

Teaching In the 21st Century: Incorporating
Online Learning Techniques Into
Curriculum Delivery

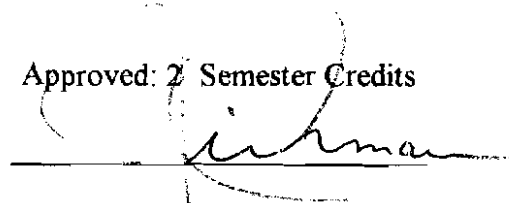
by

Julie A. Fischer

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A handwritten signature in black ink, appearing to read "Jim Lehmann", is written over a horizontal line.

Dr. Jim Lehmann

The Graduate School
University of Wisconsin-Stout

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**The Graduate School
University of Wisconsin-Stout
Menomonie, WI**

Author: Fischer, Julie A.

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ABSTRACT

The Wisconsin Department of Public Instruction in partnership with North Central Regional Educational Laboratory developed a survey titled enGauge, which identified six essential conditions for effective use of educational technology. Staff members at Hayward High School completed the survey in the spring of 2006. Recommendations were made to the school district based on the results of the survey. One recommendation was for the district to provide opportunities for meaningful online professional interactions. This study sought to develop a meaningful online training plan for staff members at Hayward High School. The online training plan incorporates Hayward Community School's technology standards for teachers. Critical components of online curriculum delivery are identified. Often referred to as the tools of the 21st century, the components include student e-mail, searching and validating information, using a

podcast to deliver instruction, creating a narrated PowerPoint for lecture delivery, using discussion forums, using a wiki, incorporating online assessment strategies, and using a course management system.

Through qualitative research, this study incorporated best practices as well as benefits and challenges in online curriculum delivery. From the literature review, online curriculum delivery methods are identified and compiled into self-paced training modules. Finally, an example of how these modules can be delivered is presented using Moodle, a course management system designed to deliver and enhance online curriculum.

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Chapter I: Introduction

The classroom of the 21st century is more than a brick and mortar building. For many students, the classroom exists online as much as it does in the physical space of the school building. According to the US Census Bureau, the majority of households have personal computers and Internet access. The Bureau found that in 2003, 70 million American households, or 62%, had one or more computers, up from 56% in 2001. Murray (2004) found that some form of online learning was offered in 41 percent of K-12 schools during the 2004-2005 school year. When they are not in the face-to-face classroom, students use mp3 players, cell phones, text messaging, chat, and contribute to blogs. In essence, technology takes over the minute students leave the school building. It is the challenge of teachers today to connect with students and deliver curriculum using the tools of the 21st century.

To generalize, the tools of the 21st century are those that allow instructors to communicate with students and offer collaborative work options using the internet. Instructional technologies of the past included computer-assisted instruction, self-paced tutorials, simulations, and the early use of the Internet as an information source (Blomeyer, 2007). Teachers today are challenged to create meaningful online or interactive activities related to the assignments that will help students understand the topic. According to Poftak (2002), 71% of Internet-connected students choose the Web over a visit to the media center to complete school projects. Creating collaborative workgroups online for students to access and obtain class-related help while doing their homework would increase student learning beyond the regular school day.

The Hayward Community School District (2006) established a goal which includes reviewing programs and offerings to provide a rigorous and appropriate education for all students, to improve and increase learning for all students, and to provide professional growth of

current personnel to help provide the best possible staff to meet the needs of students. In addition, the Hayward High School District Technology Committee (2007) has established goals which include providing access to information and technology resources, ensuring that all students and staff are information and technology literate, and integrating technology that improves student learning in the content area. As part of a comprehensive review of technology use at Hayward High School, students, staff, and administration took part in the enGauge survey created by North Central Educational Resource Laboratory (NCREL). Upon completion of the survey, NCREL made recommendations to Hayward High School. One of which was to provide a model for teachers to follow regarding incorporating technology into curriculum delivery. This research was done to compile best practices in integrating technology into a model of online curriculum delivery.

Statement of the Problem

To connect with students and keep pace with methods of teaching in the 21st century, teachers need to infuse online learning into their curriculum delivery. During the summer of 2007, an online training plan needs to be developed for teachers Hayward High School, based on recommendations made by NCREL, Hayward Community School District Technology Standards, and research of best practices in online curriculum delivery.

Purpose of the Study

This project will research and compile best practices in online curriculum delivery into a proposed product that can be used to train teachers at Hayward High School. Teachers who complete the training will be better prepared to meet the district and state technology standards for teachers as well as the district goals for education. Most importantly, the online training product will provide a tool to help teachers engage students into learning beyond the traditional

school day in a way they know how—through technology. This project will contribute to an increased knowledge of teachers by researching ways to enhance curriculum delivery and reinforcement using online methods. Recommendations were made based on this research and eight modules were designed. Teachers will have the opportunity to become knowledgeable of online learning and collaboration through experimentation with online curriculum delivery methods. They will have a resource showing them how to use the tools available to incorporate online learning through detailed training modules. Instructors who complete the training modules will be equipped to incorporate these curriculum delivery components into their existing courses.

According to the U.S. Census Bureau (2003), more than three-quarters of households with a school-aged child (6-17 years) had a computer, and 67% had Internet access. Children are using the Internet by creating blogs, listening to podcasts, and contributing to wikis for their personal use. Instructors can use this technology to their benefit by learning how to infuse these relevant and appealing tools to enhance and reinforce curricular objectives. This would lead to new content delivery strategies such as discussion boards for topic or chapter content, wikis for collaborative group work, and blogs for students' individual reflection. It would engage the students in school even while they are at home on the Internet.

Recommendations have been made to teachers at Hayward High School by the Wisconsin Department of Public Instruction (DPI) and NCREL regarding integrating technology into curriculum delivery. Until teachers and administrators are immersed in the culture of technology, they will need models along with advice on the context, content, instructional design, curriculum, and assessment that together shape effective teaching and learning with students (NCREL, 2006). This recommendation has prompted the research and compilation of best practices in online curriculum delivery.

Research Questions

This study will focus on researching best practices in online curriculum delivery. The study will address the following questions.

1. What is online curriculum delivery?
2. What are the tools used in delivering curriculum online?
3. What challenges come from delivering curriculum online?

Significance of the Study

There is no training currently in place for teachers at Hayward High School to infuse the tools of the 21st century into curriculum delivery. The goal of this research was to compile best practices to be used in developing a product to train teachers in incorporating these practices of online curriculum delivery. Teachers need to be better prepared to meeting the changing communication needs of today's youth. This study will impact education and the field in the following ways:

1. This study is designed to research best practices in curriculum delivery using the tools of the 21st century. The results will be compiled into a training product offered to staff members at Hayward High School. This training will create an opportunity for teachers to learn about, incorporate and use online learning modules in their own curriculum.
2. It is anticipated that students and staff will become excited about the way the course content is delivered and enhanced. As a result, staff will become more confident in infusing technology and students will be excited about learning.
3. The concept of using technology is not new. Many instructors have been using electronic grade books and class web pages for several years. However, this use of technology is

only a resource or documentation of course materials and does not include activities to enhance the actual curriculum which this study will address.

4. Once teachers become comfortable integrating the tools of the 21st century, they may eventually be capable of building a total online environment. This will open up several opportunities in scheduling of courses offered at the high school level that may promote increased excitement for online learning. It will demonstrate the importance of collaboration and how it affects learning and will encourage more learning related activities at home.
5. Further research in this area could be geared toward creating collaborative communities connecting students to clubs, organizations, school-to-work initiatives and community involvement, as well as opening the doors to staff training opportunities outside the face-to-face classroom not only at Hayward High School, but in districts throughout the state.
6. The end product, an online staff training course, will be available for other districts to modify for their own staff development needs.

