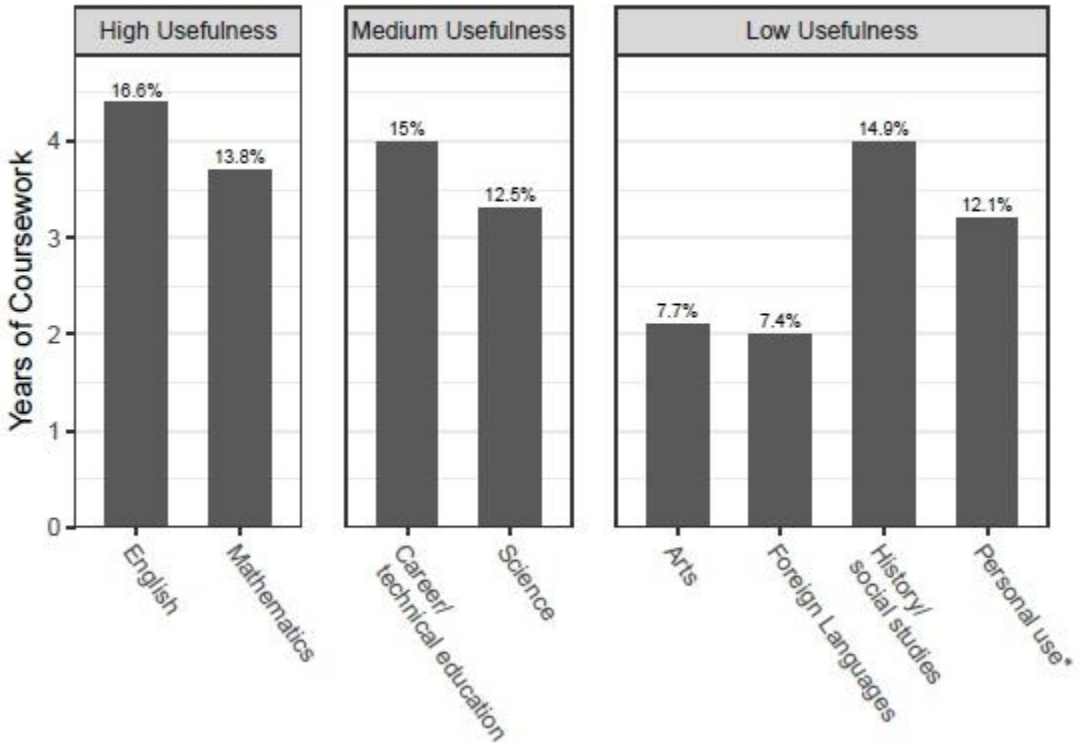
Prof. Bryan Caplan
bcaplan@gmu.edu
http://www.bcaplan.com
Econ 812

