Mastery for All Students

Through Personalized Learning

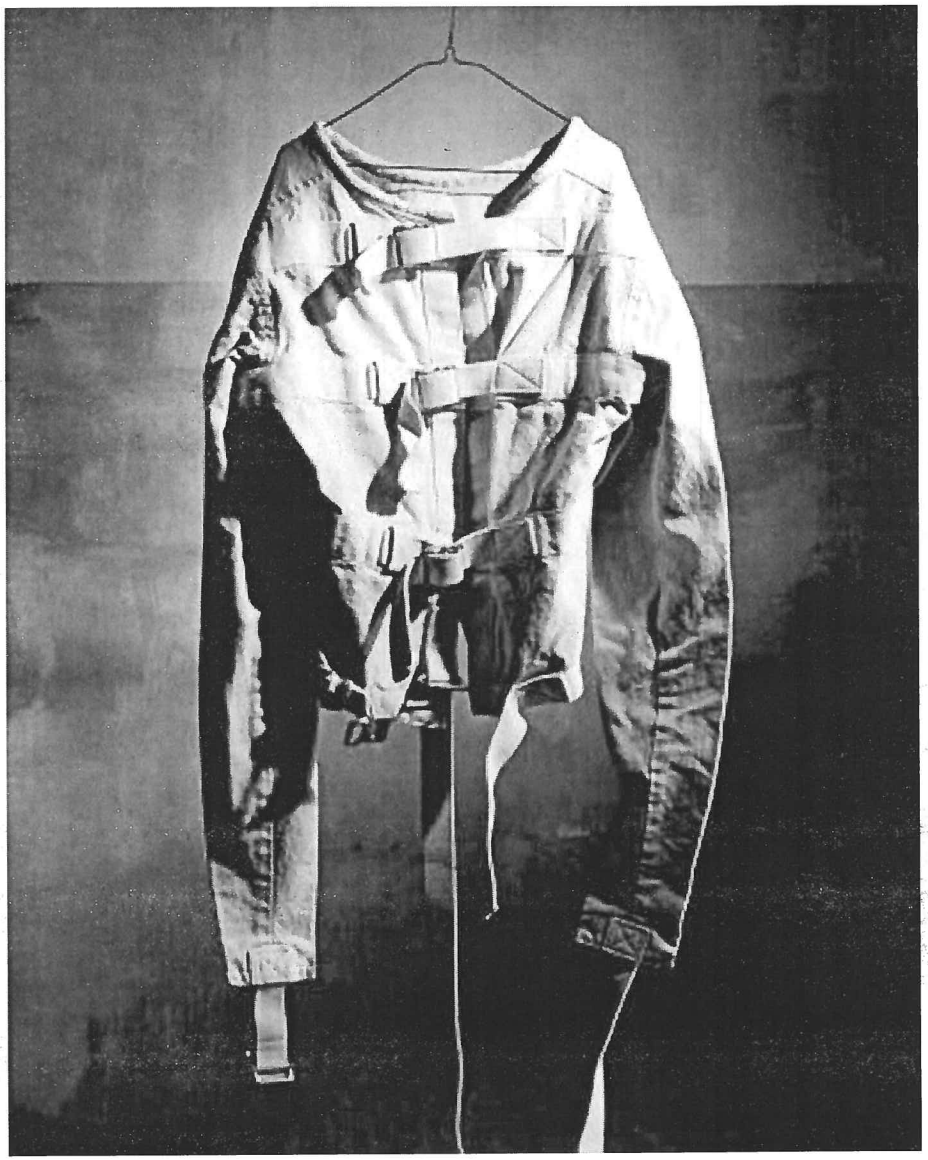
Utah Senator Howard Stephenson

Michigan Education Committee

September 15, 2016

Ignác Fülöp Semmelweis 1818-1865

Germ Theory was finally advanced by Louis Pasteur
1864
Joseph Lister
1870s



Civil War Fatalities

CAUSE OF DEATH	DEATH TOLL
DIED IN BATTLE	206,000
DIED OF DISEASE	337,000

Ayers et al. *American Passages*, p. 518

Proven Antidote to Ineffective (Harmful) Education Practices

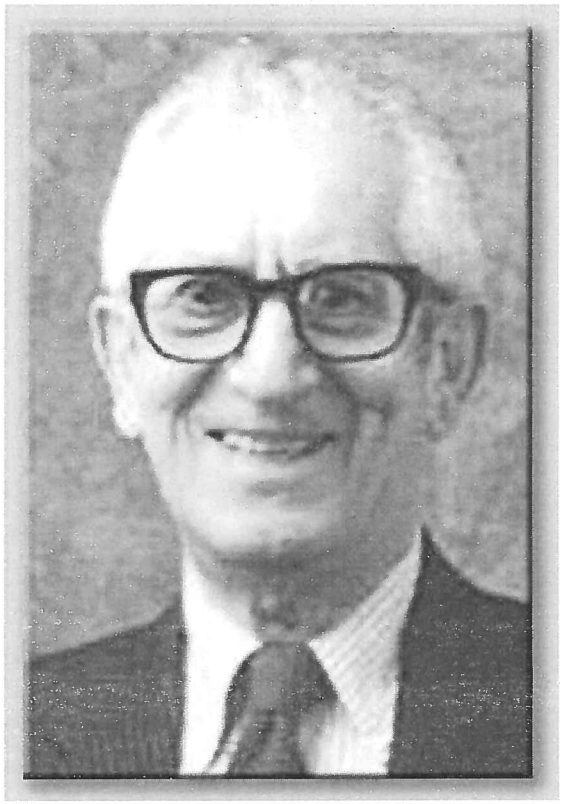
- 20% of U.S. High School Students Drop out Before Graduation
- 2/3 of those who do graduate have not achieved proficiency in basic literacy and math
- Among 34 OECD Countries the U.S. ranks 26 in Mathematics, 17 in Reading and 20 in Science

Jean Piaget
(1896-1980)

Learning Mastery Can Be Achieved through Immediate Interactive Feedback

Benjamin Bloom

Students receiving personalized learning through immediate interactive feedback double the learning outcomes of other students.

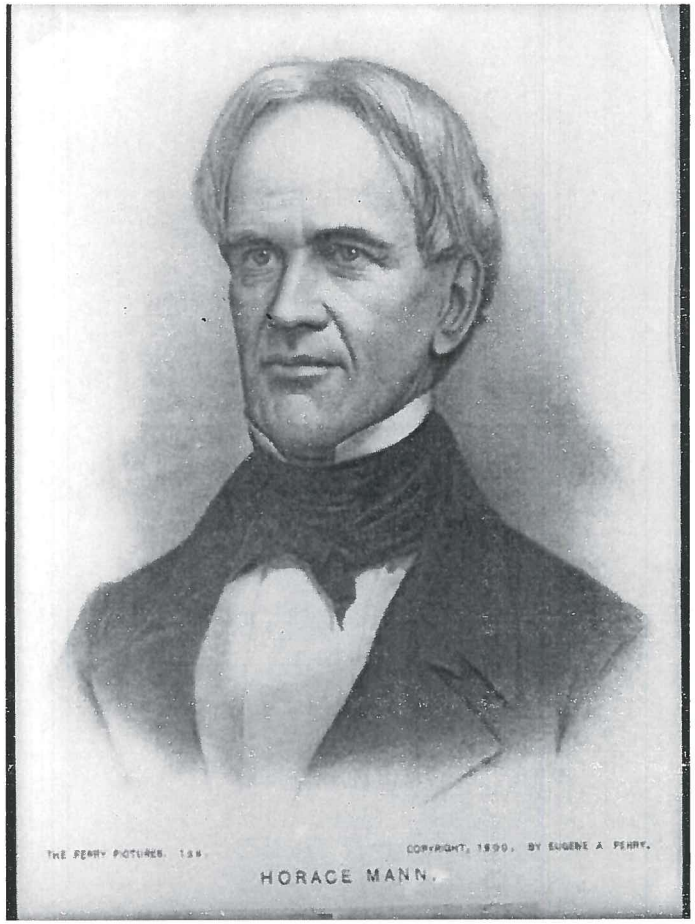


- Piaget and Bloom have been celebrated by educators for their other contributions, *but their calls for personalized learning have been largely ignored.*

- Is it possible that today's educators are unwittingly causing harm to the children they serve like the physicians in the maternity hospital?

Horace Mann

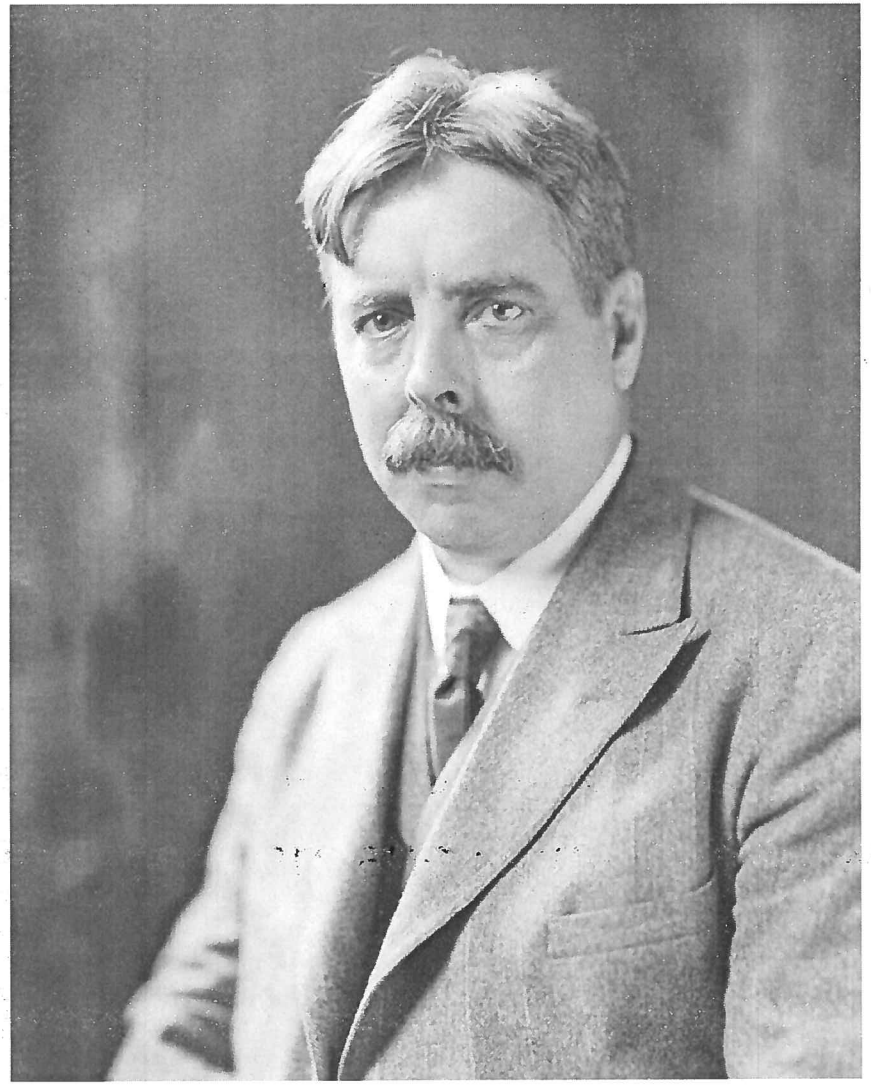
The American Public Education System was directly imported from Prussia (modern day Germany). This model of "free and compulsory" education was designed by the Prussian Emperor, in order to generate obedient workers and soldiers who would not question authority.



