The Classroom Tiers Model: Using Technology Effectively in Classrooms

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Overview

• Why Technology?
• Classroom Tiers Model
• NCLB Technology Integration Requirement
• NCLB Technology Literacy Requirement
• Research Tools
  - CARET
  - What Works
  - Metiri Database

http://www.edtech.wednet.edu
Why Technology?

Technology-use in classrooms:
Motivates students and some teachers
“Magnifies” classroom practice
Increases Productivity
Facilitates Instruction

When used with effective instruction practice technology facilitates learning so that students learn the content area to a deeper level and develop 21st Century Literacy skills in the same time (NCLB)

Technology provides individual experience and empowerment
Why Technology?

Assign Intellectually Stimulating Work
Relevance beyond school
Disciplined Inquiry
Knowledge Construction
Visual Communication

It is in the culture of the Millennials
And if we don’t change…

Source: The Condition of Education 2002, National Center for Education Statistics
When technology works:

- Used as instructional tool
- Matches curriculum objectives
- Teachers are trained
- Collaboration
- Adjusts for student ability
- Facilitates feedback on student progress
- Integrated with content
- Extends curriculum content
- Educators/community support and understanding
NETS Essential Conditions

Shared Vision – By all participants
Equitable Access – Students, teachers, staff, and administrators
Skilled Personnel – Educators and support personnel are skilled in the use of technology appropriate for their job responsibilities.
Professional Development
Technical Assistance – Personnel have technical assistance available
Content Standards and Curriculum Resources – Instructional personnel and school leaders are knowledgeable about content and technology standards, related curriculum resources, teaching methodologies, and the use of technology to support learning.
Student-Centered Teaching – Teaching in all settings includes the use of technology to facilitate student-centered approaches to learning.
Assessment and Accountability – The school district has a system for the continual assessment of effective technology use for improving student learning.
Community Support
Support Policies – The district has policies, financial plans, and incentive structures
External Conditions – Policies, requirements, and initiatives at the national, regional, and state levels support the district’s efforts.
21st Century Skills:
Literacy in the Digital Age

- Digital-Age Literacy
- Inventive Thinking
- Effective Communication
- High Productivity

http://www.ncrel.org/engauge/skills/skills.htm
Digital-Age Literacy

Basic Literacy
Scientific Literacy
Economic Literacy
Technological Literacy
Visual Literacy
Information Literacy
Multicultural Literacy
Global Awareness
Inventive Thinking

Adaptability and Managing Complexity
Self-Direction
Curiosity
Creativity
Risk Taking
Higher-Order Thinking and Sound Reasoning
Effective Communication

Teaming and Collaboration
Interpersonal Skills
Personal Responsibility
Social and Civic Responsibility
Interactive Communication
High Productivity

Prioritizing, Planning, and Managing for Results
Effective Use of Real-World Tools
Ability to Produce Relevant, High-Quality Products
When technology doesn’t work:

Uneven application of professional development, essential conditions and technology resources

Used for classroom management/entertainment/reward activity

When technology management outweighs educational needs

Instructional methods and/or products are not aligned with best-practice and research-supported models
Why Research?

One of central tenets of NCLB: scientifically based research as a basis for targeting federal funds for education programs.

Aspects:
- control groups
- replication of results through multiple studies
- ability to generalize results
- rigorous standards especially via peer review
- convergence of results between studies
Why Not Research?

Research is often poorly designed, biased and the results are applied to groups or situations that were not included in the research.

Does “High-Stakes Testing Help or Hurt?”

Very few “turnkey solutions” in education are actually supported by scientifically-based research.

