

Integrating Research into Undergraduate Education: The Value Added

Plenary Session:

Incorporating Principles of
Learning into
Undergraduate
Education



Recent High-Impact Events in Educational Research ~

- 2000: NAS and NRC publish *How People Learn: Brain, Mind, Experience, and School* →
- 2001: Bruce Albert – “*Make a Science Out of Education*”
- 2002: Education Sciences Reform Act (HR 3801) creates an autonomous “Institute of Education Sciences”
- 2003-4: NSF establishes 15-25 national \$5-M “Science of Learning Centers”

How People Learn

Key findings and implications :

1. “In order to engage students, teachers must draw out and work with the *preconceptions* they bring with them about how the world works.”
2. “To develop competence in an area of inquiry, students must
(a) understand facts in a conceptual framework and
(b) organize knowledge in ways that facilitate retrieval *and* application.”
3. “A ‘metacognitive’ approach to instruction can help students learn to take control of their own learning by defining learning goals and monitoring their progress in achieving them.”

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Figure 1
Total Federal Outlays for Defense, Health, and Education
As a Percent of Total US Outlays
1965 - 2004

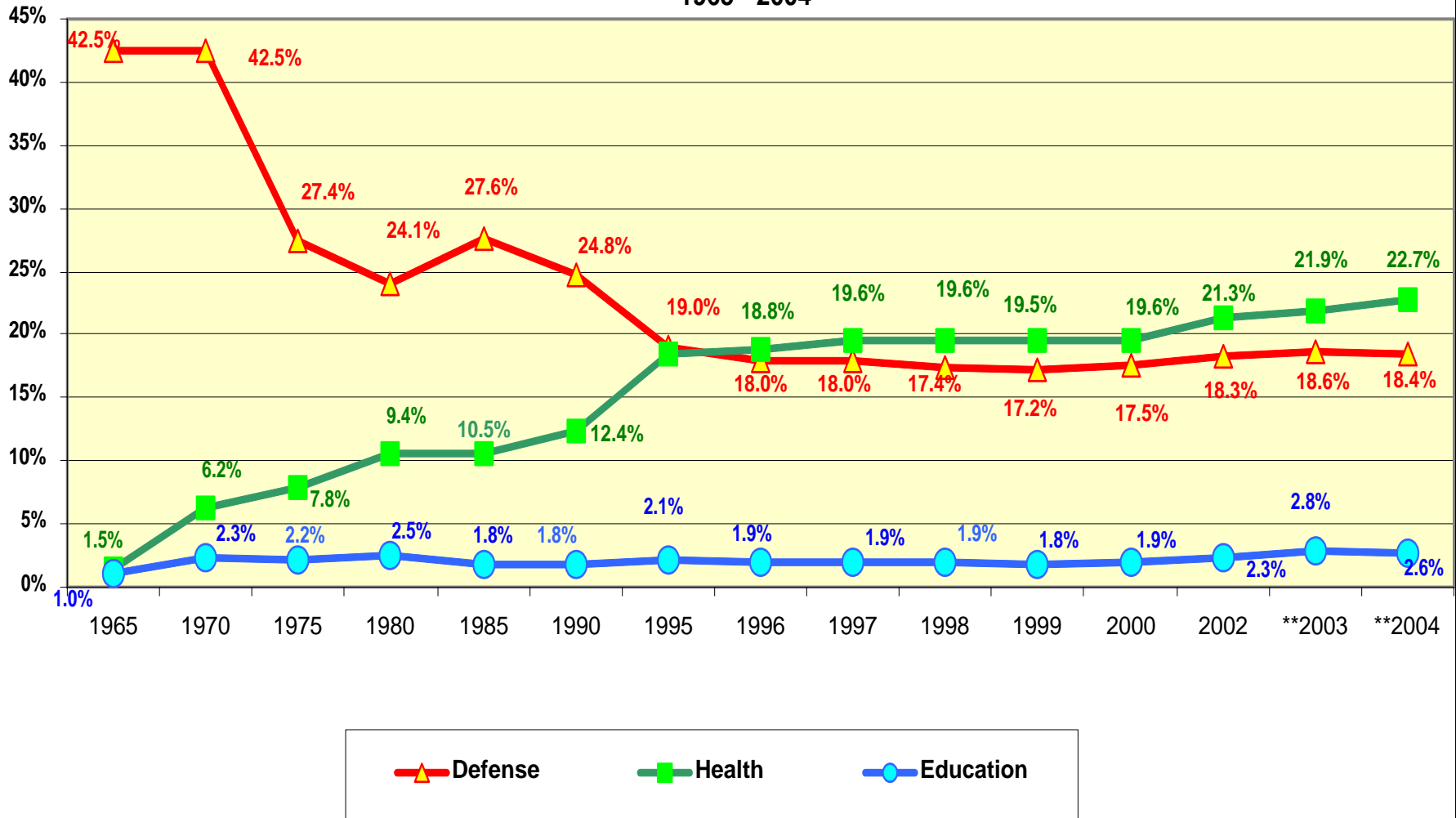
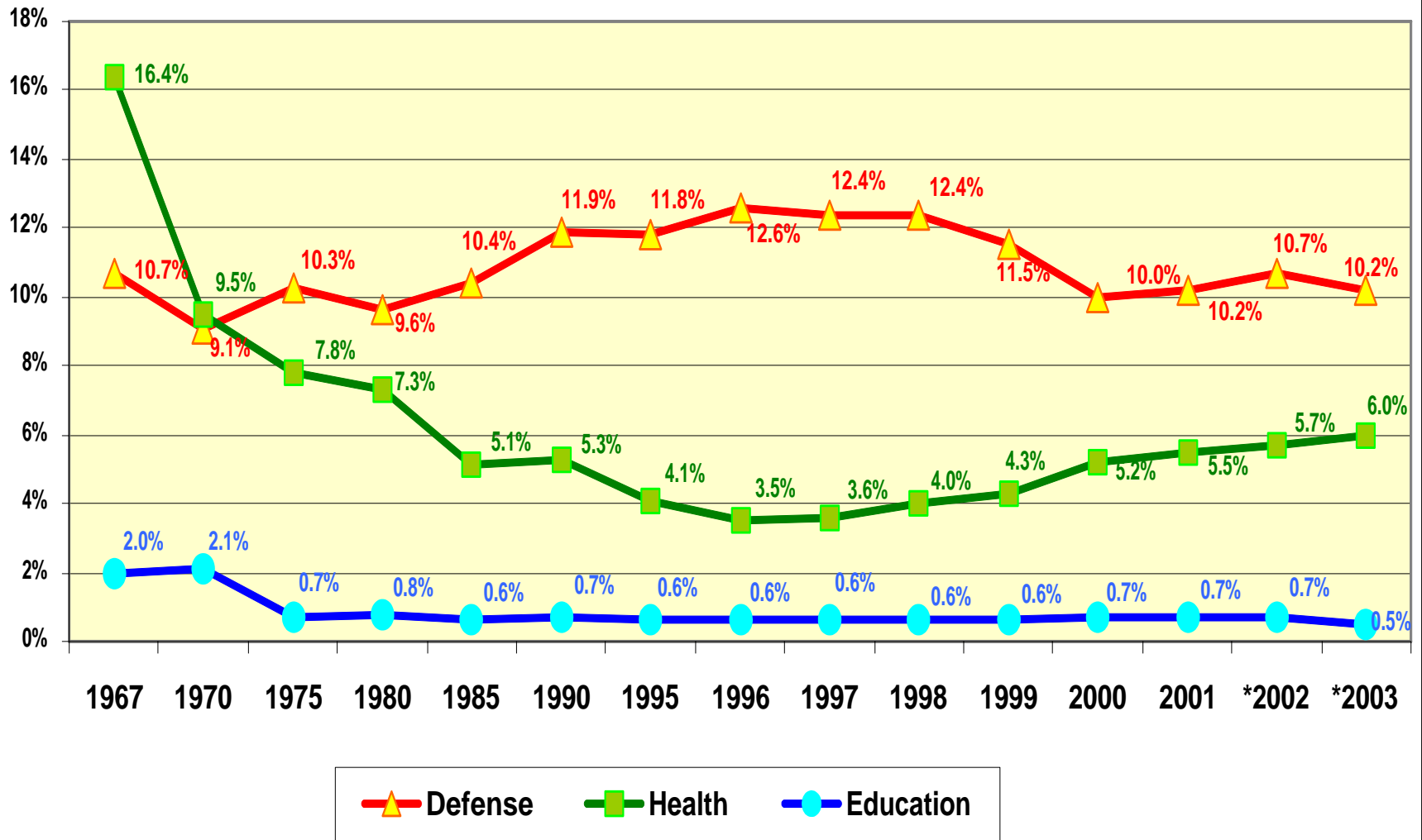


