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ABSTRACT

The need is clear for colleges of education to prepare student and teachers for a technological world. Most Texas institutions of higher education are struggling with integrating technology into courses and content areas an in offering online courses. This project was undertaken to address the need for increased faculty proficiency in technology while recognizing the challenge and the potential of the disparity between faculty and student in technology skills. The goals of the project were to facilitate faculty development through building capacity and providing technical support. Across the project, 633 technology fellows were placed with teacher education faculty (both campus and school-based faculty who work with teaching candidates). Anticipating the logistical challenges of tracking so many technology fellows at a time, an Electronic Management System (EMS) was developed during project start-up to support project management functions. The EMS is presently being used to archive 843 electronic learning objects and to support those faculty who have placed ten courses online. As additional project challenges evolved, such as assessing technology skill competence and offering professional development experiences to the technology fellows, underlying databases and programmed routines in the EMS were re-purposed to meet the need or resolve the challenge. (Author/MES)

Technology Professional Development Enabled by an Electronic Management System

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Technology Professional Development
Enabled by an Electronic Management System

Abstract

The need is clear for colleges of education to prepare students and teachers for a technological world. Most Texas institutions of higher education are struggling with integrating technology into courses and content areas and in offering on-line courses. This project was undertaken to address the need for increased faculty proficiency in technology while recognizing the challenge—and the potential—of the disparity between faculty and students in technology skills. The goals of the project were to facilitate faculty development through building capacity and providing technical support. Across the project, 633 Technology Fellows have been placed with teacher education faculty (both campus and school-based faculty who work with our teaching candidates). The logistical challenges were daunting for tracking so many Technology Fellows at a time. Anticipating these challenges, an Electronic Management System (EMS) was developed during project start-up to support project management functions. Presently, the EMS is being used to archive 843 electronic learning objects and to support those faculty who have placed 10 courses on-line. As additional project challenges evolved, such as assessing technology skill competence and offering professional development experiences to the Technology Fellows, underlying databases and programmed routines in the EMS were re-purposed to meet the need or resolve the challenge.

Technology Professional Development
Enabled by an Electronic Management System

Faculty are increasingly providing distance learning programs for their students in synchronous and/or asynchronous modes (Hirschbuhl & Bishop, 2002). Means (2000/2001) writes that while great strides are occurring in integrating technology in schools across the nation, our schools in general are not succeeding in providing a seamless, convenient, and reliable technology support structure for all students and their teachers. Many educators lament the lack of current computers and viable school networks. Yet, far too often teachers and their students are not utilizing or are under-utilizing available resources. However, Means posits an encouraging future given insights that have been gained from recent experiences with technology integration, combined with advances in cognitive science regarding how people learn, and the technological improvements that will likely occur in the coming decade.

Pre-service teachers in our Colleges of Education are predominately of the Net Generation (sometimes called Generation Y). The Net Generation teaching candidates, having grown up with the new technologies, enter our institutions of higher education with a much better comfort level for technology than the existing university faculty who grew up with television and radio. Consequently, an "Intergenerational Digital Divide" exists. To compound the problem, a second Digital Divide exists; the technology infrastructure gap between public schools and teacher education programs. Texas schools have experienced substantial technology infrastructure changes over the past few years (Denton, Davis & Strader, 2001). However, colleges of education are limited in their ability to provide substantial pre-service training in Internet-based technologies. Rather than presenting exemplary models of technology-enhanced instruction to pre-service

teachers, most Texas institutions of higher education are struggling with integrating technology into courses and content areas and in offering on-line courses.

