InTIME Impact Report
What was InTIME's Effectiveness and Impact on Faculty and Preservice Teachers?

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This article describes the outcomes of a project sponsored by the Preparing Tomorrow’s Teachers to Use Technology (PT3) initiative from the U.S. Department of Education. The Integrating New Technologies Into the Methods of Education (InTIME) project was designed to provide the necessary resources for methods faculty to revise their courses and to model the appropriate use of technology in their classes. Additionally, it supported teacher education students in the application of technology in their lessons and units. The article provides a summary of the impact of project-developed ma-
terials on faculty participants and teacher candidates involved in the project. The data were collected to determine the effectiveness of the materials throughout the 3-year duration of the project. The following instruments were used in the study with 35 faculty participants and approximately 1,100 teacher candidates in their classes: surveys, questionnaires, rubrics, phone interviews, WebCT forums, a video case study, and teacher reflective practice documentation (revised syllabi, technology integration action plans, and individual reports). Results from the data analysis indicated that the web-based video materials produced by InTIME were an appropriate and powerful tool that supported learning by university faculty, teacher candidates and inservice teachers.

Integrating New Technologies Into the Methods of Education (InTIME) is a 1999 Catalyst grant for Preparing Tomorrow’s Teachers to Use Technology (PT3) from the U.S. Department of Education to the University of Northern Iowa College of Education. Goals for InTIME were developed as a response to reports from the National Council for Accreditation of Teacher Education (NCATE) and the federal Office of Technology Assessment (OTA). These reports have called attention to existing deficiencies in teacher preparation programs in preparing preservice teachers to use technology effectively in the PreK-12 classroom. Therefore, the purpose of the InTIME project is to provide the necessary resources for methods faculty to revise their courses to model technology integration and require teacher education students to apply technology, along with components of quality education, in their lessons and units.

**InTime Resources**

InTIME’s online database has 540 video vignettes ranging from 2 to 20 minutes in length, featuring over 60 different lessons, and covering a variety of subject areas for PreK-12th grades. The vignettes exemplify teachers and students using technology as a tool for learning within a robust educational setting. The videos are not staged or scripted, but the quality and content are controlled.

InTIME online video vignettes are authentic examples of classroom practice, examined using a rich framework of educational theory and research. *The Technology as Facilitator of Quality Education Model (TFQE)*, devel-
oped at the University of Northern Iowa (Switzer, Callahan, & Quinn, 1999), has as its core, Students at the Center of Their Own Learning. This theme is also woven throughout the seven dimensions of the *TFQE Model* (Figure 1). The seven dimensions are:

1. principles of learning;
2. information processing;
3. standards from all content disciplines;
4. tenets of effective citizenship in a democratic society;
5. teacher knowledge (knowledge of students and in-depth content knowledge);
6. teacher behavior (classroom management and pedagogy); and
7

![Figure 1. Technology as facilitator of quality education model](image)

Project personnel analyze raw footage, edit video, and write narratives connecting lessons to theory, describing how the teacher is demonstrating one of the seven aspects of quality teaching. The resulting videos allow users to view the lessons through different “lenses,” or elements from the
TFQE Model. In addition, each lesson is accompanied by a teacher interview and activity overview video.

The edited videos are searchable at the project website by grade level, content area, and all elements from the quality education model. The videos are accompanied by a scrolling transcript, background information and lesson insights from the teacher (Figure 2), sets of probing questions for viewers, an online discussion forum, and a Case Study Builder feature. This feature enables educators to easily and efficiently make use of the resources as

![Figure 2. Sample INTIME video page (http://www.intime.uni.edu)](http://www.intime.uni.edu)

VALIDATING THE TECHNOLOGY AS FACILITATOR OF QUALITY EDUCATION MODEL WITH VIDEO

The TFQE Model demonstrates the integration of technology-related tools into a robust educational environment and represents how technology is affecting the complex processes of student-centered education. Though rich in research and robust in context, the model itself is theoretical. Authentic classroom videos can serve as initial proof that such practice can and does happen in schools. INTIME videos help to transpose theory into practice. INTIME’s classroom videos help to validate the TFQE Model (Callahan & Switzer, 2001) as well as current research findings about the impact that ap-
appropriate use of technology has on improved student learning (Ringstaff & Kelley, 2002).

