Education Transformation Framework:

- **Leadership and Policy**
  - Changing behaviors and ensuring quality: Consider professional development, teacher support, and quality assurance in your strategy.
  - Partnering for change: Leverage the power of public-private education alliances for successful systemic change.
  - Investing in teacher effectiveness: Understand how top-performing schools build teachers and leaders.

- **21st Century Pedagogy**
  - Developing a learning community: Foster collaboration and growth amongst peers capable of supporting the project vision.
  - Modernizing curriculum and assessment: Ensure technology makes the vision of transformation to improve student outcomes.
  - Establishing a vision: Start the cycle of transformation with examples of success and best practice.
  - Redefining learning spaces: Use technology-enabled environments that will transform schools for anytime, anywhere learning.

- **Designing Technology**
  - Customizing learning pathways: Follow a proven technology roadmap for practical ways to implement individualized learning.

- **Promoting Inclusive Learning**
  - Plan for technology solutions and accessible learning environments that empower all students.

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THE CONTEXT FOR DISCUSSION IS TRANSFORMATION
One of the world’s North Stars for education innovation and quality is now transforming its education system in partnership with Microsoft.
Finland is a world leader trending down

- Seen as a model around the globe for education with some of world’s most qualified teachers
- Technology used less compared to other globally successful education systems (e.g. Singapore, Canada, Hong Kong)

<table>
<thead>
<tr>
<th>Finland's PISA results 2003:</th>
<th>score points</th>
<th>OECD countries</th>
<th>all participants</th>
<th>Finland's PISA results 2012:</th>
<th>score points</th>
<th>OECD countries</th>
<th>all participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematical literacy</td>
<td>544</td>
<td>1st</td>
<td>2nd</td>
<td>Mathematical literacy</td>
<td>519</td>
<td>6th</td>
<td>12th</td>
</tr>
<tr>
<td>Reading literacy</td>
<td>543</td>
<td>1st</td>
<td>1st</td>
<td>Reading literacy</td>
<td>524</td>
<td>3rd</td>
<td>6th</td>
</tr>
<tr>
<td>Science literacy</td>
<td>548</td>
<td>1st</td>
<td>1st</td>
<td>Scientific literacy</td>
<td>545</td>
<td>2nd</td>
<td>5th</td>
</tr>
</tbody>
</table>
Students usage of ICT at Grade 8 in Europe

Source: European Commission Survey of ICT in Schools
Students have access to PCs

Source: European Commission
Survey of ICT in Schools – Finland National Report
... but teachers don’t use ICT in lessons much

- Note position of Portugal & Estonia: European countries which have advanced in education quality rapidly

Source: European Commission
Survey of ICT in Schools – Finland National Report
Deep Learning
Schools that support creative, happy and healthy individuals who contribute to the common good.

- Problem solving and innovation
- Global awareness
- Knowledge construction
- Skilled communication
- Self-regulation and assessment
- Collaboration
The POWER TO KNOW
Microsoft and machine learning: Answering questions with experience

1991 - Microsoft Research formed
1997 - Hotmail launches
2008 - Bing Maps launches
2009 - Bing Search launches
2010 - Kinect launches
2014 - Skype Translator launches
2014 - Azure Machine Learning launches

1991
1997
2008
2009
2010
2014

Microsoft Research formed
Hotmail launches
Bing Maps launches
Bing Search launches
Kinect launches
Skype Translator launches
Azure Machine Learning launches

Which email is junk?
What's the best way home?
Which searches are most relevant?
What does that motion “mean”?
What is that person saying?
What will happen next?

"Azure Machine Learning offers a data science experience that is directly accessible to business analysts and domain experts, reducing complexity and broadening participation through better tooling."

—Hans Kristiansen, Capgemini
TECHNOLOGY’S POWER TO TRANSFORM
Video URL:
Enable student achievement

Assess knowledge and ability
Predict future achievement
Track progress

Profile - A marker highlights if the student is on-target (green), on-the-way-to-target (orange), or off-target (red).

Standards – A student’s standards show as an accordion menu.

Learning Progression – When the teacher selects a standard (or sub-standard), it dynamically shows the correct learning progression graph (the line graph) showing the learning progression in detail for that standard for that student. The last mark is the summative score.

Social Engagement – These include comments posted to peers/teachers, documents published/created/shared, and number of posts.

Commentary – Comments provide any information/feedback that informs the teacher of what is happening with the student.

Al Bino
Age: 10 | Grade 5
English Language Learner

Learning Goal: Use equivalent fractions as a strategy to add and subtract fractions.

