

Grand Forks Public Schools Technology Plan



2010 - 2013



Technology Vision

The Grand Forks Public Schools believe technology is an integral component of learning and is necessary to learn effectively, live productively and participate globally in an increasingly digital world. Technology resources transform learning by allowing learners to create, publish, collaborate and communicate with others in a global environment. Technology helps learners gather and analyze information, solve problems and develop higher-level thinking skills through authentic real-world experiences.

The implementation of the technology vision will be accomplished by aligning all technology initiatives to one or more of the following technology principles.



Principle #1 – Student Centered Technology



Principle #2 – Enhance Communication



Principle #3 – Effective Planning & Funding



Principle #4 – Administrative Systems



Principle #5 – Inclusive Support Services



Principle #6 – Data Driven Decision Making



Planning Process

The planning process for this technology plan was completed in three phases.

Phase 1: Data Gathering & Analysis

Data was collected during the past two school years using a variety of methods, including stakeholder surveys and collaboration with the Educational Enhancement, CIAPD and Technology Committees.

Phase 2: Plan Development

After gathering and analyzing the data, the vision, guiding principles, and general format of the plan were developed by the District Technology Committee.

Phase 3: Constituent Review

The district committees reviewed the technology plan and suggested modifications that were considered for potential implementation into the technology plan.



Principle #1

Student Centered Technology

Technology will exist in the schools to transform teaching and learning for all stakeholders. Teachers will provide all students consistent exposure to curriculum focused, technology rich experiences throughout their educational experience. These experiences will allow students to create and publish their work to an authentic audience.

Rationale

Technology is pervasive and intertwined in American society. The current generation of young people has been immersed in a global digital society throughout their life. Access to powerful low cost computers, high speed Internet access and wireless mobile devices has created a world where our students always expect to be connected. Technology provides for personalized learning by allowing students to learn what they want, when they want and where they want.

Data indicate that 85% of our students have home computers with Internet access and that over 95% of secondary students have access to mobile technologies. Our students have grown up with technology and are very comfortable using technology in school and at home. Grand Forks schools should reflect American society in the Information Age by providing access to technology, modeling appropriate technology use and expecting students to use technology as a part of their educational experience.

Technology can potentially transform how teachers teach and students learn by providing immediate access to resources, promoting collaborative student experiences, and allowing students to create and publish to an authentic audience. By integrating the technology into existing curriculum, students will receive the same curricular content that is aligned to local, state and national achievement standards.

The principle of student centered technology is supported by the U.S. Department of Education's draft of the National Educational Technology Plan (2010) in the following summary statement on learning.

"The model of 21st century learning described in this plan calls for engaging and empowering learning experiences for all learners. The model asks that we focus what and how we teach to

match what people need to know, how they learn, where and when they will learn, and who needs to learn. It brings state-of-the art technology into learning to enable, motivate, and inspire all students, regardless of background, languages, or disabilities, to achieve. It leverages the power of technology to provide personalized learning instead of a one-size-fits-all curriculum, pace of teaching, and instructional practices.” (U.S. Department of Education, 2010)

Project Tomorrow (2010) surveyed 299,677 K-12 students from around the country found that students want digitally-rich, social-based learning that is un-tethered from traditional educational paradigms. Labeling these three ideas as “essential conditions”, the report goes on to explain the unique opportunity education is faced with today.

“While these three essential elements represent some dramatically new approaches to teaching and learning in a classroom setting, for the student, the incorporation of the tools and applications is merely a natural extension of the way they are currently living and learning outside of that classroom. Thus, there exists a very special opportunity today to both increase the relevancy of a student’s education experience and to start to close the persistent digital disconnect between students and educators on learning with technology. The key to unlock this opportunity is a long overdue realization that the students’ ideas on how to effectively leverage technology within learning can provide meaningful insights and even present a clear pathway for implementation.” (Project Tomorrow, 2010)

Current Operational Initiatives

The Initiatives listed below are initiatives that are currently operational and support Principle #1. Each of these initiatives is in continuous improvement based on ongoing assessment and evaluation.

