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P600/R685 Project: *Improving Teacher Quality* (ITQ) Grant Proposal

A. Preface

This paper is intended to be one portion of a grant proposal for *Improving Teacher Quality* (ITQ) Partnership Program (<http://www.che.state.in.us/ITQP.htm>), which is sponsored by the Teacher and Principal Training and Recruitment Fund through the Indiana State Commission for Higher Education.

Consistent with the grant application description, we have identified a number of needs in improving teacher quality. One of these is the effective integration of technology into classroom curricula.

B. Needs Analysis

Studies show that technology can enhance teaching and learning tremendously if used appropriately. It can help students to master basic skills including reading, writing and calculating skills more effectively and it can help with the development of higher order thinking skills. Teachers can use technology to create more authentic problems or show students how to use it in accessing, analyzing, and communicating current information. (Indiana Department of Education Strategic Plan, December 1998).

However, many teachers are not comfortable with technology. For example, a needs analysis project in 1996 in Indiana (comprising 86 educator interviewees in more than 15 schools) showed that Indiana educators felt frustrated with using the World Wide Web. They expressed feelings of beings overwhelmed with the amount of information and how to navigate through it, and described the Web as 'a big forest to get lost in'. Indiana K-12 educators also expressed a strong need for educational techniques for using the web in the classroom, as one teacher said, 'we do not know what to do educationally' (Frick, 1996).

There also exist national and state mandates that teachers be able to use technology effectively in all aspects of the classroom. To prepare students well for the information age, the International Society for Technology in Education (ISTE) developed the National Educational Technology Standards (NETS) for Students, which include six categories of skills students are expected to have. Teachers in turn need to meet the NETS for Teachers, which was developed by ISTE to help students master information age skills (The National Educational Technology Standards Project, 2002). As a result, the Indiana Department of Education has developed strategic plans, e.g. three-year technology plans by schools, ongoing professional development of educators (Indiana Department of Education Strategic Plan, 1998).

Teachers who undergo formal training in technology integration are more likely to use technology more frequently and more effectively. For instance, practical and statistically significant differences were found between participants who took part in the TICKIT (Institute for Curriculum Knowledge about Integration of Technology) program and those who did not (Keller, Ehrman, & Bonk, 2002).

Finally, surveys and other studies show that teachers want training that is as simple and timely as possible. They do not like to be away from classroom for training because they feel guilty about leaving the classroom to get training. After school training is not desirable due to teacher fatigue (Frick, 1996).

C. Goals and Objectives

The first goal of this program is to start addressing the state and national needs with respect to technology use and integration. To reach the first goal, in-service teachers will undergo training so that they will be able to list and describe current technology concepts (see "Educational Technology Standards and Performance Indicators for all Teachers" in Appendix A, Section I).

The second goal is to keep teachers up-to-date with the latest educational theories and instructional strategies. This program will allow teachers to learn and practice current instructional strategies (Appendix A, Section IIA IID, IIE; Section III) so that they may plan for and utilize relevant strategies in class.

The third goal is for teachers to be able to decide whether technology should be used at all, and if so, to prepare and implement lesson plans that integrate technology effectively (Appendix A, Section II). This program will provide case studies for teachers to critique and require that teachers prepare and implement lesson plan with the aid of examples and templates.

The final goal is to nurture a community of practitioners who will support themselves and actively seek relevant knowledge in the area of technology integration (Appendix A, Section V). It is hoped that teachers who attend this course will model attitudes and behavior that other teachers can adopt. A support system of online resources and content experts is expected to help meet this objective.

D. Project Design

1. Participants

The participants are forty-two in-service teachers in five southern Indiana schools. These individuals will attend upgrading courses over 2003-2004 to receive credit for teacher certification (CRUs) and/or postgraduate college credit.

2. Organizers

The organizers of this program are Ashley Tan and Shijuan Liu of Indiana University (IU), Bloomington. Both are doctoral students in the Instructional Systems Technology program. They also work on separate projects in the Center for Research and Learning Technology (CRLT) at IU.