Apply and extend previous understandings of multiplication and division.

3.2.15 - Ms. Wanda Rinn met with parents to discuss Al’s difficulty in reading class. Need to schedule a second meeting to discuss possible accommodations.

2.17.15 - Al successfully completed his English level 1 assessment.

2.12.15 - Al was absent from school today due to a doctor’s appointment.
Identify at-risk students

**Track current performance**

**Predict dropout probability**

**Aggregate and act**

**Targets** – This section has the teacher’s list of students (scrolling menu). The teacher can quickly identify students (using two-color system) that are below target (red dot) or in-danger zone (orange dot). The visual shows multiple data sets: target reached previous year (light-blue bar), current progress level (dark-blue line), and target level (blue hash).

**Learning Preferences** – Deep Learning skills most targeted by students

**Social Engagement** – Including comments posted to peers/teachers, documents published/created/shared, and number of posts.

**Pace Timeline** – Markers show the five main standard areas for Grade 5 Mathematics tied to the pacing guide. It also contains a red marker to help the teacher visualize where they are in relation to the pacing guide. The timeline changes with different standards and times depending on the specific pacing guide for each subject area.
Educator Dashboard: 5th grade math students

- **Algebra**
  - Joe K.
  - John D.
  - Minsha V.
  - Kumar K.
  - Susie R.
  - Stacy R.
  - Daphne Z.
  - Zoe G.
  - Griffin P.
  - Tamara R.
  - Reese S.
  - Chase M.
  - Sylvia P.
  - Emma R.
  - Grady Z.
  - Scott A.

- **Standardized Math Assessment Score Dist.**
  - Current Class
  - Other Class
  - District

- **Math Alerts**
  - Math Alert: setting up test in (5/27/15)
  - 4 students have questions
  - 2 students are behind pace in algebra
  - 1 student reported to the principal
  - 6 students are missing assignments

- **Learning Preferences**
  - 87% Collaboration
  - 33% Real-World Problem Solving
  - 58% Saamiul Communication
  - 75% Use of ICT

- **Delve**
  - **Performance Test Results**
    - Modified 4 hours ago by Ryan Guymmer
  - **Learning Plan 2015**
    - Modified 32 hours ago by Diane Tittet
  - **Academic Year Training**
    - Modified 1 hour ago by Tim Rossman
4.1 Educator View of John: Recommendations

Profile

Recommendations for John’s Learning Plan

Next Steps

ONOTE ASSIGNMENT SUGGESTIONS

☐ Order of Operations
   Assignment 3.1

☑ Expressing Using Parentheses
   Assignment 3.2

☐ Evaluating Expressions with All Four Operations
   Assignment 3.3

Load 3 More Suggestions

CORTANA SUGGESTS

☐ Commutative Properties of Addition and Multiplication
   Video Learning 3.1

☑ Identity Properties and Multiplication by Zero
   Video Learning 3.2

☐ Distributive Property
   Video Learning 3.3

Load 3 More Video Options

Math Learning Preferences

- Algebra
  - for Past 10 days

Your Notes to John

Thanks for your hard work on the last assignment...
May 25

Today let’s review last week’s evaluating expressions...
May 18

Commentary

May 25
You met with parents to discuss John’s difficulty in algebra. Need to schedule a second meeting to discuss possible accommodations.
Big conversations drive big impact

Big conversations drive transformation

*Dots on the map indicate major global engagements.

<table>
<thead>
<tr>
<th>Finland</th>
<th>USA</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board of Education</td>
<td>Manteca Unified School District</td>
<td>Ministry of Education</td>
</tr>
<tr>
<td>Chile</td>
<td>France</td>
<td>Indonesia</td>
</tr>
<tr>
<td>Ministry of Education</td>
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</tr>
</tbody>
</table>
GLOBAL DIGITAL LEARNING STRATEGY TEAM

We partner with leaders engaged in holistic education transformation through anytime anywhere learning to enable students to achieve more.

SKILL SETS

- Education Policy
- Academic Research
- Curriculum Design and Instruction
- STEM
- Change Management
- Adult Learning
- Online/Blended Education
- Large 1:1 Implementation
- Education Leadership

TEAM MEMBERS

- Aidan McCarthy
- Zhao Min Cheng
- Pranshu Singhal
- Mei Ling Tan
- Sean Tierney
- Cathy Cavanaugh
- Alexa Joyce
- Kati Tiainen
- Ginno Kelley

ACTIVITIES

- Top-Large Customer Engagements
- MOE Engagements
- Whitepapers
- Executive Briefings
- Policy Reports
- Professional Development Plans
- Leadership events
THINK BIGGER
Video URL:
https://youtu.be/w-tFdreZB94
WHAT REALLY MATTERS?