- Curriculum Technology Partner Program
- Staff Laptop Program
- Student 1:1 Pilots
- 4:1 Student to Computer Ratio
- High Speed Internet Access
- Cisco Wired/Wireless Network Infrastructure



Principle #2

Enhance Communication

Technology will be used to enhance communication and collaboration with students, parents, staff and community.

Rationale

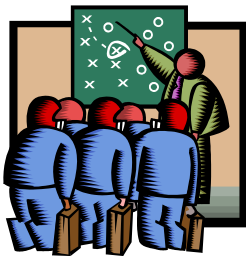
The advances in technology have created many new ways to communicate with students, parents, staff and the community. Electronic mail, web pages, social networking technologies and the pervasive use of mobile devices are all communication advances that exist today and should be leveraged to provide better and more consistent communication with our core constituency groups.

As communication technology changes and advances, the Grand Forks Public Schools must continue to identify ways that technology can improve communication with students, parents, staff and the community.

Current Operational Initiatives

The Initiatives listed below are initiatives that are currently operational and support Principle #2. Each of these initiatives is in continuous improvement based on ongoing assessment and evaluation.

- District Wide Area Network and Internet Connectivity
- Cisco wired/wireless network Infrastructure
- FirstClass Collaboration and Email System
- BlackBoard Connect Notification System
- SchoolCenter Content Management System
- GFSchools TV15
- School Electronic Mail List Server
- PowerSchool



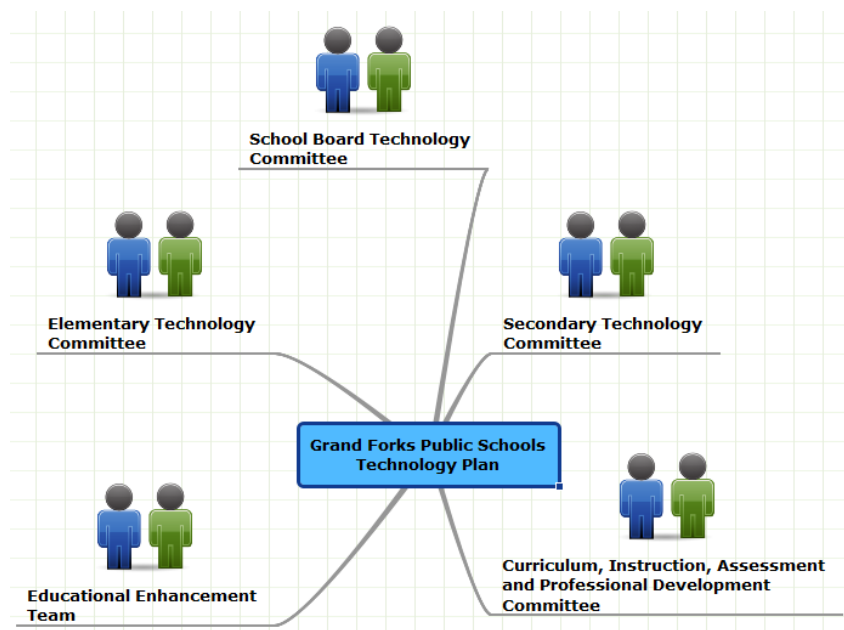
Principle #3

Effective Planning & Funding

An effective technology planning process will exist that ensures equity, appropriateness and consistency in the access, use and implementation of technology across the district. Technology will be funded using a consistent and reliable funding formula that supports immediate needs and long range objectives.

Rationale

The Grand Forks Public Schools believes that technology planning must be constant and ongoing to reflect the dynamic changes in technology and education. Five committees will be actively engaged in the annual technology planning process. An organizational chart and description of each committee is included below.



School Board Technology Committee

Membership on the School Board Technology Committee includes three active school board members, the Superintendent of Schools, Technology Director, Technology

Facilitators, Data Services Coordinator, Network Services Coordinator and the Director of Curriculum, Instruction, Assessment and Professional Development. The School Board Technology Committee reviews and approves the final technology plan document before presenting the plan to the full school board.