The Need

The need for colleges of education to prepare students and teachers for a technological world is clear. It is also apparent that teacher preparation faculty, who should be leaders and models of technology-enhanced education, are not. Current estimates are that two million new teachers will be needed in the United States in the next ten years. Added to this need for teachers is the phenomenal rate of technological change, with computing improving, expanding, and doubling in processing power every 18 months (Cairncross, 1997). The National Council for Accreditation of Teacher Education (NCATE, 1997) has called for an increased focus on technology in teacher education, citing the need for technology to move from the periphery to the center of teacher preparation. NCATE has called for "vigorous action" to integrate technology into teacher education programs to provide the knowledge base in technology and technology integration for future teachers. The question becomes: With limited financial resources, how should we support faculty so that they can provide the kinds of instruction pre-service teachers need to become effective users of technology? The answer that we suggest is that although building capacity and providing tech support provides both benefits and countering drawbacks, neither is sufficient alone. Our experience supports the proposition that both are needed for a successful professional development program for faculty.

Our PT^3 Project – Technology Mentor Fellowship Program (TMFP)

We designed our PT^3 Project, funded in 1999 by the U.S. Department of Education, to address the need for increased faculty proficiency in technology while recognizing the challenge—and the potential—of the disparity between faculty and students in technology skills. The goals of the project were to facilitate faculty development through

both approaches: building capacity and providing tech support. Our stated objectives included:

(1) Developing proficiency of the faculty in the College of Education in the use of various instructional and communications technologies **[Building Capacity];**
(2) Developing proficiency within the College of Education in digital media that supports the NCATE standards and the International Society for Technology in Education (ISTE) [**Building Capacity**]; and
(3) Supporting faculty transitioning to the new teacher preparation program by providing technical assistance **[Providing Tech Support].**

Over the course of the project, we have accomplished the following outcomes in support of the program's objectives.

Outcomes: Across the grant, 633 Technology Fellows (spring semester 2000 = 67, fall semester, 2000=137, spring semester, 2001=156, fall semester 2001=143, spring semester 2002=130) have been placed with teacher education faculty. As information spread about this program, faculty from six different academic departments elected to participate in the program.

Of the 843 electronic learning objects created to date, TrackStar tracks (on-line lessons that incorporate other web-based materials into a coherent activity for individual or group based instructional experiences) have been developed far more often than any other resource. However, assistance has frequently occurred with Technology Fellows helping their faculty member create PowerPoint presentations and personal WebPages. A large number of electronic objects have been created across a wide range of content areas for the continuum of learners from kindergarten through graduate school. These resources are being organized into an on-line teacher certification program for secondary mathematics and science teachers. Other faculty members are preparing online courses and have requested support from their Technology Fellows in putting their courses online. It is anticipated that 10 on-line courses will be operational by September 2002 in the college.

Since the program began, 428 technology skill self-assessments have occurred on the Profiler system (an on-line technology self-assessment system), and a total of 122 participants have completed a Profile at least two times. Getting faculty to complete a self-assessment has been a major challenge. Reluctance to being assessed on technology skills has proved more difficult than anticipated. While the Profiler has been a useful tool for getting individuals oriented to basic technology knowledge and skills, actual demonstrations of technology skills are thought to be necessary for measuring whether our program objectives are actually being attained. The development and implementation of a skills performance system (*I-folios),* with faculty affirming that particular technology skills have been exhibited by teaching candidates, has evolved as one of our "must do" tasks for the future. The *I-folios* assessment system and the *eEmpowerment Zone*, an on-line professional development portal, have evolved from our Electronic Management System.

Electronic Management System

The logistical challenges were daunting for tracking so many Technology Fellows at a time. Anticipating these challenges, an Electronic Management System was developed during project start-up (September–December 1999) to support the following management functions:

- track the Technology Fellow assignments,
- provide work schedule targets for Fellows
- provide payroll submission forms and confirmation of services,
- serve as a repository for electronic learning objects developed by the Faculty-Technology Fellow teams, and
- serve as an online communication system for the Technology Fellows, the Project Coordinator, and the Faculty members who worked with the Technology Fellows.

The management system utilizes the Internet to address challenges associated with multiple levels of communications, project management, and monitoring of electronic instructional object development.

Communication

The main TMFP home page <http://tmfp.coe.tamu.edu/> is used as the central communication port. From the TMFP home page, general information can be accessed about the Preparing Tomorrow's Teachers to use Technology (PT3) grant, partner districts, news, a calendar of events, and contact information for the TMFP staff and district facilitators.

