

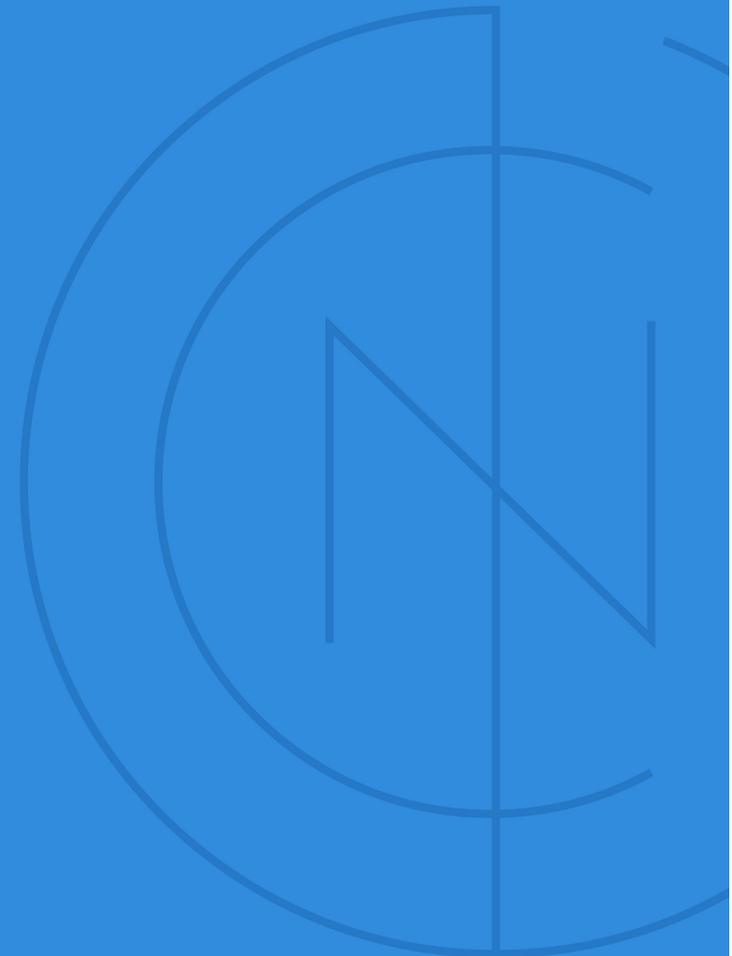


REDESIGNING MONTANA'S EDUCATION SYSTEM FOR A CHANGING GLOBAL ECONOMY

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Why Do We Have the System We Have?

The current education system has its roots in the turn of the century – The 20th Century!



Prepared workers for a burgeoning assembly line factory model



Assimilated immigrants into American culture



Provided widespread basic literacy and numeracy



Critical thinking necessary for only a select percentage



Leveraged lessons from across Europe



How Has the Current System Performed?