WHAT’S WORTH DOING?
They decide what to measure before they start.

They understand that more is NOT better.

(only BETTER is better)

They never confuse people projects for technology projects.

They have a plan for what learning will look like.
They invest in Professional Development they can track, measure and prove

They realize the economies of partnerships

They understand when technology helps, and when it hinders

They avoid redundancy of effort, research or capital
THE REAL CHALLENGE IS CHANGE

- People
- Technology
Why EDU Zone?

Connect and Communicate with Like-Minded Colleagues

Locally Managed Tenants

Enhanced Creation, Sharing, and Collaboration

Gamification and Documentation

Content (Microsoft and User Created) Dynamically Loaded Based on User
Pre-packaged MS content

EZ for Schools will be pre-populated with courses and ideas to help make the most of all MS technology, and to create awareness of new tools.

University Created and Curated Content

Schools can easily create their own content and courses not limited to technology.

Managing training online will assist with staff inductions, compliance readiness, Campus change etc.
THE IMPORTANCE OF INTERFACES

The Pen Is Mightier Than the Keyboard: Advantages of Longhand Over Laptop Note Taking

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Daniel M. Oppenheimer2

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2University of California, Los Angeles

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E-mail: pamueller@princeton.edu

Author Contributions Both authors developed the study concept and design. Data collection was supervised by both authors. P. A. Mueller analyzed the data under the supervision of D. M. Oppenheimer. P. A. Mueller drafted the manuscript, and D. M. Oppenheimer revised the manuscript. Both authors approved the final version for submission.

Abstract

Using notes on laptops rather than in longhand is increasingly common. Researchers have suggested that laptop note taking is less effective than longhand taking for learning. Prior studies have primarily focused on students' capacity to mask and distraction when using laptops. The present research suggests that when laptops are used solely to take notes, they may still be impairing learning. From their use results in shallower processing. In three studies, we found that students who took notes on laptops performed worse on conceptual questions than those who took notes longhand. We show that whereas taking more notes on a laptop, laptop note takers' tendency to transcribe lectures verbatim rather than organizing information and reframing it in their own words is detrimental to learning.

Keywords: academic achievement, cognitive processes, memory, educational psychology, open data, open materials
DO YOU AGREE?

1. If we have great teachers and curriculum, computer input tools won’t make that much difference to how well a learner will perform on a task

2. High and low performing students benefit equally from technology

3. Most people (students, teachers, parents) **DO know** when to choose the right computer tool to support their best performance

4. Learners perform the same when using digital pen and non-digital pen, provided they have technology available in some form. (e.g. BYOD)
1. If we have great teachers and curriculum, computer input tools won’t make that much difference to how well a learner will perform on a task.

Interfaces matter far more than we ever thought.
2. High and low performing students benefit equally from technology.

Computer Input Tools Will **Expand** or **Reduce** the Performance Gap!
3. Most people (students, teachers, parents) **DO KNOW** know when to choose the right computer tool to support their best performance.

Learning experts MUST drive device decisions.

**WHEN STUDENTS WERE ASKED:**

“Which tool would you prefer to use if you had to perform your absolute best for your high stakes science exam?”

91% chose interfaces they didn’t realize had already been shown to decrease their performance by at least **one full grade level**.
4. Learners perform the same when using digital pen and non-digital pen, provided they have technology available in some form.

Digital pen greatly improves learning compared with traditional pen and paper!

**COGNITION**

<table>
<thead>
<tr>
<th></th>
<th>Non Digital</th>
<th>Digital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>40%</td>
<td>60%</td>
</tr>
</tbody>
</table>
4. Learners perform the same when using digital pen and non-digital pen, provided they have technology available in some form.

Digital pen greatly improves learning compared with traditional pen and paper!

![Average Diagrams per Problem]

- **Number correct diagrams**
  - Non-digital pen: 0.82
  - Digital pen: 1.03

- **Number diagrams**
  - Non-digital pen: 1.17
  - Digital pen: 1.25

Legend:
- Red: Number correct diagrams
- Blue: Number diagrams
Digital pen – mimics real pen - precise, pressure sensitive, palm cancelling, smart ink.

