Evaluating Technology

IETC Conference
November 15, 2018

Steve Baule
University of Wisconsin - Superior
Education is the only business still debating the usefulness of technology. Schools remain unchanged for the most part, despite numerous reforms and increased investments in computers and networks.

• U.S. Secretary of Education Rod Paige, quoted in National Educational Technology Plan, 2004
Program evaluation is essential in today’s high stakes accountability environment
Why Program Evaluation

- Demonstrate program effectiveness to administration and Board of Education
- Improve the implementation and effectiveness of programs
- Better manage limited resources
- Document program accomplishments
- Justify current program funding or support the need for increased levels of funding
- Demonstrate positive and negative effects of program participation
- Document program development and activities to help ensure successful replication
Technology in Classrooms Doesn’t Always Boost Education Results, OECD Says

Overexposure to computers and the Internet causes educational outcomes to drop, study finds
Four Days of No Tech for Roxbury Students

By FRED J. AUN
October 5, 2018 at 4:15 PM
How many Illinois districts have assessed their 1:1 Programs

Q21 Have you assessed the impact of the 1:1 program?

Answered: 236   Skipped: 127

Yes

No
Indiana Results

Have you assessed the impact of the 1:1 program?

Answered: 165   Skipped: 27

Yes

No

Baule, 2017
Potential Aspects of Instructional Technology Programming

- Student Achievement
- Student Growth
- Student Engagement
- Student Behavior
- Cost Effectiveness
- Infrastructure Effectiveness
- Professional Development
- Hardware Reliability
- Time on Task
CoSN’s Elements

- Devices
- Networks
- Systems
- IT Spending
- Support
- Online Learning

From CoSN, KPI, 2014.
# IT Key Performance Indicators

**37 Information Technology Key Performance Indicators for CoSN Members**

## Devices - 6 Measures
- Advanced Presentation Devices per Teacher
- Average Age of Computers
- Computers per Employee
- Tablets per Student (Student Use)
- Devices per Student
- Devices per Teacher (Dedicated Teacher Use)

## IT Spending - 6 Measures
- Capital Investments
- Hardware, Systems And Services
- Personnel Costs
- IT Spending Per Student
- IT Spending Percent Of District Budget
- IT Spending Spending Per District FTE

## Network - 5 Measures
- Bandwidth per Student
- Bandwidth per User
- Days Usage Exceeds 75% of Capacity
- Overflow Capacity
- WAN Downtime

## Support - 6 Measures
- Break/Fix Staffing Cost per Ticket
- First Contact Resolution Rate
- District Employees per Help Desk FTE
- Help Desk Call Abandonment Rate
- Help Desk Staffing Cost per Ticket
- Mean Time to Resolve Tickets

## Systems - 10 Measures
- Business Systems Cost Per Employee
- Instructional Systems Cost Per Student
- Systems Downtime - E-Mail
- Systems Downtime - ERP
- Systems Downtime - Finance System
- Systems Downtime - HR System
- Systems Downtime - LCMS/IMS
- Systems Downtime - Online Assessment System
- Systems Downtime - Payroll System
- Systems Downtime - SIS

## Online Learning - 4 Measures
- Blended Courses Completed Per Course Offering
- Blended Courses Offered
- Online Courses Completed Per Course Offering
- Online Courses Offered

<table>
<thead>
<tr>
<th>Enrollment</th>
<th>Annual License Fee</th>
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</thead>
<tbody>
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From CoSN, KPI, 2014.
Some Flaws with CoSN KPIs

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From CoSN, KPI, 2014.
Factors for Evaluation from Intel

1:1 Computing Implementation

Contextual Factors (Background Characteristics)

Student Outcomes

Teacher Knowledge and Skills

Classroom Practice

Rockman, 2011.
What does ProjectRED say?

First and foremost, the 1:1 program needs to be focused on student learning, personalization and the most effective methods for the delivery of instruction. A 1:1 program’s vision and goals will vary from district to district, but maximizing the learning potential of each individual student must remain the core of established goals.
How can district leaders help this happen?

- Providing ongoing systemic professional learning for everyone, at all levels
- Being skilled in leading reform measures
- Creating a shared vision based on research and best practices
- Ensuring the use of assessments and evaluations to collect data that will be used to continuously improving learning and instruction.
- Transformative leadership
And you must consider...