Actually, quite well...for a long period of time

 For almost a century, the U.S. led the world in education attainment and quality

 Drove the biggest economy in the history of the world to ever new heights

 Fostered an explosion of the middle class

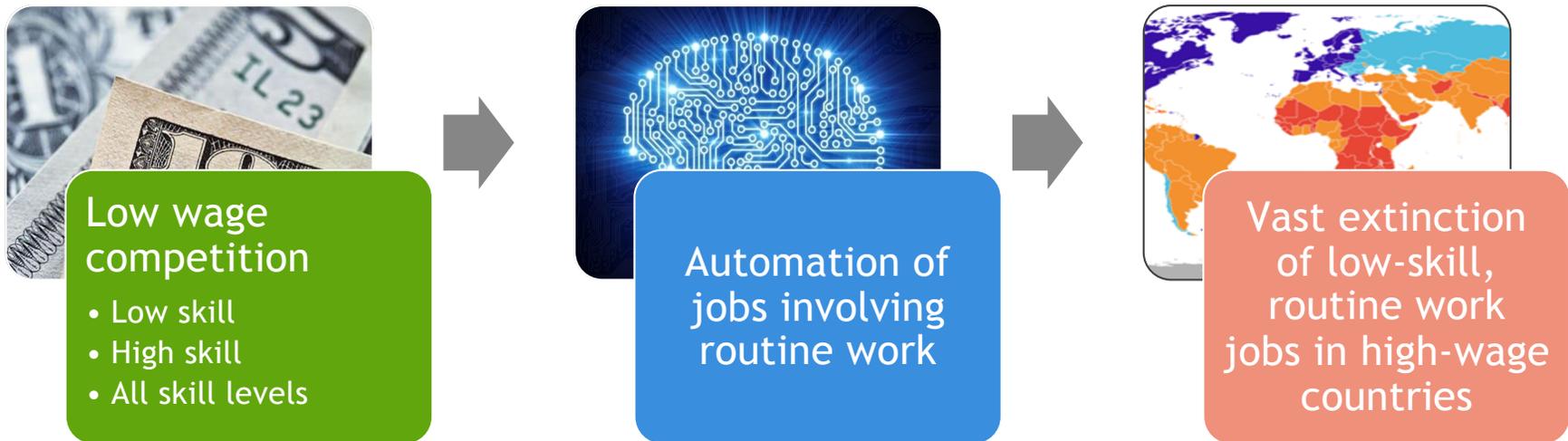
 Backbone of a stable democracy

 Production engine that helped win 2 world wars



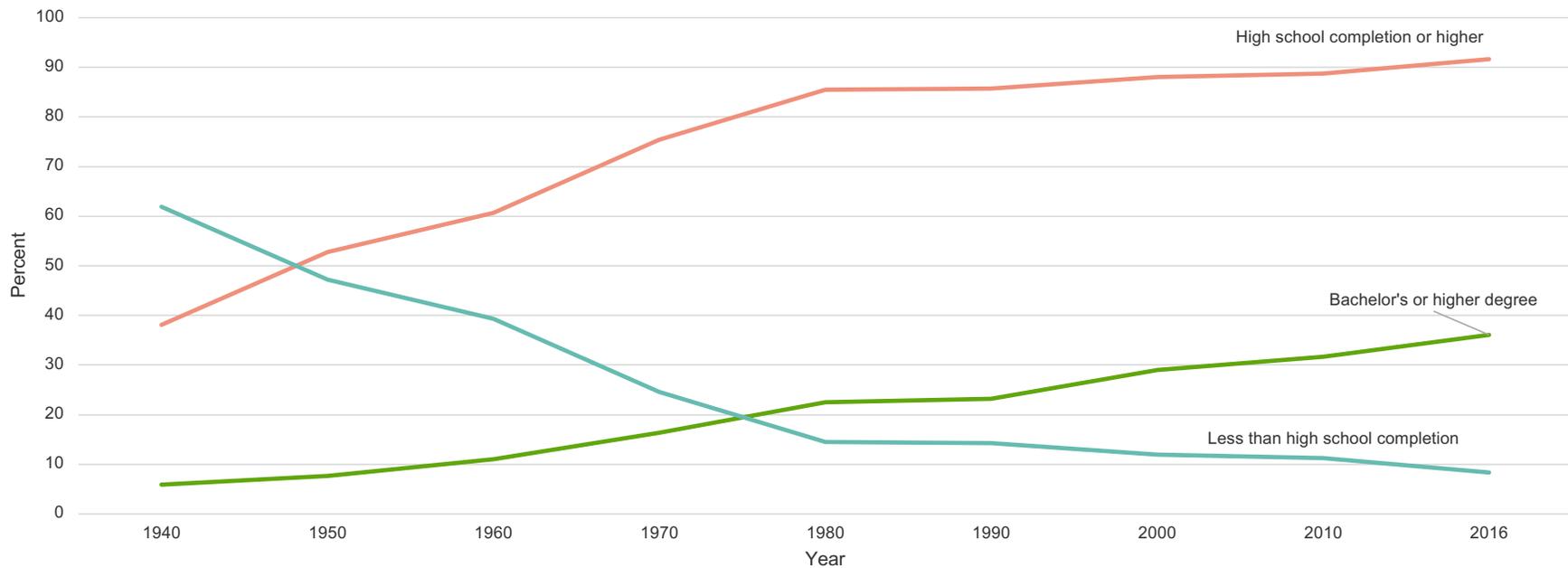
80's, 90's and 00's: Global Economic Change

So what happened?