Example:

[Baltimore Sun Article](Baltimore Sun Lightspan)

Seek Simplicity .. and Distrust It! <online>

Lee Shulman, Prof. of Education, Stanford University

We must move to a more evidence-based strategy, but no research or even controlled experiments are guaranteed to provide accurate results without expert judgment and peer review.
“Great PowerPoint, Kevin, but the answer is no.”
Classroom Tiers Model

Developed by the Educational Technology Support Center Directors statewide
Approved by OSPI
Included in Technology Planning support documents
Included in the WA State Technology Plan, 2006-2009

Presentations:
Technology Coordinators/Directors and other regional educational leaders in 2004-2006
OSPI January Conference, 2005, 2006
NW Computer Conference in Education (NCCE), 2005, 2006
OSPI Summer Institutes, 2005
Intended Outcomes

To answer the “What should we do with technology in classrooms? question
To provide educators research/effective practice-based answers to technology integration questions
To take research-based strategies and express them in a straightforward manner
To serve as a model for individual teacher growth and for School Improvement Planning
To focus on teaching and learning rather than products
To be applicable to all teachers
To provide common terminology
To fit on one page
Tier 1: Teacher Productivity Station

- More output/faster
- Communicates electronically
- Administrative Tasks
- Finding/Using resources available through technology

Key Software: Office
Key Online Resource: MarcoPolo

Every teacher in Washington should be using MarcoPolo
Tier 1: Teacher Productivity

**Station - Focus**

Focus: Teacher uses technology to get work done better/faster

Resource: MarcoPolo

http://www.mped.org

Washington website of aligned lessons:

http://www.marcopolo.wednet.edu

MarcoPolo Introduction PowerPoint
### Tier 2: Instructional Presentation and Student Productivity

<table>
<thead>
<tr>
<th>Instructional Presentation</th>
<th>Student Productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher facilitation of large group learning activities using PowerPoint, Inspiration, document camera, etc.</td>
<td>Student use of technology to increase productivity</td>
</tr>
<tr>
<td>Teacher key item: Projector</td>
<td>Ex. Student work is assigned to be completed on computer</td>
</tr>
<tr>
<td>Key software: Inspiration</td>
<td>Student key items: Desktops, Laptops or DANAs for student use</td>
</tr>
</tbody>
</table>

Every Teacher in Washington should be using Inspiration.
Teacher uses technology to instruct students more effectively
Teacher-facilitated activities based upon research – some good sites:

**MarcoPolo - Online Tools**
- Illuminations
- Read-Write-Think
- ScienceNetLinks

**Free online Interactive Thinking Tools**
- Visual Ranking

[Seeing Reason – 7 unit plans](http://www.intel.com/education/tools/)
Tier 2: Instructional Presentation - Visual Learning

Visual Graphic Organizers
Concept Maps
Thinking Maps

http://www.inpiration.com (Free 30-day demo)
http://www.graphic.org
http://www.thinkingmaps.com
Tier 3: Student Centered Learning Classroom

- Authentic Student Centered Activities
- Inquiry-based instruction
- Project-based learning
- Constructivist learning
  - Communication, Teaming and Collaboration
  - Problem-solving
  - Higher-order thinking skills

- Multimedia or online presentations
  - Expands the audience

Key support: Building-based coach
Key concept: Webquest
Tier 3: Student Centered Learning – Authentic Work

Specific examples of technology supporting an environment for authentic student work

- Writing and Publishing
- Multimedia Presentations
- Probeware and Analysis
- Simulations
- Robotics
- WebQuests
Tier 3: Student Centered Learning – Writing and Publishing

Changing the audience
  Move from the teacher to peers, family and community

Tools
  Word processors, desktop publishing, webpage authoring (DreamWeaver)
  Web sites such as “The Write Site”
  School websites
  School-based Blogs
  SWIFT (Classroom Websites)
  SHARE (Website, School/Home Communication, Curriculum Development, Tier 3 Support)
  http://share.esd105.wednet.edu
Tier 3: Student Centered Learning – Multimedia

**Powerful, motivating options**
- Students grew up in a visual/auditory world
- Digital content widely available for students to collect and construct knowledge