Members of the 2010 School Board Technology Committee are listed below.

Roger Pohlman, GFPS School Board	Cindy Grabe, Technology Facilitator
Patricia Castilleja, GFAFB School Board	Darlene Johnson, Technology Facilitator
Dr. Larry Nybladh, Superintendent	Monte Gaukler, Technology Facilitator
Darin King, Technology Director	Kent Ripplinger, Data Services Coordinator
Jody Thompson, Asst. Superintendent	
Brad Srur, GFEA	Perry Nakonechny, Network Services Coordinator

Educational Enhancement Team

Membership on the Educational Enhancement Team includes parents, community members, students, teachers, building principals and district administration. The EET committee meets monthly and is empowered to discuss district issues of educational, operational or community importance.

Members of the 2010 Educational Enhancement Team are listed below.

Dr. Terry Brenner, Director of CIAPD	Diane Stoley, Resident Mentor, Valley MS
Dr. Larry Nybladh, Superintendent	Judy Anderson, Teacher, South MS
Jody Thompson, Asst. Superintendent	Alice Smith. Teacher, Ben Franklin
Darin King, Director of Technology	Lon Gulberg, Parent-Community Member
Eric Ripley, Coordinator of CTE	Brenda Rosendahl, Parent-Community Member
Tori Johnson, Director of Special Services	Kim Jones, UND and Community Member
Kris Arason, Associate Principal, GFC	Michele Cleveland, GFPS Student
Nancy Dutot, Principal, South	Kaitlin Medal, GFPS Student
Cindy Cochran, Principal, Century Elem.	

Curriculum, Instruction, Assessment and Professional Development Committee

Membership on the CIAPD Committee includes district administration, building principals and teachers. This committee provides direction to the district in each of the areas through the extensive use of subcommittees.

Members of the 2010 CIAPD Committee are listed below.

Dr. Terry Brenner, Director of CIAPD	Anne Compton, Instructional Coach
Darin King, Director of Technology	Becky Trapnell, Instructional Coach
Terry Bohan, Principal, Community HS	Cathy Williams, Instructional Coach
Kris Arason, Assoc. Principal, GFC	Darlene Johnson, Technology Facilitator
Dr. Beth Randklev, Principal, Ben Franklin Elem.	Annette Dolleslager, Teacher, South MS
Alice Smith, Teacher, Ben Franklin Elem.	Diane Stoley, Resident Mentor, Valley MS
Dave Nowatzki, Teacher, RRHS	Scott Conrad, Teacher, GFC
Angie Jonasson, Principal Intern, Eielson Elem.	Bev Morton, Special Ed Teacher, Century

Elementary and Secondary Technology Committees

Membership on the Elementary and Secondary Technology Committees includes district administration, building principals, media specialists and teachers. The elementary and secondary committees work hard to collaborate with staff and students across the district to ensure that the technology plan is meeting the needs of all stakeholders.

<u>Elementary Committee</u>	<u>Secondary Committee</u>	<u>Ad Hoc Members</u>
Principal (Chair)	HS Principal (Co-Chair)	Director of Technology
K-2 Teacher Rep.	MS Principal (Co-Chair)	Technology Dept. Staff
K-2 Teacher Rep.	6 th Grade Teacher Rep.	Coordinator of CTE
K-2 Teacher Rep.	7 th Grade Teacher Rep.	Director of Instructional Services
3-5 Teacher Rep.	8 th Grade Teacher Rep.	Special Services Representative
3-5 Teacher Rep.	RRHS Teacher	
3-5 Teacher Rep.	Central HS Teacher	
Media Center Rep.	Community HS Teacher	
Media Center Rep.	MS Media Center Rep.	
	HS Media Center Rep.	

Members of the 2010 Elementary and Secondary Technology Committee are listed below.