Edward Thorndike (1874-1949)

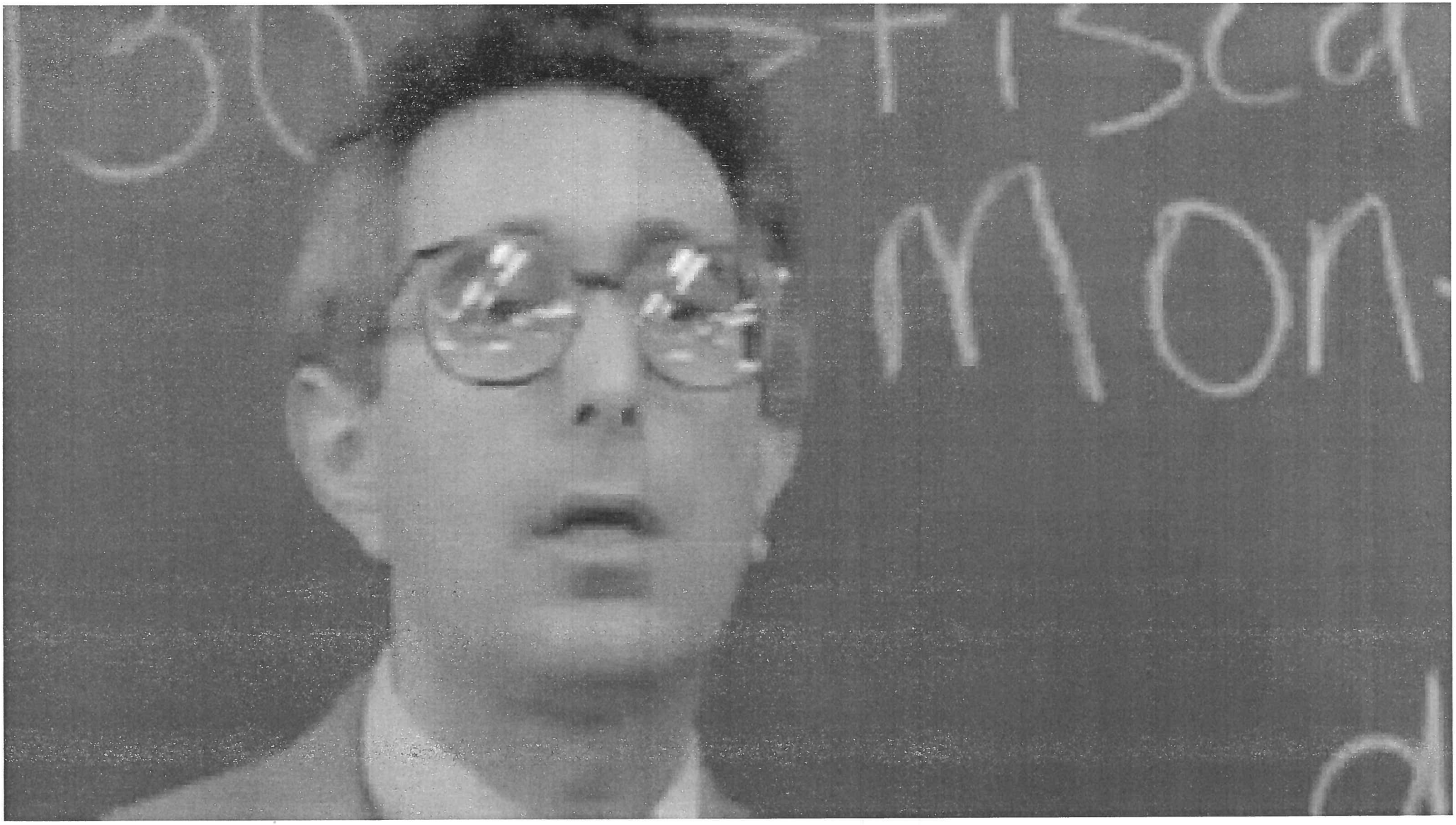
Human Intellect is fixed

The purpose of education is to sort and rank students by their fixed intellect to enable higher education and employers to know the geniuses from the imbeciles



Best Example of Factory-Model Manual 19th Century Schooling Methods Introduced by Horace Mann and Edward Thorndike

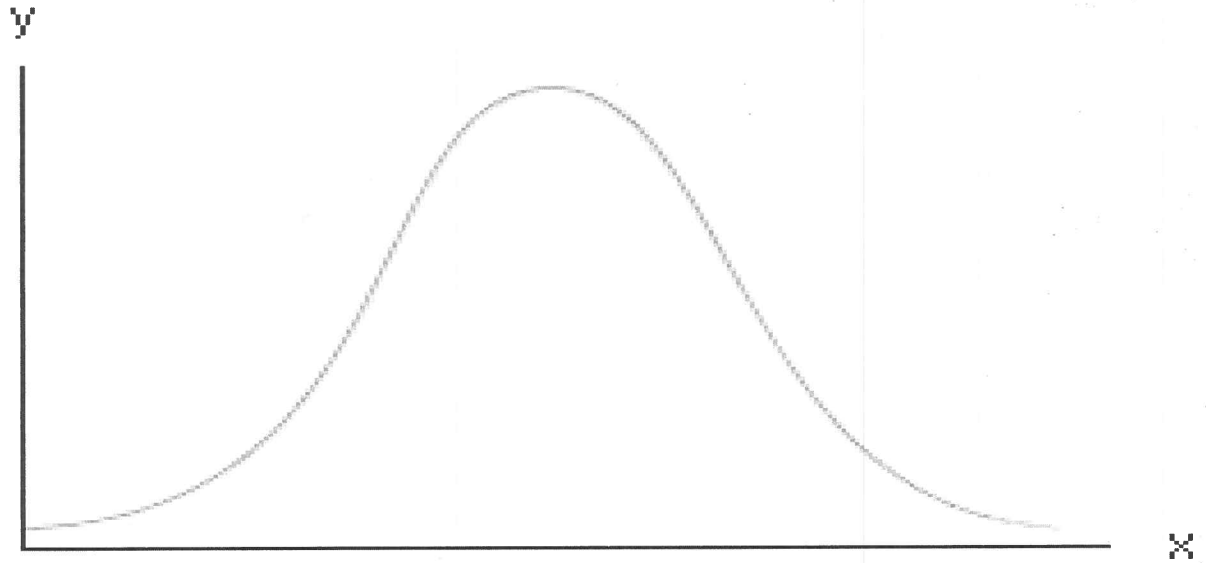
(Ferris Buhler's Day Off)



Our One-Size-Fits-All Educational System was not designed to benefit the Student. It was designed to benefit the State.

Similarly, Our High-Stakes End-of-Level Tests are not designed to benefit students

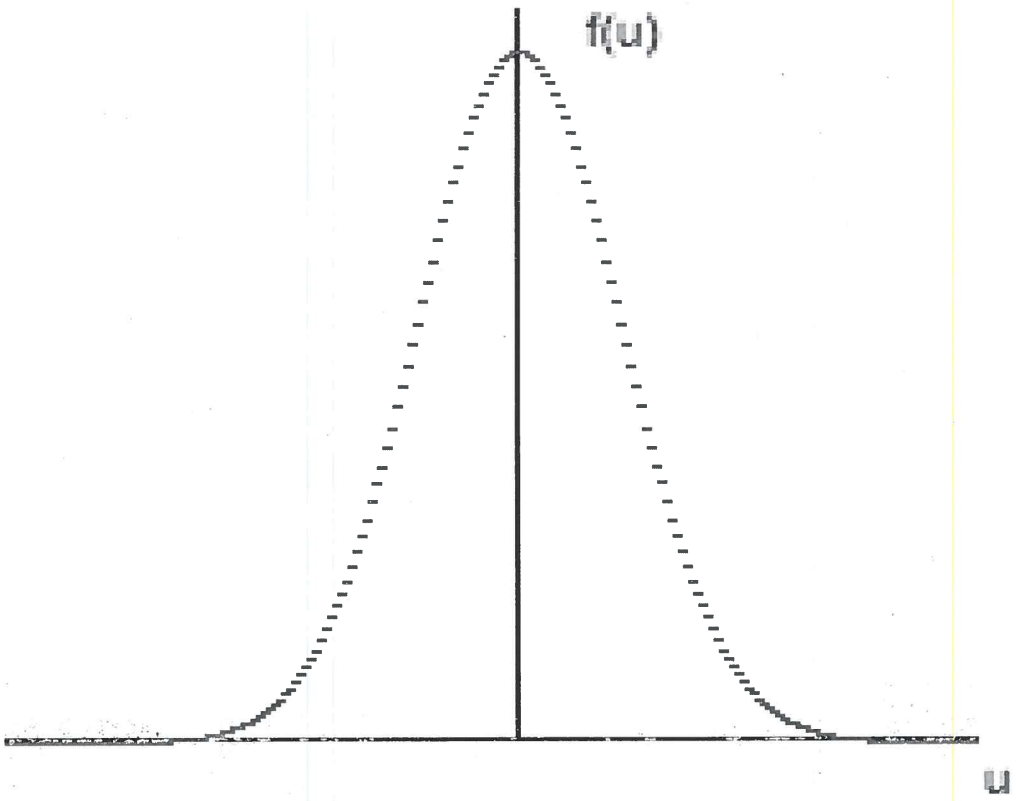
Teaching to the Middle of the Bell-Shaped Curve

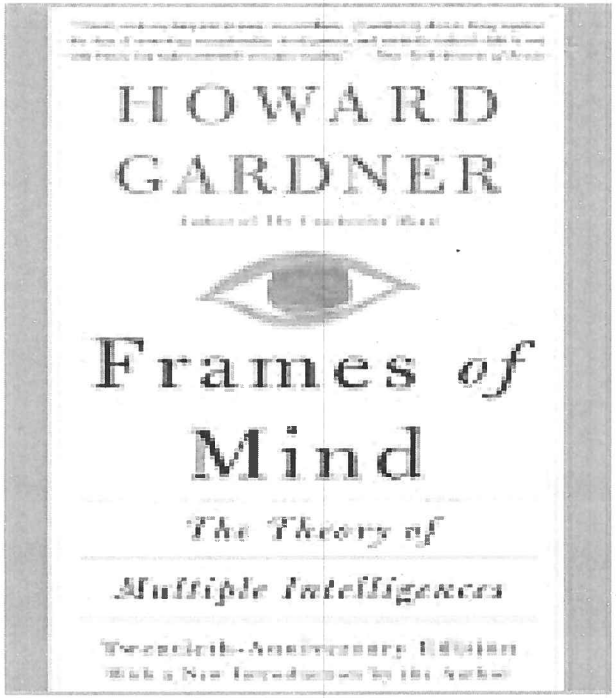


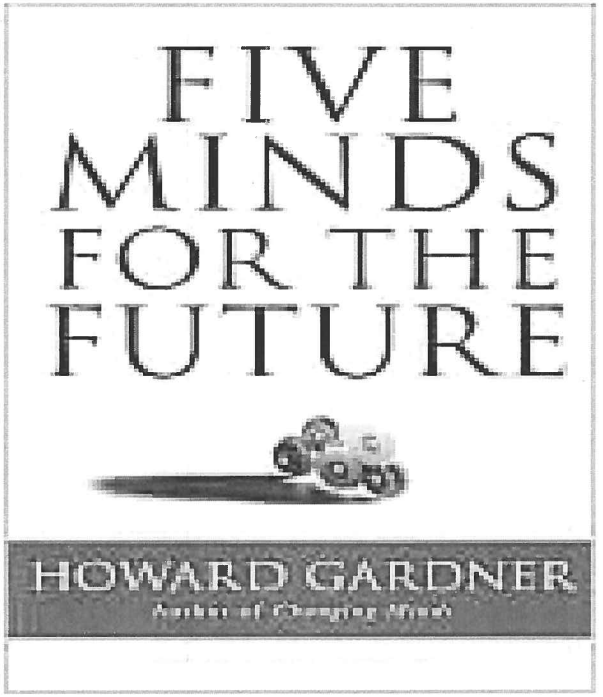
Bell-Shaped Curve

Batch processing methods require promotion of students who have not achieved mastery.

Grouping students by ability instead of by “born on date”