**Tools**
- Multimedia authoring software (PowerPoint, KidPix, MovieWorks, eZedia)
- Movie software (iMovie, Moviemaker 2)
- Image editing software (Photoshop Elements, paint software)
- Image devices (digital cameras/camcorders, scanners, digital microscopes, document cameras)
Tier 3: Student Centered Learning – Probeware and Analysis

**Real research**
- Probeware and software analysis tools allow students to explore and question
- Same tools used by scientists

**Tools**
- Standalone probes, handhelds
- Graphing Calculators
- HIP Biology
- Digital microscopes
- Excel
Tier 3: Student Centered Learning – Simulations

Discovery through experimentation
Students can explore a system by altering variables and monitoring the results.
Can model experiments that may not otherwise be possible.

Tools
A variety of products, such as Concord Consortium, Decisions, Decisions history & social studies software from Tom Snyder.
Tier 3: Student Centered Learning – Robotics

**Engineering and Inventing**
Students use Legos® with computer-programmable “bricks” to create mobile machines
Integration of mechanics, physical problem-solving with abstract programming logic

**Tools**
- Pittsco/Dacta Lego Robotics kits
- Robolab software
Tier 3: Student Centered Learning – WebQuests

Inquiry-based model developed by teachers for student-directed learning
A web-based lesson plan written directly to students with the following sections:

<table>
<thead>
<tr>
<th>Introduction</th>
<th>includes essential question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task</td>
<td>project students will do</td>
</tr>
<tr>
<td>Process</td>
<td>steps students will follow &amp; links to resources</td>
</tr>
<tr>
<td>Evaluation</td>
<td>rubric</td>
</tr>
<tr>
<td>Conclusion</td>
<td>congratulations &amp; extensions</td>
</tr>
<tr>
<td>Teacher Page</td>
<td>Tips for other teachers</td>
</tr>
</tbody>
</table>

Established in 1995
Significant use around the world
Centerpiece of EMints project in Missouri
Tier 3: Student Centered Learning – WebQuests

Many good support sites:
http://webquest.org/
http://school.discovery.com/schrockguide/webquest/webquest.html
Sample WebQuest on Lewis & Clark
Supporting Research from eMints Project
Tier 3: SCL – Building-Based Coach

Peer Coaching has been identified as one of the most valuable professional development programs we provide.

Joyce and Showers: 1987
10% of teachers can implement anything just from a workshop
80% implementation level is possible when classroom level support is available.

Teaching and Technology Coaching Initiative
295 Coaches trained statewide through 2004
http://www.pugetsoundcenter.org/T2CI

Peer Coaching by Microsoft
NCLB and Washington State

NCLB requires that all 8th grade students are literate in technology and that all teachers are integrating technology in their instruction. States were allowed to define literacy and integration. Reporting begins in December, 2006.

The new WA State Technology Plan (December 2005) includes the literacy and integration definitions and the reporting requirements. The definitions are based on the Classroom Tiers Model.
“To encourage the effective integration of technology resources and systems with teacher training and curriculum development to establish research-based instructional methods that can be widely implemented as best practices by State educational agencies and local educational agencies.”
Definition of Technology Integration

• Educators use technology to create rich environments where student work shows evidence of conceptual understanding beyond recall.
• Educators use technology to encourage students to engage in activities that develop understanding and create personal meaning through reflection.
• Educators use technology to provide opportunities for students to apply knowledge in real world contexts.
• Educators and students incorporate suitable technology to engage in active participation, exploration, and research.

• Educators use technology to provide diverse and culturally relevant experiences to help students develop an understanding of our world.