<i>District Committee</i>	<i>Secondary Committee</i>	<i>Elementary Committee</i>
Darin King, Technology Director, Chair	Mary Koopman, Principal, Schroeder MS, Co-Chair	Scott Johnson, Principal, Lewis & Clark, Chair
Darlene Johnson, Elementary Technology Facilitator	Kris Arason, Principal, Central HS, Co-Chair	Paige Strom, Teacher, 1st Grade, Kelly
Cindy Grabe, Middle School Technology Facilitator	Kim Slotsve, Principal, Red River HS	Jennifer Benjamin, Teacher, 1st Grade, Winship
Monte Gaukler, High School Technology Facilitator	Terry Bohan, Principal, Community HS	Besty Kuznia, Teacher, 2nd Grade, Lake Agassiz
Virginia Tupa, Director of Instructional Services	Matt Solberg, Teacher, Grade 6, South MS	Brad Srur, Intermediate Teacher, Phoenix
Eric Ripley Coordinator of CTE	Jon Sailer, Teacher, Grade 7, Schroeder MS	Amber Carlson, Teacher, 3rd Grade, Lewis & Clark
District Technology Partners	Nate Olson, Teacher, Grade 8, Valley MS	Liz Deere, Teacher, 4th Grade, Ben Franklin
	Judy Hagar, Media Specialist, Schroeder MS	Linda Dalzell, Media Specialist, Century
	Kathy Hill, Media Specialist, Red River HS	Adam Eckert, Physical Education, Viking
	Scott Conrad, Teacher, Central HS	
	Tim Tandeski, Teacher, Red River HS	
	Eileen Zygarlicke, Teacher, Community HS	

The planning process is collaborative in nature and includes the development of the district vision, technology planning principles and the assignment of priorities for hardware, software, inclusive support and infrastructure. The process begins in October of each school year when the elementary and secondary committees begin discussions to formulate a tactical plan and study recommendations that reflect the consensus of the committee and supports the philosophical framework defined in the district technology plan.

The other committees are brought into the discussion at a variety of times throughout the school year and the process culminates with a presentation to the Grand Forks School Board in March of each year. Throughout the entire process, there are many opportunities

to review the plan and ensure all decisions and action items are aligned to the educational and instructional goals of the school district.

6 Mil Funding Formula

An annual tactical technology plan, including budget implications, will be submitted to the school board by the district technology steering committee. This annual plan will reflect the recommendations of the committees and fit within established funding parameters.

Allocation	Percentage of Funding
Infrastructure	Maximum of 20% of total funding
Maintenance /Repair/Programs	Maximum of 20% of total funding
Hardware/Software Replacement/ Upgrades	Minimum of 60% of total funding

Equity

The Grand Forks Public Schools recognize that providing equitable access to technology and related services is an operational requirement for all strategic and tactical plans. Regardless of the school, all students and teachers will have equitable access to the same opportunities provided by the district technology plan.

Special Projects

If there are special projects that require funding beyond the established funding parameters, they should be clearly indicated as such in the annual tactical technology plan. Special projects need explicit approval from the school board.

Leased Computers

Computers will continue to be leased in certain situation where it meets the recommendations of the committees and the needs of the technology department.

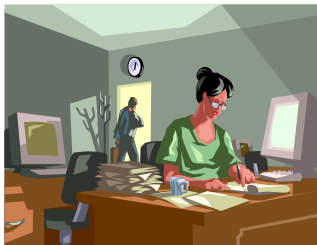
Technology Department Staffing

It is recognized that to leverage investments in hardware, software and infrastructure, it is necessary to have adequate inclusive support services funded on a regular basis. This includes administrative, technical and instructional support.

Current Operational Initiatives

The Initiatives listed below are initiatives that are currently operational and support Principle #3. Each of these initiatives is in continuous improvement based on ongoing assessment and evaluation.

- Annual 6 Mil Technology Budget
- Technology Planning Process
- Technology Staffing Allocation



Principle #4

Infrastructure and Administrative Systems

A robust network infrastructure will be maintained to provide reliable, high speed access to internal and external resources. Technology will be used to support and enhance the operational and administrative needs of the district.