Limitations of the Study

This is a qualitative study and the results will be reported as best practices, not quantitative variables. The best practices established in this study will be based on the review of literature. Analysis and recommendations will be based on the quantity and quality of literature reviewed. Further limitations of this study are as follows:

1. If this study were to be referenced in a different school, the technology recommendations and limitations for that particular school should be considered.
2. The curriculum delivery tools will need to be reviewed and revised on a continual basis to keep current with technology trends in the 21st century.
3. The goal of this study is to research best practices in online curriculum delivery which will be used in a staff training product. The administrative aspects of staff training such as in-service time needed to complete the training, instructor compensation for completion of the training, and scheduling of the staff training will need to be addressed.

Definition of Terms

Blog: A log of information stored on the internet or World Wide Web often referred to as a web-log.

Course Management System (CMS): A technology platform through which online courses are offered. A CMS includes software for the creation and editing of course content, communication tools, assessment tools, and other features designed to enhance access and ease of use (Watson, 2005, p. 126).

Discussion Forum: A software program that permits you to "post" messages online and allows others to reply to your posting with one of their own (Ko & Rossen, 2004, p. 296).

enGauge: A professional development program which provides a comprehensive research-based view of the critical factors in the educational system that strongly influences the effectiveness of learning technology (Learning Point Associates, 2007).

Hybrid: A course that combines both online and face-to-face components (Ko & Rossen, 2004, p. 296).

Moodle: A modular object-oriented dynamic learning environment that enables the user to create online learning experiences (Rice, 2006, p. 5).

NETS: National Education Technology Standards are standards that were published by the International Society for Technology in Education in 1998. The standards document a U.S. consensus defining what students needed to know about and be able to do with technology (ISTE, 2007).

NCREL: North Central Regional Educational Laboratory is a nonprofit educational organization working with and for educators and policymakers to transform education systems and student learning. The services of NCREL are now being carried out by Learning Point Associates (Learning Point Associates, 2007).

WDPI: The Wisconsin Department of Public Instruction is a state agency that regulates educational licensing and programs as well as provides information to parents, community members, and educators about children's learning and schools in Wisconsin (Wisconsin DPI, 2007).

Podcast: An audio file that can be produced with a standard computer, microphone, free software, and a web site. Podcasts can be listened to with any computer connected to the internet and able to play standard MP3 audio files (Warlick, n.d.).

Wiki: An online software feature that enables students to collaborate on a book-like writing project (Rice, 2006, p. 162).

Methodology

The remainder of this paper will outline best practices in the integration of the tools of the 21st century into online curriculum delivery. The qualitative study will address how incorporation of specific training modules will meet the needs of staff regarding technology use as identified in the enGauge survey. Finally, the study will provide examples of training modules related to eight of the tools identified.

The Internet holds students attention more today, than ever before. In an effort to connect students academically beyond the traditional school day, teachers are challenged to enrich their curriculum with online counterparts. This project will provide teachers with an online training tool for integrating online learning into curricular offerings as well as helping teachers to demonstrate proficiency in meeting certain National Educational Technology Standards.

Chapter II: Literature Review

Chapter two includes a review of literature related to integrating technology into curriculum delivery. Specifically, this chapter will explore the following areas: (a) defining online curriculum delivery, (b) identifying tools used in delivering curriculum online, and (c) exploring the challenges in using online curriculum delivery. This review will explore the meaning of online learning including pedagogical and technical aspects. It will explore the different delivery methods used in online learning and how tools such as blogs, podcasts, wikis, e-mail, and the like have affected the pedagogical practices of teachers at the high school level. This review will give the reader an overview of the benefits and challenges of online curriculum delivery and why it is being infused into high schools today. Finally, the review will discuss why

the online curriculum delivery training content recommended in chapter three of this document is appropriate.

Online Curriculum Delivery Defined

Students live in an on-demand society. From downloading tunes on their mp3 players to watching movies-on-demand, today's students expect an on-demand learning environment where content is accessible by the click of a button (Miller, 2006). Smith (2007) makes the analogy—When in Rome, do as the Romans Do—to online learning stating that in order to communicate with today's youth, instructors need to use the tools that students use in their everyday interactions. This, in essence, will assist instructors in extending the learning environment beyond the walls of the classroom. Teachers need to teach the way students learn—using the tools of the 21st century. Online interactions make the classroom available beyond the physical classroom doors. They open the lines of communication between teachers, students, and parents (Catalano, 2005).

Pedagogical methods differ in the online classroom. Kontos (2007) discusses good practices in online curriculum delivery including maintaining contact between instructor and student through e-mail, chat, and threaded discussions. Cooperation among students is encouraged through online group collaboration, peer reviews, and threaded discussions. Active learning naturally happens as students share information that they investigate, and report findings to the class. Prompt feedback is given by the instructor and by peers, which provides immediate reinforcement and acknowledgment of student work. The online environment encourages time spent on task by providing timelines, clear objectives, due dates, and expectations. The instructor in the online environment communicates high expectations through examples and demands

excellence in submitted work. Finally, through discussions, learning styles can be determined and teaching strategies can be adjusted to meet the needs of individual students.

According to Seitzinger (2006) constructivist learning engages students. It lets them manipulate information integrating new material with prior knowledge. Through reflections, students articulate their learning goals and the progress that they make toward those goals. Constructivist learning simulates real-world with authentic applications and assessment. Students interact, share ideas, negotiate and discuss solutions. Problem-based learning presents real-world problems and tasks and ties students to prior knowledge of students while teaching them how to properly evaluate informational resources. Learner centeredness is evident as students are in control by actively participating in discussion forums, giving feedback to peers, and reflecting on their own learning. Collaborative learning takes place as students learn in teams sharing information and making shared decisions. A social presence is developed as students develop relationships with other students and the instructor. Interactivity is demonstrated by students being actively involved in the learning process by clicking, navigating, seeing, hearing, and watching content. Support is provided through feedback from instructor and students, modeling and coaching students in the right direction. Finally, cognitive tools such as video or audio conferencing, presentation methods, and podcasting are used to deliver and enhance curriculum in a constructive way.

Tools of the 21st Century

In the online environment, students initiate learning by checking e-mail, contributing to discussion forums, and downloading supplemental course materials. In the face-to-face (f2f) classroom students wait for the instructor to initiate a discussion or to present a lecture. Students develop stronger one-to-one relationships with instructors using online communication because

of the amount of personal one-to-one communication that exists through e-mail and discussion forums (Smith, Ferguson, Caris, 2001). The following paragraphs will provide information about as well as the benefits and challenges of tools used in online curriculum delivery. Lehmann (2004) defines text-based communication tools as those including Email, threaded discussion forums, chat, instant messaging, and file transfers. Many of these are used extensively in asynchronous communication and provide the backbone for online curriculum delivery. It is clear that, in today's digital age, students must be technologically literate to live, learn, and work successfully (NCREL, 2006). Technology literacy involves not only knowing the terminology that goes along with today's communications, but also the ability to perform certain tasks using a computer, or other electronic device. Appendix X lists certain standards that teachers and students should be able to meet to be considered technology literate. Being technology literate isn't the only element that is needed to deliver curriculum online. "To create important human connections in the online classroom requires two elements: selection of the proper communication tools for each particular course and good facilitation by the instructor (Lehmann, 2004, p. 9)."

E-mail. Teachers are to demonstrate proficiency in communicating effectively using verbal and nonverbal communication techniques as well as instructional media and technology to foster active inquiry, collaboration, and supportive interaction in the classroom (Wisconsin Teacher Standards, Appendix B). According to Partee (1996), e-mail can be used to counsel students individually. Through e-mail, instructors are available to their students at any time with the added benefit of having an electronic record of communications with students. Shy students can respond to the teacher more freely through e-mail whereas the not-so-shy students may wish to reply to all students in the class. With e-mail, interaction between teacher and student is two-

way. It provides a venue for the teacher to be able to counsel each student individually by having personal contact with students regarding attendance or other learning issues.