Consistent with the TFQE Model, Ringstaff and Kelley (2002) confirmed in their summary of research findings that educational technology use supports the kinds of changes in climate and roles that are at the heart of the educational reform movements. Where educational technology is used, students are more actively engaged and there is a greater emphasis on inquiry. Substantial research exists that suggests that technology has a positive effect on student achievement under certain circumstances and when used for certain purposes. Evidence shows that computers can help students improve their performance on standardized tests and that “student-centered approaches are better suited to fully realizing the potential of computer-based technology” (Ringstaff & Kelley, 2002, p. 2). The most prominent circumstances for student-centered approaches are when technology is used as a tool for problem solving, conceptual development, and critical thinking.

Ringstaff and Kelley (2002) described one study (Penuel, Golan, Means, & Korback, 2000) in which teachers were provided training to integrate an “exemplary model of interdisciplinary, project-based learning with multimedia, and thereby provide students with the opportunity to acquire content knowledge, as well as improve composition and presentation skills” (Ringstaff & Kelley, 2002, p. 12). In completing their real-world projects, students used a variety of technological tools. Teacher reports and classroom observation data showed that these teachers were less likely to lecture, students spent more time in active, small-group collaborative activities or discussions, and projects were more organized around the collaborative construction of complex products than those in comparison groups. A performance assessment was used to measure the effects of technology use. The assessment task required students to work in small groups for one hour constructing a brochure to inform elementary school principals and teachers about the problems that homeless elementary students encounter when they go to school. The assignment required students to document these problems, suggest solutions, and propose arguments about why these solutions would work. Brochures were rated on a variety of dimensions related to communication and presentation skills, understanding of the content, attention to audience, and design. They were rated by judges that were blind to whether the students had been involved in the student-centered classrooms or the comparison groups. Those in student-centered classrooms outperformed those in the comparison groups on all dimensions of the performance assessment, and when given standardized tests, students in both groups scored compara-
bly. Positive impact on higher order thinking did not come at the expense of achievement on standardized tests.

Other teaching strategies for effective technology use summarized by Ringstaff and Kelley (2002) and validated through INTIME videos include: using technology as one piece of the puzzle, articulating goals for student learning prior to the introduction of technology, and making appropriate use of limited technology in the classroom. When teachers use technology as one of many tools in the instructional repertoire and only when appropriate for completing the assignment, students are less likely to become bored. An INTIME teacher uses technology as one piece of the puzzle in her lesson on modeling quadratic data. The teacher explains the context of technology in her lesson plan:

Students sketch graphs, list x-intercepts, and then convert functions written in the general quadratic form to an equivalent factored form by utilizing graphing technology. As students develop awareness of the patterns in the graph of quadratic functions, the formerly difficult algebraic abstraction of factoring is easier to understand. Students are able to “see” what a factored polynomial looks like and are better able to understand conceptually the mathematics behind the symbol manipulation. The investigation and the data collection experiment in this unit give students the opportunity to model quadratic data and discover real-world meanings for the x-intercepts and the vertex of a parabola. The district curriculum requires students’ understanding of functions. (Schmitt, 2002)

Technology is also more effective when teachers articulate goals for student learning prior to the introduction of technology. An INTIME middle school science teacher articulates her goals for student learning about how sound travels. Following their study of what sound is, how sound is produced, and how to vary the dimension of pitch and amplitude, students explore answers to questions about how sound travels and how we hear sound by searching for information in books, through Internet sources and through class lab activities. The teacher articulates learning goals in her lesson plan. In their investigation of how sound travels, students should,

- continue to ask good questions, researching pertinent background information using a variety of resources (library and Internet, experts in the community, their science books and teacher handouts),
- carry out investigations that they design based on their own questions that are centered around a driving question and sub-questions for the unit we study that are real-life situated,
- continue to develop sound predictions based on their research that sup-
ports their predictions based on the background information they construct,
• continue to appreciate the need to care for and calibrate the technology tools they will use to collect data during their student-designed experiment,
• continue to use a variety of data collection and analysis techniques (data tables, graphs) and learn the importance of creating a procedure that controls variables and carefully addresses the question to be studied,
• continue to develop in drawing conclusions after logical and critical reflection of all the information they collect that may answer their question,
• share this information with each other throughout the process and present their findings at the end of the investigation as oral presentations based on their formal written experimental labs or multimedia presentations,...
• use these science process skills to analyze the data they collect during their student designed experiments, and
• use the technology tools and probes to collect accurate real time data therefore enhancing and aiding in the development of student-designed experiments. (Gleason, 2001)