- How to cultivate district, building and staff leadership
- What is the short and long-term financial planning
- Expectation management
- Infrastructure
- Technology preparation, rollout and support
- Communications
- Policies

Of major importance in successfully engaging a 1:1 program is the community's will to let go of outdated, ineffective practices to make way for the new
IT Program Evaluation: Following the Correct Steps

1. Determine project goals & objectives to be measured ~ Key Performance Indicators
2. Determine criteria (or norms) to measure success
3. Determine measurement period(s)
4. Determine who will collect the data and how it will be collected
5. Conduct an analysis of the data & present your results
How to Measure Success

- Compare to Benchmarks
  - Criterion Referenced
  - Rubrics can work well here
- Measure Growth
  - Norm Referenced
- Qualitative Measures
Evaluation Design Models

- Experimental Design (Possible in some cases using control and experimental groups; requires random assignment of students)
- Quasi-experimental design
- Non-experimental design (Comparison of variables within a single sample; Pre-test / Post-test model)
- Qualitative methods (Interviews, observations and descriptive data)

From KC-AERC, 1:1 Technology in Classrooms: Establishing Plans for Evaluation
For a 1:1 Program

- What would you want to measure?
- How would you measure each?
What to Measure
<table>
<thead>
<tr>
<th><strong>What</strong> will you measure?</th>
<th><strong>How</strong> (What is the measurement tool)?</th>
<th><strong>When</strong> (Annually, Quarterly, etc.)</th>
<th>Success will equal what?</th>
<th><strong>Who</strong> (Which stakeholders are involved in the goal setting and reporting?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Engagement and Motivation</td>
<td></td>
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<tr>
<td>Cost savings</td>
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<tr>
<td>Increased Student Achievement</td>
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</table>
A Student Engagement Example

- Goal to increase student engagement through the implementation of 1:1 technology
- How will you measure student engagement?
  - Survey data?
  - Attendance?
  - Observation?
Better Student Engagement

“The use of todays meet [sic] resulted in the participation of 100% of the students. So many students are too shy to share aloud, but a discussion board gives them an opportunity to express themselves without feeling as self-conscious.”

“The discussion board then served as a quick-reference. I could quickly and easily see and address any misconceptions and provide reinforcement of how accurate the students were.”

Dana Rosenquist, 7th grade language arts teacher
Example: How to measure?

How Michigan’s 1:1 computing program is meeting its goals.

**GOAL 1:** Enhance student learning and achievement in core academic subjects with an emphasis on developing the knowledge and skills requisite to the establishment of a 21st century workforce.

**FINDING:** Student scores on the MEAP increased after their participation in the program. Results identify 1:1 as the reason for this increase.
## Example: How to measure?

<table>
<thead>
<tr>
<th>Action Items</th>
<th>Person(s) Responsible</th>
<th>Source Timeline</th>
<th>Source of Funds/Resources</th>
<th>Formative Evaluation</th>
<th>Summative Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Establish online learning communities anytime, anywhere.</td>
<td>All Staff</td>
<td>Ongoing</td>
<td>Time to share ideas</td>
<td>Learning communities are created, listservs</td>
<td>Educators will collaborate with others electronically Number of hits Number of job alike courses created</td>
</tr>
<tr>
<td>2. Provide technology training that is job embedded.</td>
<td>Director of Inst. Tech., Tech Coordinators, ITSs</td>
<td>Ongoing</td>
<td>Tech Allotment</td>
<td>ITSs conduct training at campuses on specified topics</td>
<td>Number of hours provided at each campus Evidence of technology being used in the classroom</td>
</tr>
<tr>
<td>3. Provide more time for staff development through the district calendar.</td>
<td>Asst to the Supt Staff Dev. Coord. IISD Board</td>
<td>TBA</td>
<td>Two days of student instruction</td>
<td>District calendar is changed to provide two more days for teacher training, waiver submitted to state</td>
<td>Teachers have more time to learn and collaborate with colleagues</td>
</tr>
</tbody>
</table>
North Boone 1:1 Tablet Program