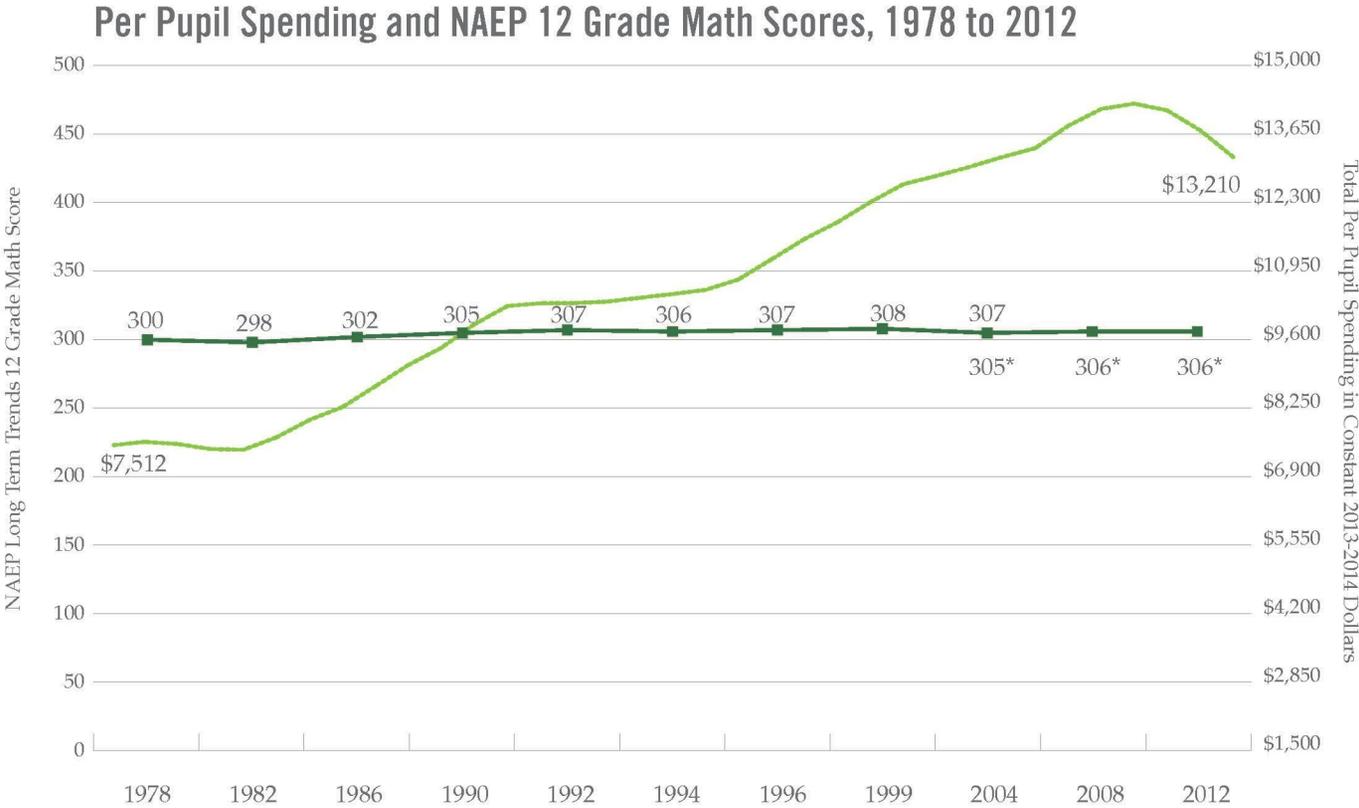


Attainment: The Last 70+ Years

Percentage of persons 25 through 29 years old, by highest level of educational attainment: Selected years 1940-2016



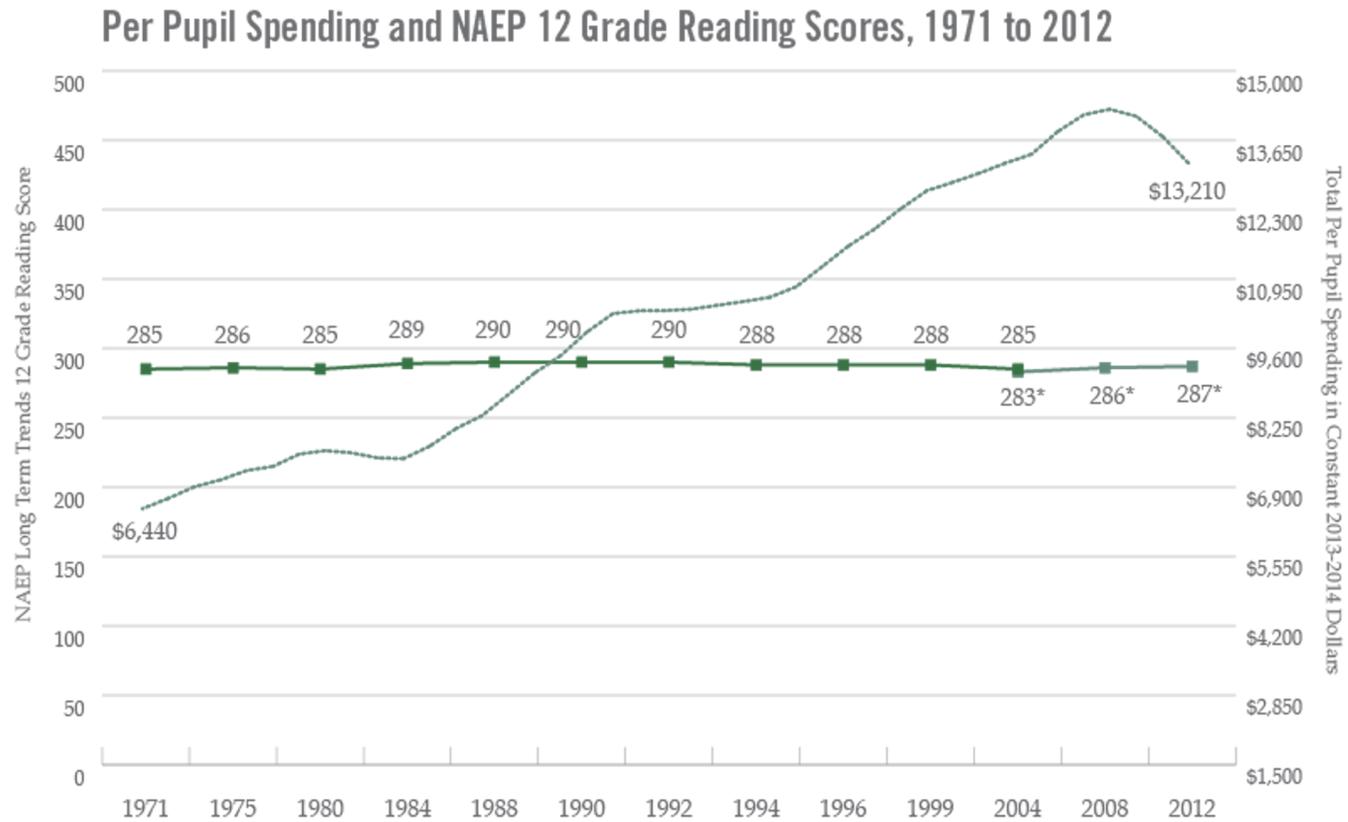
What We Spent, What We Got for It



*Revised assessment format
 Sources: The Nation's Report Card "NAEP 2012 Long-Term Trends in Academic Progress"; NCES Digest of Education Statistics 2014