Rationale

The Grand Forks Public Schools identified the educational potential of networked computers in 1991 when all schools were fully networked and connected by a wide area network. The wide area network was upgraded in 1995 to provide Internet access to all schools and classrooms. In 1997, a project to rewire all building based local area networks was initiated and completed in 2000. The district upgraded the wide area network again in 2002 when a fiber optic network was built that provided Gigabit Ethernet connections to all district schools and increased the Internet access speed to 6 Mb/s. In 2009, the district increased Internet Access speed again to the current speed of 100 Mb/s.

The district implemented a Network Operations Center in 2002 that provides consistent and reliable access to a vast array of network applications and services. In 2009, the Network Operations Center moved to a fully virtualized server environment by implementing high capacity blade servers, a large storage area network and the VMWare Sphere management suite.

The sustained strategic focus on infrastructure was not developed by administrative decree, but rather represents the operational results of the comprehensive annual technology planning process described in this document. It is critical to continue to monitor and upgrade the district network infrastructure on continuing basis to ensure stakeholders have access to high speed, reliable network services.

Like any business, there are many administrative uses for technology in our district. The Grand Forks Public Schools will continue to update existing administrative systems and investigate new systems that could potentially add value to the operation of the district. Administrative systems include, but are not limited to student management, financial management, human resources management, inventory/warehouse/asset management, document management, building access control, library services and food services.

It is necessary for the district to continue to monitor the effectiveness of administrative systems and continually search for new and improved solutions. New solutions may allow systems to be consolidated, easier to manage and less expensive to support.

Current Operational Initiatives

The Initiatives listed below are initiatives that are currently operational and support Principle #4. Each of these initiatives is in continuous improvement based on ongoing assessment and evaluation.

- PowerSchool
- ViewPoint Data Warehouse
- My Learning Plan
- NWEA MAP Testing
- Gateway Library Management System
- Online Employee Application System
- Cisco Network Management
- State Network Internet Connectivity
- Kronos
- Infinite Visions ERP Suite
- FirstClass Email System
- AESOP Substitute System
- VMWare Sphere Virtualization



Principle #5

Inclusive Support Services

A comprehensive professional development and instructional support process will be in place to ensure teachers, administrators and support staffs are trained to use and implement technology that supports the mission of the school district. Adequate technical support will be in place to ensure district technology is maintained and repaired in a timely manner.

Rationale

For technology to be used effectively, it is critical that users are supported with timely and ongoing professional development, instructional support and technical support. Research clearly indicates that ongoing professional development opportunities for teachers and support staff are necessary to effectively utilize technology to improve instructional and administrative practice.

The Curriculum Technology Partner Program

The Curriculum Technology Partner (CTP) Program is a professional development and instructional support program that develops and delivers standards based technology rich experiences to classroom teachers and students throughout the Grand Forks Public Schools. Founded in 1992 and based on emerging research in the area of peer coaching and professional development, the Curriculum Technology Partner Program was expanded in 1998 and again in 2001 to reflect the growing needs of the district. The Grand Forks Public Schools currently employ five elementary and five secondary Curriculum Technology Partners that work with teachers and students in every district school.

The program was developed using the research of Showers, Joyce and Bennett (1987) and Joyce and Showers (1996) that indicate professional development is most likely to result in a change in instructional practice when teachers study instructional theory, observe demonstrations, have an opportunity to practice and receive feedback during the professional development experience. In addition, the research indicates the need for the professional developers to build a personal relationship with the teachers to obtain the best results. The Grand Forks Public Schools continues to use recent instructional coaching research to guide the continuous improvement of the program.

In the Grand Forks program, the curriculum technology partners are successful classroom teachers that receive extensive curriculum and technology training with the focus on

integrating technology into the curriculum. The teacher is then re-assigned as a Curriculum Technology Partner and works full time with teachers planning, implementing and assessing integrated technology experiences that are classroom based, focused on the curriculum and aligned to state and national standards.