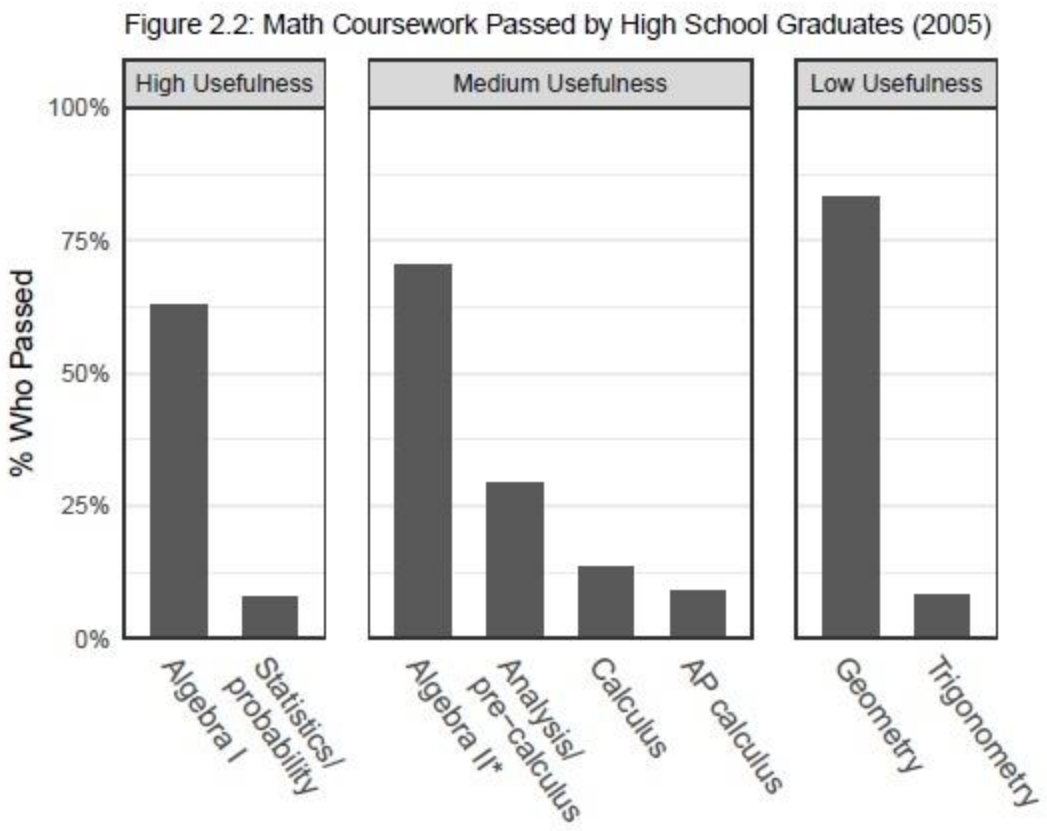
Weeks 2-3: The Puzzle Is Real: The Ubiquity of Useless Education

I. The Content of the Curriculum: High School
   A. What do students actually study in grades 9-12 – and how useful is it?
   B. How I classify subjects:
      1. High usefulness: "knowledge of the subject improves job performance in a wide range of occupations"
      2. Medium usefulness: "knowledge of the subject improves job performance in some common occupations"
      3. Low usefulness: "knowledge of the subject at best improves job performance in rare occupations"

Figure 2.1: Average Years of Coursework Passed by High School Graduates (2005)



   C. Given my classifications, under a third of course hours are spent on High usefulness subjects, and about 40% on Low.
      1. Challenges to my classifications?
   D. This overstates, because even High usefulness subjects are more academic than they sound. Take math:



1. Challenges to my classifications?

E. U.S. curriculum is more practical than a "classical education" in Latin and Greek, but that's damning with faint praise.

II. The Content of the Curriculum: College

A. What majors do college students actually study – and how useful are they?

B. How I classify majors:

1. High usefulness: explicitly prepares students for well-defined technical careers
2. Medium usefulness: funnels students toward predictable occupations after graduation, but teaches few technical skills, and non-majors readily compete for the same jobs
3. Low usefulness: doesn't prepare student for predictable occupations… except teaching the very subject.
4. Note that I classify economics as Low! Economists have great job options, but few non-academic jobs actually use what econ classes teach.
5. Challenges to my classifications?

C. Results: 24% of graduates receive degrees in majors with High usefulness, 35% in Medium usefulness, 40% in Low usefulness.

Table 2.1: Bachelor's Degrees by Field of Study (2008-9)

Field of Study	# Graduates	%
High Usefulness		
Agriculture and natural resources	24,988	1.6%
Architecture	10,119	0.6%
Biological/biomedical sciences	80,756	5.0%
Computer/information sciences	37,994	2.4%
Engineering	84,636	5.3%
Health professions	120,488	7.5%
Legal professions	3,822	0.2%
Other*	162	0.0%
Physical sciences/science technology	22,466	1.4%
Statistics/applied mathematics	1913	0.1%
Subtotal	*384,431*	*24.1%*
Medium Usefulness		
Business	347,985	21.7%
Education	101,708	6.4%
Mathematics	13,583	0.8%
Parks/recreation/leisure/fitness studies	31,667	2.0%
Public administration	23,851	1.5%
Security/protective services	41,800	2.6%
Transportation	5,189	0.3%
Subtotal	*567,696*	*35.3%*
Low Usefulness		
Area/ethnic/cultural/gender studies	8,772	0.5%
Communications	83,109	5.2%
English	55,462	3.5%
Family/consumer sciences	21,905	1.4%
Foreign languages	21,158	1.3%
Liberal arts	47,096	2.9%
Multi/interdisciplinary studies	37,444	2.3%
Philosophy/religious studies	12,444	0.8%
Psychology	94,271	5.9%
Social sciences/history	168,500	10.5%
Theology	8,940	0.6%
Visual/performing arts	89,140	5.6%
Subtotal	*648,242*	*40.5%*
Total	**1,601,368**	**100%**

Source: Snyder and Dillow 2011, pp.412.