What We Spent; What We Got For It



*Revised assessment format

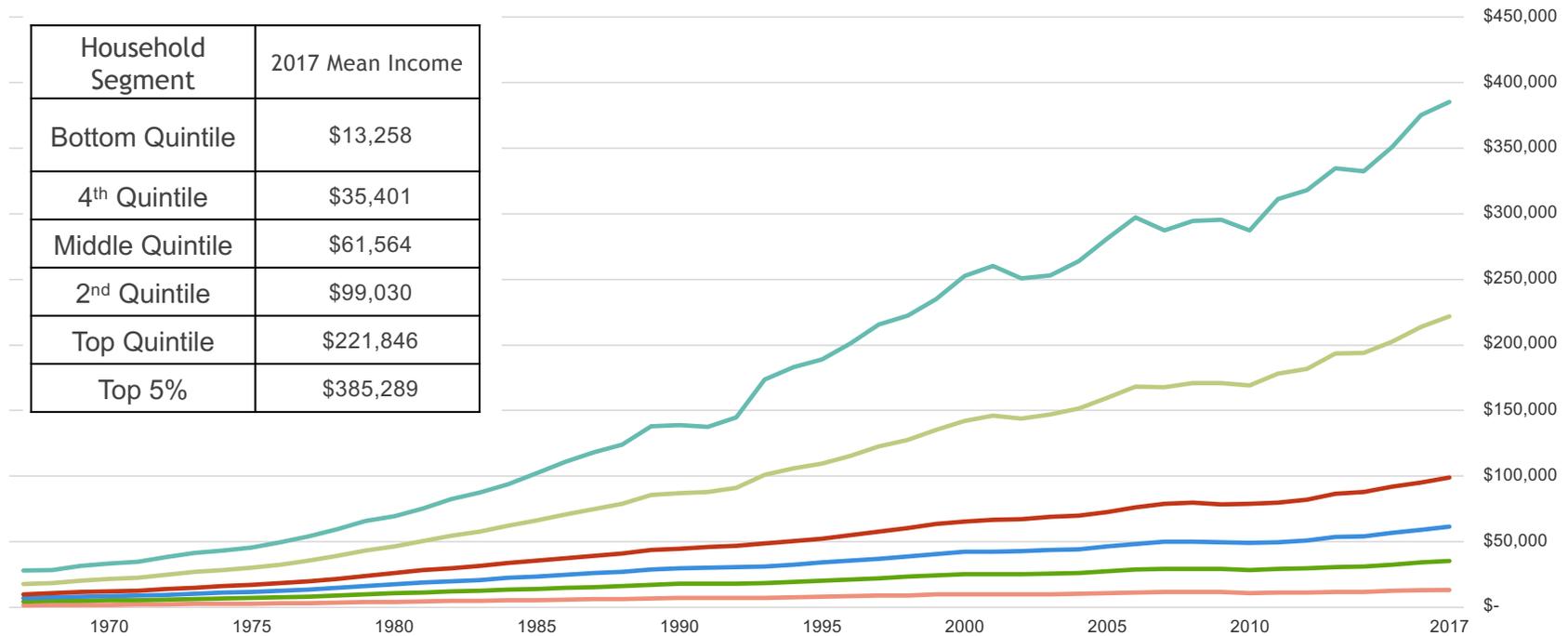
Sources: The Nation's Report Card "NAEP 2012 Long-Term Trends in Academic Progress"; NCES Digest of Education Statistics 2014