The key to using e-mail successfully in an online or hybrid face-to-face and online course is to develop and enforce a set of rules (Ko and Rossen, 2004). With e-mail, instructors are free to respond to students when they have time to do so, providing them with opportunities to structure other activities during the normal class time. According to Smith, Ferguson, and Caris (2001), the time an instructor spends online creates a presence, which in turn creates a perception for students that the instructor is out there. If an instructor does not maintain this online presence, students may quickly become insecure and lose interest in the online method of communication. E-mail provides a method for teachers to use to create this presence.

Searching and validating information. In planning and designing learning environments and experiences, teachers need to be able to identify and locate technology resources and evaluate them for accuracy and suitability (NETS for Teachers, Appendix C). As an instructor or student, you need to know what material you are able to use, under what circumstances you can use it, and when you may be breaking the law (Ko and Rossen, 2004). In order for teachers to teach appropriate technology strategies, they must also be able to model appropriate methods of searching and validating appropriate online technology-based resources. There are many opportunities online in terms of finding learning activities to integrate into the face-to-face classroom, but it is important for the instructor to encourage and model the skills in differentiating valid and useful information from the biased and untrue. (Smith, Ferguson, & Caris, 2001).

Schrock (2006) offers several points to consider when evaluating whether a site is trustworthy or not. The first is technical evaluation, which includes load time, author

information, date of last update, and link mechanics. Second is evaluating the content of the web page for its title, purpose, and whether or not the information may be biased. Third is to investigate the origin of the information including finding out who created the site, and what organization or business is the person is affiliated with. Overall, the user of a website needs to validate the content for technical content, authenticity, authority, bias, and subject content.

Podcasting. Seitzinger (2006) defines podcasting as a rich learning environment that provides flexibility in curriculum delivery. Podcasting can replace a missed lecture, reinforce curriculum with additional material, provide a guest speaker, and present new material in a new form to students opening the door to self-paced learning. Learners maintain control in a podcast as they can listen and repeat as many times as they want.

Audio is not new in education. From audio cassette tapes to CD's, audio has been neglected and is underused (Lee & Chan, 2006). Podcasting is a technology that allows digital audio content to be downloaded for listening to on an mp3 player, computer, or other audio device. There is a renewed sense of usability with the increase in use of portable audio players, high-speed internet and software for easy creation and distribution of audio files. Podcasting is inexpensive, readily available, portable, easy to produce and great for non-readers. Podcasts can be listened to on-the-move, which provides new insight into delivering curriculum beyond the f2f classroom.

Flanagan (2005) discusses academic uses for podcasts to include course content dissemination, classroom recordings, field recordings and study support. Podcasts are beneficial to students as they can listen to recorded lectures as reinforcement or replacement for the actual lecture. They are a way to provide students with audio version of a book, as well as other audio content. One must obtain permission to use the content in a podcast. If an instructor is creating a

podcast, the instructor is legally responsible for what is said in the podcast. Podcasting requires considerable hard drive space in addition to a large amount of bandwidth when students download the material, which may pose as a challenge on the technical end of the using the technology.

According to Deubel (2007) deciding what to say is the most important step in creating a podcast. If the quality of a podcast is poor, it will not suffice as an online method of curriculum delivery. Deubel offers tips for creating a quality podcast. One of these tips is to use sufficient hardware and software. On the hardware side, having a headset-type microphone will produce better quality than a regular microphone that plugs into a computer. As far as software, Audacity, a free audio editing program, is available for both Windows and Mac platforms. There are other platform-specific programs available as well. Another challenge in podcasting is brought about through the Americans with Disabilities Act and Section 508 which requires authors of content on a web site to make content available to the deaf and hearing impaired. If a podcast is posted to a website, a text alternative should be made available as well. Another benefit of the text is that it will allow the material to be searched by a web browser.

Discussion Forums. A discussion forum is a web page which allows threaded posting where one participant, or the course facilitator, starts a discussion thread and others respond, building on the conversation (Tyson, 2007). Forums and discussion boards operate by being stored on a server maintained by the owner or originator of the forum or discussion board. Discussion forums provide a way for students to communicate with each other within a structured framework offered by the course facilitator. On the operational side of discussion forums, the administrator or course facilitator controls the discussion by adding the initial post and controlling comments by editing, deleting or revising replies to the discussion. This makes it

possible for the instructor to maintain control of the class discussion as would be done in a face-to-face classroom. Discussion boards are a way to collaboratively discuss a particular topic as communication strengthens with those who are most interested in the same topic. Discussion forums are also beneficial for obtaining different views about a topic from each of the participants in the forum. Lehmann (2004) offers the following advantages to using online discussion forums: (a) the entire discussion is recorded because it is done in writing, (b) everyone can and should participate, and (c) the online environment releases people from inhibitions that keep them from being full participants.

According to Ko and Rossen (2004), putting your class online doesn't mean copying your lectures and syllabus word for word. Discussion forums should be used to encourage collaboration and conversation among students in the online classroom. The instructor can help foster discussions by posting thought-provoking statements. If the discussions go outside of the topic area, it is the instructor who needs to narrow down the topic and guide the discussion back to the right direction. Facilitating a discussion forum is much more than reading and responding to students contributions. Instructors need to organize forums and threads to reflect the sequence of curriculum delivery whether the curriculum is delivered in units, modules, or lessons. The discussion thread topics should relate to the activities that occur in each unit, lesson, chapter, or module. Instructors must let students know what the expectations are as far as their contributions to the discussion. Proper facilitation includes establishing a pattern of frequent response. It is the facilitator's job to build on participation and guide students' responses. Finally, instructors need to be aware of cultural differences in discussion forums as well as personal styles.

The asynchronous nature of discussion forums is great for students who need to think about a response before actually responding. In the face-to-face classroom, discussions are

limited to the class time available and sometimes those discussions are monopolized by a select few students. In the online discussion forum, more students can participate. Students may think deeper about responses knowing that the response will be posted semi-permanently to the forum. Students who do not post are noticed for their lack of effort as much as those who post frequently are noticed for their contributions (Smith, Ferguson, & Caris, 2001). For some students, contributing to a discussion online may be much more enticing than participating in a face-to-face discussion Partee (1996). Some students are shy and do not like to speak in front of others where others like to think about a response before blurting it out. The discussion forum provides a venue for these students to participate in the conversation. Students who otherwise wouldn't participate may offer impressive quantity and quality to the forum. The discussion forum is always available. It is comparable to a classroom being open all of the time. Further, when a student posts a thread to a discussion a response may happen within a few minutes or a few hours.

Some disadvantages exist in the use of discussion forums. One is that not all students have access to the internet at home and would be unable to participate in the online discussion unless given time from the face-to-face classroom to do so. Another problem with discussion forums is that at first, some students will lurk rather than participate. The instructor must be visible in the discussion forum and must pay close attention to the direction of the discussion--not only to remove inappropriate comments, but to provide direction if the discussion goes off-track. In the case of the latter, if a student responds inappropriately during a post, the instructor can edit, remove, and contact the individual student by responding privately through e-mail, or in some cases, responding for all to read in the discussion forum Partee (1996).