Making appropriate use of limited technology in the classroom is another important strategy for teachers. An InTime preschool teacher demonstrates an effective technique as her students gather around the computer station with her to view their classroom website of field trips the class has taken with their class mascot, Simon the monkey. They also see and discuss places Simon has visited in his travels (Bradshaw, 2001). In a kindergarten classroom, an InTime teacher uses one computer in her classroom as a station. Students work on a slide to contribute to a student-created slideshow and book about vehicles that is modeled after the book, Brown Bear, Brown Bear, What Do You See? First students draw their picture on paper. Then they draw the picture with assistance using Kid Pix, add text, and record their own voice reading the text for that slide. They do this individually at the computer station, while other students are completing their hand-drawn pictures for their book (Robinson, 2001).

FACULTY IMPACT

Videos can serve to make images of classroom reform more concrete than an abstract discussion of new ideas in teaching practice. Both future
and current teachers need more opportunities to see children engaged in inquiry and problem solving, in using technology within challenging content, and in observing teachers’ pedagogy and classroom management. INTIME videos were made available to teacher education faculty for three semesters beginning in Spring, 2001. INTIME faculty participants were charged with piloting the resources with preservice teachers in their classes and seeking creative ways to implement the video vignettes to enhance students’ understanding of the TFQE Model and appropriate technology integration. It should be noted that the INTIME resources were in development throughout the implementation. Several data sources were used at the formative stage of the INTIME evaluation to provide compelling evidence about the impact of the project and its materials on faculty participants.

The PT3 baseline survey instrument was administered to all 35 INTIME project faculty participants. This survey is a 52-item formal evaluation instrument used to assess the impact of PT3 grant activities on teacher preparation programs at recipient institutions of higher education. Based on the data collected from the 31 INTIME faculty completing the form, allowing for some missing data, some major differences occurred between the period before and after project implementation. Most notable was the demonstrated change in faculty professional practices targeted by the project including assessing technological skills of students, obtaining hardware and/or software, integrating technology, and redesigning curriculum:

1. Participating faculty engaged in new activities as a result of the project. More specifically, faculty improved their professional practices in many areas as shown in Figure 3. Some of the highlights include: assessing the technological skills of students increased by 36%, obtaining hardware and software increased by 32%, and integrating technology into the curriculum increased by 35%.

2. Faculty and students in the participating teacher preparation programs shifted from inadequate to adequate access to technology. Faculty survey respondents indicated adequate or ample availability of hardware and software increased by 19%, access to the Internet increased by 26%, instructional software availability increased by 16%, classrooms equipped with technology increased by 26%, and availability of computer labs increased 23%, as shown in Figure 4. Conversely, the frequency of those who marked inadequate access to technology in these areas decreased on average 16%.
Figure 3. Survey results of the faculty participants (N=31) who engaged in new activities as a result of INTIME
Before INTIME

<table>
<thead>
<tr>
<th>Faculty access to hardware/software</th>
<th>Faculty access to the Internet</th>
<th>Variety of instructional software available</th>
<th>Classrooms equipped with technology</th>
<th>Number of computer labs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple</td>
<td>8</td>
<td>16</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Adequate</td>
<td>13</td>
<td>11</td>
<td>9</td>
<td>13</td>
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After INTIME

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Simple</td>
<td>14</td>
<td>24</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>Adequate</td>
<td>17</td>
<td>7</td>
<td>22</td>
<td>22</td>
</tr>
</tbody>
</table>
Figure 4. Survey results of the faculty participants’ (N=31) access to technology

3. Participating faculty have improved their technology knowledge and skills by expanding their curriculum to include more technology-focused classes and integrating more technology in the curriculum of non-technology classes.

- Faculty changed their curricula to include: (a) more online courses (52% of the participants), (b) more student time spent observing PreK-12 teachers by way of electronic means (i.e., video) (35% of the participants), and (c) more technology-focused courses are required (10% of the participants).
- Faculty used more technology in instruction, as shown in Figure 5. The proportion of core courses in teacher preparation programs that make use of technology in the following areas has increased during the implementation of the InTime project. Respondents indicated a 36% increase in use of video case studies of promising practices for instruction, a key component of the InTime project. Faculty use of the Internet to facilitate discussion of course materials (a service provided through a bulletin board discussion area throughout the InTime project) rose by 25%. The use of multiple media to communicate information in the classroom climbed by 23%. And faculty use of simulations of teaching situations for instructional or diagnostic purposes increased by 13%. Finally the percentage of faculty requiring students to make frequent use of the Internet for gathering information also increased by 23%.
- The number of core courses offered by the faculty in which students are instructed on basic technology skills, classroom information management, ethical issues related to technology, and ways to integrate technology into the curriculum increased by 13%.