The goals of the Curriculum Technology Partner Program are to:

- Work in partnership with classroom teachers to provide technology rich educational experiences for all students in the Grand Forks Public Schools that are aligned to curriculum and technology (ISTE-S) standards.
- Provide instructional leadership by working with individual teachers, administrators and curriculum committees so they better understand how to change instructional practice to improve student learning.
- Provide ongoing professional development and instructional support for teachers through the planning, implementation and assessment stages of an experience.
- Provide all teachers with the experience and background necessary to replicate and independently expand technology rich experiences in their individual classrooms.

Since the inception of the Curriculum Technology Partner Program in 1992, the cornerstone is the relationship built on trust and mutual respect between the technology partner and the classroom teacher. It is expected that the classroom teacher be involved in all aspects of planning, implementing and assessing the technology rich experience. The technology partner is not someone who comes into a classroom and “teaches technology”, but rather an instructional coach that works directly with the teachers and students.

The Curriculum Technology Partners use a clearly defined set of strategies to maximize their impact on student learning, instructional practice and the professional growth of the teacher. These strategies are categorized as marketing, planning, implementation and assessment.

Technical Support

Technical support of the hardware and infrastructure of the district is critical to the education and business operations of the district. Adequate technical support personnel must be in place to ensure same day response to mission critical systems and next day response for all other systems. Hardware and software based support solutions should be investigated and implemented as a means to improve the ability of the technical support staff to respond to technical issues quickly and efficiently.

Current Operational Initiatives

The Initiatives listed below are initiatives that are currently operational and support Principle #5. Each of these initiatives is in continuous improvement based on ongoing assessment and evaluation.

- Network Services Coordinator
 - Coordination and management of district network infrastructure.
- Data Services Coordinator
 - Coordination, management and training for district data systems.
- Curriculum Technology Partner Program
 - Professional Development and Instructional Support
 - 10 FTE's
- Technical Support Team
 - Hardware and software support
 - 8 FTE's



Principle #6

Data Driven Decision Making

Technology will be used to enhance the collection, analysis and dissemination of data for teachers and administrators to use in improving student performance.

Rationale

Emerging technologies have become available that allow data to be quickly gathered, analyzed and evaluated. These systems allow teachers and administrators to make informed decisions with information provided by these systems.

The Grand Forks Public Schools will continue to implement data systems that support the mission of the school district.

Current Operational Initiatives

The Initiatives listed below are initiatives that are currently operational and support Principle #6.

- PowerSchool
- ViewPoint Data Warehouse
- Building Level Data Leadership Teams
- NWEA MAP Data System
- iVisions Financial/HR System
- AESOP Substitute Tracking



2010

Tactical Technology Plan

Instructional Priorities

Action Item #1-- Replace all Secondary Computer Labs

All secondary computer labs are 5-7 years old and represent the primary hardware resources used instructionally by teachers and students at the secondary level. In addition, they are used for six weeks annually for MAP testing.

Budgetary Impact

Projected cost to complete Action Item #1 is \$600,000.

Action Item #2 -- Replace all Elementary Learning Carousels

All elementary learning carousels (labs) are 5-7 years old and represent the only instructional area in each building with desktop computers available for use teachers and students. In addition, these computers are used for six weeks annually for MAP testing. Some buildings do not have learning carousels due to facility issues and would receive an updated set of portable computers. These computers augment and support the extensive use of portable technology in our elementary schools.

Budgetary Impact

Projected cost to complete Action Item #2 is \$150,000.

Action Item #3 - Upgrade and Expand Wireless Network

The existing wireless networking infrastructure is currently 4-5 years old and is need of both an upgrade and expansion. Our existing wireless management engine will be upgraded to better meet the needs of our expanding portable technology devices. Additional managed access points will be added to instructional areas to support the increased use of portable technology by staff and students.

Budgetary Impact

Projected cost to complete Action Item #3 is \$100,000.

Action Item #4 – Replace Edge Network Infrastructure

The existing edge network infrastructure is 8-10 years old and needs to be retired. The devices at the edge are the wired switches that provide both wired and wireless network services.

Budgetary Impact

Projected cost to complete Action Item #4 is \$100,000.