Narrated PowerPoint. Learning is an active process in which both the instructor and the learners must participate if it is to be successful (Paloff & Pratt, 1999). Teachers are to design developmentally appropriate learning opportunities that apply technology-enhanced instructional strategies to support the diverse needs of learners (See NETS: Appendix C). Ko and Rossen (2004, p. 161) offer the following suggestions for when to use multimedia to deliver content: (a) to illustrate the mechanics of how things work, (b) to clarify or emphasize abstract concepts, (c) to enliven or illustrate unfamiliar material, and (d) as the basis for an assignment.

Teachers control the amount of internet activity involved in their curriculum delivery. They choose whether or not to make assignments available online or to supplement course material with online activities. Thus, the way students use the internet for school is widely driven by the demands of instructors. Many students view the internet as a way to receive instruction, especially when they are confused or unclear about a particular topic. In conversations with students about the quality of internet-based assignments they overall suggestion was that students wanted more engaging activities. (Levin & Arafah, 2002). According to Frey and Birnbaum (2002), PowerPoint is often the first step for faculty when it comes to incorporating technology into curriculum delivery. Most students prefer PowerPoint presentations over the traditional methods because of the animation, color, graphics, and ability to control the sequence of the slides. Students depend on the visual representations for organizing and processing course content. PowerPoint is one way to deliver a lecture using this format in the online environment.

Wiki. Another online tool is the wiki. Wikipedia.org defines a wiki as a collaborative website which can be edited by anyone. Wikipedia is one of the most commonly used websites of this kind. Ward Cunningham developed the first wiki and described it as a simple online database (Wikipedia.org, 2007). A wiki is an interactive tool that records the thoughts and

progress of students while collaborating on a book-like writing project (Rice, 2006). Engstrom and Jewett (need date) discuss the rationale for using a wiki as being a communication and knowledge-building tool. Contributions are organized by content, not chronologically, and an edit trail is left so that the process behind the collaborative effort can be viewed. Some benefits to using a wiki include an increase in students' knowledge of technology. Students also learn to work cooperatively through the assigning of wiki roles such as recorder, note taker and discussion facilitator. Response time using a wiki isn't as quick as chat or instant messaging, so instructors should be available to prompt students' thinking and keep the project on track. Also, students who are part of the collaboration may have difficulty participating if they lack access to the internet.

Lamb and Johnson (2007) discuss the instructional benefits of using a wiki. The main benefit is that wikis lead to authentic activities. Students are actively participating in a project that is useful and relevant to real life situations. Emphasis is placed on authoring content, so that a student's focus is on the content rather than the tool. Links can be created not only to other pages within the wiki, but also to outside resources. Text, graphics, animation and video are all options in a wiki providing a variety of skill-based options for the wiki editors. Wikis provide for cooperative and collaborative learning as the students editing the wiki learn to work together to produce an end product. It is important for an instructor to establish guidelines on the acceptable use of a wiki in general and for each activity for which the tool is used.

Online Assessment. As students become more engaged in the learning process, teachers will find it necessary to use alternative forms of assessment to capture the full extent of the student's performance. Teachers will be faced with assessing technology-based student products

(NCREL, 2005). Blogs, portfolios, and online quizzes and surveys are just a few ways to assess student work online.

Blogging is a constructivist learning tool in that it is used for reflection—through journalizing. The constructivist learning approach includes such activities as experiments, interaction, collaboration, shared goals, group activities, and simulations (Paloff & Pratt, 1999). Blogging is authentic in that using a blog to create, format and upload material gives students more time and attention for the task at hand. Students are more articulate because of other readers and the possible feedback by peers. Blogs also provide students with a social presence. Students become part of an online community and feel like they belong. Comments to blog entries are a powerful form of online assessment as they provide a real one-to-one communication between the instructor and student. Overall, students become active learners using blogs as they read posts, ponder what was written and formulate opinions Seitzinger (2006).

Using a blog can be a great experience for students—especially at the middle and high-school levels. In fact, many students are already blogging using social networking sites. Sifry (2007) reports as of the fourth quarter of 2006, there were 70 million blogs being tracked. Teachers can help students develop better writing skills by using blogs as part of their assessment. According to middle school teacher Nehr (February, 2007), “Blogs provide instant insight into whether or not students understand the concept being covered while also providing a source for immediate feedback by clicking the ‘comment’ button.”

According to Richardson (2004), students in the F2F classroom rarely reflect on their learning. Blogs provide an opportunity for students to reflect as well as a technology tool that will assist them in connecting what they learn to their prior knowledge to show that they are

making connections. Depending on the purpose, a blog can encourage responses from other readers as well by allowing them to post related comments and start related conversations. Blogs can become a compilation of many user comments and can become time-consuming for an instructor to read. However, the content of blogs needs to be reviewed, and many times commented on by the instructor (Poling, 2005). However, blogs help build communication and collaboration among students. This communication may be deeper than in the face-to-face classroom because of the individual comments that students receive from other students as well as the instructor. Students become motivated by this audience that they create with their blogs.

In addition to using blogs for online assessment, digital portfolios are used. Digital portfolios allow students to assume ownership and control of their own learning. They also motivate students to produce high-quality work because they can be easily shared online, making them readily accessible (Guhlin, 2002). Portfolios provide administrators, parents, teachers, and state licensing bodies with evidence that the student is prepared and competencies are met. Overall, the portfolio provides a means for student improvement on a continual basis (Klein & Chandler, 2003).”

Dr. Helen C. Barrett (2004) describes the process of creating the digital portfolio as providing students with instructions on the process of collecting information. Students and instructor should assess and decide on the content for the portfolio and an approved design should be followed. A template may be developed based on the plan or design. Implementation of the portfolio needs to be communicated to the students as well as the plan for evaluating the contents. The instructor can give as much or as little lee-way for creativity in the actual portfolio design to the student.

Teachers need to demonstrate understanding and uses of formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of their students (Wisconsin Teacher Standards, Appendix B). The online survey tool makes assessment easy, fast, and affordable. However, it takes some thought and consideration to put together an effective survey. According to Day (2007), when creating a survey, it is important to evaluate what type of information you are looking for. When creating online surveys, excellent question design elicits more effective answers from students.

Teachers need to use technology resources to collect and analyze data, interpret results, and communicate findings to improve instructional practice and maximize student learning (NETS, Appendix C). Effective online student assessment surveys consist of questions about the students' attitudes towards learning as well as the experience with the course. Surveys can be used to ensure that a constructivist online learning environment exists. Surveys are also used to determine students' attitudes toward thinking and learning online which will help the instructor determine a student's learning style. Surveys are also used after each topic or week to provide instructor with the information needed to make changes to a course in progress (Rice, 2006).

Course Management System. Putting information on a web site simplifies distribution of course materials (Partee, 1996). Online course management systems provide a way for instructors to keep record of daily lecture notes, and students can read information at their leisure or print the material if they wish to do so. Implementing technology-supported strategies requires educators to innovate and take risks. Schools would do well to provide teachers with a great deal of support through this process. In many cases the best forms of support are 'teacher coaches' who can team teach with them, model lessons, and provide sideline assistance (NCREL, 2005).

According to Rice (2006), the phrase “online learning experience” explains an experience where web pages can be explored in any order and where students can chat not only with the teacher, but also with other students. This experience demonstrates social constructionist pedagogy because the learning style is interactive. Students participate in discussion forums, online workshops, polls, and collaborative work space. In summary, an active and sometimes interactive learning environment is one that is full of different types of online interactions.

Perkins and Pfaffman (2006) noted benefits, challenges, and software that is beneficial in developing an online course. Uploading files to the right location can be difficult using high-end web-authoring tools. These tools are also expensive and are rarely found in K-12 education. It is important to keep a consistent look throughout a school’s web-site and this, alone, would be difficult to do if each instructor used a different web-authoring tool. Web-based applications allow users to publish information with little or no training, provide a consistent look and are easily navigated. They also work from any computer. Instructors can easily post assignments, lesson plans, announcements and course documents to the online course.