Three distinct sections have been created for pre-service teachers, cooperating teachers, and college faculty members. These sections are accessible from the TMFP home page. Figure 1 shows the pre-service teacher page. The cooperating teacher page and college faculty member page are similar in structure. Each page contains current news and announcements for the specific group as well as links to a professional development section, biographical sketches, and resources.

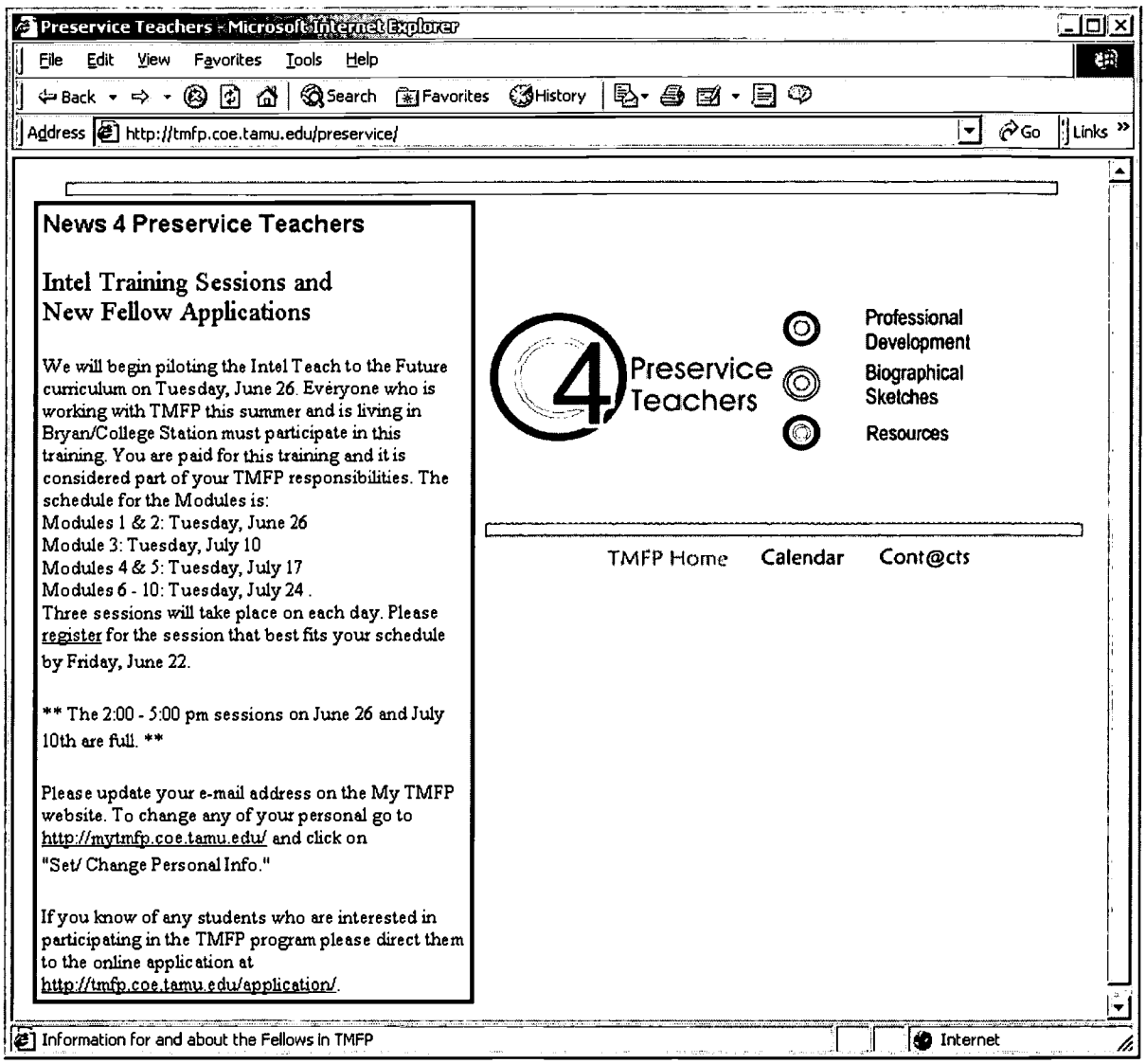


Figure 1 – Pre-service Teacher Web Page

The professional development section contains information about various training sessions as well as electronic resources for personal development, while the biographical sketch sections include brief personal biographies of the participants in TMFP. The resources section has links to various educational resources and applications on the Internet, downloadable TMFP documents, and a link to the My TMFP site.

The My TMFP Site

The My TMFP site is the private data entry site for each participant in TMFP. Technology Fellows access their My TMPF site through a password protected login. The

two main functions performed from the personal My TMFP page (Figure 2) are payroll and project management (data collection).