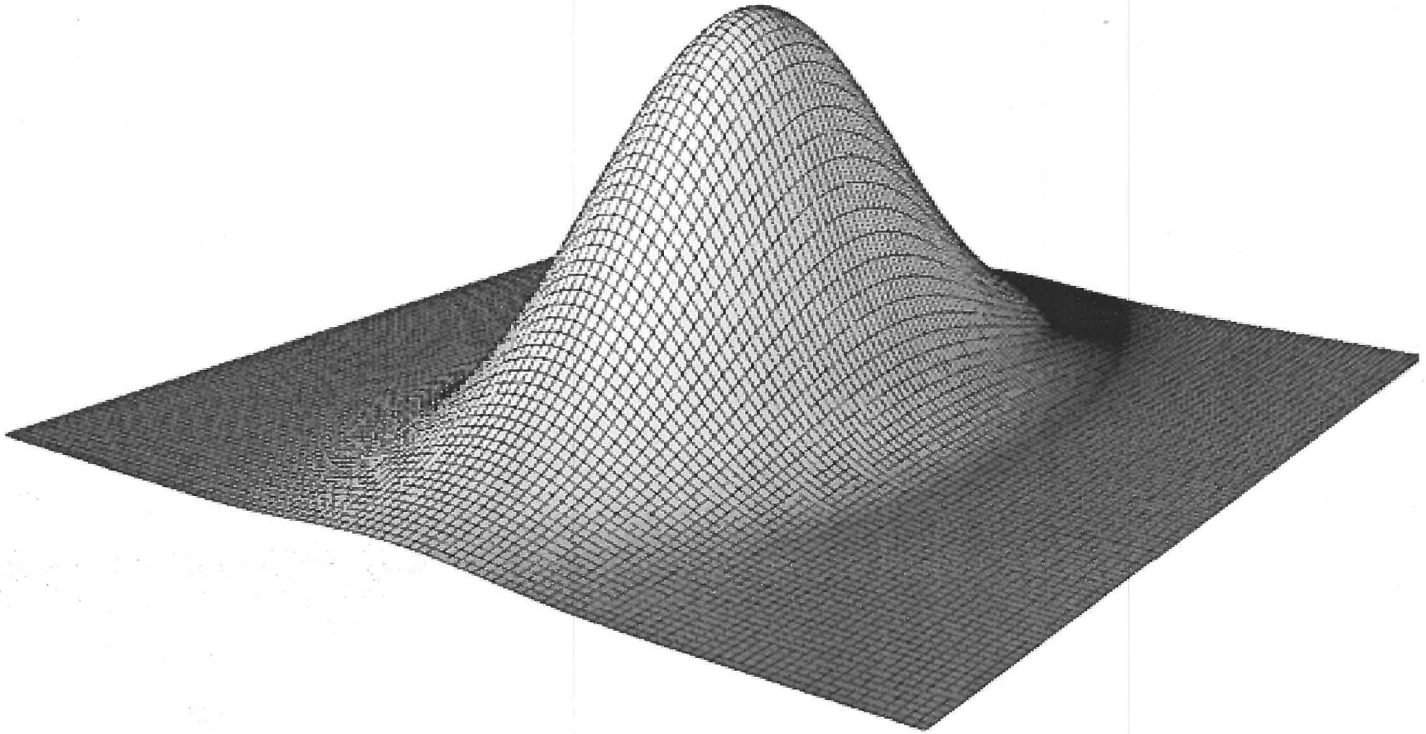






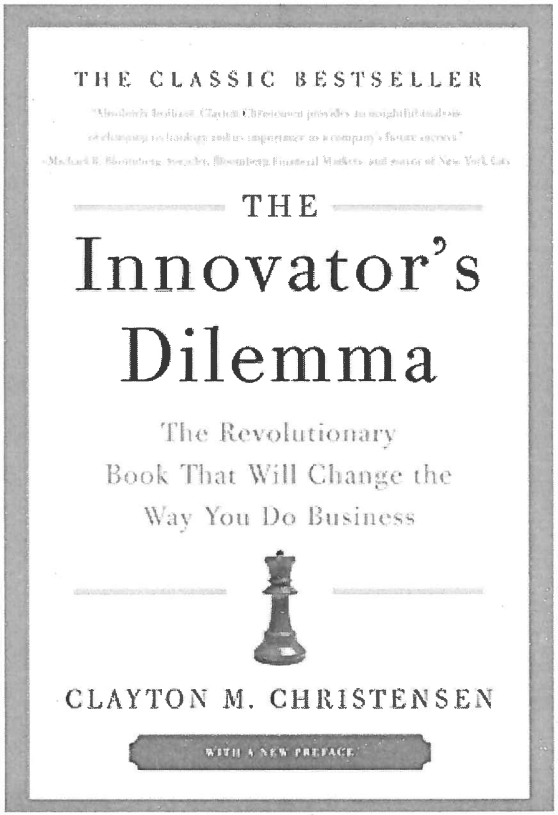
Multiple Intelligences

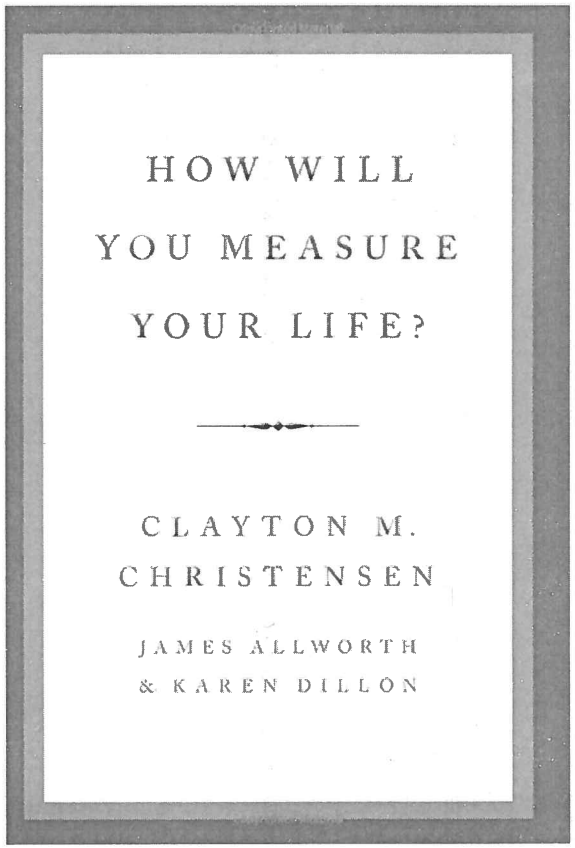
Multiple Intelligences Create a Three Dimensional Bell Shaped Curve

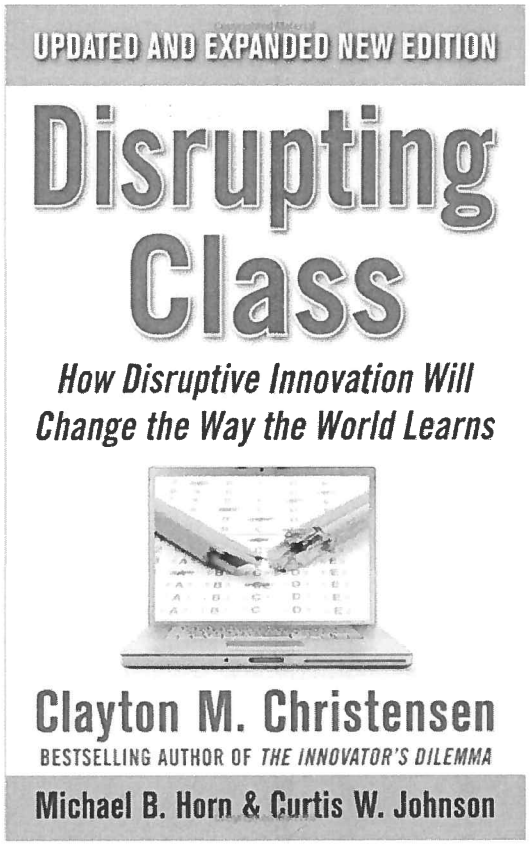


Why Is Transformative Change Resisted by Traditional School Systems?

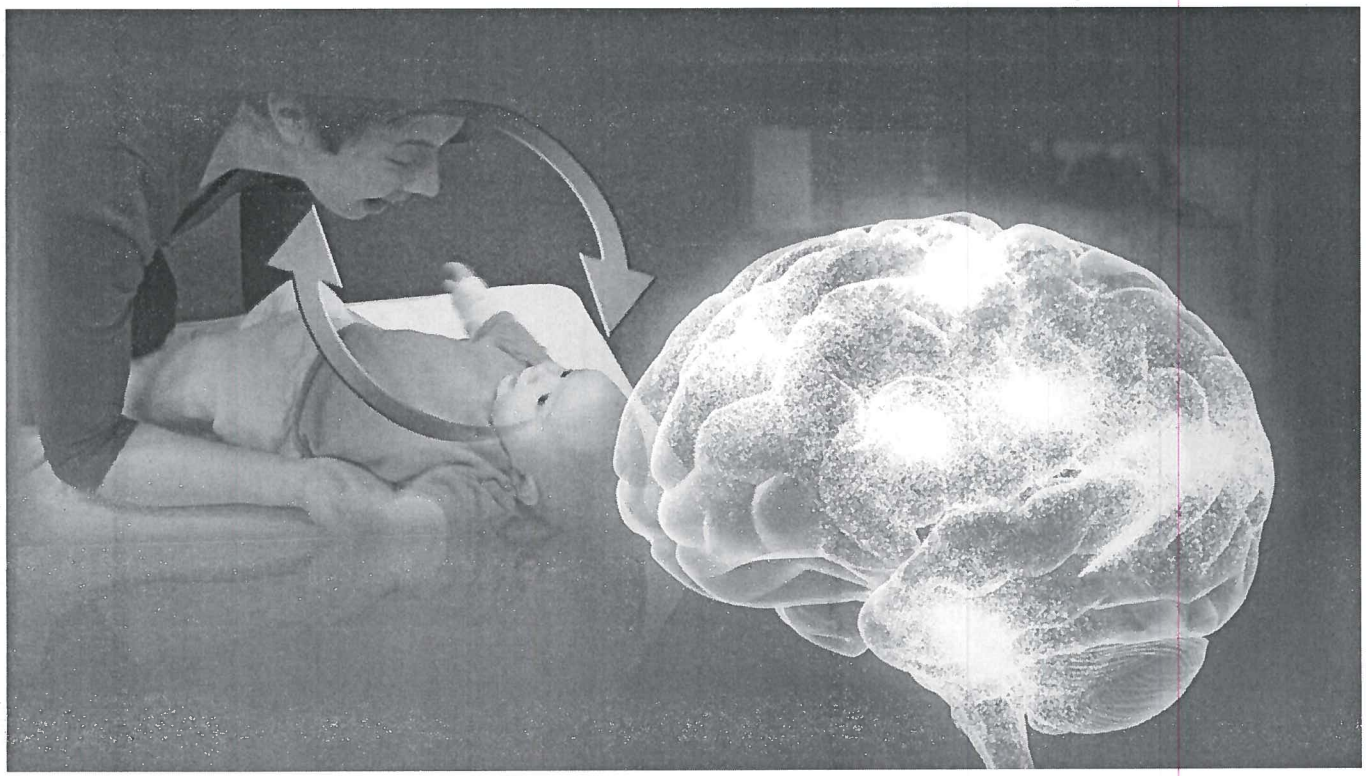
Transformative Change Is Always Resisted by Incumbent Providers