- Each 7th & 8th Grader had a ASUS Droid Tablet
- Teachers and students were using Google Apps for Education (GAFE) to produce much of their work
- Teachers, parents and students all have access to student work via Schoology, a learning management system or LMS
Improving Student Motivation & Engagement

**Success Indicators**
- A decrease in office referrals, detentions and suspensions
- A decrease in the number of days absent
- An increase in homework completion

**Results**
- Reduced from 138 to 28
- 45.8% decrease in days absent
- Completion increased from 59% to 76.2%
Increase Student Achievement

**Success Indicators**
- Increase MAP and ISAT scores
- Increase the use of formative assessment via Schoology
- Increase RTI interventions for struggling students

**Results**
- 77% of students met benchmarks in reading; 68% in math ~ highest rate in district
- 100% of 7th grade staff reported an increase
- The delivery of accommodations and modifications through the use of the tablet has been more than we could have asked for.
Reduce Ongoing Instructional Costs

Success Indicators
- Reduction in the paper budget
- Decrease in staff absences
- Long term reduction in textbook costs as we move to digital resources

Results
- Saved 30% of paper budget in first year
- Staff absences decreased by about 66%
- Undetermined at this point
## Technology Integration Rubric

<table>
<thead>
<tr>
<th></th>
<th><strong>Initiating</strong></th>
<th><strong>Developing</strong></th>
<th><strong>Demonstrating</strong></th>
</tr>
</thead>
</table>
| **Attitudes**          | Teacher is not sure that technology will enhance their teaching or students’ learning, but tries to integrate nonetheless.  
Teacher is fearful of change. | Teacher has some positive experiences with technology and begins to see its potential to enhance their teaching and to enhance student learning.  
Teacher occasionally shares practices with other teachers. | Teacher has had many positive experiences with technology integration.  
Teacher is a champion of technology integration.  
Teacher frequently shares practices among teachers. |
| **IT Fluency**         | Teacher uses technology primarily for presentation or demonstration purposes.  
Teacher begins to use technology for interactive student activities.  
Teacher uses online access to information from within school.  
Teacher uses technology for professional and personal use, such as Microsoft Office software or e-mail. | Teacher sometimes uses technology for both presentation and interactive student activities (communication, production, collaboration).  
Teacher uses online access to information from within school and from home, or from other settings.  
Teacher uses technology for personal and professional use, such as MS Office, e-mail, and some Web 2.0 technologies. | Teacher regularly uses technology for both presentation and interactive student activities (communication, production, collaboration).  
Teacher uses online access to information from within school and from home, or from other settings.  
Teacher uses technology for personal and professional use such as MS Office, e-mail, and is comfortable with different Web 2.0 technologies. |
| **Planning and Instructional Design** | Teacher is comfortable with the Common Instructional Framework and is starting to plan lessons that have a technology component.  
Teacher is somewhat comfortable with the Common Instructional Framework, but has started to plan lessons with technology components. | Teacher is comfortable with the Common Instructional Framework and has planned some lessons that integrate technology.  
Teacher most often chooses technologies appropriate to their activity and need.  
Teacher begins to evaluate effectiveness of technology. | Teacher integrates technology seamlessly within the Common Instructional Framework.  
Teacher regularly uses technologies to support higher-level learning objectives.  
Teacher chooses technologies appropriate to their activity and need.  
Teacher encourages students to |
Performance Management Resources

- CoSNs KPI

- Information Technology Infrastructure Library (Best Practices)
  - http://www.itil-officialsite.com/

- ISTE Standards and Performance Indicators

- ISTE Essential Conditions
  - http://www.iste.org/standards/essential-conditions
Rubric Websites

- Rubistar
  - http://rubistar.4teachers.org

- iRubric
  - http://www.rcampus.com/indexrubric.cfm

- Teacher Planet
  - http://www.sites4teachers.com/ (search for rubric or assessment generators)

- How & When to Use Rubrics
  - http://pareonline.net/getvn.asp?v=7&n=3
Questions:

sbaule1@uwsuper.edu
or 715-394-8054

Special Thanks to Del Wright,
UW-Superior’s CETL Media Specialist
REFERENCES


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Project RED (2010). The Research. Available at: [http://www.projectred.org/about/research-overview.html](http://www.projectred.org/about/research-overview.html).