3. Program Overview

Duration:

Two-day workshop (7 hours per day including lunch) in summer 2003. The program will contribute to four credits required for teacher certification or postgraduate credit.

Overall Method:

Teachers will participate in a hybrid learning environment (face-to-face and online learning activities) where they will learn about technology integration, instructional strategies, and online resources while using those very techniques and resources. The organizers will act as facilitators and online mentors throughout the program.

It is important to note that this program is *not* a technology skills course. Instead, this program intends to provide teachers with the necessary knowledge and strategies to integrate technology effectively. This is a course about “soft” skills, not “hard” skills. Details of the workshop are provided in Section 8b.

4. Materials/Resources

The organizers will provide the following materials and resources for the duration of the program:

- a. Questionnaire to determine the needs, current capabilities, and mindset of the participants (see Program Details and Appendix B).
- b. Course packet containing outline, time table, participant tasks, and organizer expectations.
- c. *Te@chnology* website (<http://start.at/teachnology>) for content.
- d. Web-based asynchronous threaded discussion forum.
- e. Organizers will also source for faculty from the College and Arts and Sciences to act as content experts should teachers require such assistance.

5. Rationale for using the *Te@chnology* website

Integrating technology into classroom curricula is a complex skill. Several resources on the Web attempt to help teachers in this respect. Websites like MERLOT (<http://www.merlot.org>) and Kathy Schrock’s Guide for Educators (<http://www.school.discovery.com/schrockguide/>) provide

lesson plans or teaching resources. While these resources show a teacher what to do, they do not show a teacher how and why to integrate technology.

One way to show teachers how to integrate technology is for them observe other teachers attempting to use technology in the classroom. Some websites such as *Inquiry Learning Forum* (<http://ilf.crlt.indiana.edu/>) and *Best Practices* (<http://129.219.22.87:86/index2.html>) provide streaming video clips so that both preservice and in-service teachers can watch other teachers model technology use and good teaching practices from a distance. These websites also provide lesson plans and teacher reflections. Such websites allow teacher to watch other teachers at their convenience. However, observers might not get to watch an expert in their content area and would have to watch several teachers to begin to get an idea about what technology integration means. Learning how to integrate technology is incidental: The theory behind what they observe is not necessary explained clearly. In addition, not all teachers have access to the bandwidth necessary for higher resolution video clips.

Websites like Intel's *Teach to the Future* (<http://www.intel.com/education/teach/>) provide courses on how to prepare lesson units that incorporate technology and rubrics with which to assess other teachers or yourself. Such a program would cost school districts a fair amount of money and there is no guarantee that the content is customized according to the needs of each batch of teachers. The *Te@chnology* website was designed after a needs analysis on preservice teachers in Arizona State University (ASU). The designers and developers of this site decided to take an *inductive* approach to technology integration. Teachers would first be introduced to four broad technology concepts: visualization, multimedia, e-resources, and communication. They would also be armed with knowledge of some instructional strategies, i.e. collaboration, communication, project work, and case studies. These concepts and strategies would provide a theoretical foundation on which to observe and critique three case studies (two textual, one streaming QuickTime video). This knowledge would also be used to plan a suitable lesson that included the use of relevant technology, implementing that lesson, and then reflecting on it. In the process of learning, teachers were expected to work in groups to critique case studies and/or to produce lesson plans.

Te@chnology differs from other technology integration efforts as it

- Uses an *inductive* approach to delivering content
- Relies on *face-to-face* and *online activities/learning* (see details in Section 8b)
- Is a *balance* between "old" and "new" modes of learning: Objective-based learning of content which is comforting to most teachers is blended with elements of social constructivism (see details in Section 8b)

- Has built-in *scaffolds* that are content, procedural, and metacognitive in nature (see <http://start.at/teachnology>)
- Is *modular* in nature: Content and structure can be added or removed according to the needs of the audience. The facilitator can also choose to structure learning experiences differently whether online or face-to-face.