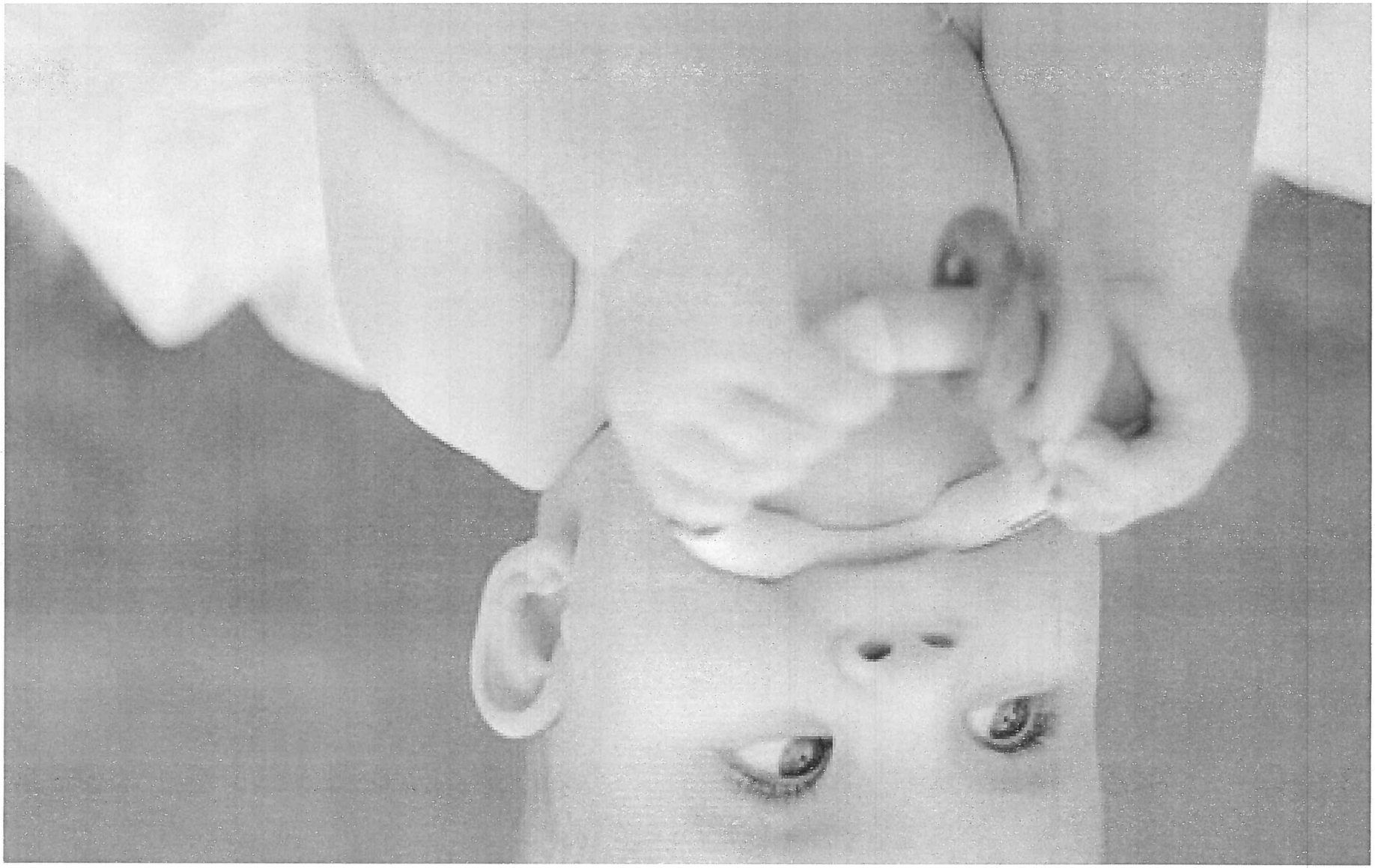






Serve and Return: Center on the Developing Child at Harvard University

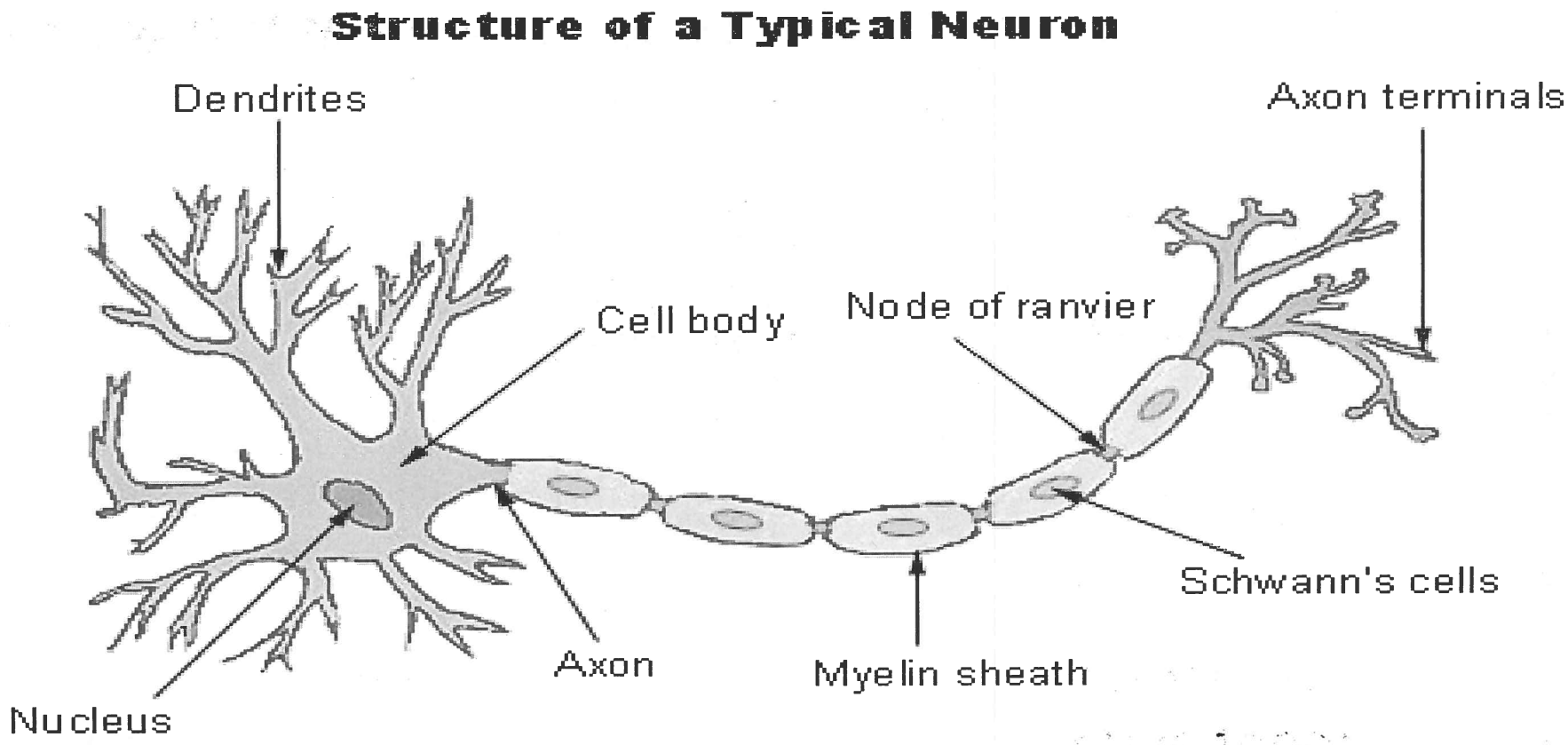




America's Achievement Gap is caused by our Engagement Gap

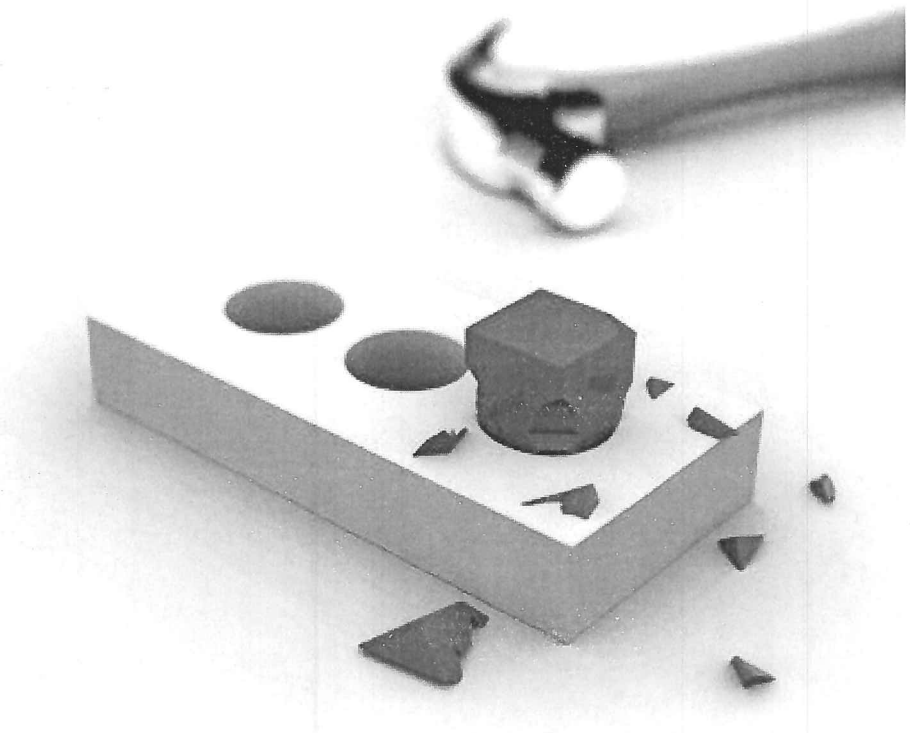
Dr. Martha Burns

- The Brain Science of Language, Reading, and Learning
- Human intelligence is formed as each attempt is followed by immediate interactive feedback.

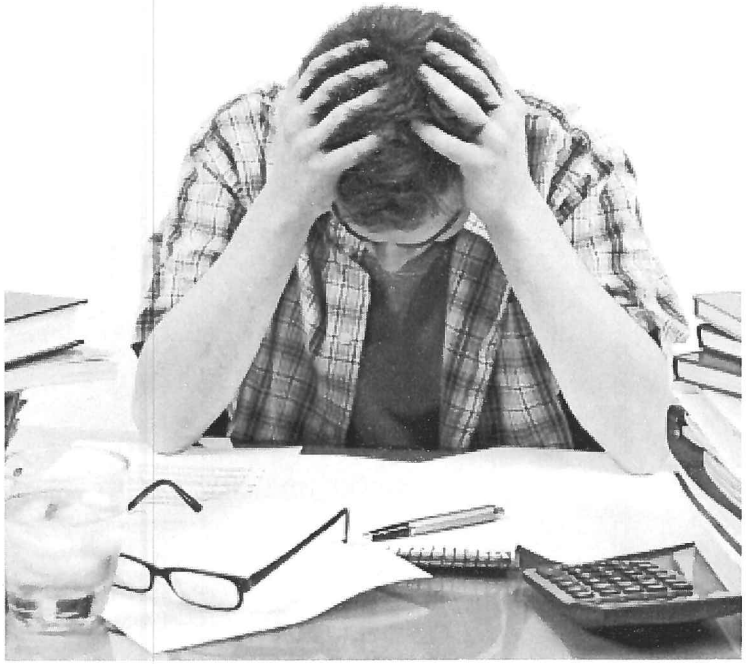


Human brain has 100 billion cells connected 10 trillion ways

Authentic Learning is NEVER Painful

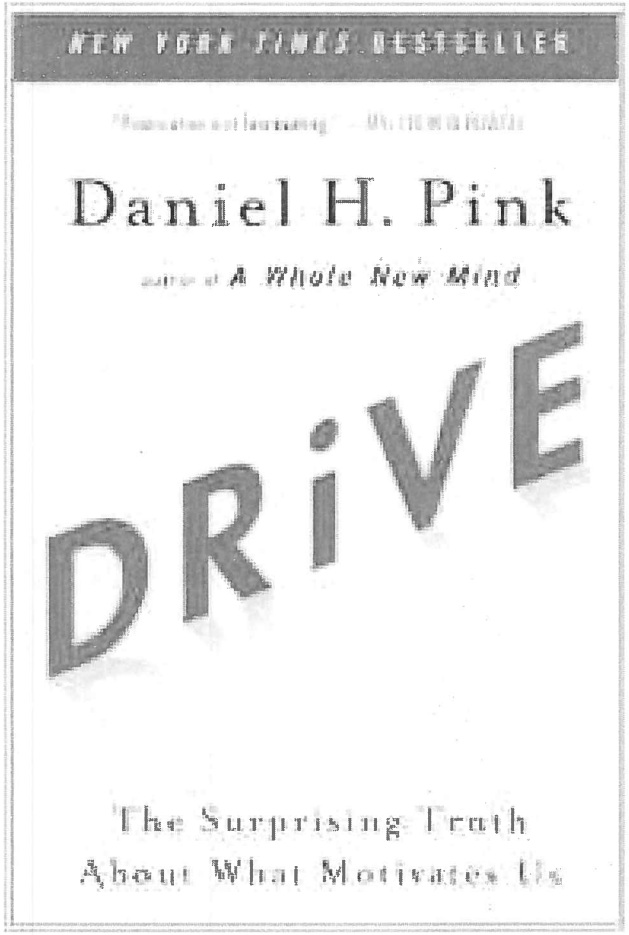


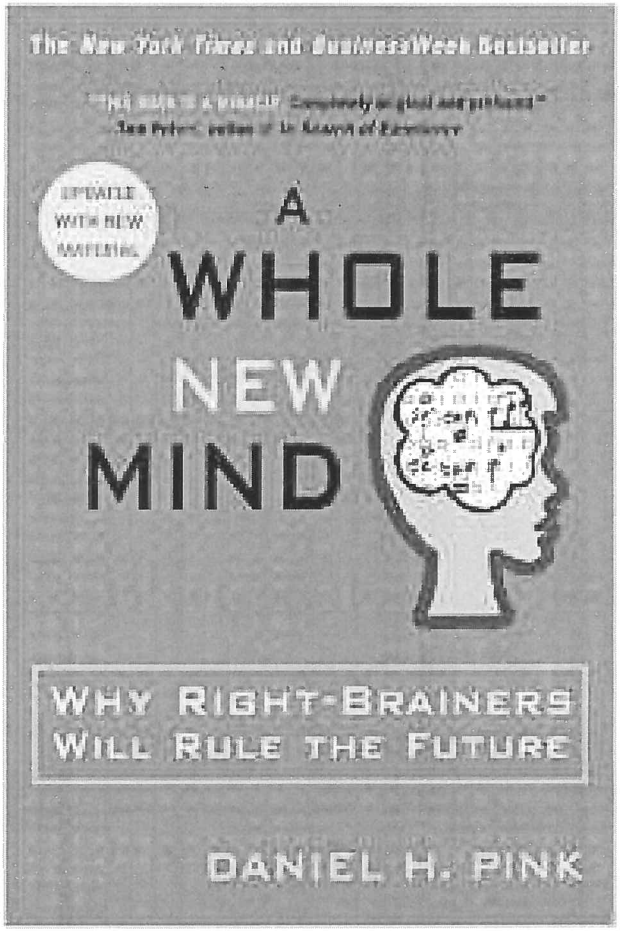
Do math students receive immediate feedback?



Forced Learning of Disassociated Concepts Inhibits the Brain's Natural Dopamine Production