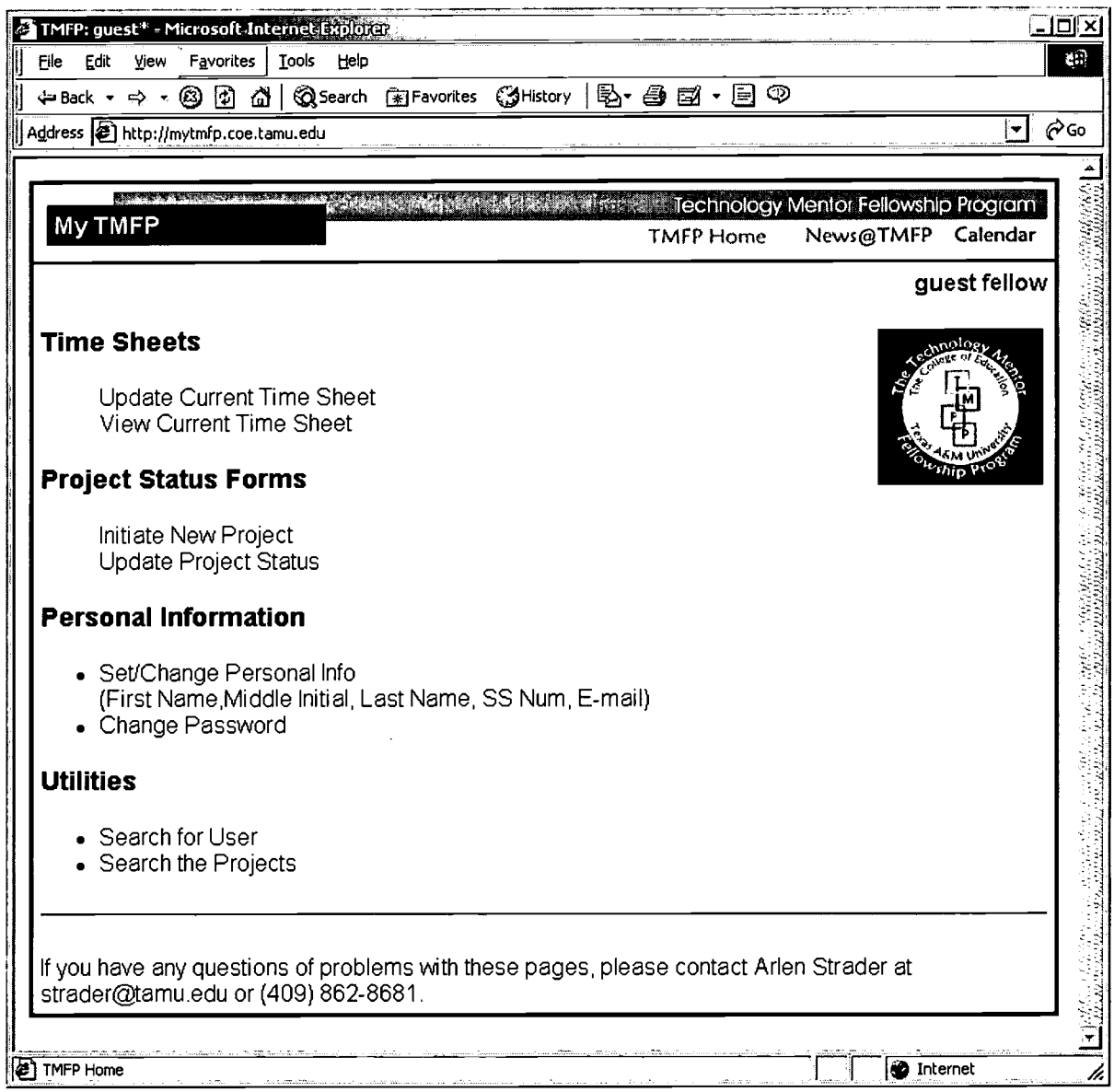


Figure 2 - My TMFP Personal Page

Payroll Functions

All of the payroll functions for the Technology Fellows (pre-service teachers) are performed electronically through the My TMFP site. Electronic timesheets make it

possible for Technology Fellows to be paid without physically delivering a timesheet to the TMFP staff. Electronic timesheets also allow for more automated data collection of payroll information and the day-to-day activities of the Technology Fellow.

Figure 3 shows the top half of the electronic timesheet that is completed every two weeks. The first data field requests information about the number of campus visits during the current pay period. This information is used to calculate the mileage reimbursement that is paid to technology fellows who are placed outside of the local area. The hours worked are entered next to the corresponding day and are totaled automatically.

Timesheet of guest - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://mytmfp.coe.tamu.edu/timesheets/ Go Links

Enter the number of Trips made from B/CS to your Campus: 0

Enter the date of Trips made from B/CS to your Campus: ex. 4/23/2001, 4/24/,2001

BIWEEKLY TIME REPORT
FOR NONEXEMPT EMPLOYEES

1. First Name MI Last Name **guest . fellow**		2. Soc Sec # **Be sure that the Social Security Number listed here is correct. Otherwise, you may not receive your check.**	
1st Week of Pay Period Starting **2001-07-12**		2nd Week of Pay Period Starting **2001-07-18**	
Week Day	**Hours Worked**	**Week Day**	**Hours Worked**
Thursday	0	Thursday	0
Friday	0	Friday	0
Saturday	0	Saturday	0
Sunday	0	Sunday	0
Monday	0	Monday	0
Tuesday	0	Tuesday	0
Wednesday	0	Wednesday	0
1st Week Totals	0	2nd Week Totals	0

Done Internet

Figure 3 - TMFP Time Sheet Form: Top Half