Moodle, a free open-source course management system, provides the features of common web-authoring products and is easy to use (Perkins & Pfaffman (2006). MOODLE is an acronym which stands for Modular Object-Oriented Dynamic Learning Environment. The web-based program provides tools to support learning as well as communication. Open-source software is software that people are free to study, change, or distribute. The idea behind it is that this collaboration will improve the product over time. Moodle is a prime example of open-source course management. OpenOffice.org is another open-source example of a program that includes a word processor, spreadsheet and presentation tool. When instructors manage a course using Moodle, they see what students see, which makes the transition easier. Instructors can link to

resources and create activities. The editor in Moodle is much like a standard word processor as far as changing fonts, colors, sizes, and creating hyperlinks. Moodle is also capable of subscribing to news feeds so that current topics show up on the main page and are updated automatically.

Stith (2000) lists some challenges to using a course management system for curriculum delivery. One of which is student access. If students are not able to connect at home, or if they connect at a slower rate than is needed, they may not be able to make efficient use of the delivery methods. However, the advantage of learning on demand outweighs the challenges. Students are able to take and repeat quizzes until they comprehend the material that is presented. Also, by working in groups, students with lower skills learn from kids who are more skilled. Instructors who survey students to determine their skill level at the beginning of the course will be best able to organize these groups.

Challenges in Online Interactions.

Catalano (2005) mentions barriers to online interactions which include security issues. Students may post too much information. These issues may be resolved by using private or restricted sites for the management of online materials which would require students to log in to the site. Another issue to consider is that the content that students write in e-mail, blogs, or discussion forums needs to be monitored. This can take a lot of instructional time and measures need to be in place, such as acceptable use policies, to provide some type of regulation on student contributions.

Instructor Skill Level. Teachers are expected to be competent users of computers for instructional purposes. The National Education Technology Standards define the fundamental concepts, knowledge, skills, and attitudes for applying technology in educational settings

(Appendix C). According to Miller (2006), staff members look to take advantage of an on-demand staff development. They want a training that they can access when they have time to access. Staff members are already making use of on-demand video content as they download an entire video, or selected chapter of a video when they need it. These downloads can be done simultaneously with other staff members.

Staff may become leery about putting curriculum online because the content can be monitored by parents, administrators, and colleagues, which may be viewed as intrusive to the instructor (Miller, 2006). Furthermore, some instructors may fear losing the pedagogical benefits of face-to-face instruction. Partee (1996) stated many instructors are tied to the teaching methods of yesterday. One reason is that they fear technology. Another is that they are ignorant in changing their ways.

“As technology comes into greater use, faculty and students alike are grappling with the changes it brings to the educational environment (Paloff and Pratt, 1999, p. 4).” Blogs provide an effective way to bring staff together. They provide sustained support and communication with staff members who would otherwise be unavailable in a face-to-face meeting (Poling, 2005).

Chapter III: Methodology

“Qualitative studies are a distinctive type of research in education and the social sciences that can produce vivid and richly detailed accounts of human experience (Ary, Jacobs & Razavieh, 1996, p. 491)” The type of research applied to this study was qualitative.

Documentation of instructional experiences and research related to the delivery of curriculum using online learning methods was investigated by reviewing journals, textbooks, and through personal experiences and communications in online learning.

The Wisconsin Department of Public Instruction in partnership with North Central Regional Educational Laboratory developed a survey titled enGauge. This survey identifies the school's progress in the effective use of educational technology. It included the questions based on the vision of the district in terms of technology advancements. The survey also addressed whether or not staff and students actually practiced using technology, whether they were proficient at using technology, and if the systems are in place for them to do so. Finally, the survey addressed issues such as equity in technology opportunities as well as access to the technology. The Hayward Community School District chose enGauge as the tool to measure staff technology competencies because of their work with state teams including DPI, alliances such as NCREL and Learning Point Associates and stakeholders such as community members, students and parents.

Thirty Five educators, six community members, 135 students, one district technology coordinator and one building administrator completed the enGauge survey. The survey was completed in the spring of 2006. Staff members were not required to complete the survey, but were encouraged to do so. Each staff member was given an anonymous access code to log in to the enGauge website. They completed the online survey consisting of 35 multiple choice questions which took each staff member approximately ten minutes to complete. The survey results were compiled by NCREL and an assessment profile was developed for Hayward High School based on the responses to the online surveys by students, community, and staff. This profile was given to the districts to use to be better prepared to make decisions that will ultimately improve teaching and learning. This study focuses on one of those recommendations.

Based on the enGauge assessment profile, one recommendation to Hayward was for the district to provide opportunities for meaningful online professional interactions. This

recommendation prompted the research of best practices in online curriculum delivery in combination with the development of an online professional development activity designed specifically for staff members at Hayward High School. According to NCREL, local education agencies should provide professional development for staff to integrate technology effectively into their jobs (NCREL, 2005). The research supports a professional development opportunity created for staff members at Hayward High School.

The qualitative research was limited to the technology available to staff members at Hayward High School including hardware and software. The research is also limited based on the recommendations of the Hayward Community School District, and would differ in other districts depending on the technology hardware and software resources available.

Chapter IV: Results

This chapter will address the research questions from chapter one and will answer the questions by synthesizing the information from the literature review. It will also detail how this research applies to the professional development of staff members at Hayward High School. The research questions were based on the following problem statement: To connect with students and keep pace with methods of teaching in the 21st century, teachers need to infuse online learning into their curriculum delivery. During the summer of 2007, an online training plan needs to be developed for teachers Hayward High School, based on recommendations made by NCREL, Hayward Community School District Technology Standards, and research of best practices in online curriculum delivery. The format for this section will be question and response based on qualitative research.

Defining Online Curriculum Delivery

Research question one sought to define online curriculum delivery. Online learning is comparable to face-to-face learning in many ways, but also lends itself to social constructionist pedagogy. According to Rice, (2006) students learn best when they interact with the material. Online learning provides this interaction in curriculum delivery through the tools of the 21st century.

Staff members at Hayward High School are required to meet Wisconsin Teacher Standard #6, which requires teachers to demonstrate effective verbal and nonverbal communication techniques as well as instructional media and technology to foster active inquiry, collaboration, and supportive interaction in the classroom. Staff members at Hayward High School have access to the tools necessary to provide this type of interaction to students.

The Tools of the 21st Century

Research question two sought to define the tools used in delivering curriculum online. The tools used in online learning include those that provide social interaction, reflection, discussion, and collaboration. The tools at Hayward High School that are available for this constructivist approach to curriculum delivery include e-mail, search engines, podcasts, discussion forums, wikis, narrated PowerPoint lectures, online assessment tools, and a course management system. An online training was compiled for staff members at Hayward High School where a learning module was developed for each of these tools. The tools are further defined below, as well as a description of how the tool is incorporated into the professional development opportunity (Appendix A).

Module 1: E-Mail. E-mail provides a consistent form of communication between instructor and student. E-mail can be used to counsel students individually. Through e-mail,

instructors are available to their students at any time with the added benefit of having an electronic record of communications with students Partee (1996).

At Hayward High School Gaggle.net is the e-mail program chosen by the technology department for student use. Teachers, however, use an e-mail program called GroupWise, and will need to be introduced to the student program, its benefits, and uses. Student e-mail at Hayward High School has been non-existent until now. The issues that accompany student e-mail use have created challenges that have kept Hayward High School from allowing students access to this communication tool through school. Gaggle.net has provided the solution to this problem by hosting free safe, filtered e-mail access for students. With Gaggle.net, teachers have control over how much or how little access students have with their e-mail account. Teachers are able to quickly review any and all messages, customize blocked words, give or take away student permissions and control incoming messages. Gaggle.net also provides students access to a blog so that they can use the blog for reflection on learning as well as for documentation of digital portfolio elements. .