• Educators use technology to enhance and differentiate instruction in order to present students with a challenging curriculum designed to help each individual student develop a depth of understanding and critical thinking skills.
• Educators use technology for meaningful assessment data that informs their practice and allows students to exhibit higher order thinking and to demonstrate knowledge.
• Educators use and facilitate student use of technology to communicate, collaborate, and create communities with educators, parents, students, and additional stakeholders.
Tier 1: Teacher Focus on Productivity

Sample Performance Indicator (with optional example):

Teachers produce, store, and retrieve learning materials electronically (e.g., create lesson plans in Word and store them on file server, create and print handouts for students that can be saved and modified in future years).
Tier 2: Instructional Presentation and Student Productivity

Sample Performance Indicator (with *optional example*):

Teachers conduct one-computer classroom lessons (e.g., *use software such as Decisions, Decisions and Timeliner by Tom Snyder, lead virtual field trips to museums using K-20 Network*).
Tier 3: Powerful Student-Centered 21st Century Learning Environment

Sample Performance Indicator (with optional example):

Teachers enable students to research, analyze data and problem-solve in a global context (e.g., student engage in projects such as ThinkQuest with classrooms in other states or countries).
Annual Technology Inventory

What percent of your certificated teachers are integrating technology in Tier 1?
What percent of your certificated teachers are integrating technology in Tier 2?
What percent of your certificated teachers are integrating technology in Tier 3?
Meeting the Requirement

The Big Question:
How will districts meet this requirement?

The Big Answer:
Each district will decide!

Implication:
*It will NOT make sense to compare one district to another, but each district’s growth over time will be more useful information*
Meeting the Requirement

Ways to meet the annual reporting requirement:

- Teacher self-reporting survey
  (PILOT - 30 Questions)
- Classroom observations
- Combination of the above

Each has advantages and disadvantages depending on a variety of factors unique to each district

Starts in Fall 2006
“To assist every student in crossing the digital divide by ensuring that every student is technologically literate by the time the student finishes the eighth grade, regardless of the student’s race, ethnicity, gender, family income, geographic location or disability.”
Technology literacy is the ability to responsibly, creatively, and effectively use appropriate technology to:
communicate;
access, collect, manage, integrate, and evaluate information;
solve problems and create solutions;
build and share knowledge; and
improve and enhance learning in all subject areas and experiences.
**Definition of Technology Fluency**

**Technology fluency** builds upon technology literacy and is demonstrated when students:
- apply technology to real-world experiences;
- adapt to changing technologies;
- modify current and create new technologies; and
- personalize technology to meet personal needs, interests, and learning styles.
Tiers of Technology Literacy

Tier 1: Personal use & communication
Tier 2: Access, collect, manage, integrate, and evaluate information
Tier 3: Solve problems and create solutions

Students in all tiers use technology to build and share knowledge and to improve and enhance learning in all subject areas and experiences.
Tier 1: Personal use & communication

Sample Performance Indicator (with optional example*):
Students know how to connect and use a wide variety of input and output devices and common peripherals and how to access networked resources (e.g., connect a mouse, keyboard, portable storage device, or digital camera to the computer, connect to a shared network drive).

*Districts are encouraged to download Indicators without the examples & populate them with examples that match their own district initiatives.
Sample Performance Indicator (with *optional example*):
Students create, publish and/or present products for an assigned project (e.g., *create effective PowerPoint or digital video presentations, post webpages of class work*).
Tier 3: Solve problems & create solutions

Sample Performance Indicator (with optional example):

Students define problems or essential questions, then use and/or adapt content-specific technological tools to gather data, visualize information, or conduct investigations (e.g., access primary source data to refute or support an original hypothesis, create and conduct surveys and analyze results).
2006-07 Reporting Requirement

Annual Technology Inventory Questions:

What percent of your Grade 8 students are technologically literate in Tier 1?
What percent of your Grade 8 students are technologically literate in Tier 2?
What percent of your Grade 8 students are technologically literate in Tier 3?
Meeting the Requirement

The Big Question:
How will districts meet this requirement?

The Big Answer:
Each district will decide!