Once the hours worked are entered, the Technology Fellow checks the box next to his or her name to verify the accuracy of the information entered.

Technology Fellows describe their activities for the current pay period in the last data field on this form. This information provides a brief, but fairly complete, picture of the progress of the technology fellow. Timesheets are printed and signed by a member of the TMFP staff and submitted to the payroll department for processing just like the traditional timesheets.

Project Status Forms

The major activity of the Technology Fellows and faculty partners is to produce instructional materials for use by the faculty partner. An on-line database was created to facilitate the process of conceptualizing, developing, tracking, evaluating, and submitting projects. Projects are initiated, updated, and maintained by the Technology Fellow through the My TMFP site. When projects are initiated by the Technology Fellow, they work with the faculty partner to decide the project title, target audience, grade level, and content area intended for the final product. Figure 4 shows this part of the project status form.

TMFP Projects - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites History

Address http://mytmfp.coe.tamu.edu/projects/ Go

TMFP Project Status Technology Mentor Fellowship Program

TMFP Home News@TMFP Calendar Cont@cts

Fellow guest fellow

Teacher No Cooperating Teacher Assigned

Project Authors

Project Title

Date

Target Audience
- K-12 Students
- K-12 Teachers
- Undergraduate Students
- Graduate Students
- Higher Ed. Faculty
- Administrators

Other:

Grade Level
- Kindergarten
- 1st Grade
- 2nd Grade
- 3rd Grade
- 4th Grade
- 5th Grade
- 6th Grade
- 7th Grade
- 8th Grade
- 9th Grade
- 10th Grade
- 11th Grade
- 12th Grade
- Undergraduate Students
- Graduate Students
- Continuing Ed.