Revised syllabi and technology integration action plans have been collected from 35 participating faculty as evidence of their planning process centered on InTime. The activities demonstrate a trend of methods used to engage preservice teachers with InTime materials during project implementation. The following commonalities among these revised syllabi focus on certain instructional objectives designed to accommodate the InTime project:
students are to identify the ways in which technology can support student learning;
students are to view and critique the InTIME online video vignettes;
students are to engage in online chat using the InTIME WebCT;
students are to take a set of pre- and posttests designed to assess their technology competencies as preservice teachers; and
instructors are to model the use of varied instructional technologies in alignment with those demonstrated in the InTIME online video vignettes that students are to watch as a class requirement.

For example, faculty participant A identified in one of the course objectives that “upon the completion of the course, the student will have demonstrated the knowledge base and skills necessary to…design a lesson plan integrating technology resources and tools learned through the InTIME website from the University of Northern Iowa.” Consequently, the syllabus states that students were also expected to “use InTIME website and WebCT” and complete “a lesson plan using technology as an instructional tool.”
Faculty participant B states in the Technology Integration Action Plan that students will:

- view video clips and evaluate using checklist;
- select clips based on their area or discipline;
- share observations through the chatroom and during class discussions; and
- write a reflective paper after completing the video activities and the chatroom and class discussion.

Faculty participant C described the goal of the course as “to provide candidates for physical sciences teaching degrees opportunities to increase their knowledge and skills and develop positive dispositions regarding appropriate uses of educational technology.” This participant included the INTime website address in the syllabus as one of the course materials and noted, “In line with INTIME goals and objectives, a conscientious effort will be made to incorporate various instructional technologies to provide opportunities for students to develop and enhance the knowledge, skills, and dispositions needed to become a successful physical science teacher.”

Faculty participant D developed Technology Critique Guidelines, which are “to allow [students] to critically review selected technology lessons and analyze them using the Technology as Facilitator of Quality Education Model.”

Participant E integrated InTime materials with classroom observations that students completed during the semester. This assignment included students developing their own classroom observation and evaluation tool that was used to analyze one of the INTIME video case studies. Students’ written reports constituted 25% of their course grade.

Stages of Concern Questionnaire (SoCQ) data collected from the participating faculty reflect the movement of individual faculty toward integrating technology into their methods courses. These changes have been charted using the SoCQ from the Concerns-Based Adoption Model created by Hall, George, and Rutherford (1977).

[The model] assumes change to be a highly personal and lengthy process, one that affects individuals differently. The model hypothesizes two dimensions along which individuals grow as they become more familiar with and sophisticated in using innovations: Stages of Concern about the Innovation (SoC) and Levels of Use of the Innova-

The following different stages of concern in the questionnaire assess several major factors that influence the adoption process of any given instructional innovation: awareness, informational, personal, management, consequence, collaboration, and refocusing.

Overall, analysis of the patterns in the evolution of innovation-related concerns from non-user to experienced user reveals a decrease in the scores for the first four stages, while the last three stages demonstrate a proportional increase that could be linked with faculty’s enhanced comfort with the innovation.

![Participant 6 SOCQ Sets I-V](image)

**Figure 6.** Sample faculty participant stages of concern questionnaire graph

Also, the graphs based on individual faculty responses on SoC Ques-

Questionnaires indicate faculty’s increasing familiarity with the innovation. The individual differences in scores are related to the specifics of the contexts in which each participating faculty uses InTIME. These data can also be tied with the information gathered from the Website Usability Questionnaire administered to all participating faculty. Their increasing familiarity with the innovation is to be found in the degree to which they find the InTIME online resources accurate content-wise, effective, and helpful in their professional practice.

