

PUTTING LEARN-BY-DOING TO WORK FOR THE CREATIVE FUTURE:

A NEW EDUCATIONAL PARADIGM

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THE UNKNOWN

There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we know we don't know. But there are also unknown unknowns. There are things we don't know we don't know.

Donald Rumsfeld, Former Secretary of Defense



THE UNKNOWN AND THE WORKPLACE

Please indicate in which one of the following situations Cal Poly agricultural graduates are best prepared to perform when faced with a problem in the workplace:

Frequency
(n = 85)

The problem is well-defined and the steps needed to solve it are clearly specified.

30%

The problem is well-defined, but the steps needed to solve it are not clearly specified.

40%

It is clear that there is a problem, but the problem is not well-defined and there are no clear steps to solve it.

30%

THE SURVEY AND HOW CREATIVE THINKING EMERGED

- Who
- Questions
- Emergence of Creative Thinking

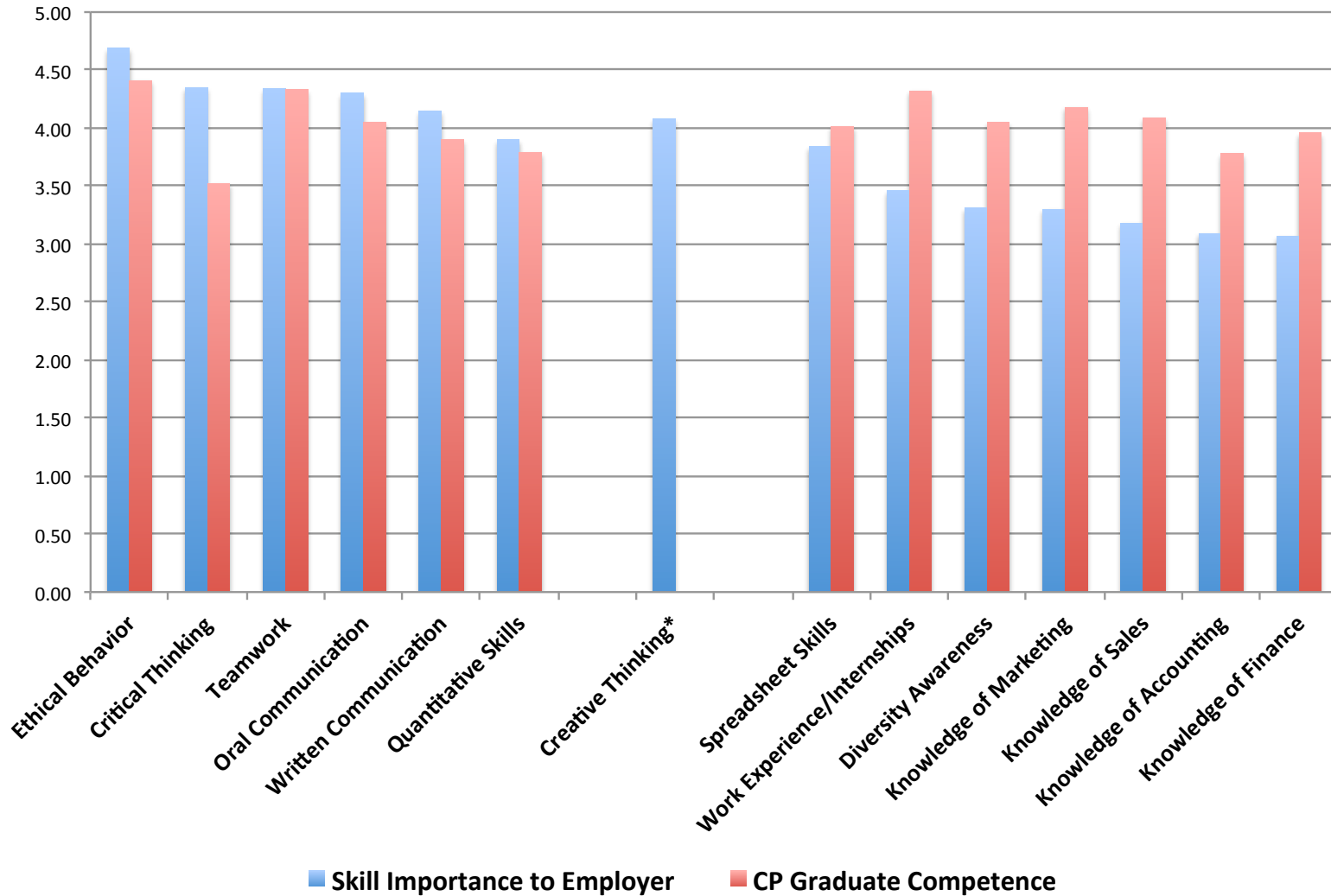


SOME INTERESTING RESULTS

Skill Importance, Competence and Skill Gap

<i>Attributes</i>	<i>Importance (Employer)</i>	<i>Competence (Graduate)</i>	<i>Skill Gap</i>
Ethical Behavior	4.69	4.41	1.3132
Critical Thinking	4.35	3.52	3.6105
Teamwork	4.34	4.33	0.0434
Oral Communication	4.3	4.05	1.0750
Written Communication	4.15	3.9	1.0375
Quantitative Skills	3.9	3.79	0.4290
Creative Thinking*	4.08	-	-
Spreadsheet Skills	3.84	4.01	-0.6528
Work Experience/Internships	3.46	4.32	-2.9756
Diversity Awareness	3.31	4.05	-2.4494
Knowledge of Marketing	3.3	4.18	-2.9040
Knowledge of Sales	3.18	4.09	-2.8938
Knowledge of Accounting	3.09	3.78	-2.1321
Knowledge of Finance	3.07	3.96	-2.7323

SOME INTERESTING RESULTS (CONT'D)



ARE WE PREPARING STUDENTS TO MEET THE NEEDS OF INDUSTRY?