Other:

Content Area
- English
- Reading
- Special Ed.
- History
- Social Studies
- Mathematics
- Gifted/Talented
- Science
- Fine Arts
- ESL
- P.E.
- Business

Other:

TMFP News Internet

Figure 4 - TMFP Project Status Form: General Information

The next section of the project status form is concerned with the format of the projects, the description of the projects, and linking to or uploading the projects. The format of the project has been critical to the success that the Technology Fellows and faculty partners have experienced. The suggested project formats are listed in Figure 5. These types of projects have proven to be most successful because they are easily supported across TMFP and easily delivered in the educational environments for which they are produced.

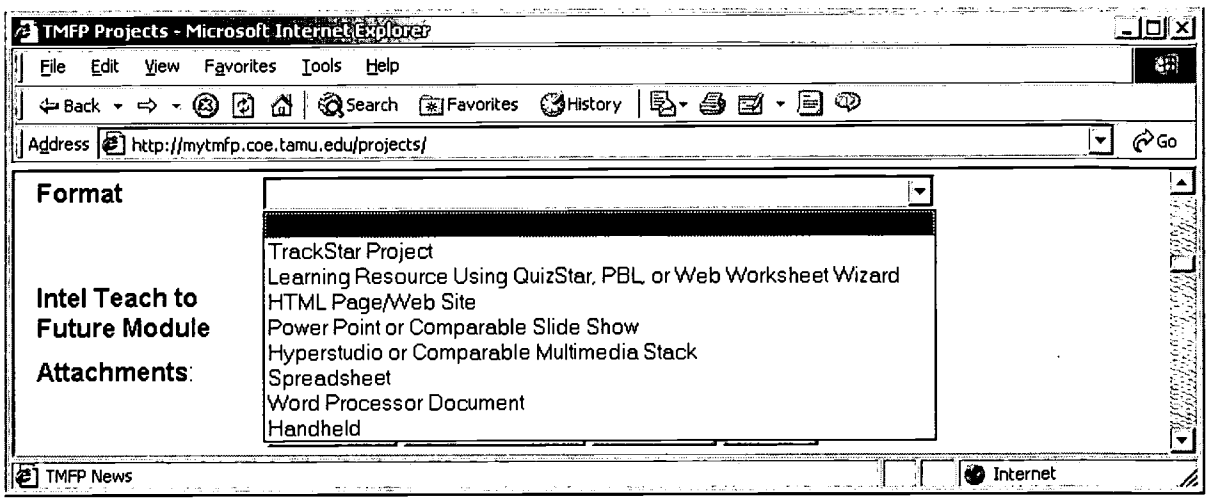
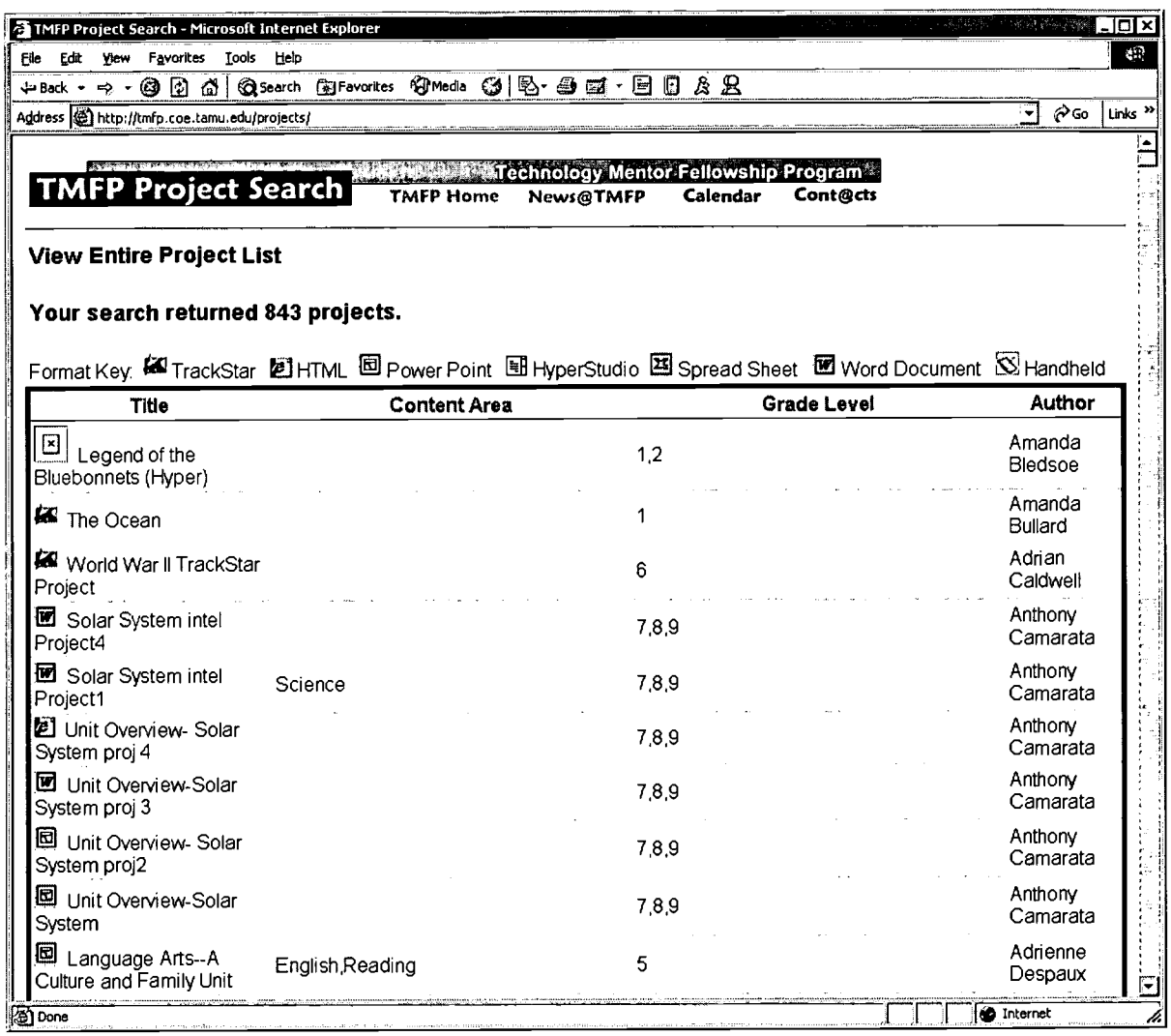


