Re-organizing the CPT Undergraduate Guidelines to Elevate the Status of Safety and Ethics in the Chemistry Curriculum

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of the People, by the People, for the People

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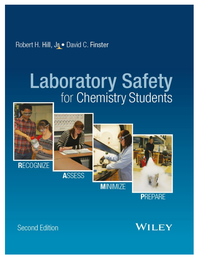
CH&S CONNECTING CHEMISTRY AND SAFETY

"Curriculum looks (mostly like) "content" areas
"Skills" looks like "non-content" areas

5.3 Foundation Course Work. Foundation course work provides breadth and lays the groundwork for the in-depth course work. Certified majors must have instruction equivalent to a one-semester course of at least three semester credit hours in each of the **five major areas of chemistry: analytical, chemistry, biochemistry, inorganic chemistry, organic chemistry, and physical, chemistry.**

Plus: "polymer chemistry" required (Section 5.1) → "**ABIOPp**"

- Is "content" just the knowledge that is learned in (lecture) courses?
- Does listing ABIOPp in "Curriculum" suggest that there are not "skills" to be learned in these areas?
- Why are "Student Skills" in a separate list? (Likely an historical artifact.)
- Is there no "content" to be learned with regard to:
  literature searching?
  ethics?
  communication (oral and written)?
  team skills?
  problem-solving skills?
  safety?



Isn't it possible to "test for knowledge" in these areas?

So, why do we separate "curriculum" from "skills"?

The 2015 Guidelines

5. Curriculum
   - 5.1 Content Requirements
   - 5.2 Introductory or General Chemistry
   - 5.3 Foundations Course Work
   - 5.4 In-Depth Course Work
   - 5.5 Frequency of Course Offerings
   - 5.6 Laboratory Experience
   - 5.7 Cognate Courses
   - 5.8 Degree Tracks or Concentrations
   - 5.9 Pedagogy
   - 5.10 Capstone Experiences
   - 5.11 Online and Virtual Instruction
6. Undergraduate Research
7. Development of Student Skills
   - 7.1 Problem-Solving Skills
   - 7.2 Chemical Literature and Information Management Skills
   - 7.3 Laboratory Safety Skills
   - 7.4 Communication Skills
   - 7.5 Team Skills
   - 7.6 Ethics

A proposal for reorganizing the Guideline Sections

Section 5 Topics

Chemistry-specific topics
- Content Requirements
- Introductory or General Chemistry
- Foundation courses (ABIOP)
- In-depth courses
- Problem-Solving Skills
- The Chemical Literature / IMS
- Laboratory Safety

Non-chemistry-specific topics
- Cognate Courses
- Communication
- Teamwork
- Scientific Ethics

Section 6 Implementation
- Pedagogy
- Laboratory Experience
- Undergraduate Research
- Frequency and Location of Courses
- Capstone Experiences
- Degree Tracks
- Online and Virtual Instruction

"Content" areas are a "must"…

"Skills" "should" be addressed…

Section	Topic	"must"	"should"	(other: "could", "may"…)
5	Intro			"… lab work is integral…"
5.1	Content Requirements	5		
5.2	Gen Chem	1		
5.3	Foundation	1	3	
5.4	In-depth	3	1	
5.5	Frequency	5	1	
5.6	Laboratory	3	1	
5.7	Cognate	1		"strongly recommends"
5.8	Tracks			
5.9	Pedagogy		5	
5.10	Capstone		1	
5.11	Online./Virtual	1	3	
6	Research	2	2	
7	Intro	1	1	
7.1	Problem-solving		2	
7.2	Literature	1	2	
7.3	Safety	4	1 (x6)	"needs to…" (x2)
7.4	Communication		1	
7.5	Team		1	
7.6	Ethics		3	

Advantages of this reorganization:

1) Eliminates the artificial (and misleading) separation of the curriculum into "content" and (*vs*?) "process".

2) Clarifies the distinction between topics that can and should be taught by chemists…
Introductory/General Chemistry · Foundation courses (ABIOP) · In-depth courses · Chemical Health and Safety · The Chemical Literature

…. and those topics for which chemistry faculty are (or may be) ill-prepared to teach.
Communication · Teamwork · Scientific Ethics · Cognate Courses

3) Elevates the importance and centrality of chemical health and safety and ethics in the undergraduate curriculum. Avoids (☺) the implication (☹) that safety and ethics is a "skill" that is bereft of content.

Change a few more "shoulds" to "musts."