Intrinsic vs. Extrinsic Motivators

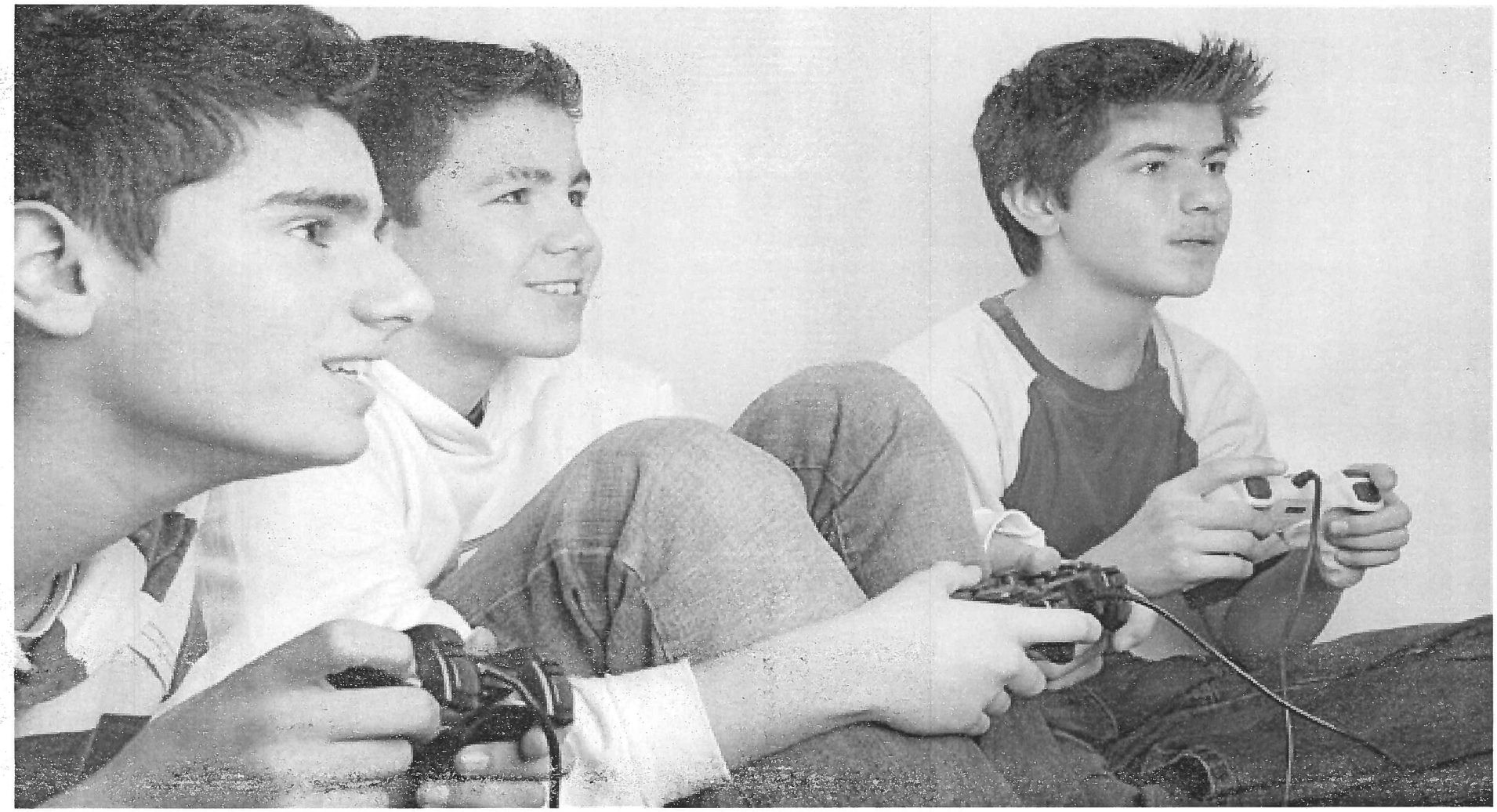




Forced Learning of Disassociated Concepts

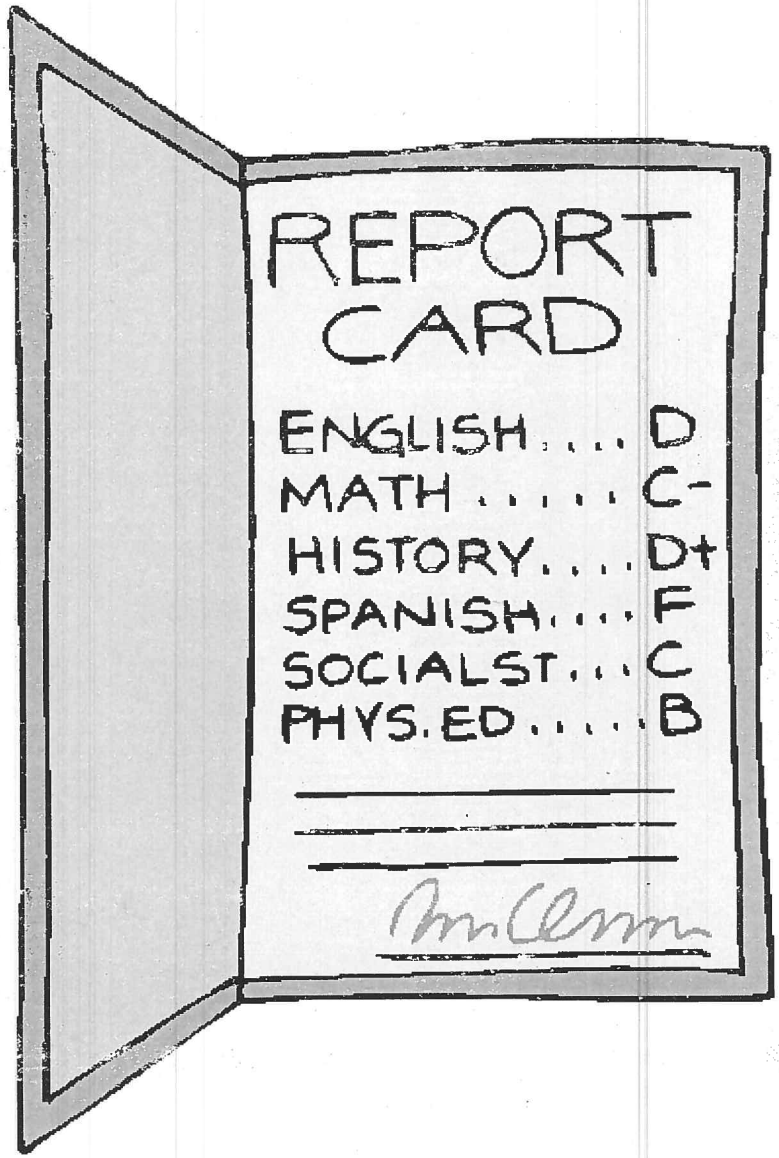
Inhibits the Brain's Natural Dopamine Production

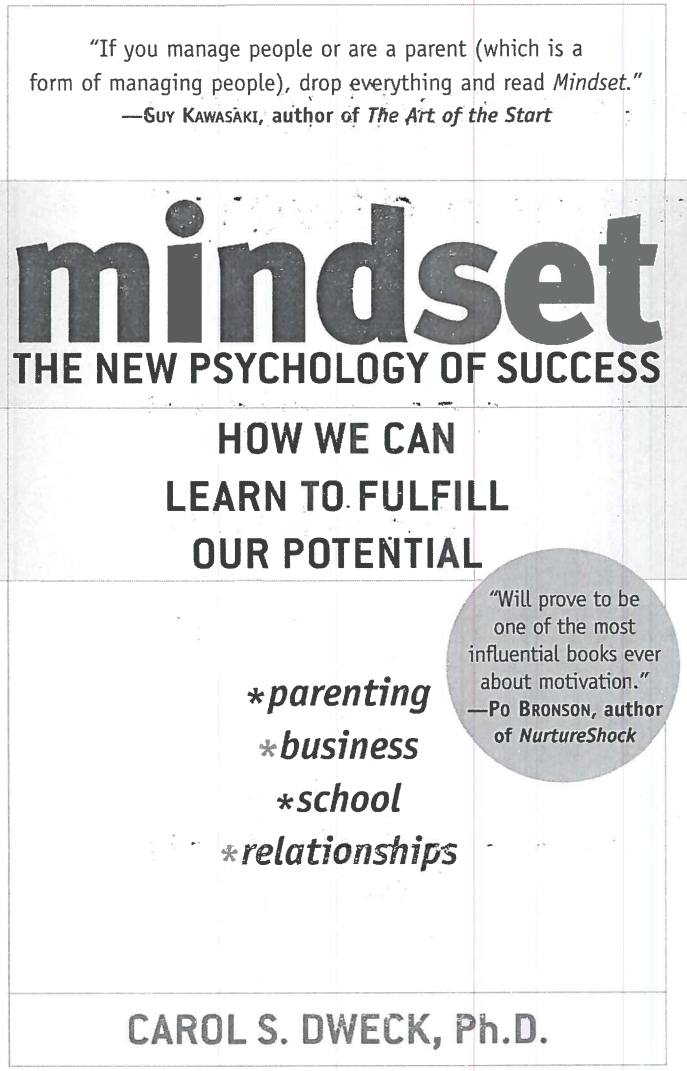
Use of Extrinsic Motivators Messes with the Brain's Natural, Intrinsic Reward System and Severely Limits Desired Outcomes. (Exception: Piecework)



Man's Search for Happiness

Man's Search for Dopamine


REPORT
CARD
ENGLISH.... D
MATH..... C-
HISTORY.... D+
SPANISH.... F
SOCIALST... C
PHYS.ED..... B



Carol Dweck researches "growth mindset" — the idea that we can grow our brain's capacity to learn and to solve problems. Are you not smart enough to solve it ... or have you just not solved it yet?

Historic Education:

Learning Just In Case

Today's Education:

Learning Just In Time

- Through Digital Learning tools

Types of Education Technology

Online Courses

PARENT COMMUNICATION SYSTEMS

Virtual Classroom

School Connectivity

Online Textbooks

CAIS

MOOCs

School Connectivity

Blended Learning

Khan Academy

Virtual Schools

Student/Home Connectivity

COMPUTER LABS

Teacher Collaboration Tools

Mobile Learning

Flipped Classrooms

Student Information Systems

Educational Apps

Gamification

LEARNING MANAGEMENT SYSTEMS

Bozeman Science

Online Wikis

Educational Software

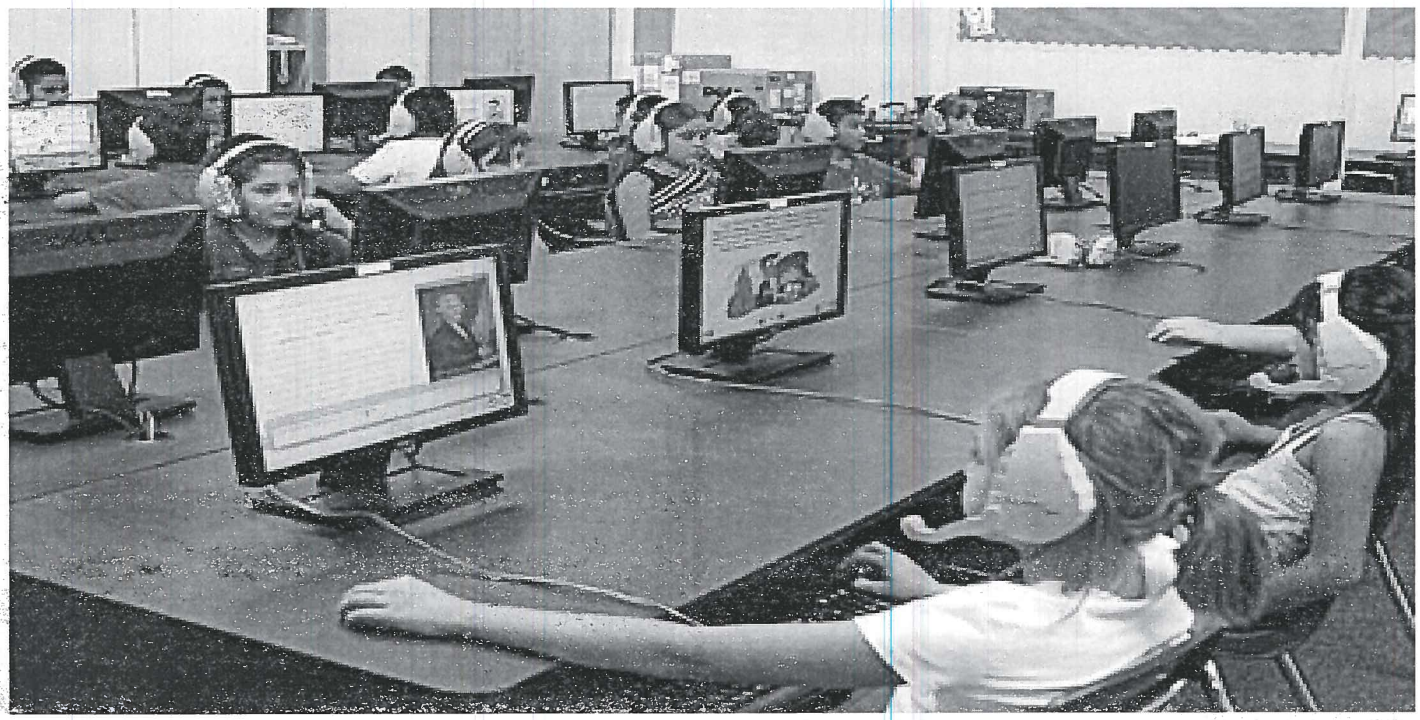
One-to-One Devices

CAIS

Computer-Assisted Instructional Software which
Delivers Immediate, Interactive, Adaptive Feedback
To Each Student Response

CAIS respects the learning style of *each* student and personalizes learning for *every* learner.

Skill building and content knowledge through individualized adaptive instruction



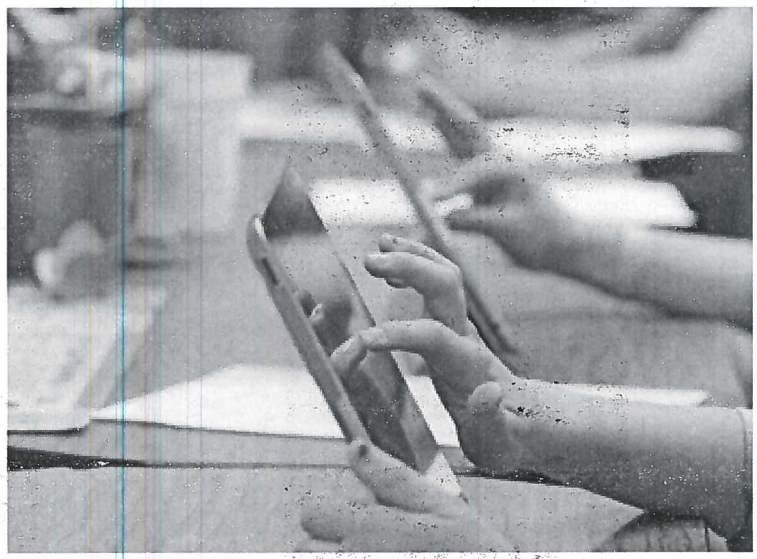
Screens In Schools Are a $60 Billion Hoax

Dr. Nicholas Kardaras Aug. 31, 2016

IDEAS *Dr. Kardaras is the author of the new book Glow Kids: How Screen Addiction is Hijacking Our Kids—and How to Break the Trance.*

It's a gold rush, not a flood of educational concern

As the dog days of summer wane, most parents are preparing to send their kids back to school. In years past, this has meant buying notebooks and pencils, perhaps even a new backpack. But over the past decade or so, the back-to-school



George Frey—Bloomberg/Getty Images

Second graders work on iPads as part of their classroom work in a Utah elementary school on Monday, May 20, 2013.