Stylus - mimics finger painting

Remember, comparing a digital pen to a stylus is like comparing a skateboard to a Ferrari.
<table>
<thead>
<tr>
<th>GOOD EDUCATIONAL INTERFACES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increase students’ expressive power (ability to create &amp; refine rich content)</td>
</tr>
<tr>
<td>• Reduce students’ cognitive load (simplicity, lack of distraction)</td>
</tr>
<tr>
<td>• Increase students’ total activity (physical and/or communicative)</td>
</tr>
<tr>
<td>• Include input capabilities (e.g., representations, modalities) well matched with students’ learning activity or content domain</td>
</tr>
<tr>
<td>• Include input capabilities well matched with students’ native language</td>
</tr>
<tr>
<td>• Increase input capabilities well matched with students’ ability level</td>
</tr>
</tbody>
</table>
What we can bring to enhance every engagement

Sharing best practice and ideas in your context

<table>
<thead>
<tr>
<th>Facts and guidance</th>
<th>Research to support</th>
<th>Workshops &amp; Forums</th>
<th>RFP Support and advice</th>
<th>Proven resources</th>
<th>Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summarised, clear research and recommendations</td>
<td>Evidence is critical in influencing the customer around “Why Microsoft”</td>
<td>High impact workshops from 1 hour to 2 days designed to ensure customer success</td>
<td>Expert consultation and partnerships to support success in responding to RFPs, Tenders or competitive opportunities</td>
<td>Templates, documentation and scaffolds to help you reach your goals</td>
<td>Access to the best ideas, examples, case studies, or people to help you succeed in your context (Internal and External)</td>
</tr>
</tbody>
</table>
Critical Conversations to support Transformation

**Transformation Framework**
- Full day (or part day) workshop outlining the key components for transformation success (Ministerial Level)

**Design, Deploy & Transform**
- 1 or 2 day workshops to share a model for how to succeed in 1-to-1 using global examples, evidence, and resources

**Design, Deploy & Transform IT**
- 1 or 2 day workshops to deep dive into the technical architecture, design and implementation required for success

**Machine Learning / BI**
- Up to 1/2 day session exploring benefits of analytics for system, school, and students to improve learning and organizational decisions

**School Transformation Process**
- Templates, documentation and scaffolds to help you reach your goals
- Technology blueprints and support to make it easy to get it right

**Change**
- An overview of the process for changing culture, increasing workforce capacity, and ensuring people are on board the transformation
Our collateral is simple and powerful

Ministry level

- The Education Transformation Framework
  - 8-page overview

- The Education Transformation Framework
  - Poster

- The Implementation Handbook
  - Complete, step by step guide to transformation
  - (think “The Idiots Guide to transformation”)

School level

- The Schools Transformation Framework
  - 8-page overview

- The Schools Transformation Process
  - 8-page overview & Poster

Inform

- Whitepaper
  - 2-page executive summary

Interact

- Workshops

- Whitepaper
  - 16-page
Overview

Created in partnership with:
• leading policy makers
• academics
• Researchers
• Schools & school districts

Tested with over 130 policy makers globally

Education Transformation Framework

The Microsoft Education transformation Framework helps fast track system-wide transformation by summarizing decades of quality research. It includes a library of supporting materials for ten critical conversations, each underpinned by an executive summary and an academic whitepaper detailing global evidence. This provides a short-cut to best practice, speeding up transformation and avoiding the mistakes of the past. Microsoft also offers technology architectures and collaborative workshops to suit your needs.
School Transformation Process

The School Transformation Process is a tool that helps schools systematically reflect on, plan and implement reform. It does this by providing six lenses through which to examine important issues and steps. The six phases can be undertaken in any order or simultaneously. However, the entire process is cyclical with insights gained from continuous improvement initiating new cycles of the process.

This process was adopted from work on school leadership by Knapp, Copland and Talbert (2013).

1. **Inspection**
   - A team of teachers, students, parents and school leaders collaborate to define a vision, values and goals.

2. **Innovation**
   - Schools decide on the innovations in curriculum, pedagogy, leadership, technology and learning space design that will bring about their vision.

3. **Inclusion**
   - Schools seek input and strategic partnerships with governments, businesses, parents and community leaders to help achieve their values.

4. **Implementation**
   - Schools focus on meeting and implementing their plan for change.

5. **Insight**
   - To guide continuous improvement, schools reflect on their experiences and review outcomes against their school’s mission and success metrics.

6. **Investigation**
   - Schools learn about innovations in teaching, learning, assessment and school design to discover opportunities for change.