These tendencies can be exemplified by considering data gathered and analyzed from 16 respondents concerning Stage 6 (refocusing). High scores indicate that an individual has personal ideas on how to use the innovation; in conjunction with high Stage 1 scores, an individual would like to learn more so that he/she can implement these ideas. Out of the 16 individuals whose data have been analyzed, six have fluctuating high scores for Stage 1, thus pointing out the individual’s desire to learn more about the innovation. The remaining 10 individuals display fluctuating average scores (six respondents) and low scores (four individuals) for Stage 1. Furthermore, the analysis of graphs indicates that 9 out of the 16 respondents may have other ideas as to how the innovation could be improved or implemented differently because their graphs tail up for Stage 6, thus indicating refocusing. The Stages of Concern Questionnaire (SoCQ) (Hall, George, & Rutherford, 1977) graphs reveal a positive evolution whose indepth analysis points to the fact that the InTIME users have been creative and effective in the overall use of the project materials and technology.

The Website Usability Questionnaire, an instrument designed by InTIME staff members to evaluate usability of online project resources, was administered to faculty-participants (N=29). The data analysis demonstrates that for the vast majority of respondents the overall resources were (a) easy to use (93%), (b) useful for instruction (79%), (c) supportive of teaching and learning styles (79%), and (d) the content was accurate and free of errors (93%). When asked to comment on each of the resource components, the faculty-participants expressed overall satisfaction with the format and content of video examples and teacher insights available on the site. Based on the data collected using this questionnaire, the majority of faculty participants used the project developed online resources quite frequently in their classes and found them to be supportive of teaching and learning. One example is the comment of a participant in regard to the overall usefulness of the InTIME Web site:
This web site is helpful to visual, auditory, and tactile learning. Students like to see the videos and read the lesson plans, articles, and video captioning. Others like the auditory features of the videos. Tactile learners like the computer aspect. Summary: TELL ME and I’ll forget. SHOW ME and I may remember. INVOLVE ME and I’ll understand. This web site does all three.

*Phone interviews* were conducted with 16 participating faculty, based on the formative evaluation of their increasing use of the project-developed resources (Boboc, 2002). Based on input collected from 16 *InTime* participating faculty members who were interviewed by phone, the following information relates to the various ways in which faculty effectively used the *InTime* project in the college classroom. As a result of having implemented *InTime*:

- Half of the respondents (8 out of 16) indicated that they had used *more instructional technology* whose various applications they could model in their college classrooms. All of these 8 participants either described or implied that the impact of the project on the structure of their courses as having resulted in becoming more aware of what technological resources would be available to incorporate in instruction.
- Ten out of the 16 respondents (62%) indicated that their use of the *InTime* project in the classroom made them *more aware of ways to incorporate technology in the classroom*. As a result, classroom discussions would be geared toward sharing such knowledge with their students, in an attempt to encourage them to be reflective and inquisitive as professionals. At the same time, the project motivated the faculty members to include other online resources into subsequent syllabi, therefore making a few of them shift to a more facilitating role in the classroom.
- Three participants (18%) considered their *InTime*-related experience to have been a logical continuation of what they had done in the classroom before implementing the project. Moreover, one of them commented on the fact that the video vignettes “would allow one to individualize instruction by referring them (students) to different parts of the videos or different ideas” (Respondent A, Interview II). Yet another faculty pointed out that *InTime* helped her provide her students with “a more comprehensive and indepth underpinning” (Respondent D, Interview II) to what she was trying to teach. Another important aspect of her use of the project in the classroom was the fact that the “philosophical basis” (Respondent D, Interview II) gave her credibility because it reinforced
what she was teaching. As a result, she became more comfortable as a professional.

- Two respondents focused on their use of the theoretical framework that led to either more flexibility in cross-curricular teaching (“a good teacher has skills that will transfer into any setting, while the only thing that changes is the content”—Respondent F, Interview II) or to using the TFQE Model as a good resource for students when designing an evaluation rubric.

_Course revision report articles_ of the participating faculty’s use of the project include reflections on their professional experiences with InTIME. An analysis of these articles shows several common patterns:

1. The faculty agreed that InTIME provided a number of ways for them to _strengthen their own skills_, offered _new technology experiences_ in their classroom, and gave them _cause to think_ about their teaching methods.

2. Faculty reported that InTIME helped them think about technology in new ways. For example faculty may:
   - see a number of ways to use the project materials;
   - become more aware of teachers’ responsibility to demonstrate and model technology use;
   - become more conscious of and apt to look for places and ways to use technology to teach;
   - become more proficient at incorporating computer/technology instruction into their teaching; and
   - realize that students need more technology training, more time to obtain knowledge, skills, and information about various types of technology; that lack of training creates a barrier for integrating technology into field experience; that students should be aware of the search engines and information available on the Internet.