Income Distribution: The Last Half Century

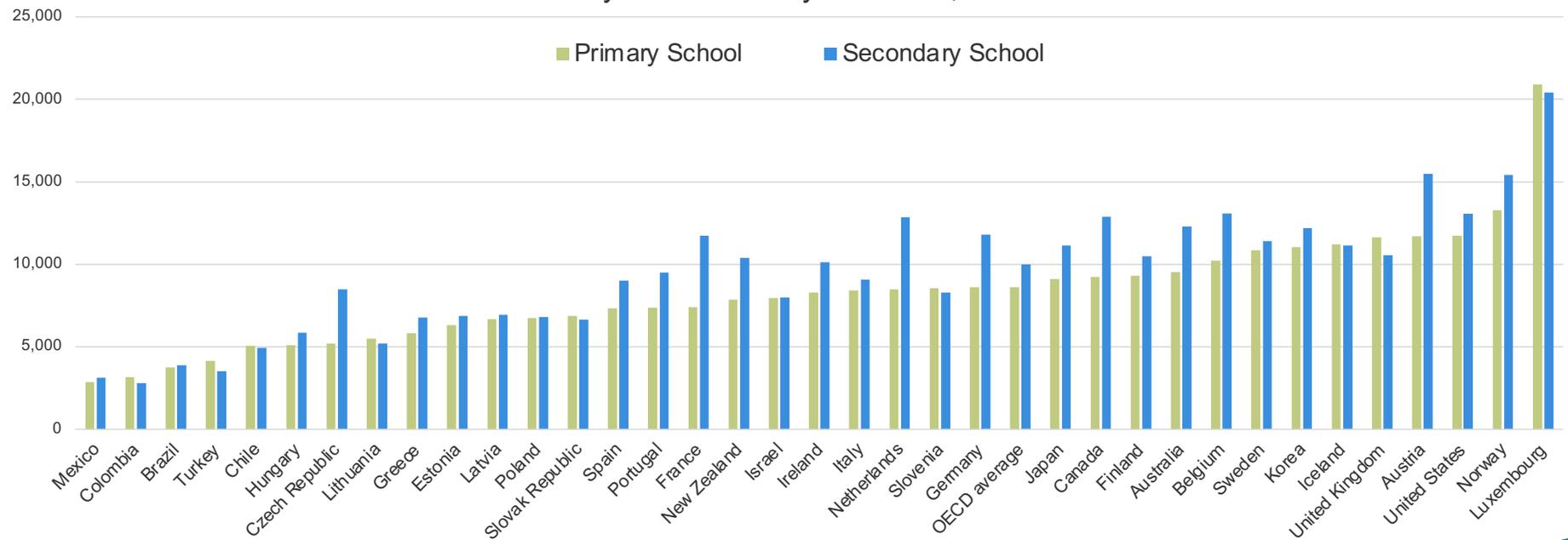
Mean (Average) Household Income by Quintile and Top 5%

Household Segment	2017 Mean Income
Bottom Quintile	\$13,258
4 th Quintile	\$35,401
Middle Quintile	\$61,564
2 nd Quintile	\$99,030
Top Quintile	\$221,846
Top 5%	\$385,289



Spending Per Student

Per Pupil Expenditure by Country, 2015
Primary and Secondary Education, All Services

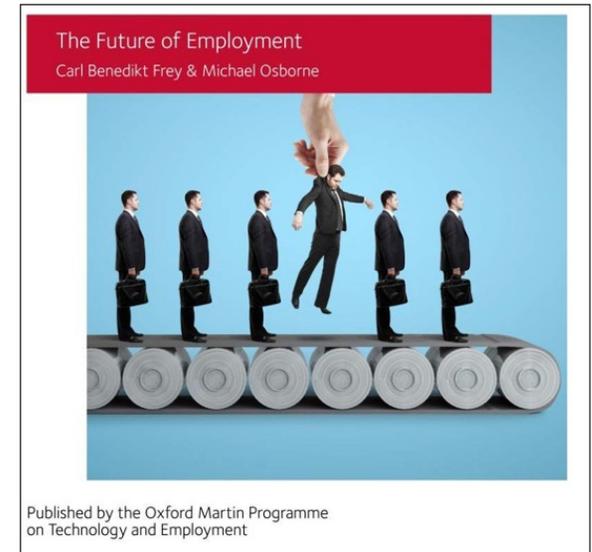
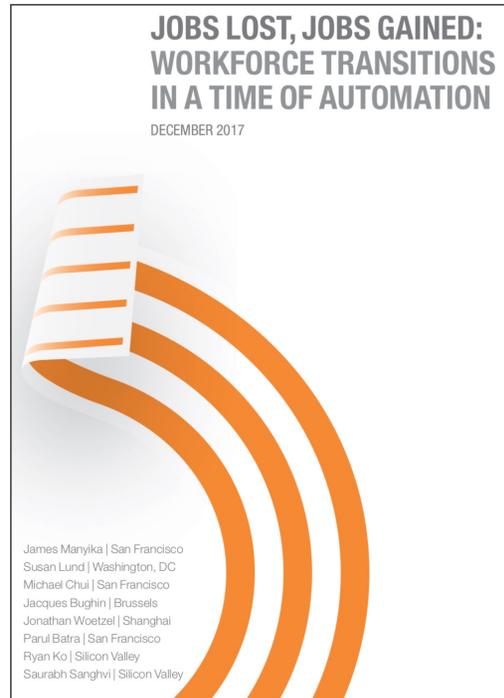


Source: OECD Education at a Glance, 2018



Milestones

2013, Frey and Osborne conclude that 47% of U.S. jobs could be automated with existing equipment