Module 2: Searching and Validating Information. As an instructor or student, you need to know what material you are able to use, under what circumstances you can use it, and when you may be breaking the law (Ko and Rossen, 2004). Teachers at Hayward High School are required to understand the social, ethical, legal, and human issues surrounding the use of technology and to apply those principles in practice. Teachers will benefit from investigating effective ways of searching for information, including the use of Boolean search commands. They will be trained in ways to validate the information for accuracy, as well as gain experience with citing resources. From collaborative efforts, teachers will have a list of tips compiled that will serve as a valuable resource for incorporating online learning into curriculum delivery.

Module 3: Using a Podcast to Deliver Instruction. Seitzinger (2006) defined podcasting as a rich learning environment that provides flexibility in curriculum delivery. Podcasting can replace a missed lecture, reinforce curriculum with additional material, and provide a guest speaker or present new material in a new form to students opening the door to self-paced learning. Learners maintain control in a podcast as they can listen and repeat as many times as they want.

A podcast is a very useful format for a recorded lecture, or weekly updates. Teachers at Hayward High School have access to sound recording software to record lectures, instructions, or feedback on certain assignments. Staff would benefit from technology training in creating podcasts to help them meet Wisconsin Teacher Standard #2 (Appendix B) which includes the ability to adapt instruction to meet the diverse needs of pupils, including those with disabilities.

Module 4: Discussion Forums. Through the use of discussion forums, knowledge is generated through the relationships and interactions among people (Paloff & Pratt, 1999). Tasks and exercises should emphasize student this type of collaboration and deemphasize the

traditional role of the instructor as the central figure in the pedagogical play (Ko & Rossen, 2004). This student collaboration can also provide the instructor with valuable insight into how effectively the material in lectures has been conveyed. A major benefit of discussion forums is the ability for students to think before responding, which helps to create a deeper level of participation and engagement in course conversations (Paloff & Pratt, 1999). Flanagan (2005) discusses academic uses for podcasts to include course content dissemination, classroom recordings, field recordings and study support.

The discussion forum tool at Hayward High School is part of the Moodle course management system. Instructors will be able to create a discussion topic in the online classroom to take advantage of the many benefits that online discussion has to offer. As recommended by the NCREL, technology enables the school to engage students in real-world applications of content; often this involves using real data sets to solve real problems. One of the easier ways to engage classes in real-world applications is to join an online forum that has a structure for multiple classes. As teachers become familiar with the online experience, they can then branch out into less structured forums. Eventually, some will create their own linkages to both local and global partners who can add insights, expertise and real-world experiences to their students' learning.

Module 5: Narrating a PowerPoint. Presenting material online can prove to be very challenging if one wants to do it effectively. From preparing a narrated slide-show to an animated movie file, teachers are challenged to come up with ways to maintain connections with today's students. A narrated slide presentation is particularly good for taking students through a series of steps. (Ko and Rossen, 2004).

At Hayward High School, instructors have made use of PowerPoint to deliver instructional content in the f2f classroom for several years. Adding the narration and animation features for a more exciting delivery online would benefit both students, and instructors, as it would actively engage the learners while making efficient use of instructional technologies.

Module 6: Using a Wiki. A wiki is an interactive tool that records the thoughts and progress of students while collaborating on a book-like writing project (Rice, 2006). Engstrom and Jewett (need date) discuss the rationale for using a wiki as being a communication and knowledge-building tool. Contributions are organized by content, not chronologically, and an edit trail is left so that the process behind the collaborative effort can be viewed.

Group work will have a whole new look with the use of a wiki. Hayward High School staff members have access to the course management system, Moodle, wiki option. With this tool, they will be trained to provide an opportunity for students to collaborate and learn group work while at the same time, integrating technology.

Module 7: Online Assessment. According to Richardson (2004), students in the F2F classroom rarely reflect on their learning. Blogs provide an opportunity for students to reflect as well as a technology tool that will assist them in connecting what they learn to their prior knowledge to show that they are making connections. Digital portfolios allow students to assume ownership and control of their own learning. They also motivate students to produce high-quality work because they can be easily shared online, making them readily accessible (Guhlin, 2002). Teachers need to use technology resources to collect and analyze data, interpret results, and communicate findings to improve instructional practice and maximize student learning (NETS, Appendix C). Effective online student assessment surveys consist of questions about the students' attitudes towards learning as well as the experience with the course. Surveys can be

used to ensure that a constructivist online learning environment exists. Surveys are also used to determine students' attitudes toward thinking and learning online which will help the instructor determine a student's learning style. Surveys are also used after each topic or week to provide instructor with the information needed to make changes to a course in progress (Rice, 2006).

At Hayward High School, teachers have access to technology to use blogs, portfolios, surveys and quizzes in online interactions. Blogs are made available both through Goggle.net as well as Moodle. Portfolios may be developed by using specific software, by posting content to a blog, or by creating course-specific areas for student portfolios online through a course management system.

Module 8: Using a Course Management System. Putting information on a web site simplifies distribution of course materials (Partee, 1996). Online course management systems provide a way for instructors to keep record of daily lecture notes, and students can read information at their leisure or print the material if they wish to do so.

The course management system, Moodle, in combination with the online staff development opportunity will provide instructors with experience in keeping a record of daily lecture notes as well as course materials that students can read at their leisure or print the material if they wish to do so. It will also provide them with a tool to facilitate technology-based learning activities that will not only engage students in the analysis, synthesis, and interpretation of original products, but also will address their social needs, cultural identity, and promote interaction with the global community.

Challenges in Delivering Curriculum Online

Research question three sought to investigate the challenges encountered by staff in delivering curriculum online. Staff may become leery about putting curriculum online because

the content can be monitored by parents, administrators, and colleagues, which may be viewed as intrusive to the instructor (Miller, 2006). Furthermore, some instructors may fear losing the pedagogical benefits of face-to-face instruction. Partee (1996) stated many instructors are tied to the teaching methods of yesterday. One reason is that they fear technology. Another is that they are ignorant in changing their ways.

The development and implementation of technology based on best practices will help faculty members at Hayward High School become better prepared to delivering curriculum in the constructive way that students learn best.

Chapter V: Discussion

This study sought to develop an online training format to be offered to staff members at Hayward High School. The content of the proposed online training is based on qualitative research regarding online curriculum delivery. As a result of this research modules of instruction were developed, as well as recommendations for further study.

Limitations

This was a qualitative study based on recommendations for staff at Hayward High School. If this study were to be referenced in a different school, the recommendations for that particular school should be considered.

Technology changes faster than we can study it. Therefore, the content of this training will need to be reviewed and revised on a continual basis to keep current with technology trends in the 21st century. The application of new technologies to improve teaching and learning will necessarily follow the ongoing invention and development of new hard and soft technologies (Blomeyer, 2007.)

There are many methods in online course delivery; however, this study researches and expands on eight specific topics: e-mail, search engines, podcasting, discussion forums, wikis, narrated lecture delivery, online assessment, and using a course management system.

Training Modules

According to Lehmann (p. 14, 2004) there are three qualities or characteristics that must be present for a tool to be used successfully in any communication. The tool must be: (a) in the student's possession (b) reasonably accessible to the student, and (c) operable by the student. Through the literature review of the tools of the 21st century, eight tools were identified as being necessary for curriculum delivery online as well as assessable to Hayward High School students and teachers. Appendix A provides instructions to access the staff training that was developed based on this research.

Conclusions

Through an online training opportunity, staff needs to be introduced to the 21st century tools. Appendix A provides instructions for viewing the online training. Schools would be wise to provide teachers with proven solutions that add value to the teaching of various curricula (NCREL, 2006). This online training opportunity is one such example.

