruction in the participant's classroom or school and for professional development for other educators within their sphere of influence. Required elements included:

- an analysis of an important need based on student achievement data in their school
- a vision statement about how to address the identified need
- student learning goals based on state or national standards
- an instructional unit for students
- a related professional development plan for educators.

The ChIP was a reflective teaching process for continuous improvement with steps for assessing: student learning, added value of technology to the instruc-

tion, and the overall effectiveness of the instruction. The ChIP process included revisions for the future, a recursive application of the reflection process.

### Backward Design of Instruction

Another essential element of the MTA program was the incorporation of the principles of backward design of instruction, which are explicated by Grant Wiggins and Jay McTighe in their book *Understanding by Design*. Understanding by Design (UbD) is an instructional framework for standards-based curriculum, instructional design, and performance assessment. The three stages of the UbD process are to: (1) identify desired results (especially enduring understandings); (2) determine acceptable evidence (i.e., how learning will be assessed); and (3) plan learning experiences and instruction. Participants planned multiple methods of assessing student performance, particularly higher-level assessments such as performance tasks and projects involving the use of technology.

Although educators from all content areas attended the MTA, every fellow was expected to focus on boosting student achievement in core content areas, especially reading, writing, and other language skills. The first step in developing the ChIP was to identify achievement gaps by analyzing school data. Based on the identified needs, participants selected appropriate state content standards to address in both the instructional unit they planned for students and the professional development experience they planned for educators. Although technology was considered a powerful tool for teaching, increasing student achievement in core content was the focus in developing all learning activities.

### Reflective Teaching

The curriculum of the MTA encouraged a wide range of self-reflection activities. Participants were required to

look at the effect of their work at both the classroom and school levels. During their year of active participation in the MTA, participants implemented their ChIPs, gathered evidence on the effects on students and peers, reflected on their work on a continuous basis, and made revisions to their plans based on their conclusions.

Participants were required to systematically collect evidence on the effects of their instruction on students, and the infusion of technology into that instruction. The project evaluators developed an online database to record information about participants' action research and reflective teaching activities. Participants entered the details of what they did and then provided their reflections on student achievement and engagement, instructional efficiency and classroom management issues, and the value added by infusing technology into the unit. Participants reported their results and showed examples of student work at conference presentations throughout the year.

### Effects of the Program

The MTA Leadership Program employed an outside evaluator to provide formative feedback and document the effects of the program. The evaluation included observation of summer institute and follow-up sessions; pre-institute, post-institute, and follow-up surveys of participants; and interviews and focus groups with selected participants. The evaluation provided information on:

- participants' satisfaction with the program
- changes in participant attitudes, knowledge, skills, and their use of technology
- the professional development and other leadership activities undertaken by participants

Most participants judged the program to be of very high quality. The

program planners, keynote speakers, team leaders, and strand instructors received high marks. Participants also believed that the project-based learning approach used in the program was appropriate and worthwhile. The vast majority of participants believed the program had a substantial effect on their instructional practice, and most believed that they were much better prepared to help others use technology effectively.

The MTA program was quite successful in changing participants' attitudes and beliefs about the potential of technology and themselves as technology users. In particular, participants showed gains in their comfort using technology in instruction, confidence that they had the skills needed to effectively integrate technology into instruction, and belief that technology could help them address the diverse learning needs of their students.

Participants gained a wide variety of technical and curriculum integration skills. Overall, they believed that they were much more proficient users of technology. In particular, they indicated they were much more familiar with the instructional potential of technology; better able to design collaborative, inquiry-based learning activities using technology; and more prepared to design learning experiences using technology that are linked to curriculum goals and state assessments.

Participants used technology more frequently after participating in the program. Frequency of technology use increased both for productivity and instruction. Most dramatic were changes in frequency of use for instruction. The most recent follow-up in the spring of 2004 indicates that more than 80% of participants were using technology at least twice a week with students. They used technology in a range of ways, most commonly to gather information, create and publish text, create graphics and other visuals, and report results from investigations.

Participants contributed to their schools and districts by providing training and assistance to other educators. Many were involved in an associated MTA satellite program, often serving as a program planner or instructor. They also provided a substantial amount of training and assistance to other educators through just-in-time training, mentoring, and inservice workshops. Most of this occurred at the building level, but some participants provided workshops or were involved in technology planning at the district level.

Participants held a wide variety of leadership positions. Most commonly, their leadership roles were at the building level, such as serving on the school improvement team or school technology committee. Because the MTA was a competitive program, some were already leaders in their schools or districts, but often leadership roles were assumed after they attended the summer institute.

More than 13% of the participants received a promotion after attending an MTA summer institute, many to technology specialist positions. In addition, nearly 10% have earned a new degree since attending the Institute, many more are enrolled in a graduate degree program, and more than 15% have earned a higher level of professional certification.

### Closing Thoughts

The primary goal for establishing the MTA Leadership Program was to establish a network of instructional technology leaders for the state. There are many indications that this goal has, to a large extent, been achieved. Participants highly valued the networking opportunities afforded by coming together during the summer institute. Many reported establishing very close relationships with educators they would otherwise not have met, and it was very appealing to many that so many educators with a shared in-

terest in technology had the opportunity to come together and collaborate for three weeks. Many took advantage, and continue to take advantage, of the ELC established for the program.

As a result of the MTA, the state ISTE affiliate, MICCA, has increased its membership substantially, and a few have become involved in leadership of the organization. Others have moved into new positions where they have influence at the district, state, and even national levels. The MTA served as a mechanism to build a network of technology leaders across the state. The influence of this network continues to be an active force for increasing use of technology in K-12 instruction throughout Maryland.

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