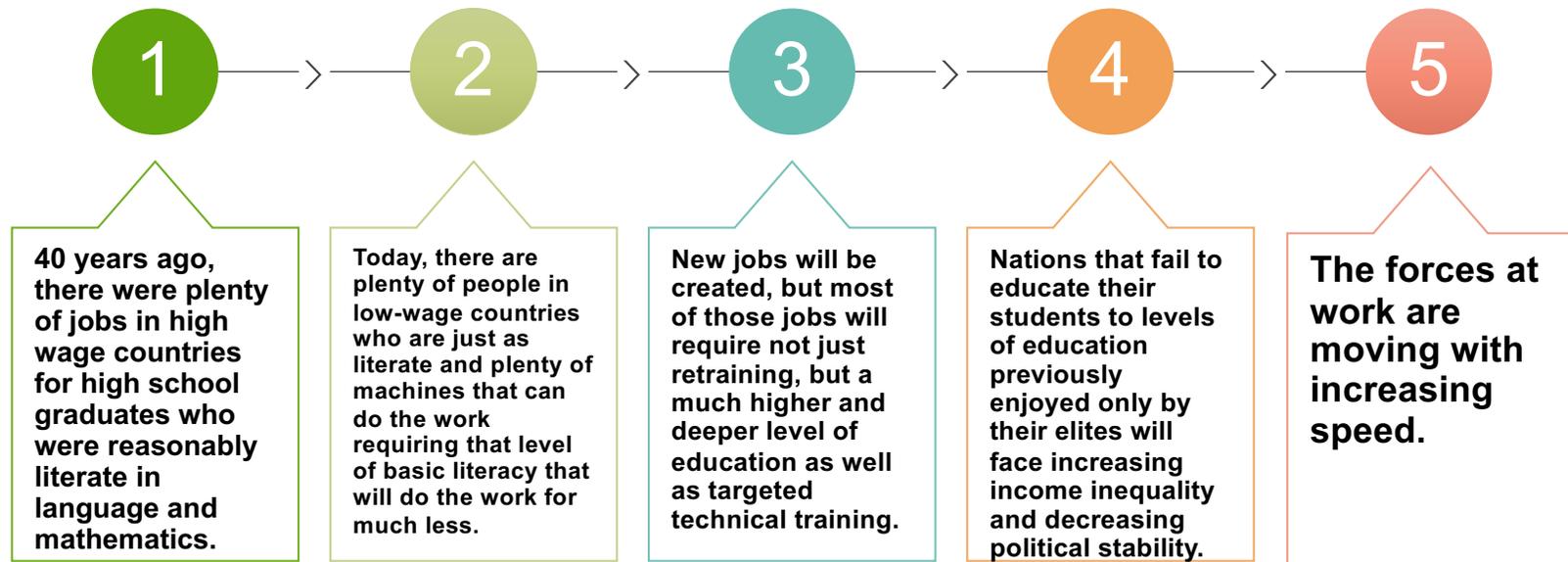


2017, McKinsey and Co. conclude that ~50% of *global* work activities can be automated with currently available equipment

Demand for high-wage [high-skill] occupations will grow, while demand for middle-wage [middle-skill] occupations will decline



Bottom line of economic argument...



To What Extent is this True in Montana?

FIGURE 1
Montana Monthly Job Openings and Hires



Source: US BLS Job Openings and Labor Turnover Survey

From Montana Department of Labor and Industry: “Increasing consumer demand coupled with a shortage of available workers led to more job openings remaining unfilled, even after businesses made 27,000 hires during August.”



Montana's Aging Population



Population > 65 has been growing, but the population < 65 has been relatively flat since 2000



Proportion of children expected to shrink as the state population is expected to grow around 1% per year



20% of Montana's workforce will retire in the next 10 years



Can Montanan's Fill the Jobs

OF A FLOURISHING, HIGH-TECH INDUSTRY?

- Defined by BBER as “firms that make or sell high tech products, provide professional services or consulting related to high tech, conduct e-commerce, or engage in manufacturing using skilled labor”
- These jobs pay 59% more than average state earnings and raise wages 0.8% faster than the state average
- Forecast employment and revenue gains 7x higher than statewide growth rates
- In 2019, high-tech firms grew 9x faster than other sectors, generating \$2.5 billion in revenues (an all-time high)
- ***But as skill needs become more sophisticated, will Montanan's be able to continue to do the jobs needed?***



But it's about much more than economics ...

Morality and ethics

1

Ability to deal as citizens with a wide range of highly complex existential issues

2

Much fuller development of those qualities that make us fully human

3

Ability to interact with a broad range of people all over the globe

4

Capacity and desire to preserve and defend freedom and democracy



So...What Do Young People Need to Compete in an A.I. World?



Deep understanding of the core concepts underlying the disciplines—the big ideas



Ability to apply those concepts and ideas to wide range of practical problems



Full range of intrapersonal and interpersonal skills

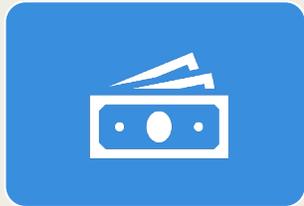


The moral and ethical grounding needed to make wise decisions



Potential Solutions - How the US Responded

REFORM AGENDA SINCE 1970'S



More money
(more than
doubled over a
period of 20
years)



Lower class
size



School
competition
(charters and
vouchers)