Figure 2
Federal Outlays for Research & Development As a Percent of Total US Outlays
For Selected Agencies - 1967-2003



Most Profitable US Companies in 2002: R&D*

Company Name	US Rank	Net Profit (\$ Mil)	Total Revenue (\$ Mil)	R & D Expenditures (\$ Mil)	R&D as % of Revenue
Citigroup	1	15,323	93,041	n/a	–
General Electric	2	15,133	131,698	2,631	2.0 %
Altria Group	3	11,102	80,408	n/a	–
Exxon Mobil	4	11,011	204,506	631	0.3 %
Bank of America	5	9,249	46,012	n/a	–
Pfizer	6	9,181	32,373	5,176	16 %
Wal-Mart Stores	7	8,039	244,524	n/a	–
Microsoft	8	7,829	28,365	4,307	15 %
SBC Communications	9	7,473	43,138	n/a	–
Merck	10	7,150	51,790	2,677	5.2 %
Johnson & Johnson	11	6,597	36,298	4,146	11 %
Wells Fargo	12	5,710	28,473	n/a	–
Freddie Mac	13	5,530	n/a	n/a	–
American International Group	14	5,519	67,482	n/a	–
International Business Machines	15	5,334	81,186	4,750	5.9 %

•Source: BusinessWeek Online, *The 2003 Global 1000 Scoreboard*; and financial reports on corporate web sites. n/a, not available.

[http://bwnt.businessweek.com/global_1000/2003/index.asp?sortCol=profits&sortOrder=DESC&pageNum=1&resultNum=25&country=\)](http://bwnt.businessweek.com/global_1000/2003/index.asp?sortCol=profits&sortOrder=DESC&pageNum=1&resultNum=25&country=)

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