The Agenda

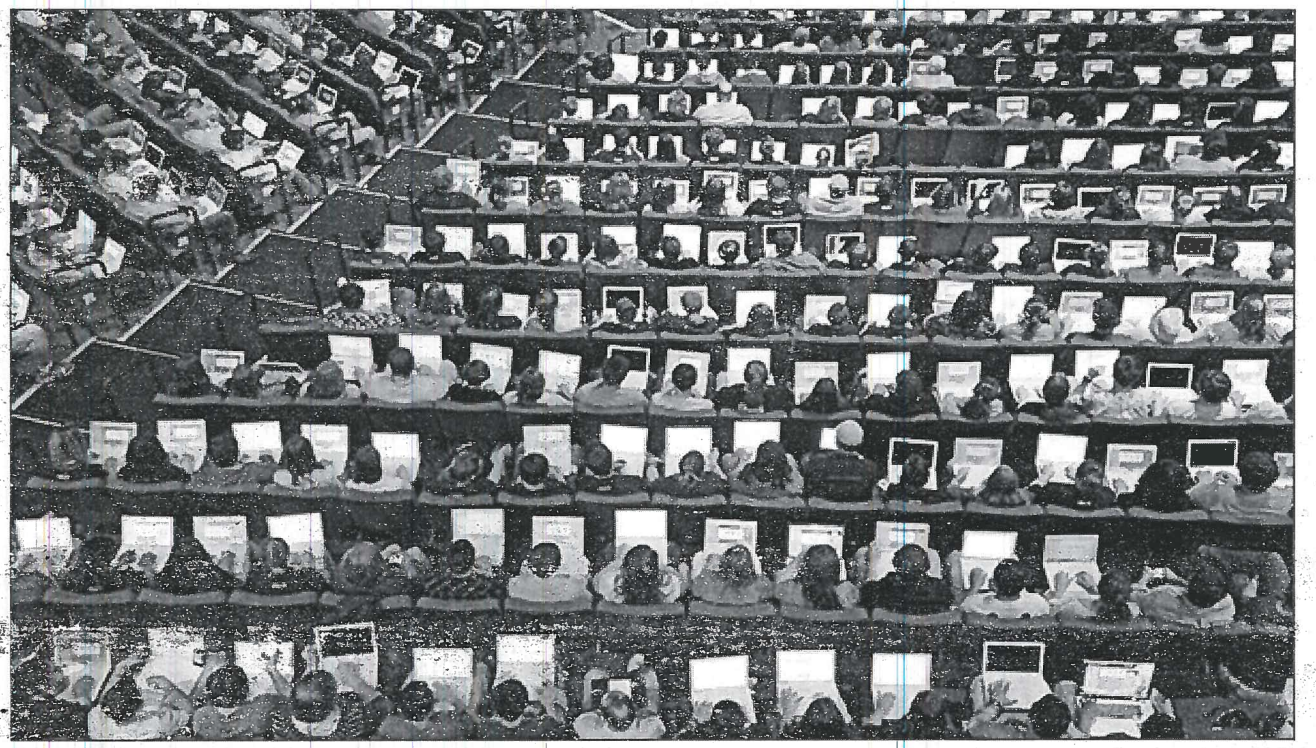
Obama's misguided plan to connect schools to the Internet

My new research shows that more Internet access funding doesn't help students. And almost all U.S. schools are already online.

By THOMAS HAZLETT | 08/23/16 09:27 AM EDT

September 6, 2016
EDUCATION WEEK
LOGIN | REGISTER | SUBSCRIBE

Maine 1-to-1 Computing Initiative Under Microscope



About 1,000 students participated in the 9th-annual Maine Learning Technology Initiative Student Conference at the University of Maine in Orono in 2013. They learned about digital game design and other computer skills.
—Gabor Degre/Bangor Daily News-File

By Benjamin Herold & Jason Kazi

Column

State-of-the-art education software often doesn't help students learn more, study finds

2 lessons from the most rigorous study to date of "adaptive-learning" courseware at colleges and universities

Education by the Numbers
Column by JILL BARSHAY

June 20, 2016

INFIDELITY

Lack of Focus/Vision/Leadership

Belief that it's about the device and connectivity

Insufficient Professional Development

Lack of Integration in the Instructional Model

Failure in Dose Rates – Frequency & Duration

Ignoring Prescriptive Teacher Interventions

95% of Computer Assisted Instructional Software not used with fidelity

Pre-K Program Comparisons

- Michigan's High Quality Bricks and Mortar Pre-K Program

  $7,000 per student

  - Marginal results without lasting effects

- Utah's UPSTART in-home computer software

  $700 per student

  - Significant and Lasting Results for Low-Income, Immigrant & Minority Students

Figure 8. Growth Rate Comparisons on the Brigance

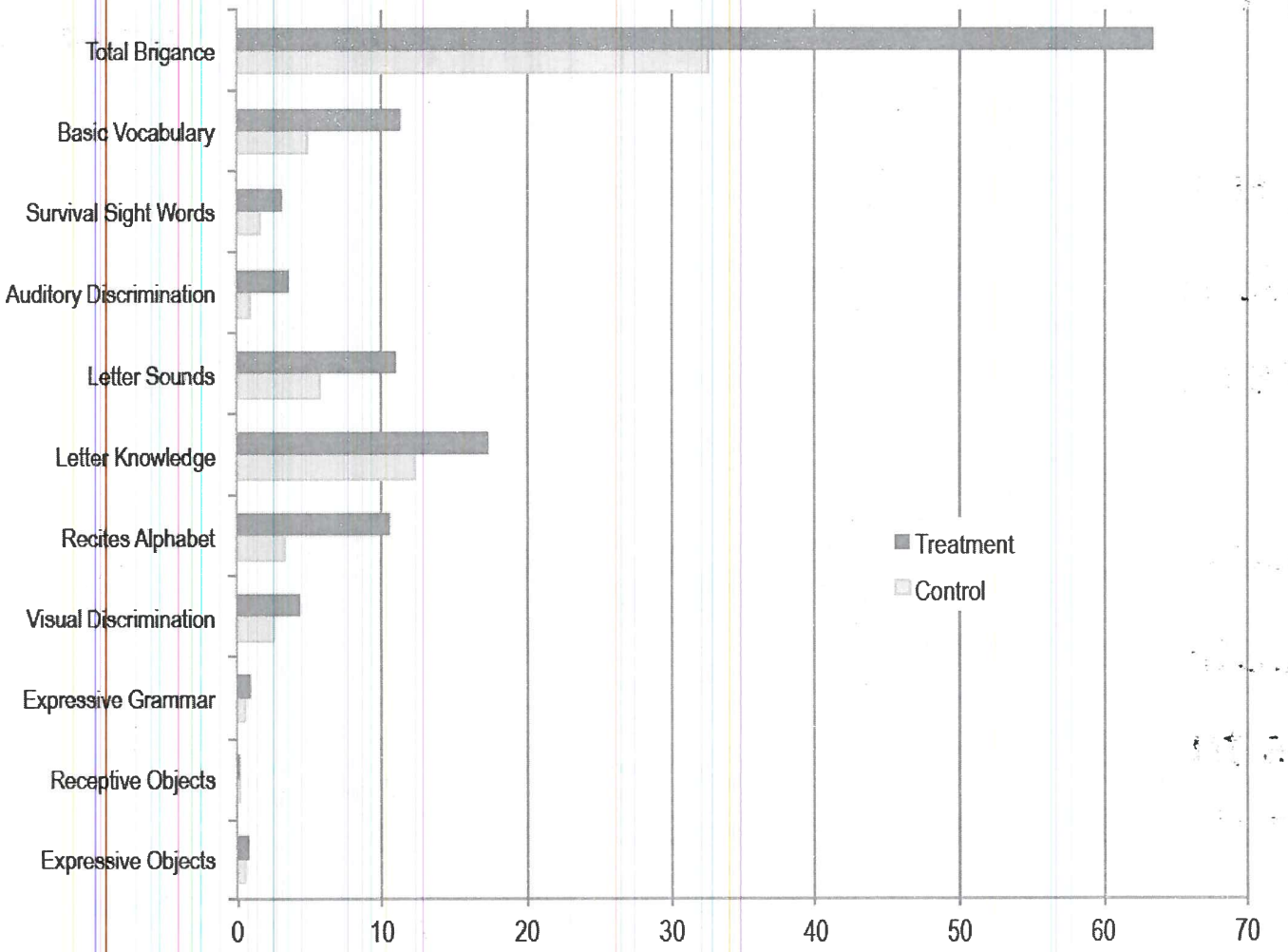
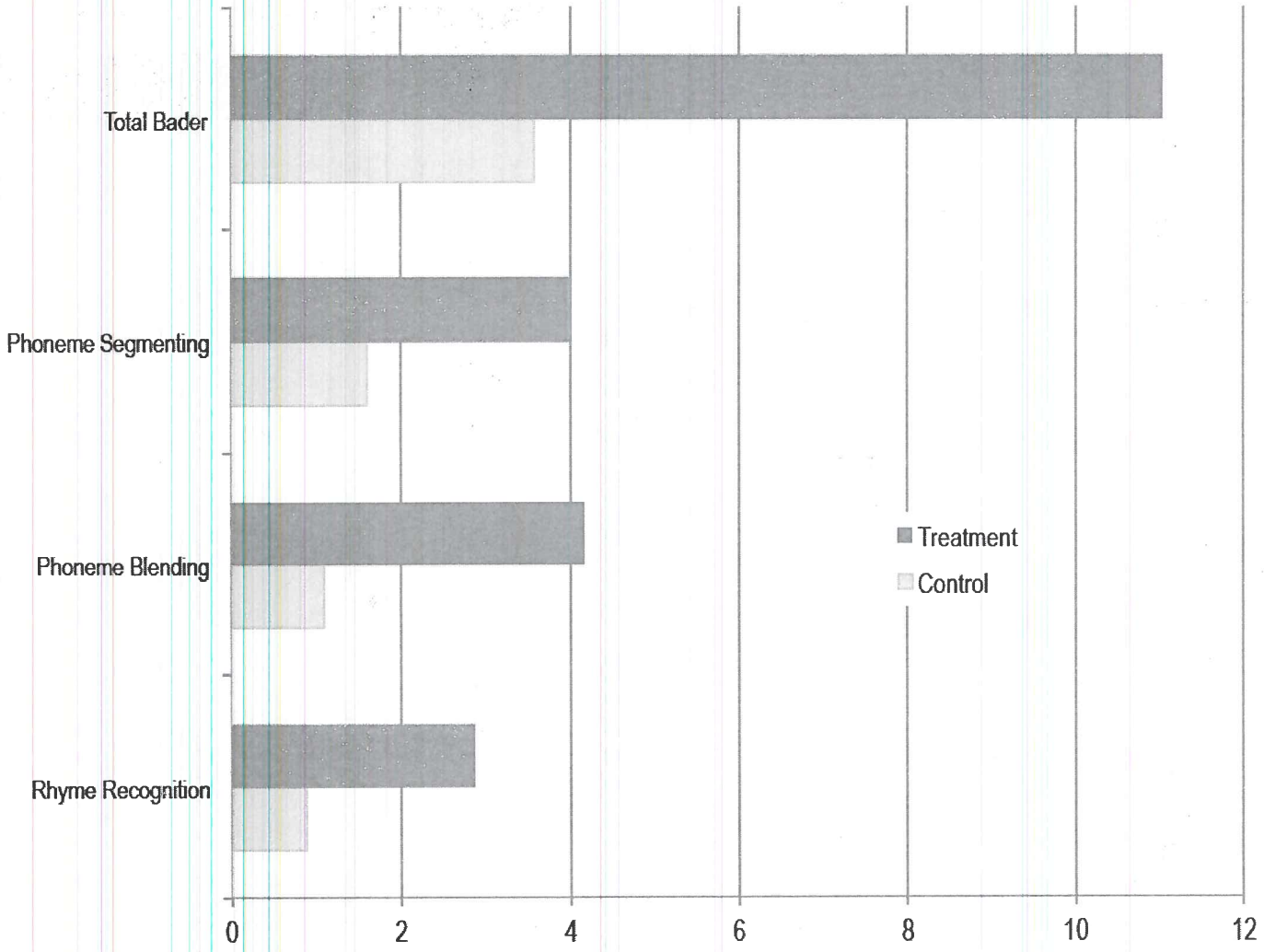
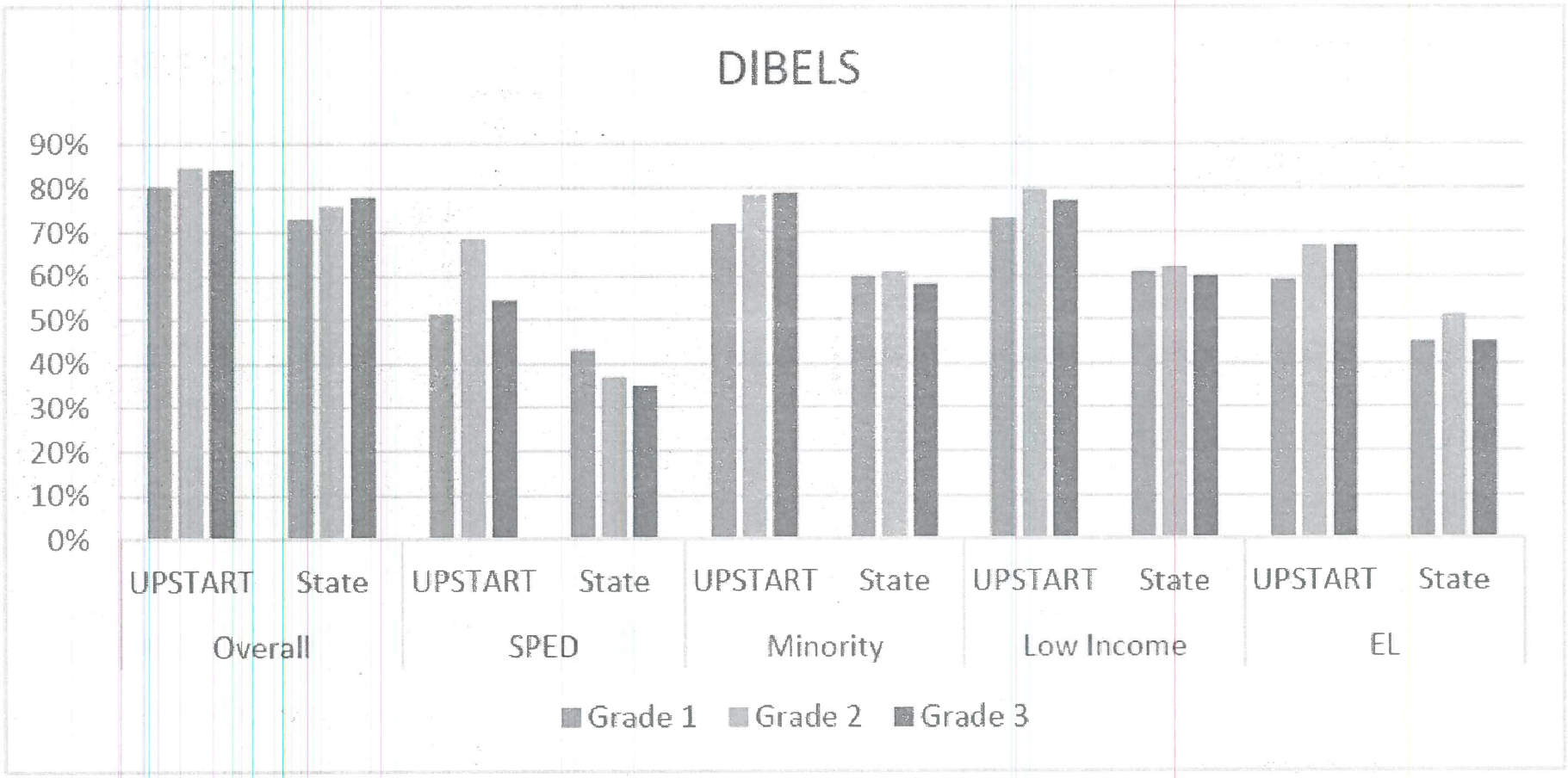
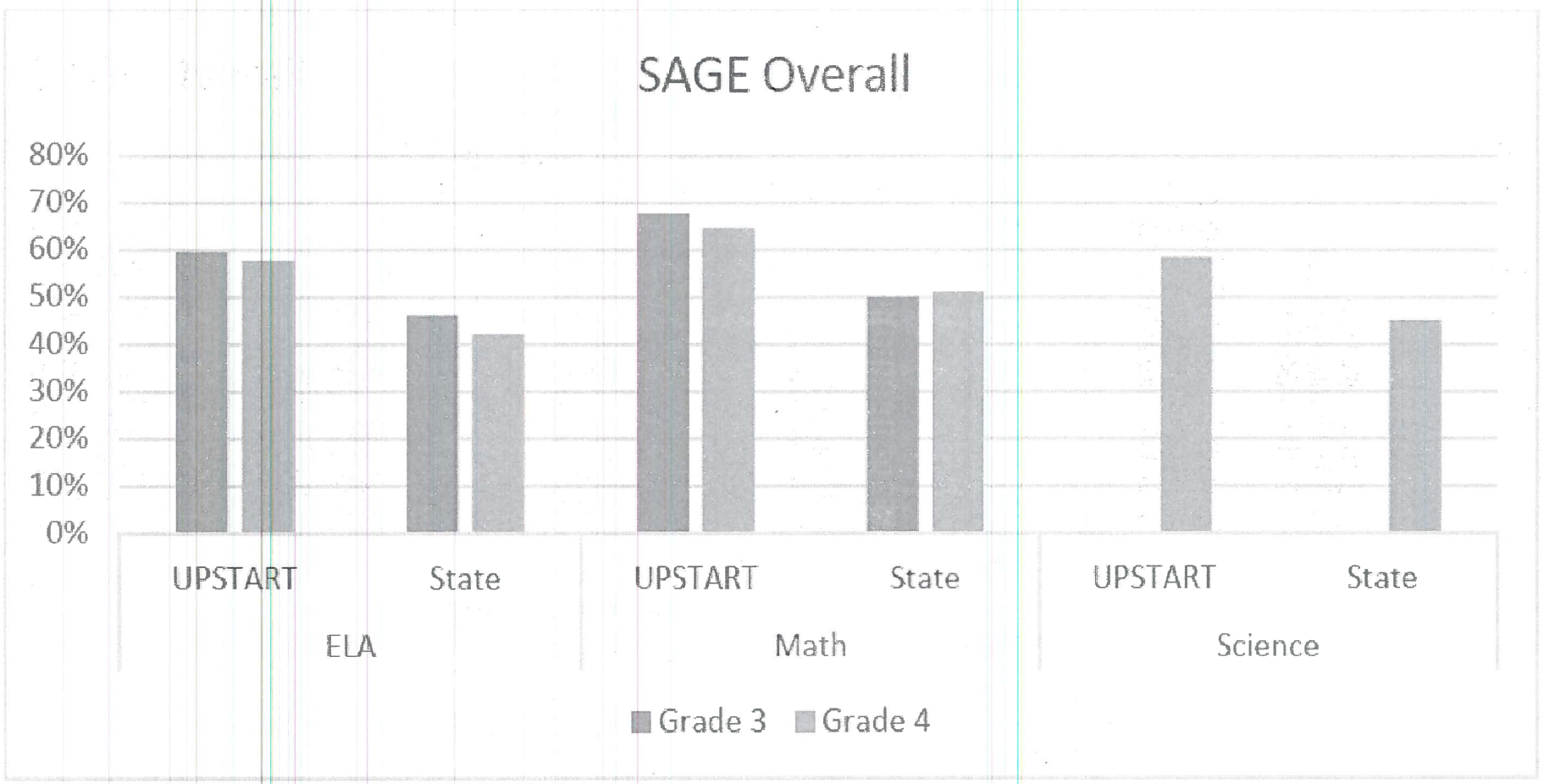