We propose that the same components of *Te@chnology* be used under the current program. Previous usage of the website was in hybrid mode (face-to-face and access from home) for pre-service teachers in Arizona State University. This iteration will add the use in a simulated asynchronous discussion forum for in-service teachers in southern Indiana.

6. Program Outline

What	When	Who	Where
Send out e-mail notification of online questionnaire.	Jan 06, 2003	Organizers	CRLT/IU
Complete online questionnaire.	Feb 03, 2003	Participants	School/home
Analysis of questionnaire data.	Feb 17, 2003	Organizers	CRLT/IU
Fine-tuning of program to suit the needs of the audience.	Mar 17, 2003	Organizers	CRLT/IU
Day 1: <ul style="list-style-type: none"> • Introduction • Technology concepts • Instructional strategies 	Jun 09, 2003	Participants and organizers	IU School of Education auditorium and computer laboratories
Day 2: <ul style="list-style-type: none"> • Video case study (whole group) • Case study 1 (think-pair-share + postings) • Case study 2 (individual) • Lesson planning • Projects <p>Details of these activities are provided in Section 8b.</p>	Jun 10, 2003	Participants and organizers	Computer laboratories
Follow up face-to-face meeting: Sharing, reflections, survey.	Aug 18, 2003	Participants and organizers	IU School of Education auditorium

7. Program Details

a. Questionnaire

All 42 participants will be notified by e-mail to complete and return an online questionnaire. The questionnaire will measure their understanding of, and readiness to, integrate technology into classroom curricula (see Appendix B for a copy of the questionnaire). Note that the questionnaire is the final part of a needs assessment that includes literature review and prior data on teacher needs in Indiana.

After the data from the questionnaire has been analyzed, the organizers will fine-tune the design and implementation of the course to suit the needs of the audience.

b. Activites

i. *Day 1*

The organizers will go through the course packet and ensure that all participants are clear about the program goals, syllabus, timeline, and organizer expectations. Participants will also be given time to set short and long-term goals for the course.

Participants will be divided into two groups for a computer laboratory session where they will be introduced to the *Te@chnology* website and online forum discussion space. They will be shown how to find the main sections of the website and then allowed to explore the technology concepts section individually. They will be required to use the question-and-answer scaffold to ensure that they have a basic grasp of these concepts. After they submit their answers online, the facilitator will conduct a group discussion about the same concepts so that participants may clarify doubts or raise relevant points.

The morning session will end with the facilitator debriefing the activity and pointing out the instructional strategies used in that session: focused individual work, jig-saw, scaffolding, etc.

After a lunch break, participants will be assigned one instructional strategy to read about online. They will then be grouped with other participants using the jig-saw method so that they teach and learn from others. A whole class discussion on the practical realities of using these and other strategies follow.

ii. *Day 2*

The facilitators would have received and graded the participants' answers to the technology concepts task. If necessary, the facilitators will discuss common mistakes or misconceptions first.

The day will continue with the whole group watching the streaming video case study. (This is done to reduce bandwidth demands and provide an example of a case study critique.) The facilitator will lead a group discussion of good and poor teaching practices and highlight considerations for technology integration.

After the group critique, the facilitator will divide the group into dyads (pairs). Each pair will critique the case study 1 together with the aid of an online scaffold and submit a summary of their thoughts to an online discussion forum. If there are 20 teachers in the lab, there should be 10 postings. Each dyad will be given a role to play in critiquing other dyads' comments online.

The morning session will end with the facilitator debriefing the activity and pointing out the instructional strategies used in that session: whole group discussion, think-pair-share, individual work, scaffolding, etc.

After lunch, participants will work individually to submit an online critique of case study 2 to the facilitator. They may use the online scaffold, prior discussions (online and in-person), or their own experience to structure their comments. After this activity is over, teachers will be briefed on the details of their projects.

They will be told that they need to design a lesson plan that clearly shows how they intend to integrate technology, implement that plan, evaluate it, reflect upon it, and present their experience at the follow-up meeting in Fall 2003. They will be shown the online forms for lesson planning and reflecting. They will be expected to post their lesson plans online so that other teachers may view and critique them. Where possible, the facilitator will group teachers of similar content areas together so that they may discuss ideas. However, it will be up to each teacher whether to make the project group-based or not.