* Library science, military technologies, and precision production.

D. The *Hoarders* defense

III. Measured Learning

A. In general, it's better to measure educational outputs (how much people learn) than educational inputs (what classes they take).

B. But this is easier said than done. If you just measure learning by subtracting what students know at the beginning of the school year from what they know at the end, you:

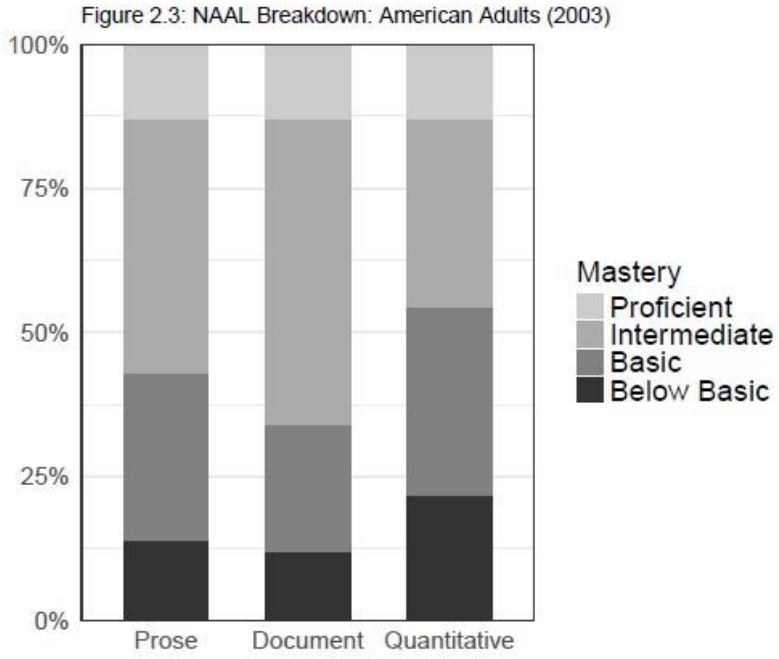
1. Assume school teaches everything they learn.
2. Neglect the issue of long-term retention.

C. Some experiments handle the first problem, but virtually none deal with the second.
D. Large literature finds the retention problem (or "fade-out") is severe.
    1. Most impressive study: Most people forget half their high school algebra and geometry in five years – and *all* their algebra and geometry in 25 years.
E. My approach: Use ***adults'*** knowledge of classroom subjects to measure education's *maximum* long-run effect on learning. (Schools can't cause more than 100% of what people know).
F. Using this approach, the effect of education on literacy and numeracy is modest. The National Assessment of Adult Literacy grades knowledge as "Below Basic," "Basic," "Intermediate," or "Advanced."
    1. The scale is charitable. Using finding a table in an almanac and summing two prices are "Basic" tasks.