3. Faculty also reported that InTIME _helped them to change their teaching_:
   - Syllabi were revised to infuse technology throughout the whole semester.
   - Assignments became more strongly inclusive of technology use.
   - Course textbooks were changed (For example, participant E started using use core text in the class—Jim Burke’s The English Teacher’s Companion, which contains a chapter on “Digital Literacy” and a chapter on “Visual and Media Literacy.”)
   - Faculty expanded the use of instructional technology far beyond the
intended course by a) teaching all courses either in computer laboratories or “smart rooms” b) adding a dimension in courses in that faculty posts reserve materials in the “Electronic Reserves”; c) using PowerPoint presentations as a standard part of classroom lectures; d) using electronic texts such as hypermedia and hypertext increased; and e) using InTIME technology competencies checklist for field experience evaluation since it is more objective than the previously used self-report instrument.

4. They also reported differences in student work after using InTIME:

- Students began to view the teaching process differently. They began to perceive teaching as a multidimensional process rather than as a collection of separate acts. Faculty believe that the structure of the model contributed to the students’ developing concept of teaching.

5. In addition to the positive comments of uses of InTIME, some faculty reported that the resources were more effective when used with graduate students, when compared with undergraduate level students. Frustration with the technology, difficulties with installation of appropriate software, and slow Internet connections were also mentioned as hindrances to use of materials.

**IMPACT ON PRESERVICE TEACHERS**

Based on faculty reports gathered by several evaluation tools, InTIME has had a significant impact on preservice teachers, which is shown by:

**PT3 Baseline Survey:**

1. The participating faculty perceive an increase in terms of student access to hardware and software. The number of respondents who marked:

   - “adequate” decreased from 16 participants (51%) prior to PT3 to 8 (26%) after project implementation;
   - “ample” increased from 11 respondents (35%) prior to PT3 to 19 (61%) after project implementation. (Figure 7).

2. As compared to program graduates prior to the InTIME implementation, faculty perceive their students as more proficient in terms of the International Society for Technology in Education (ISTE) National Educa-
Figure 7. Faculty perception of student access to hardware and software.

- The number of participants who marked that graduates were proficient in use of software packages increased by 65%.

Planning and Designing Technology-Enhanced Learning Environments and Experiences.
- The number of participants who indicated graduates were proficient in integrating technology into general lessons increased by 51%.

Teaching, Learning, and the Curriculum.
- The number of participants who said graduates were proficient users of technology used to develop students’ higher order thinking skills and creativity increased by 42%.

Assessment and Evaluation.
- The number of participants who marked students proficient in use of technology to assess and/or evaluate student learning increased by 42%.

Productivity and Professional Practice.
- The number of participants who see graduates as proficient in using technology for ongoing professional development increased by 55%.

Social, Ethical, Legal, and Human Issues.
- The number of participants who feel graduates understand legal and ethical practice related to technology use increased by 45%.

WebCT discussion forum postings represent individual input from participating faculty and the students enrolled in their methods classes. The rationale for using this method to assess the project effectiveness capitalizes on facilitating reflective thinking and encouraging an exchange of ideas about the integration of technology and components of quality education.
The following abstracts from preservice teachers’ WebCT postings provide convincing evidence of the impact of InTIME:

- **Student S1:** “Because of these learning experiences, I have a better understanding of what it means to integrate technology into the classroom. It involves concentrating not only on the fact that you now have the new technology to use, but also how both the teacher and the student will best use it.... I have learned that integrating technology is as much or even more involved with the study of curriculum and how students learn than just teaching them how to use the technology.”

- **Student S2:** “The main idea that I have learned from this is integrating technology does not mean just going to the computer lab. To me it means to focus on a subject and begin to use various tools like digital cameras, I-books, Franklin Dictionaries, etc. When do this, the teacher is providing a knowledge base. This will help the students retain information and be motivated to learn.”

- **Student S3:** “The implications of these learning experiences for my school or classroom reinforces that we must continually diversify our planning of instruction. I am amazed by all of the great technology that is out there to enhance our classrooms. If money were no object, I would have Quictionary pens for all of students. Since I teach reading I was very excited to see those pens. I plan to get involved with a grant writing project so I can get more technology into our district.”

- **Student S4:** “Technology resources can and should shift the role of the classroom teacher. The teacher becomes more of a facilitator of learning. Students become more responsible for their own learning. They often take charge by defining learning goals and problems. This often provides a deeper understanding of the content.”