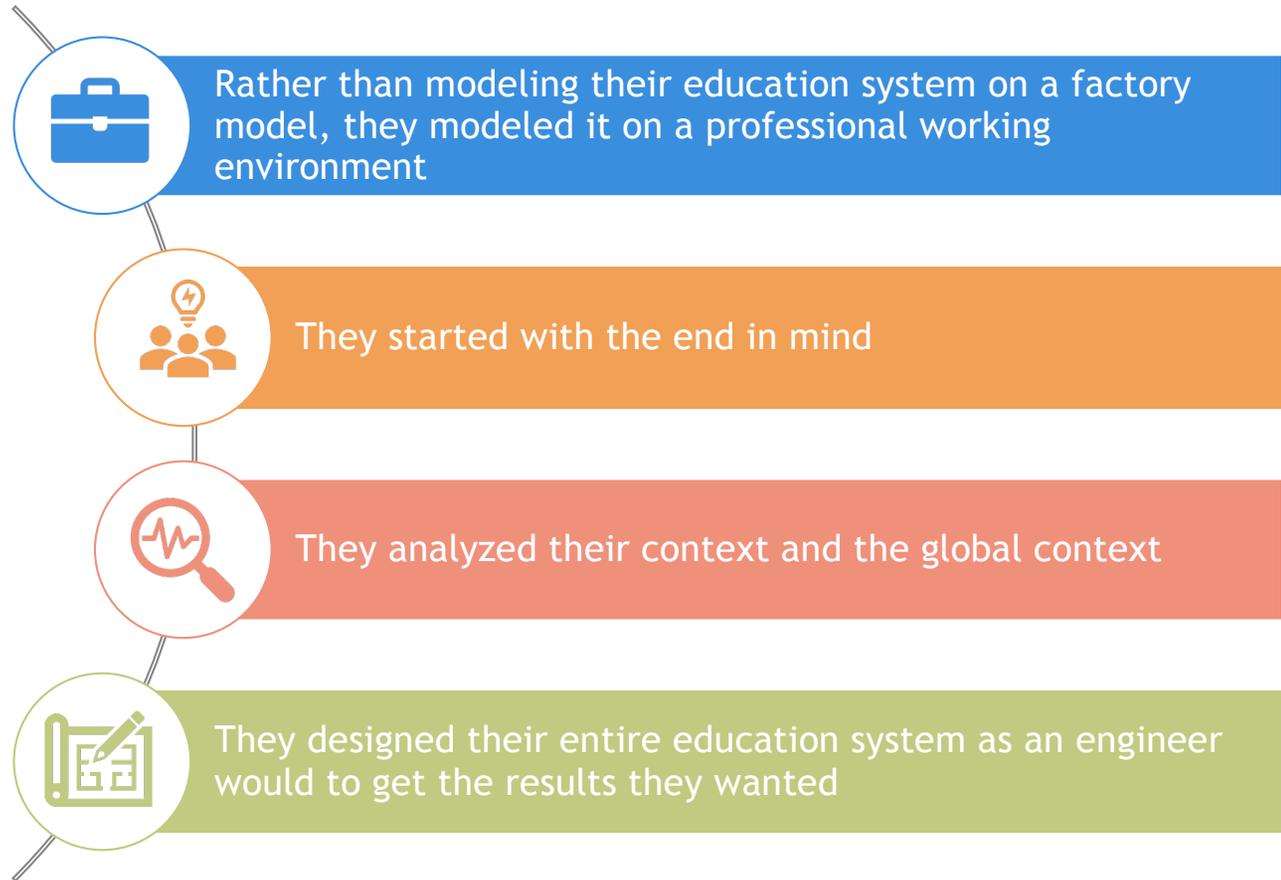
Technology



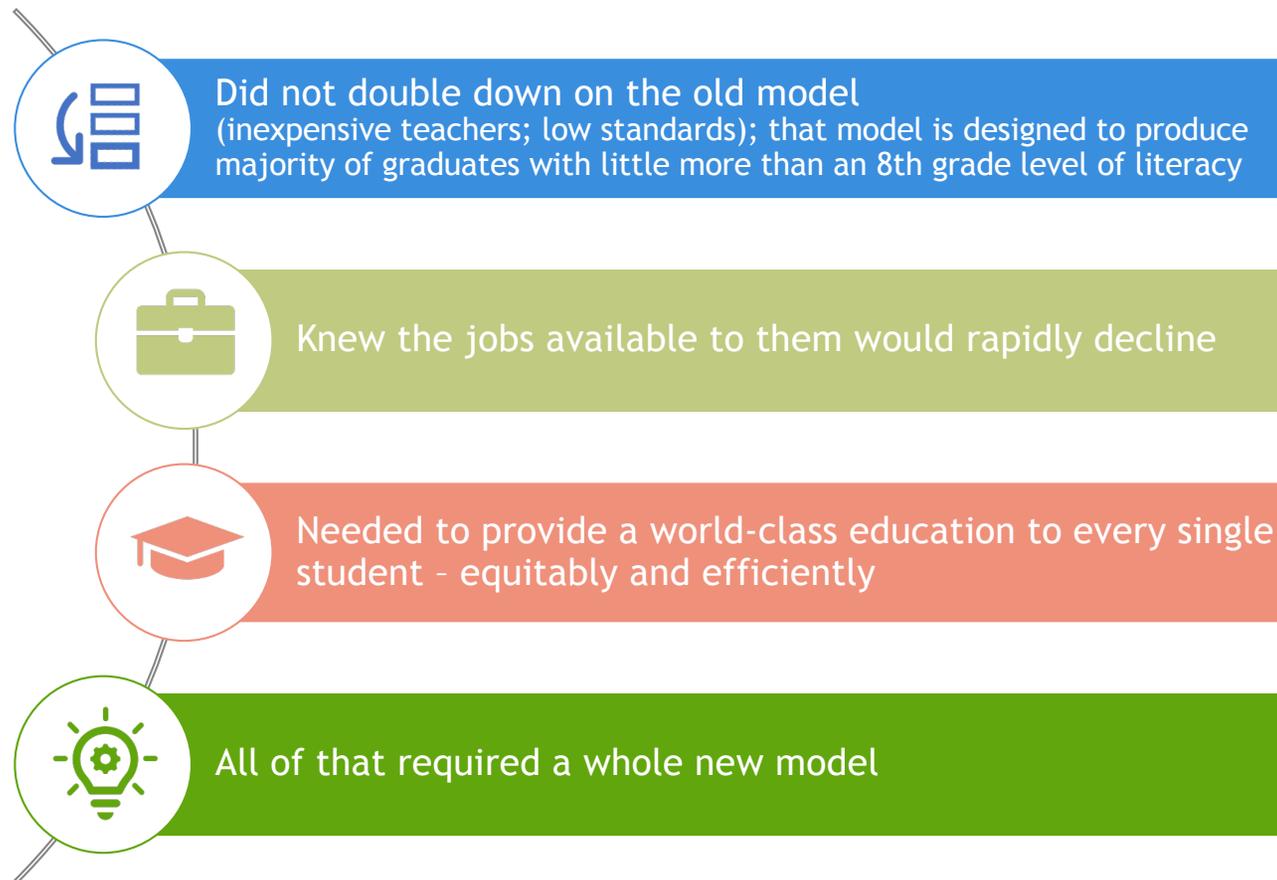
Tough test-
based
teacher-
accountability
systems