Action Item #5 – Implement Google for Education

The district has used the Sendit email system provided free by the state for many years. Although this state service has met our needs for many years, it has proven difficult to use for institutionalized student email use. Google for Education provides free, branded collaboration systems for educational institutions that include email, calendaring, shared documents and file storage. We have already built a Google for Education site for the Grand Forks Public Schools called GFPSApps and plan to fully implement it for instructional purposes during the 2010 school year.

We will evaluate the solution as a potential replacement for FirstClass, our existing staff collaboration system, during the 2010 school year.

Budgetary Impact

Google for Education is free, however there is a management commitment by district staff to configure and maintain the system.

Action Item #6 – Implement District Based Internet Filtering

The district has used a filtering solution provided by the state for the past 10 years. This solution provides CIPA compliant filtering for all devices connected to the GFPS network.

With the increase in district provided mobile devices, there is a need to have a remote filtering solution in place that insures CIPA compliance regardless of where a district owned device is accessing the Internet. A district owned solution would also provide robust usage data for proactive management of district devices and network infrastructure.

Budgetary Impact

Projected cost to complete Action Item #6 is \$15,000 annually.



2010

Study Recommendations

Study Recommendation #1 – Student 1:1

The Grand Forks Public Schools should study and evaluate the potential of a 1:1 computer implementation for students during the 2010-2011 school year.

The recommended study would engage community members, students and district staff in a comprehensive study to determine the educational, instructional, social and fiscal impact of a student 1:1 program in the Grand Forks Public Schools. Potential implementation scenarios would be developed as a part of this process.

The U.S. Department of Education (2010) is supporting 1:1 student implementation in the draft of the National Educational Technology Plan in the goals listed below.

“Ensure that every student and educator has at least one Internet access device and software and resources for research, communication, multimedia content creation, and collaboration for use in and out of school.” (U.S. Department of Education, 2010).

“Develop and adopt learning resources that exploit the flexibility and power of technology to reach all learners anytime and anywhere.” (U.S. Department of Education, 2010).

Study Recommendation #2 – Development of Digital Curriculum And 21st Century Standards

The Grand Forks Public Schools should study the potential of digital curriculum resources that support 21st century teaching and learning during the 2010-2011 school year.

The recommended study would engage community members, students and district staff in a comprehensive evaluation of existing and new curriculum resources that would support a 1:1 student computer implementation focused on using digital resources to support 21st century teaching and learning.

The U.S. Department of Education (2010) is supporting digital curriculum and 21st in the draft of the National Educational Technology Plan in the goal listed below.

“Develop and adopt learning resources that exploit the flexibility and power of technology to reach all learners anytime and anywhere.” (U.S. Department of Education, 2010).

“Revise, create, and adopt standards and learning objectives for all content areas that reflect 21st century expertise and the power of technology to improve learning.” (U.S. Department of Education, 2010).

Study Recommendation #3 – Social Media

The Grand Forks Public Schools should study the potential use of social media systems to support administrative and instructional practices.

The recommended study would engage community members, students and district staff in a comprehensive evaluation of the appropriate uses of social media technology to support the operational and instructional goals of the district.

Study Recommendation #4 – Course Management Software

The Grand Forks Public Schools should study the potential of course management software that would support instructional practice.

The recommended study would engage community members, students and district staff in a comprehensive evaluation of asynchronous, synchronous and blended course delivery options for students.

References

Joyce, B., & Showers, B. (1996). The evolution of peer coaching. *Educational Leadership*, 53(6), 12-18.

Project Tomorrow. (2010). *Creating our future: Students speak up about their vision for 21st Century Learning*. Retrieved March 16, 2010 from <http://www.tomorrow.org/speakup/pdfs/SUNationalFindings2010.pdf>.

Showers, B., Joyce, B., & Bennett, B. (1987). Synthesis of research on staff development: A framework for future study and a state-of-the-art analysis. *Educational Leadership*, 45(3), 77-87.

U.S. Department of Education. (2010). *Transforming American Education: Learning Powered by Technology - National Educational Technology Plan 2010 Draft*. Retrieved March 10, 2010 from <http://www.ed.gov/technology/netp-2010>.