Figure 9. Growth Rate Comparisons on the Bader





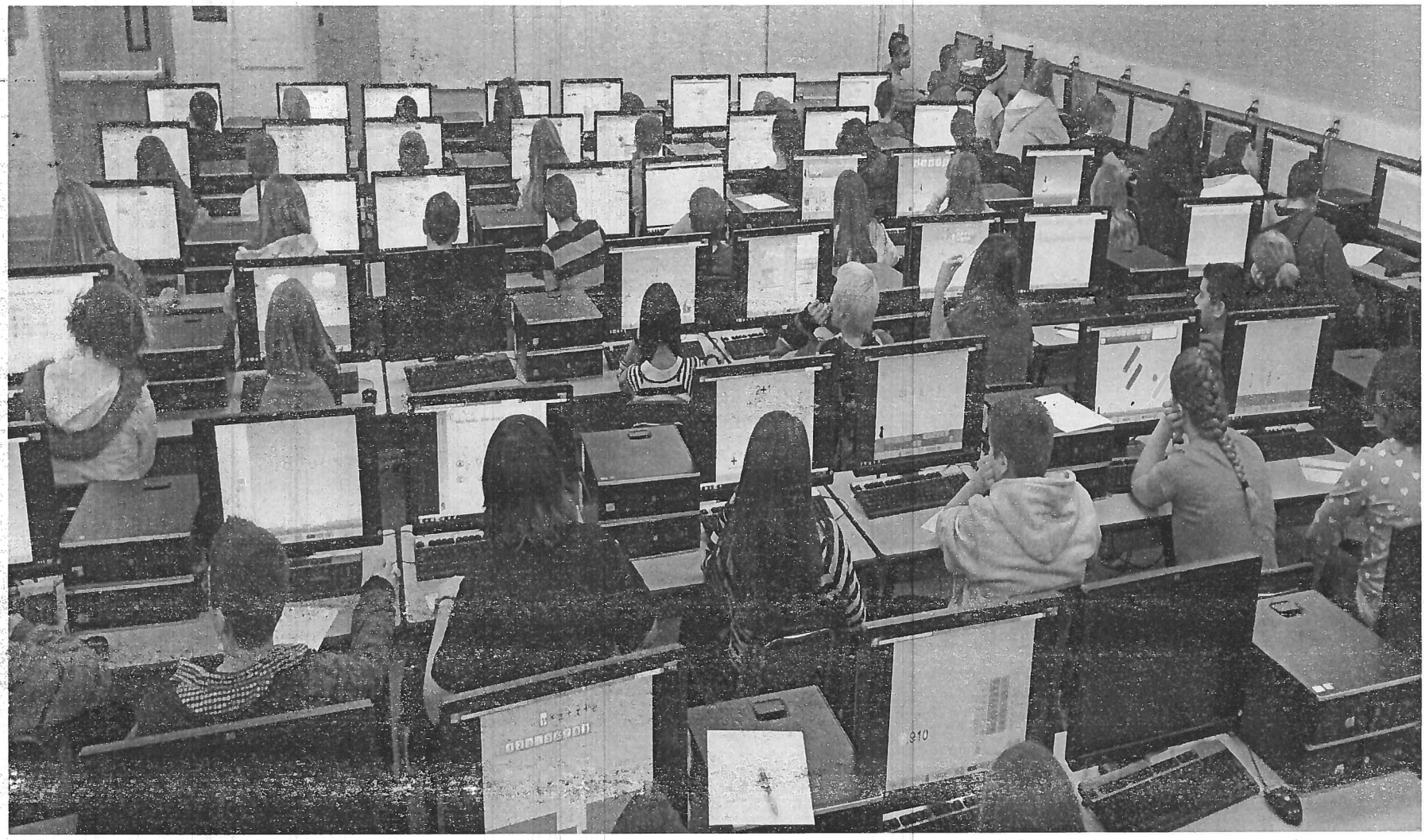
UPSTART Home-based Pre-K Longitudinal Effects
on DIBELS Scores - Grades 1, 2 & 3



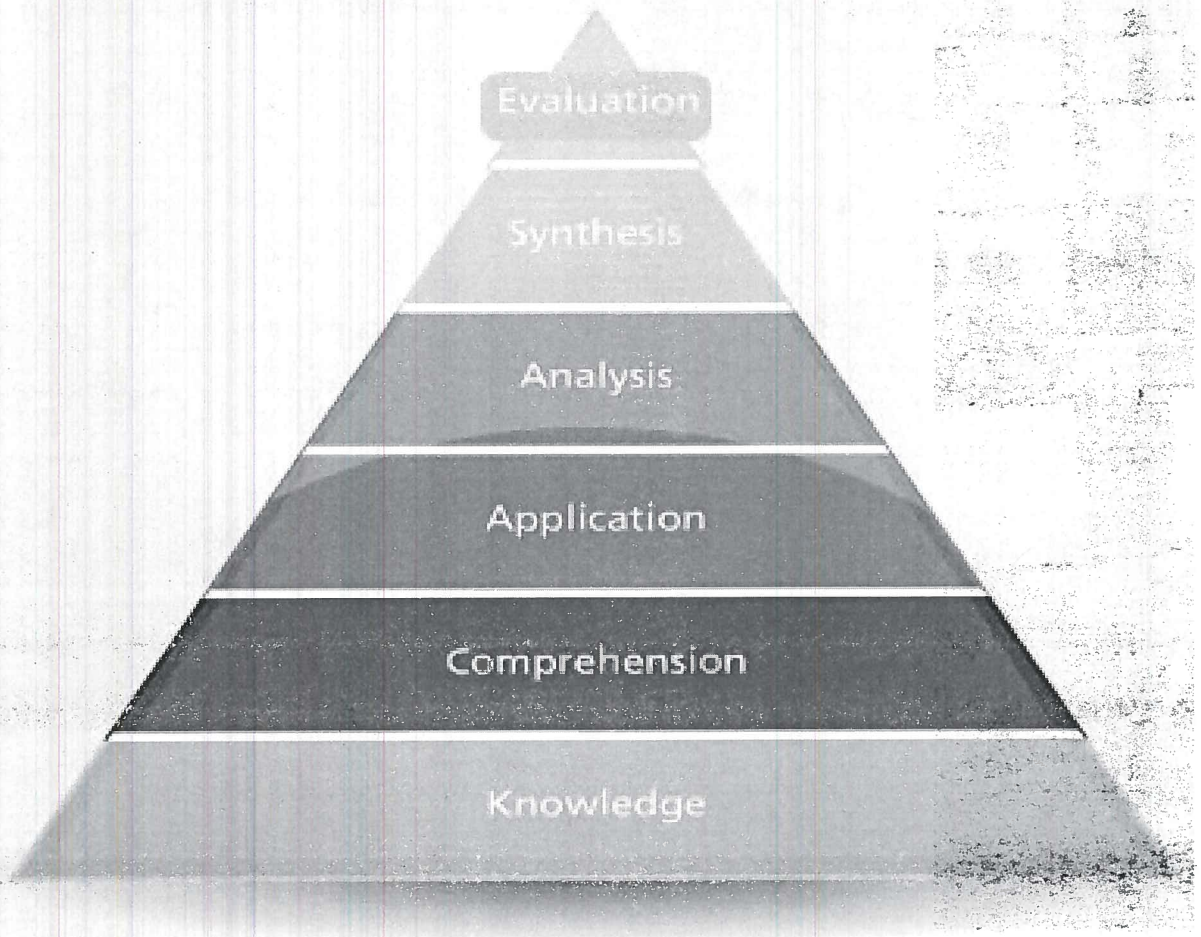
UPSTART Home-based Pre-K Longitudinal Effects
on State Assessments - Grades 3 & 4