Figure 5 - Project Status Form: Project Format

There are two ways to link to projects. Non-Internet projects such as spreadsheets or word processing documents can be uploaded to the project database using the attachment section. Uploading these types of projects allows partners to centrally share files and allows the projects to be downloaded by anyone from the main TMFP website. The URL field allows the database to link to web-based projects. The estimated class time and project descriptions are entered in their corresponding fields.

Another feature not depicted in Figures 4, 5 and 6 of the project status form enhances the planning and communication of Technology Fellows and faculty partners is the description of tasks and plans. This section allows the Technology Fellows and their faculty partners to list all of the different tasks that need to be addressed in order to complete the project. Tasks range from learning certain functions of a piece of software or equipment to researching the contents of a topic or possibly reserving labs or equipment. The tasks can be modified at any time and comments can be added to each step for future reference. The date completed fields are useful for tracking the progress of each task by the Technology Fellow or faculty partner.

Finally, the project evaluation section allows both the Technology Fellow and the faculty partner to provide feedback concerning the finished project. The result of these iterations is a listing of electronic objects that are available for Technology Fellows and their faculty partners. Figure 6 presents the beginning of a listing of over 800 resources.



Title	Content Area	Grade Level	Author
Legend of the Bluebonnets (Hyper)		1,2	Amanda Bledsoe
The Ocean		1	Amanda Bullard
World War II TrackStar Project		6	Adrian Caldwell
Solar System intel Project4		7,8,9	Anthony Camarata
Solar System intel Project1	Science	7,8,9	Anthony Camarata
Unit Overview- Solar System proj 4		7,8,9	Anthony Camarata
Unit Overview-Solar System proj 3		7,8,9	Anthony Camarata
Unit Overview- Solar System proj2		7,8,9	Anthony Camarata
Unit Overview-Solar System		7,8,9	Anthony Camarata
Language Arts--A Culture and Family Unit	English,Reading	5	Adrienne Despaux

Figure 6 - Project Listings

The properties of the Electronic Management System presented in the preceding figures and related discussion have been applied to the development of *I-folio*, an electronic portfolio system for teaching candidates.

The *i-Folio* Tool

TMFP staff members have developed *i-Folio,* an interactive portfolio documentation tool that allows pre-service teachers to display products from pre-professional experiences and correlate those artifacts to state and national standards. The products in *i-Folio* are artifacts of the teaching candidate that reflect on the preparation of the individuals as well as the nature of the experience provided by the teacher preparation program. The tool serves as an electronic clearinghouse for student portfolios developed as teaching candidates complete competency demonstrations associated with certification and course requirements. Students will maintain their own portfolio web-site on a College of Education server that will contain assignments and projects from courses, student organizations, community service projects, and personal interests. The student will place their work products (responses to assignments) on their own college web-site and then send a request to their professor to evaluate the product. Some of these submissions may be electronic objects (e.g., PowerPoint presentations, Excel spreadsheets, CAD drawings, video productions) or they may be word documents that provide a description of an event (e.g., reflections from teaching a lesson to a fourth grade class) or a research paper. The professor can approve, disapprove, or request additional information regarding the artifact. The prototype system is currently being field-tested with approximately 130 Technology Fellows. Assuming a successful field-testing experience and some adjustments of the system based upon that experience, the system will be available for implementation at the beginning of the fall semester, 2002.

The eEmpowerment Zone (eZone)

The eEducation group has developed a comprehensive, web-based e-learning and professional development center that is designed for a far-reaching community of

learners: preservice and inservice teachers, administrators, and higher education faculty.

The eZone is designed to focus on providing instructional modules, and integrated resources and tools that support teaching and learning performance. By organizing instructional web-based learning objects, resources, and tools into a comprehensive system, learners can participate in "knowledge networking." The eEmpowerment Zone is designed as a dynamic, on-demand environment that adult learners can use to learn new technical and pedagogical skills, and K-12 learners can use to explore subject specific content. eZone resources are embedded in realistic and relevant contexts and are tied to State and national standards, curriculum integration, and best practice.

eZone professional development modules are the hallmark of the eEmpowerment Zone. They are on-demand, knowledge objects that can be used as stand-alone resources or integrated into full academic courses or professional development programs. eZone modules are framed as online lessons that integrate tutorials and project-based learning activities that learners submit. eZone modules incorporate audio voiceovers, interactive response and feedback mechanisms, or introductory video clips. The browser-based *My eAccount* administration and reporting system facilitates remote registration and enables students and instructors to track student progress.

Concluding Remarks

Out of sheer necessity, the Electronic Management System was developed to manage the assignments, work-schedules, bi-weekly payroll processes, and program product archival for the technology fellows. The functions designed into the system enabled the TMFP staff to effectively maintain communication links with the Technology Fellows and their assigned faculty members, provide organized data sets for the preparation of status study reports associated with technical assistance and building program capacity, and enable the fiscal management of nearly one-hundred fifty employees working in nearly that many locations. As additional program needs and challenges were identified, such as, assessing technology skill competence and offering professional development

experiences to the Technology Fellows, underlying databases and programmed routines in EMS were re-purposed to meet the need or resolve the challenge.

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