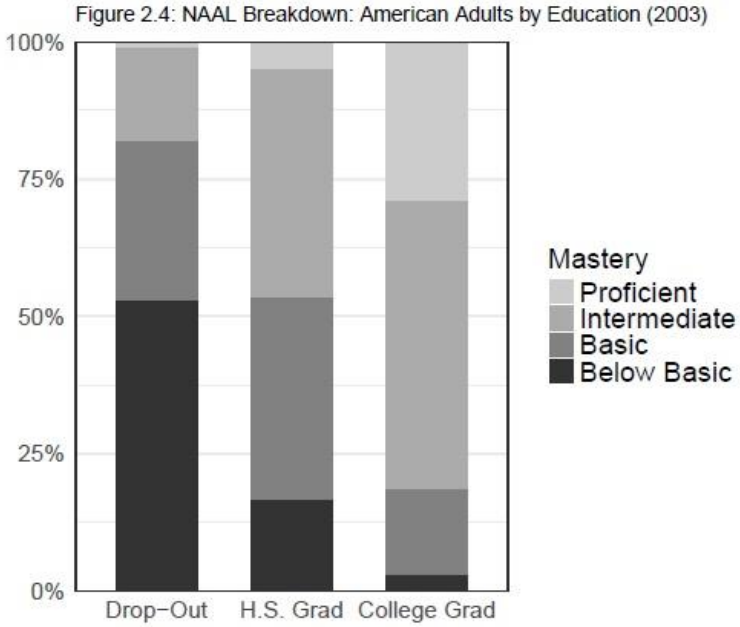
Table 2.2: Sample NAAL Tasks, By Level

	Below Basic	**Basic**	**Intermediate**	**Proficient**
Prose	Identify what it is permissible to drink before a medical test, based on a short set of instructions.	Find information in a pamphlet for prospective jurors that explains how citizens were selected for the jury pool.	Summarize the work experience required for a specific job, based on information in a newspaper job advertisement.	Compare viewpoints in two editorials with contrasting interpretations of scientific and economic evidence.
Document	Circle the date of a medical appointment on a hospital appointment slip.	Find a table in an almanac with information on a specified topic.	Find the time a television program ends, using a newspaper television schedule that lists similar programs showing at different times on different channels.	Contrast financial information presented in a table regarding the differences between various types of credit cards.
Quantitative	Add two numbers to complete an ATM deposit slip.	Calculate the cost of a sandwich and salad, using prices from a menu.	Calculate the total cost of ordering office supplies, using a page from an office supplies catalog and an order form.	Calculate an employee's share of health insurance costs for a year, using a table that shows how the employee's monthly cost varies with income and family size.
Source: Kutner et al. 2007, pp.5-7.				

G. You might think almost all American adults would score at least Intermediate, but they don't. Americans' literacy and numeracy in the NAAL:



H. You might think almost all college grads would score Proficient, but they don't. Americans' literacy and numeracy by education level:



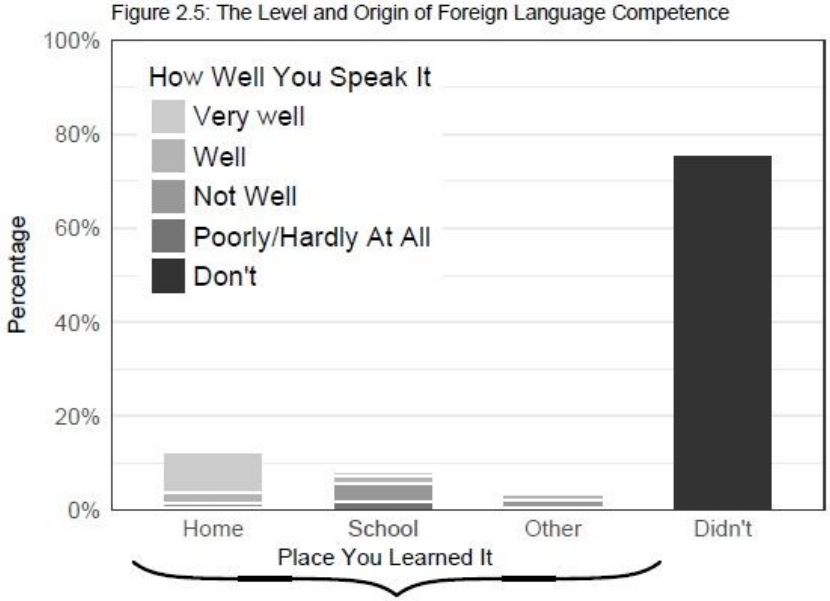
I. Notice: Modern drop-outs spend at least 9 years in school, but over half remain functionally illiterate and innumerate.

J. Still: While absolute performance is shockingly low, marginal gains could still be highly valuable on the job.

K. Measured learning in other subjects is far worse. Adults know roughly half of the most basic fact in history, civics, and science.
   1. Is that really so bad? The alphabet analogy.