Recommendations for Further Study

NCREL (2006) recommended that the school culture at Hayward should encourage technology-based innovations provided they are grounded in sound theory, research, and emerging practice. This research was done to do just that. This training will help to bring teachers closer to incorporating those innovations. Overall, the development of an online staff training program incorporating the standards and recommendations would bridge the gap between teachers and students in terms of integrating technology into curriculum delivery.

As more virtual learning opportunities become available, Hayward High School should review current course offerings to determine what curricula should be provided through “just in time” asynchronous learning rather than face-to-face or synchronous interactions. An area of further research would be to determine which classes would be candidates for this asynchronous course delivery.

The isolation of the professional educator is rapidly diminishing as more and more educators get online. Teachers need advice and counsel on how to join this virtual, online professional community. Districts and schools should provide teachers with the time, opportunity, and mentors necessary to get them actively engaged in meaningful online professional interactions. Schools can encourage this by providing time and support as well as in-service credit for such activities (NCREL, 2005). Further research in this area would be beneficial in compiling administrative aspects of online curriculum delivery including class size, instructor time and compensation.

References

- Ary, D., Jacobs, L., & Razavieh, A. (1996). *Introduction to research in education* (5th ed.). Fort Worth: Harcourt Brace College Publishers.
- Barrett, Dr. Helen C. (2004). *My online portfolio adventure* Retrieved February 17, 2007 from <http://electronicportfolios.com/myportfolio/versions.html>>
- Blomeyer, Robert L. (n.d.). *E-learning knowledge base* Retrieved July 12, 2007 from <http://www.ncrel.org/tech/elearn/system.htm>
- Catalano, F. (2005, December). Why blog?. *THE Journal*. Retrieved July 12, 2007, from <http://thejournal.com/the/printarticle/?id=17616>
- Deubel, P. (2007, June). Podcasts: Improving quality and accessibility. *THE Journal*. Retrieved July 12, 2007, from <http://thejournal.com/the/printarticle/?id=20818>
- Engstrom, M. & Jewett, D. (2005). Collaborative learning the wiki way, *tech trends*, 49, 6. Retrieved July 12, 2007 from WilsonWeb Education database.
- Flanagan, B. & Calandra, B. (2005, November). Podcasting in the classroom. *Learning & Teaching with Technology*. Retrieved July 12, 2007 from WilsonWeb Education database.
- Guhlin, Miguel. (2007, February 17). *Electronic portfolios*. Retrieved March 13, 2007, from http://www.edsupport.cc/mguhlin/artifacts/writings/misc/99_2000/portfolios.html
- Klein, S. & Chandler. (2003). *E-Portfolio for pre-service and in-service art teachers*. Retrieved February 17, 2007, from <http://www.uwstout.edu/art/artedportfolios/reflection/index.html>>
- Ko, S., & Rossen, S. (2004). *Teaching online: A practical guide*. Boston: Houghton Mifflin Company.

Kontos, G. (2007). Integrating the seven principles for good practice into online teaching.

(Presented at the Instructional Technology Conference 2007. Abstract retrieved July 12, 2007 from: <http://www.mtsu.edu/~itconf/proposals07/7.html>

Lamb, A., Johnson, L. (2007, June). An information skills workout: Wikis and collaborative writing. *The Teacher Librarian*, 34, 5, 57-59. Retrieved July 12, 2007, from: WilsonWeb Education database.

Lee, M. & Chan, A. (2007, January). Reducing the effects of isolation and promoting inclusivity for distance learners through podcasting. *Turkish Online Journal of Distance Education*, 8, 1, 7. Retrieved July 12, 2007, from: WilsonWeb Education database.

Lehmann, K. (2004). *How to be a great online teacher*. Lanham: Scarecrow Education.

Miller, M. (2006, June). Learning on demand. *THE Journal*. Retrieved July 12, 2007, from <http://thejournal.com/the/printarticle/?id=18626>

Murray, Corey. (2004, September 30). Study reveals trends in ed-tech spending. *eSchool News Online* Retrieved July 7, 2007, from:

<http://www.eschoolnews.com/news/showStory.cfm?ArticleID=5279>

North Central Regional Educational Laboratory. (2002). Key concepts: Technology integration into the curriculum. *Learning Point Associates*. Retrieved July 7, 2007, from:

<http://www.ncrel.org/tech/qkey3/techint.htm>

North Central Regional Educational Laboratory. (2006). [enGauge online assessment profile for Hayward High School]. Unpublished raw data.

Palloff, R., & Pratt, K. (1999). *Building learning communities in cyberspace*. San Francisco: Jossey-Bass Publishers.

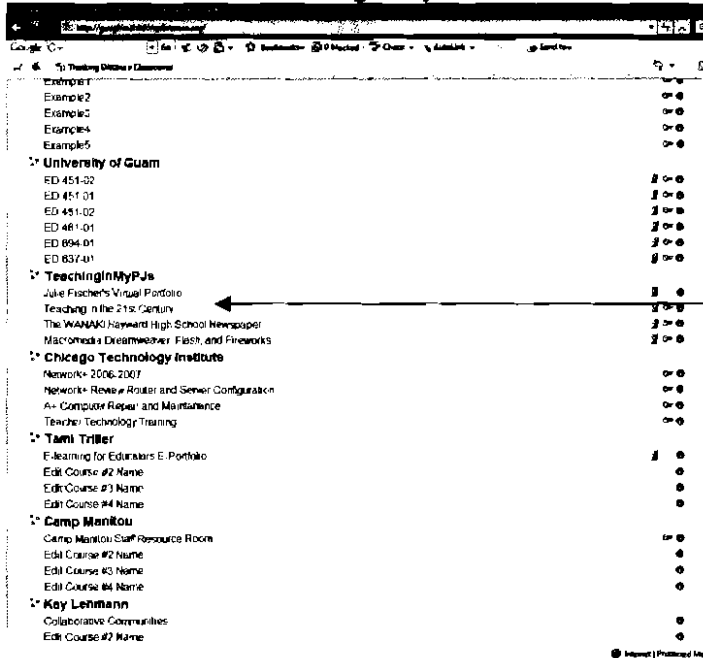
- Partee, Dr., M.H. (1996, June). Using e-mail, web sites & newsgroups to enhance traditional classroom instruction. *THE Journal*. Retrieved July 12, 2007, from:
<http://thejournal.com/the/printarticle/?id=12459>
- Perkins, M. & Pfaffman, J. (2006, October). Using a Course Management System to Improve Classroom Communication. *The Science Teacher*, 73, 7, 33-7. Retrieved July 12, 2007, from: WilsonWeb Education database.
- Poftak, A. (2002, August 15). *Net-wise teens: Safety, ethics, and innovation. techLEARNING* Retrieved July 7, 2007, from:
http://www.techlearning.com/db_area/archives/TL/2002/08/netwise.php
- Poling, C. (2005, March) Building communication and collaboration among staff and students. *Learning & Leading with Technology*, 32, 6. Retrieved July 12, 2007, from: WilsonWeb Education database.
- Rice, W. (2006). *Moodle e-learning course development*. Birmingham: PACKT Publishing.
- Richardson, Will. (2004, Jan/Feb). *Infotoday*. Retrieved March 13, 2007, from:
<http://www.infotoday.com/MMSchools/jan04/richardsons.html>
- Schrock, K. (1995, June 1). *Kathy Schrock's guide for educators*. Retrieved July 12, 2007, from
<http://discoveryschool.com/schrockguide/>.
- Seitzinger, J. (2006, November). *Be constructive: Blogs, podcasts and wikis as constructivist learning tools*. The eLearning Guild's Learning Solutions. Retrieved July 12, 2007, from:
WilsonWeb Education database.
- Sifry, Dave. (2007, April 6). Blog usage statistics and trends. *Masternewmedia.org*. Retrieved July 7, 2007, from:
http://www.masternewmedia.org/news/2007/04/06/blog_usage_statistics_and_trends.htm