Our Competitors Had a Different Analysis



Our Competitors Had a Different Analysis



Their Model vs. Ours

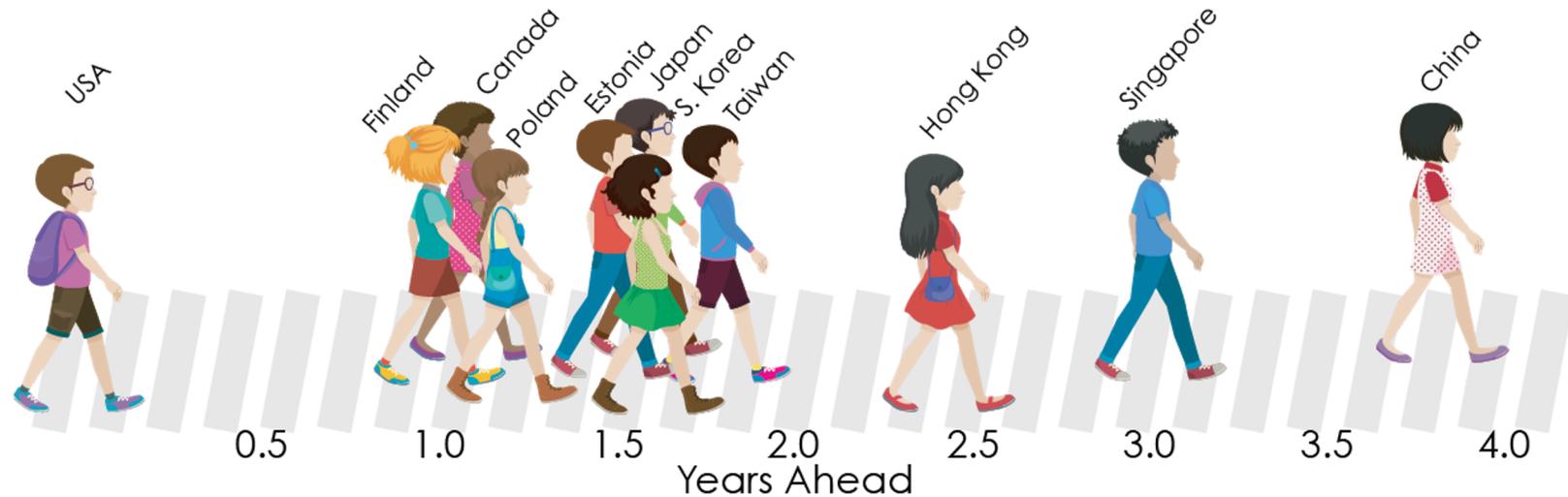
THE 2018 PISA RESULTS

- In reading...
 - 8 systems outscored the U.S.
 - 11 systems were statistically tied with the U.S.
 - 57 systems scored worse than the U.S.
- In mathematics...
 - 30 systems outscored the U.S.
 - 8 systems were statistically tied with the U.S.
 - 39 systems scored worse than the U.S.
- In science...
 - 11 systems outscored the U.S.
 - 11 systems were statistically tied with the U.S.
 - 55 systems scored worse than the U.S.



Just How Far Behind Is the Average US Student in Mathematics?

According to data from PISA 2018



In mathematics performance, average 15-year-old US students are more than a year behind students from the top-performing countries. Students in Hong Kong and Singapore are between 2.5 and 3 full years ahead of average US students in math while Chinese students are nearly four full years ahead of US students.

Montana ranks just slightly above national average on NAEP, so how does this suggest Montana would compare at a global level?