Implication:
*It will NOT make sense to compare one district to another, but each district’s growth over time will be more useful information*
Meeting the Requirement

Ways to meet the requirement
1. Embedded curricular projects or assignments
2. Technology Literacy class(es)
3. Stand alone assessments
4. Student self-reporting survey
Combination of the above

Each has advantages and disadvantages depending on a variety of factors unique to each district
“8th Grade Project”

Use Embedded Curricular Projects or Assignments
Local assessments of embedded NETS Standards within core content areas
Locally developed progress monitoring assessments or assessments of unit projects
Observations logs
Examination of artifacts and/or portfolios
A Series of Assessments

Each NETS Standard is matched to a specific class. Teachers in that class teach the NETS Standard as an "integrated" standard along with their "content area" standards, and the NETS Standard is identified in the units they are taught in.

A NETS Standard is taught in a specific unit in a specific class.

- The unit is assessed
- The student earns a "passing" grade on the assessment for the unit.
- The student is deemed to have then passed the NETS Standard.

The unit is a part of a class made up of many units.

- The student passes the class because they passed the assessments for each of the units.
- The student is then deemed "proficient" at each of the NETS Standards identified in that specific class.
Other Strategies

Technology Literacy Class(es)
  e.g., Bellingham SD Technology Literacy Course
Stand Alone Assessments tied to NETS Standards
  Free standardized tests such as NETS Online Assessment (ISTE/Microsoft site)
  Not-free tests under development from ICDL and Learning.com
Student self-reporting survey
  May be problematic to get accurate data
Combination of methods
To the Research!

ISTE Center for Applied Research in Educational Technology
All uses of technology

U.S. Dept of Education What Works Clearinghouse
MS Math instructional programs (with/without technology)

Metiri Technology Solutions that Work
Primary-Level, Early Literacy Software
(MS/HS – was added on March 15, 2004)
• Identifies and reviews current, relevant studies
• Answers critical questions
• Summarizes findings and practical implications
• Focuses on technology use and impact
• Focuses on studies within instructional contexts
• Critiques research design and methodology
• Answers online questions
• Seeks feedback through surveys and contact links
• [http://caret.iste.org/](http://caret.iste.org/)
Findings from CARET

Technology can enable the development of higher order thinking skills when students work in collaborative groups while using computers to solve problems, or are taught to apply the process of problem solving and then apply technology in the development of solutions.
Technology can also enable the development of critical thinking skills when students use technology presentation and communication tools to present, publish, and share results of projects.
Collects, screens, and identifies studies of the effectiveness of curriculum-based interventions (programs, products, practices, and policies)

All areas of education

Based on high-quality scientific research.

Decision making through easily accessible databases and user-friendly reports

Differentiate high-quality research from weaker research and promotional claims

Current Data: Middle School Math

http://www.w-w-c.org/
Technology Solutions That Work

Washington State now has access to a database that summarizes the effectiveness of technology learning solutions according to research. What works for underachieving students? What Works, New and Promising, Inconclusive, Can’t Recommend?

Contact ETSC Director for login token. Early Literacy and Secondary Math now available.

http://www.metiri.com/techsolutions
Research Site Review

ISTE Center for Applied Research in Educational Technology
http://caret.iste.org/

U.S. Department of Education What Works Clearinghouse
http://www.w-w-c.org/

Metiri Technology Solutions that Work
http://www.metiri.com/techsolutions
Research Summaries/Resources

Solutions That Work Listing (Metiri)
Technology and Academic Achievement: What the Research Shows from the Puget Sound Center
Educational Technology Support Center Research Clearinghouse
Leadership Institute for Technology in Education
June 19 - 22, 2006
Chewelah Peak Learning Center

Hands-on and in depth coverage of the Classroom Tiers Model

Are you ready to see the LITE?
Classroom Tiers Model
http://etsc.esd105.wednet.edu/tiers

Get This Presentation
http://etsc.esd105.wednet.edu > Resources for Educators > Classroom Tiers Model
Contacts for Additional Information:
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Educational Technology Support Center Program Directory
http://www.edtech.wednet.edu/etscccorner/directory.shtml

Have a great day!