- Smith, G., Ferguson, D., & Caris, M. (2001, April). Teaching college courses online vs. face-to-face. *THE Journal*. Retrieved July 12, 2007 from:
<http://thejournal.com/the/printarticle/?id=15358>
- Smith, C. (2007, April 1-3). *Engaging the learner*. Paper presented at the Middle Tennessee State University 12th Annual Instructional Technology Conference. Retrieved July 12, 2007, from: ERIC database.
- Stith, B. (2000, March). Web-enhanced lecture course scores big with students and faculty. *THE Journal*. Retrieved July 12, 2007 from: <http://www.thejournal.com/articles/14643>
- Tyson, J. (n.d.). How newsgroups work. *How stuff works* Retrieved July 12, 2007, from:
<http://computer.howstuffworks.com/newsgroup.htm>
- U.S. Census Bureau. (2003). *Computer and Internet use in the United States*. Retrieved October, 2006, from: <http://www.census.gov/population/www/socdemo/computer.html>
- Warlick, D. (n.d.). What is a podcast? *The Education Podcast Network* Retrieved July 12, 2007, from: http://www.epnweb.org/index.php?view_mode=what
- Watson, John. (2005). *Keeping Pace with K-12 Online learning, a review of state-level policy and practice*. Learning Point Associates, North Central Regional Educational Laboratory, Naperville, IL. Retrieved on July 12, 2006 from:<http://www.ncrel.org/tech/elearn.htm>
- Wisconsin Department of Public Instruction. (2007). Wisconsin standards educator development and licensure. *Wisconsin teacher standards*. Retrieved July 7, 2007, from:
<http://dpi.state.wi.us/tepd/standards.html>
- Wiki. In *Wikipedia* [Web]. Wikimedia Foundation, Inc. Retrieved 7/12/2007, from
<http://en.wikipedia.org/wiki/Wiki>

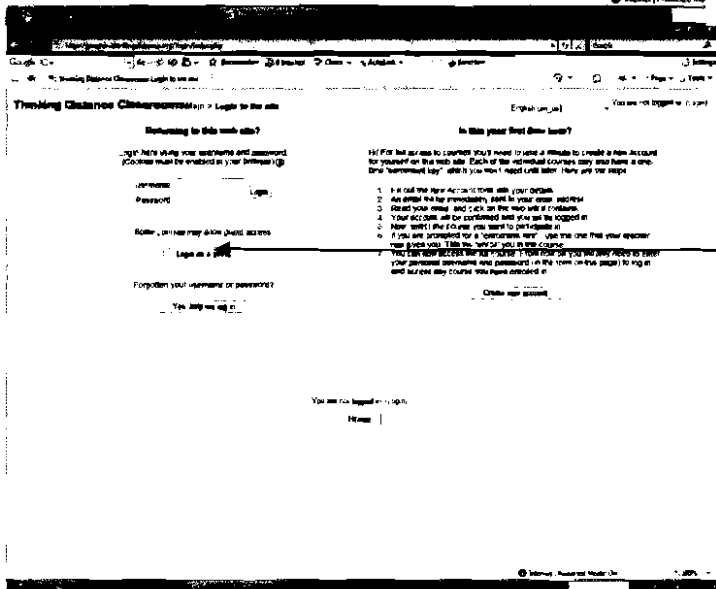
Appendix A: Moodle Course Management System

Accessing Teaching in the 21st Century Moodle Project

Go to the following website: <http://gaughin.thinkingdistance.org/>
 Scroll down to the TeachinginMyPJs section:



Click the link for Teaching in the 21st Century



Click Log in as Guest.

Enter Fischer (capital "F") as the Enrollment Key, and then click the button "Enroll me in this course."

You will then be entered into the site with guest access, which means you won't be able to post a comment to the forums, etc., but you should be able to preview all the course components.

Appendix B: Wisconsin Teacher Standards

Ten Standards for Teacher Development and Licensure

To receive a license to teach in Wisconsin, an applicant shall complete an approved program and demonstrate proficient performance in the knowledge, skills and dispositions under all of the following standards:

1. **Teachers know the subjects they are teaching.**
The teacher understands the central concepts, tools of inquiry, and structures of the disciplines she or he teaches and can create learning experiences that make these aspects of subject matter meaningful for pupils.
2. **Teachers know how children grow.**
The teacher understands how children with broad ranges of ability learn and provides instruction that supports their intellectual, social, and personal development.
3. **Teachers understand that children learn differently.**
The teacher understands how pupils differ in their approaches to learning and the barriers that impede learning and can adapt instruction to meet the diverse needs of pupils, including those with disabilities and exceptionalities.
4. **Teachers know how to teach.**
The teacher understands and uses a variety of instructional strategies, including the use of technology, to encourage children's development of critical thinking, problem solving, and performance skills.
5. **Teachers know how to manage a classroom.**
The teacher uses an understanding of individual and group motivation and behavior to create a learning environment that encourages positive social interaction, active engagement in learning, and self-motivation.
6. **Teachers communicate well.**
The teacher uses effective verbal and nonverbal communication techniques as well as instructional media and technology to foster active inquiry, collaboration, and supportive interaction in the classroom.
7. **Teachers are able to plan different kinds of lessons.**
The teacher organizes and plans systematic instruction based upon knowledge of subject matter, pupils, the community, and curriculum goals.
8. **Teachers know how to test for student progress.**
The teacher understands and uses formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the pupil.
9. **Teachers are able to evaluate themselves.**
The teacher is a reflective practitioner who continually evaluates the effects of his or her choices and actions on pupils, parents, professionals in the learning community and others and who actively seeks out opportunities to grow professionally.
10. **Teachers are connected with other teachers and the community.**
The teacher fosters relationships with school colleagues, parents, and agencies in the larger community to support pupil learning and well-being and acts with integrity, fairness and in an ethical manner.

Source: <http://dpi.state.wi.us/tepd/stand10.html>

Appendix C: National Educational Technology Standards for Teachers

NETS for Teachers

Educational Technology Standards and Performance Indicators for All Teachers

Building on the NETS for Students, the ISTE NETS for Teachers (NETS•T), which focus on pre-service teacher education, define the fundamental concepts, knowledge, skills, and attitudes for applying technology in educational settings. All candidates seeking certification or endorsements in teacher preparation should meet these educational technology standards. It is the responsibility of faculty across the university and at cooperating schools to provide opportunities for teacher candidates to meet these standards.

The six standards areas with performance indicators listed below are designed to be general enough to be customized to fit state, university, or district guidelines and yet specific enough to define the scope of the topic. Performance indicators for each standard provide specific outcomes to be measured when developing a set of assessment tools. The standards and the performance indicators also provide guidelines for teachers currently in the classroom.

1 TECHNOLOGY OPERATIONS AND CONCEPTS.

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

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

2 PLANNING AND DESIGNING LEARNING ENVIRONMENTS AND EXPERIENCES.

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

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

3 TEACHING, LEARNING, AND THE CURRICULUM.

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

- facilitate technology-enhanced experiences that address content standards and student technology standards.
- use technology to support learner-centered strategies that address the diverse needs of students.
- apply technology to develop students' higher order skills and creativity.

- manage student learning activities in a technology-enhanced environment.

4 ASSESSMENT AND EVALUATION.

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

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

5 PRODUCTIVITY AND PROFESSIONAL PRACTICE.

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

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

6 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:

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