The day will end with a reminder of project deadlines, organizer contact information, and content expert contact information. Participants will complete a survey on the workshop before they leave.

E. Anticipated Analyses

This section will outline how the organizers intend to determine how the goals, objectives, and outcomes of the workshop will be achieved and measured.

At the end of the workshop, a survey will be distributed to participants to determine if they found it relevant, meaningful, and helpful. The survey will also

determine if there are other needs on technology integration that should be addressed.

Ideally, the participants should be pretested and posttested. However, this is not easy or logical with a complex skill like technology integration. The organizers will rely on the quality of the lesson plans and teacher reflections to determine if there has been a change in attitudes of teachers. At the invitation and in coordination with participating teachers, the organizers will observe the lesson plans in action.

Another possible measure is the analysis of student products (e.g. portfolios) over a period of time. However, the organizers are still debating the usefulness, practicality and feasibility of such a measure.

F. Future Plans

Depending on the responses of participants, the workshop may be introduced as a distance education only course in 2004. The reason for this is that preliminary data and organizers' experience indicate that in-service teachers find it hard to set aside common group time. If they are able to work at their own time and pace, they may learn more effectively.

Participants will still be required to attend a preliminary meeting and a final meeting face-to-face. The course will also be held over a longer period (over the entire spring or summer terms). Participants will read content and case studies online, take part in online collaborative activities, participate in online discussions, and complete assigned projects.

Mentors/Facilitators will initiate activities, monitor participants' progress, and provide support when necessary.

The organizers intend to invite previous participants back as models or online mentors on a voluntary basis. It is hoped that a community spirit may be established so that teachers help each other within schools or even between schools.

G. References:

Ehman, L. & Curt.B. (2002). *A model of teacher professional development to support technology integration*. Retrieved July 9, 2002 from <http://www.indiana.edu/~tickit/infocenter/pdf/model.pdf>.

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Indiana Department of Education Strategic Plan (December 1998), Indiana's K-12 Plan for Technology: 1999-2001. Retrieved December 9, 2002 from <http://www.doe.state.in.us/olr/techplan/strategicplan.html>.

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The National Educational Technology Standards (NETS) Project (2002), Educational technology standards and performance indicators for all teachers. Retrieved December 9, 2002 from http://cnets.iste.org/teachers/t_stands.html.

Appendix A: Educational Technology Standards and Performance Indicators for All Teachers (http://cnets.iste.org/teachers/t_stands.html)

The following are the six standards areas with performance indicators that the International Society for Technology in Education (ISTE) defined for teachers in the National Educational Technology Standards (NETS).

I) TECHNOLOGY OPERATIONS AND CONCEPTS

Teachers demonstrate a sound understanding of technology operations and concepts. Teachers:

- A) demonstrate introductory knowledge, skills, and understanding of concepts related to technology (as described in the ISTE National Education Technology Standards for Students)
- B) demonstrate continual growth in technology knowledge and skills to stay abreast of current and emerging technologies.

II) PLANNING AND DESIGNING LEARNING ENVIRONMENTS AND EXPERIENCES

Teachers plan and design effective learning environments and experiences supported by technology. Teachers:

- A) design developmentally appropriate learning opportunities that apply technology-enhanced instructional strategies to support the diverse needs of learners.
- B) apply current research on teaching and learning with technology when planning learning environments and experiences.
- C) identify and locate technology resources and evaluate them for accuracy and suitability.
- D) plan for the management of technology resources within the context of learning activities.
- E) plan strategies to manage student learning in a technology-enhanced environment.

III) TEACHING, LEARNING, AND THE CURRICULUM

Teachers implement curriculum plans, that include methods and strategies for applying technology to maximize student learning. Teachers:

- A) facilitate technology-enhanced experiences that address content standards and student technology standards.
- B) use technology to support learner-centered strategies that address the diverse needs of students.
- C) apply technology to develop students' higher order skills and creativity.
- D) manage student learning activities in a technology-enhanced environment.