L. School's effect on foreign language competence is near-zero, despite an average of two years of instruction (and self-assessment!).

Figure 2.5: The Level and Origin of Foreign Language Competence



IV. The Relevance of Relevance

A. Teachers' classic reply to "We won't need to know this in real life": "You're learning how to think" or "You're learning how to learn." Variants:
   1. Critical thinking
   2. "Mental muscles"
   3. "General cognitive skills"

B. Do these claims check out? Rarely.

C. Simple Transfer of Learning experiments.
   1. Background: a century of dismay in educational psychology.
   2. The Dunker radiation problem: under ideal conditions, success rises from 10% to 30%.

D. How to make Transfer even worse:
   1. Reduce similarly of surface features.
   2. Add a distractor problem. ("interference")
   3. Change environment. (location, instructor)
   4. Add delay. ("decay")

E. Non-laboratory evidence.
   1. College attendance boosts scores on tests of critical thinking, but fails to durably improve critical thinking outside the classroom.
   2. The Perkins study of informal reasoning: while more-educated people get higher scores, there's minimal improvement *within* any degree program.

Table 2.5: Average Overall Reasoning Score (1-5 scale, 5 being highest)

	1st-Year	4th-Year
High School	1.6	2.1
College	2.8	2.8
Graduate School	3.1	3.3
Source: Perkins 1985, p.566.		

F. Modest counter-examples:
   1. From the algebra of arithmetic progression to the physics of constant acceleration. (10% transferred physics to algebra, but 72% transferred algebra to physics).
   2. Fong et al. study: *Outside* the classroom, stats students transferred their learning on two out of four sports questions. (But what about retention?)
   3. College and grad students do measurably improve in areas they heavily practice.

G. Gardner on "inert knowledge": biology, math, stats, economics.
   1. The Leshowitz study: College students fail to apply basic statistics and experimental reasoning to practical questions.

H. Common-sense case *against* the "mental muscles" analogy.

V. Making You Smarter

A. Large body of evidence finds that education raises IQ, psychologists' standard measure of intelligence.
   1. Extra years of education raise IQ.
   2. Summer vacation, intermittent attendance, delayed school entry, and dropping out all depress IQ.
   3. Some early childhood programs raise IQ by over 30 points (2 SDs)!

B. Big problem: people can improve on any test by practicing, especially if you "teach to the test."
   1. Standard view: Teaching to the test yields only "hollow gains."
   2. Extreme case: Just hand students the answer key.

C. Challenge: Is the effect of education on IQ hollow as well?
   1. Many IQ tests include questions from standard academia curricula.

D. Less philosophical problem: fade-out.
   1. None of the famous IQ-boosting experiments achieve large lasting gains; most achieve none.
   2. Summer learning loss: Average student loses one month of performance per summer. Average middle-schooler loses three months of performance per summer.
   3. Note: Year-round school is not a long-term remedy, because everyone graduates eventually.

E. How people really get good at their jobs: practice.
   1. 10,000 Hour Rule is exaggerated. Practice is not sufficient for excellence, but it is the path to *improvement*.

VI. Discipline, Socialization, and Connections

A. School plausibly builds “non-cognitive skills” – obedience, tolerance for boredom, ability to get along with others, knowing how to work as a team. Could this explain education’s return?
B. Key question: Compared to what? If they weren’t in school would students be working? Or just playing videogames?
C. “School ethic” and “work ethic” are imperfect correlated:
    1. Abstract understanding vs. practical results.
    2. Passing exams vs. the market test.
    3. Fairness vs. profit.
    4. Especially clear for college: Researchers find that “full-time” college students average only 27 hours of academic work per week, earning an average GPA of 3.2.
D. We should therefore expect school to be worse preparation for workplace norms than actual work experience. And how much does work experience pay? 2-3% premium per year – far less than the education premium.
E. What about connections? About half of all workers say they used contacts to get their current job. But in the data, the valuable contacts are:
    1. Friends in your narrowly-defined occupation.
    2. Older male relatives who know the boss or vouch for you.
F. Problem: Modern economy is so vast, and most academic majors so amorphous, that your classmates are unlikely to ever be in a position to help you.
    1. Obvious exceptions: CS, engineering, academia…