"Too few [graduates] have what business needs. More complex economies demand more sophisticated talent 'with global acumen, knowledge of different cultures, ecological literacy, entrepreneurial skills, and the ability to manage increasingly complex organizations.' Employers say they want people who can think creatively, who can innovate, who can communicate well, work in teams and are adaptable and self-confident. They complain that many graduates have few of these qualities."

Sir Ken Robinson (2011)



THE DIFFICULTY OF KNOWING WHAT WE WANT BUT FIGURING OUT HOW TO ACHIEVE IT SYSTEMATICALLY

"I shall not today attempt further to define the kinds of material I understand to be embraced within that shorthand description ["hard-core pornography"]; and perhaps I could never succeed in intelligibly doing so. But I know it when I see it, and the motion picture involved in this case is not that."

Justice Potter Stewart
Concurring opinion
Jacobellis v. Ohio 378 U.S. 184 (1964)

WHAT IS LEARN-BY-DOING?

“At Cal Poly, Learn-by-Doing is a deliberate process whereby students, from day one, acquire knowledge and skills through active engagement and self-reflection inside the classroom and beyond it.”

Cal Poly Academic Senate

Resolution on a Working Definition of Learn-by-doing (AS-727-11)

April 2011



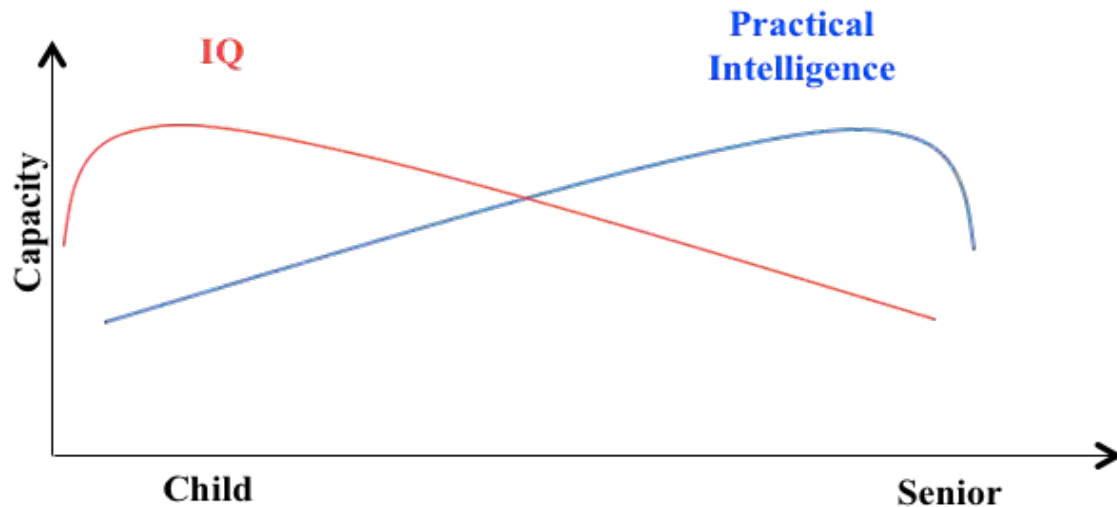
THE SATISFACTION AMONG CAL POLY ALUMNI HIRING RECENT CP GRADS

<i>Questions</i> (n = 85)	<i>Score</i>
How important do you believe is the Learn-by-Doing approach for the future graduates?	4.33*
<i>Agree/Disagree:</i> Cal Poly Agribusiness graduates are able to make an immediate positive contribution to the workplace with minimum supervision.	4.04**
<i>When hiring for an entry level job:</i> a. I always hire the Cal Poly graduate, all other qualifications being equal. b. I hire the Cal Poly graduate and offer a slightly higher starting salary, all other qualifications being equal. c. Cal Poly's Learn-by-Doing reputation would not be a decisive factor in the decision process.	52% 9% 39%

Scales:

* 1 = least important and 5 = very important

** 1 = strongly disagree and 5 = strongly agree



Trajectories of Academic and Practical Intelligence through Life. Sternberg and Grigorenko (2000).

"In fact, both accomplishments along the [scientific] frontier and the final eureka moment are achieved more by entrepreneurship and hard work than by native intelligence. This is so much so the case that in most fields most of the time, extreme brightness may be a detriment.

...

[Those with extreme brightness] choose not to take the hard roads to the frontier, over which the rest of us, the lesser intellectual toilers, must travel." (pp. 78-79)

Edmund O. Wilson
Letters to a Young Scientist (2013)

Two Principles for the New Learn-By-Doing:

1. Managing Learning as a Whole
 2. Assessing for Student Creative Capacity
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1. Managing the Whole:

- Integrating High Impact Activities
- Incorporating Co-Curricular Activities



2. Assessing for Student Creative Capacity:

- Formative assessment over summative assessment
- Broadening involvement of who assesses students
- Iterative feedback (process over form) across all boundaries



"With the approach of peak world oil production, the prospect for international agreements to reduce greenhouse gas emissions, and the potential for significant shifts in food production patterns due to climate change, there are likely to be large shifts in relative prices over the next quarter century. This could trigger an unpredictable, radical restructuring of the food system and critical strategic positioning issues for agribusiness firms."

King, Boehlje, Cook and Sonka (2010)

THANK YOU!

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