IV) ASSESSMENT AND EVALUATION.

Teachers apply technology to facilitate a variety of effective assessment and evaluation strategies. Teachers:

- A) apply technology in assessing student learning of subject matter using a variety of assessment techniques.
- B) use technology resources to collect and analyze data, interpret results, and communicate findings to improve instructional practice and maximize student learning.
- C) apply multiple methods of evaluation to determine students' appropriate use of technology resources for learning, communication, and productivity.

V) PRODUCTIVITY AND PROFESSIONAL PRACTICE.

Teachers use technology to enhance their productivity and professional practice.
Teachers:

- A) use technology resources to engage in ongoing professional development and lifelong learning.
- B) continually evaluate and reflect on professional practice to make informed decisions regarding the use of technology in support of student learning.
- C) apply technology to increase productivity.
- D) use technology to communicate and collaborate with peers, parents, and the larger community in order to nurture student learning.

VI) SOCIAL, ETHICAL, LEGAL, AND HUMAN ISSUES.

Teachers understand the social, ethical, legal, and human issues surrounding the use of technology in PK-12 schools and apply those principles in practice. Teachers:

- A) model and teach legal and ethical practice related to technology use.
- B) apply technology resources to enable and empower learners with diverse backgrounds, characteristics, and abilities.
- C) identify and use technology resources that affirm diversity
- D) promote safe and healthy use of technology resources.
- E) facilitate equitable access to technology resources for all students.

Appendix B: ITQ Grant Questionnaire

Instructions: *There are 15 questions in this survey. Please complete this questionnaire honestly and as completely as you can. The questionnaire should take no more than 15 minutes to complete. If you have any questions, please refer to the end of the questionnaire for contact information. Thank you.*

1. What grade level are you teaching? (Check all that apply.)
 Grade 7 Grade 8 Grade 10
 Grade 10 Grade 11 Grade 12

2. What subject(s) do you teach? (Check all that apply. If you do not teach, select "Other" and state your job description.)
 English Mathematics Science
 Social studies Other: _____ (specify)

3. How many years have you been working in your current position? (Round up to nearest year and check only one.)
 Less than 1 year 1 to 4 years 5 to 9 years
 10 to 14 years 15 years or more

4. I am familiar with the phrase "technology integration". (Check only one.)
 Yes (continue to Q5) Not sure (continue to Q5) No (go to Q6)

5. What does the phrase "integrating technology into classroom curriculum" mean to you? Please describe your understanding in a few sentences.

6. If you have tried to integrate technology into your classroom, please describe what you have done. (If not, please indicate "N.A.")

7. I have discussed with other teachers how to integrate technology into classroom curricula.
 Yes (continue to Q8) No (go to Q9)

8. Please describe under what circumstances you discussed technology integration with other teachers (e.g. regular weekly planning meeting).

9. Please state why you did not discuss technology integration with other teachers (e.g. no prior knowledge, do not see the necessity, etc.)

10. State how many hours of technology-related courses you have attended over the last two years.

11. State how many hours of curriculum-related courses (e.g. thinking skills, instructional strategies) you have attended over the last two years.

12. Would you be interested in a course on technology integration?

- Yes (go to Q12) Not sure No (go to Q13)

13. State the technology integration course format you would most prefer. (Select one only.)

- Online only Workshop (face-to-face)
 Workshop with online components Other: _____ (specify)

14. State where you have reliable Internet access. (Select all that apply.)

- My home My classroom
 No access Other: _____ (specify)

15. I prefer to engage in professional development activities (please rank; 1: most preferred, 5: least preferred)

- In school during work hours (during breaks)
- In school after work hours
- At home on weekdays
- At home on weekends
- Other: _____ (specify)

Submit

Reset Form

Contact information:

Please email us if you have any questions about this survey.

- Shijuan Liu (shijliu@indiana.edu)
- Ashley Tan (ashley@singmail.com)