- **Student S5:** “Technology is an important factor in creating problem based real life experiences for students. It provides interdisciplinary approaches to learning that all learning styles can benefit from. It also promotes student and teacher creative thinking, communication, and cooperative learning. Technology has it’s own necessity for curricular development. Students need to be taught electronic communication ethics and practices. This should be a gradual developmental progression as students age. Also, teachers should be aware that different socio-economic factors affect students’ prior knowledge and that they must help “bridge the gap” for some students.”

*Preservice teacher technology competency* pre and posttest data were collected from students enrolled in the classes taught by the InTIME partici-
pating faculty. The pretest was administered at the beginning of the semester, prior to exposing students to the InTImE project, while the posttest was administered at the end of the same semester. While implementing the new online video resources and standards, faculty modeled the use of instructional technology to their students.

The three semesters for which data were collected are as follows: Spring 2001, Fall 2001, and Spring 2002. An overall numerical description of the data collected revealed the following: out of the 915 pretest and 777 posttest sets received, 627 were validated, meaning that there was a match between the pretest and posttest student ID numbers assigned either by UNI or by the other participating universities prior to taking the Preservice Technology Competencies tests.

The results show that in the spring semester of 2001, 96 out of 161 students (60%) show no change in their responses on the posttest compared to the pretest. The remaining fall into the following categories: 53 students (33%) display a positive change, 6 students (3%) have the highest distribution of scores for negative change, and 6 students (4%) have an equal distribution of scores between positive and no change. Most of the students who show no change have maintained their technology competencies at the apprentice level (2).

In the fall 2001, 153 out of the 269 students (57%) show no change in their responses on the posttest compared to the pretest. The remaining fall into the following categories: 87 out of 269 students (32%) show a positive change in their responses on the posttest compared to the pretest; 9 out of the 269 students (3%) display a negative change; 18 out of the 269 students (7%) have an equal distribution of scores split between no change and positive change; while 2 out of the 269 students (1%) have an equal distribution of scores split between no change and negative change. Most of the students who show no change have maintained their technology competencies at the apprentice level (2).

In the spring 2002, 111 out of 197 students (56%) show no change in their responses. The remaining fall in the following categories: 72 students (37%) display a positive change, 1 student (0.5%) has the highest distribution of scores for negative change; 12 students (6%) have an equal distribution of scores between positive change and no change, and 1 student (0.5%) has an equal distribution of scores between negative change and no change. Most of the students who show no change have maintained their technology competencies at the apprentice level (2).

Analyzing all results in terms of “no change” or “positive change” based on the pre/posttest difference in the students’ self-assessment of their technology skills, 356 respondents (57% of all valid responses) show “no
change,” while 216 students (34% of all valid responses) demonstrate improved technology skills. One possible interpretation of these figures is in line with comments from the 16 INTIME faculty members in the aforementioned phone interviews. Due to the content-specific nature of the courses that implemented the INTIME project, the Preservice Technology Competencies did not always manage to assess adequately the impact the project-created online resources had on students’ technology skills.

A negative change on the posttest compared to the pretest would point out the fact that students could have over-rated their technological skills before using the INTIME project in class. Under these circumstances, the lower posttest scores would be interpreted as students’ better self-reflection regarding their skillfulness in using technology in the classroom as demonstrated by the INTIME video case studies they analyzed in class. A positive change could rely on the learning curve that students go through while using the INTIME project in class, as well as on the methods faculty’s modeling of appropriate uses of instructional technology.

No change in technology competencies could indicate various hindrances that affected the learning process assisted by the INTIME project. In this case, the faculty member’s insights on the dynamics of the class would reveal the possible causes for the zero difference between the technology competencies pre- and posttest.

Course revision report articles provide more evidence about impact of the project on the preservice teachers. The methods faculty reported that after involvement with INTIME, their students:

- increased their use of technology;
- initiated its use without instructors’ promptings;
- became more proficient and confident users of technology. For example, they started implementing technology into their lesson plans. They showed excitement about finding electronic resources to design their lesson plans; integrated video, digital cameras, palm pilots, PowerPoint, and reported that they will continue to add technology component to other prepared lessons in the future.
- became more experienced with websites and online discussions. Faculty member E said that the students “developed strategic Internet search skills to locate web-based education resources including subject directories, clearinghouses, and gateways.”
- realized “technology helps facilitate the dissemination of class materials and communication between teacher and students” (faculty F).
- acknowledged the use and critique of INTIME videos helped students
“refine the skills of critical reflection and analysis” (faculty D). The following abstract written by a group of preservice teachers critiquing one of the InTime videos exemplifies students’ critical thinking as they examine strengths and weaknesses of this video and make suggestions:

Strengths: This teaching tool provided students with the opportunity to examine what individual parts make up culture. It helped students to think about the complex term, “culture,” and that no culture is better than anyone else’s. The use of multiple intelligences, higher level thinking, Bloom’s taxonomy, and group collaboration were very positive. Students are provided with technology, such as the Ibook to use.