350,000 Utah Students Are Receiving Daily Personalized Learning

- Pre-K UPSTART
- Early Intervention Reading
- ELL English Language Acquisition
- Elementary Math Software
- Secondary Math Software



Bloom's Taxonomy



Non-cognitive benefits of digital learning tools are as significant as cognitive benefits

- Self confidence
- Prevents Stigma of grouping students
- Sense of well-being
- Positive attitude towards school
- Less absenteeism
- Social and emotional growth

350,000 Utah Students Are Receiving Daily Personalized Learning

- Home-Based Pre-K
- Electronic DIBELS Assessment
- Early Intervention Reading Software
- ELL English Language Acquisition Software
- Elementary Math Software
- Secondary Math Software

Todd Rose

A 7th Grade Misfit from Hooper Utah

Copyrighted Material

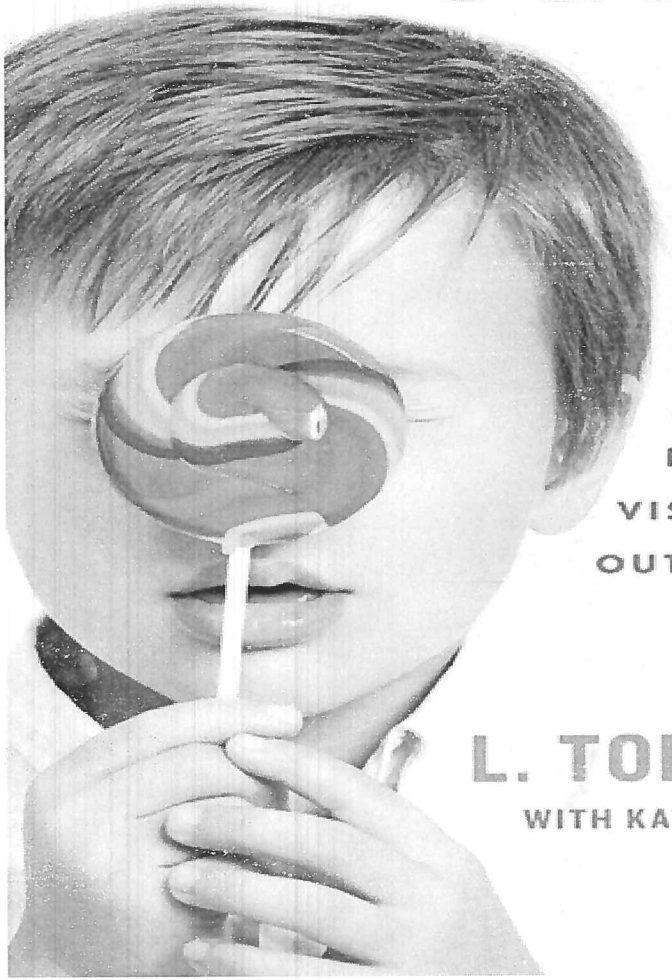
THE END OF AVERAGE

HOW WE SUCCEED
in a World That Values Sameness

TODD ROSE

Copyrighted Material

SQUARE PEG

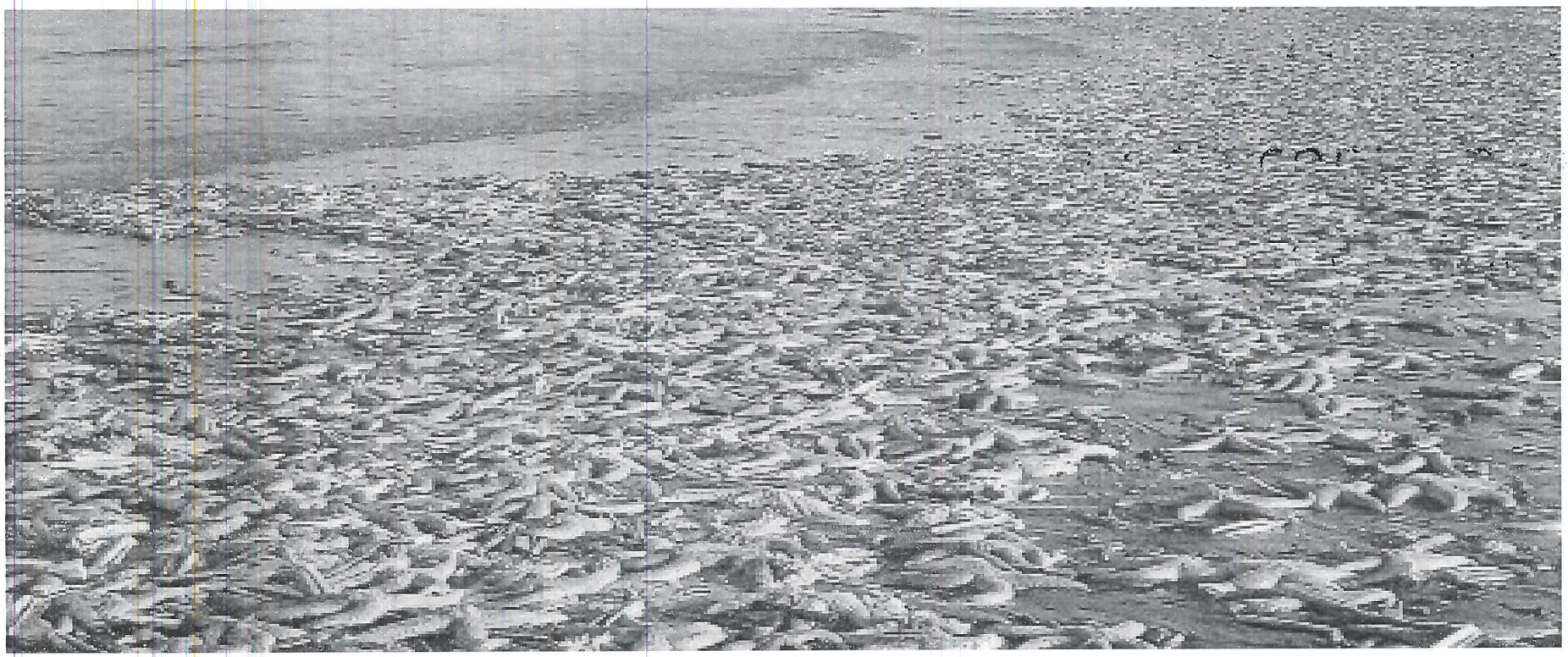


MY STORY AND WHAT IT MEANS FOR RAISING INNOVATORS, VISIONARIES, & OUT-OF-THE-BOX THINKERS

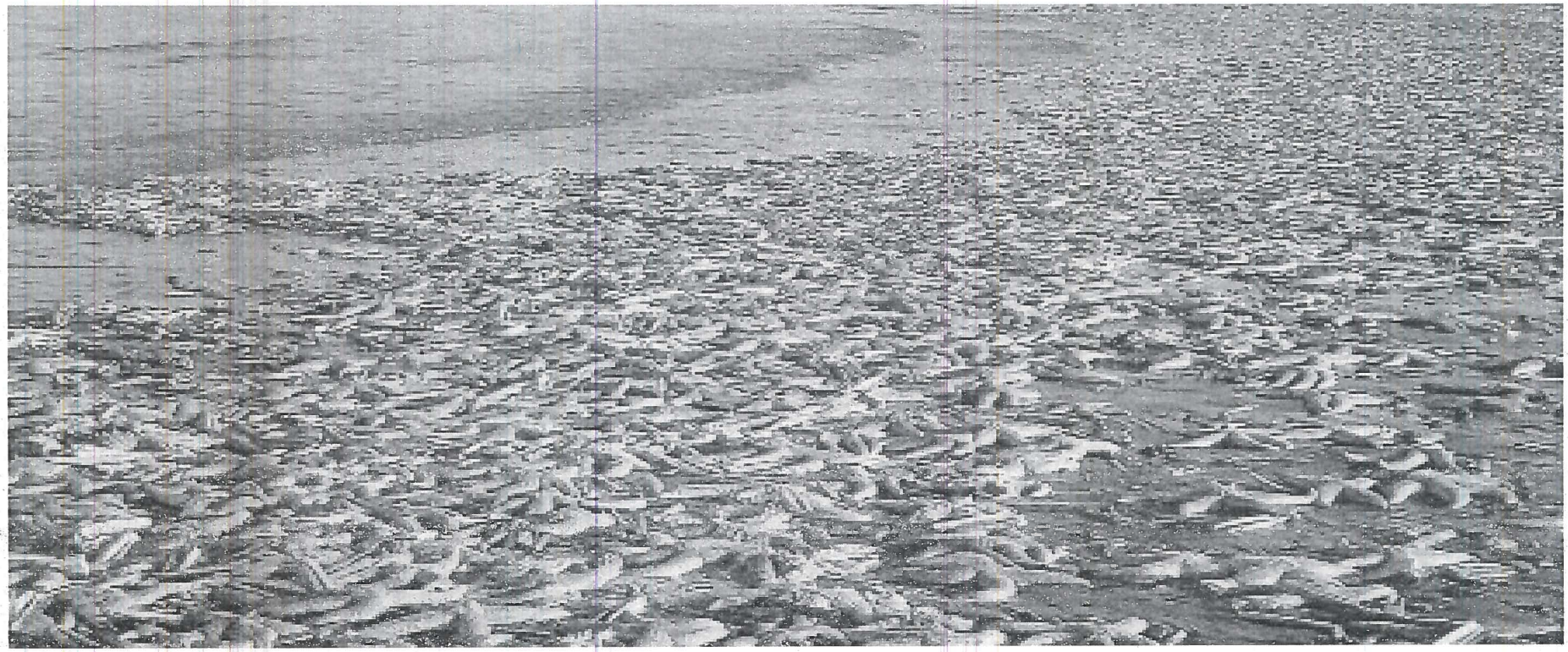
L. TODD ROSE
WITH KATHERINE ELLISON

Todd's story has a happy ending, unlike millions of other misfits forced painfully to conform to normative education

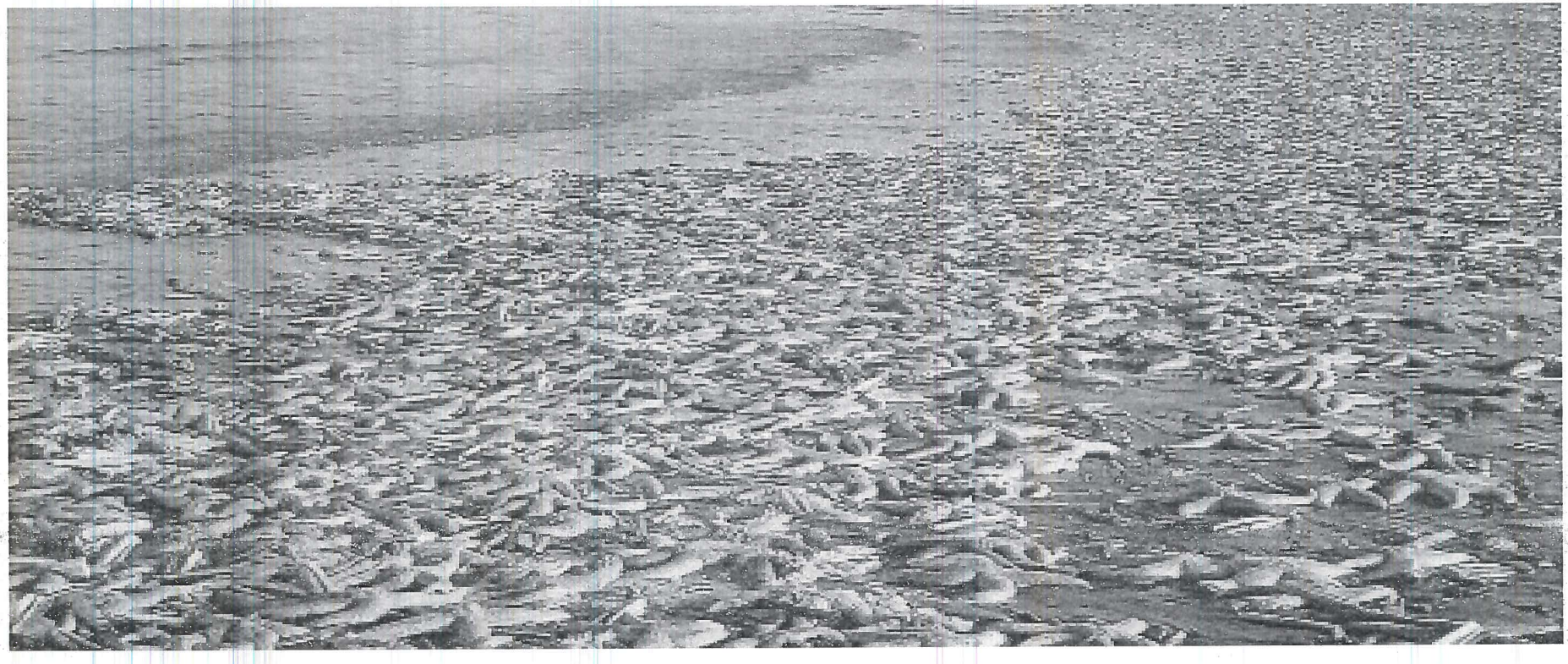
Story of the Starfish Thrower



Starfish allegory in education admits that millions will be left behind



Through Personalized Learning, we can re-immerse all students in an environment where they can thrive



Let's Restore Students
As Autonomous,
Self Directed Learners
through
Personalized Learning which is
Immediate, Interactive, and Adaptive