The main goal was to enhance critical thinking. Students did not need to worry about penmanship or spelling with the use of technology.

Weaknesses: This lesson did not cover any “real” culture. The building of reliance on technology may take away true imaginative learning. The lesson overall was too repetitive for the viewer.

Recommendations: Teachers can use this lesson as a bridge to learn how cultures could have been created. The video voiceover person told us what we should be observing without giving the viewer the opportunity to see it for ourselves. A better approach might be to ask questions of the viewer and what they see, instead of stating what it is we are supposed to see.

Overall, methods faculty reports indicate that after using InTime, their students demonstrated an increased appreciation for the use of technology for teaching, informally suggested an eagerness for the opportunity to use some of the technology skills for future lessons. Several faculty members said their students expressed enthusiasm for technology and, as one of them said “generally applauded the InTime inclusions.”

PT3 now! Case study of InTime, available at http://www.pt3now.org/107.php (2002) provides interviews with one of the project’s methods faculty and his preservice teachers. After using InTime, preservice teachers comment on many positive aspects of the project and its value for both preservice and inservice teachers:

- Student 6: “It’s organized and it has a lot of information. I noticed they
have lessons plans right now, objectives. So you can use that, and that’s a great tool, especially for new teachers trying to develop a unit. You don’t have time to develop a unit using all this technology, trying to figure out how to do a lot of it and put it together, so it’s a lot of planning. So it’s nice to go on there and see it done, and all you have to do is adapt it for your own classroom. I think that why it’s all helpful.”

- Student 7: “I think especially as a student teacher or a new teacher, you don’t always know where to go to look for new ideas, so that is gonna be a really good start because you can see it in action. It’s not just hearing about it or reading it. You can see what they are doing, even their movements around the room see how…management wise it helps a lot.”

- Student 8: “The more I use it, the more I find out about it. I am just realizing how much you can do with it. I was looking at one of the art lessons given and I realized when you scroll down, they have all the hardware and software that went along with it, resources they found on the Internet. It’s just nice to see all the things teachers are doing.”

- Student 9: “I think just the way teachers and students have been educated recently, you almost need something with…to use technology, and keep them active because, as we learn, attention span is very short, and the more active they are, the more attentive they’re gonna be and things like that, so I think something like this is very good.”

Video provides the capability for viewers to stop, think, write, talk about it, replay the activity over, and chunk activities together in different ways for different analytic purposes. Various teacher actions or points in the lesson can be scrutinized by individuals or groups and suggestions for instructional decisions may be made, based on research and insight gained from viewing evidence of student learning and differences among students (Darling-Hammond & Ball, 1997). Viewers may compare their interpretations and analyses with others, consult research and rationale in educational frameworks of effective practice, and expand their ability to communicate about teaching processes, thus indicating teachers’ understanding of theory and practice and the impact on student achievement.

In conclusion, the InTime project set out to create a dynamic resource for faculty to use in any way they wanted. Using the analogy of a textbook, faculty may determine ways to use the text to support their courses. In the same light, faculty may use InTime resources in linear order, in random sequence, or choose appropriate sections or small snippets as they fit their courses. This resource is appropriate for use as a pictograph, to show what PreK-12 educational research-based reform looks like (Callahan & Switzer,
INTIME Impact Report

The INTIME external evaluator concluded that the resources developed are “information-rich and of value to multiple constituent groups...and provide examples of legitimate uses of technology in teaching...and do not promote the use of technology for technology’s sake” (Sorenson, 2002, pp. 8-9). While not intended for use as a case study approach, many may choose to use the resources for that purpose. INTIME continues to serve faculty and future and current teachers as a dynamic resource for examining the elements of quality teaching and the support the technology provides in the development of the relationships between these components.

References


from PT3Now, Soundprint Media Center, Inc. web site: http://www.pt3now.org/107.php


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