2007 New Faculty Workshop

Charting a Meaningful Scholarly Career

Björklunden
Lawrence University
July 13–15, 2007

Midstates Consortium for Math and Science (MCMS)

Summary Agenda

Friday, July 13, 2007

4:00 p.m.	**REGISTRATION**
5:30 p.m.	**EXPERIENTIAL LEARNING EXERCISE** *Pre-dinner welcoming initiative*
6:30 p.m.	**DINNER** *Assigned tables: Clusters*
7:30 p.m.	**PLENARY I** *Introductions, best ideas, and nuts & bolts*
8:30 p.m.	**S'MORES LEARNING ACTIVITY** *Curricular innovations & changes*

Saturday, July 14, 2007

7:00 a.m.	**BREAKFAST ON YOUR OWN**
8:30 a.m.	**PLENARY SESSION II** *Panel: Early career faculty*
9:35 a.m.	**ASSIGNED CONSULTING PAIRS**
10:15 a.m.	**PLENARY SESSION III** *Reporting out*
11:15 a.m.	**PLENARY SESSION IV** *Case study: Teaching and student learning*
12:30 p.m.	**LUNCH** *Time for personal reflection*
2:00 p.m.	**PLENARY SESSION V** *Building an undergraduate research program*
3:00 p.m.	**ASSIGNED CONSULTING PAIRS**
3:30 p.m.	**FREE TIME**
5:00 p.m.	**EXPERIENTIAL LEARNING EXERCISE**
6:00 p.m.	**DINNER** *Birds-of-a-feather*
7:15 p.m.	**PLENARY VI** *Challenges for new faculty*
8:15 p.m.	**FREE TIME** *Time to work on agendas for action*

Sunday, July 15, 2007

7:00 a.m.	**BREAKFAST ON YOUR OWN**
8:15 a.m.	**REPORTING OUT IN CLUSTERS**
9:35 a.m.	**CHECK OUT OF YOUR ROOM**
9:50 a.m.	**PLENARY VII** *Reporting out: Best ideas*
10:45 a.m.	**FINAL REMARKS**
11:00 a.m.	**WORKSHOP CONCLUDES**

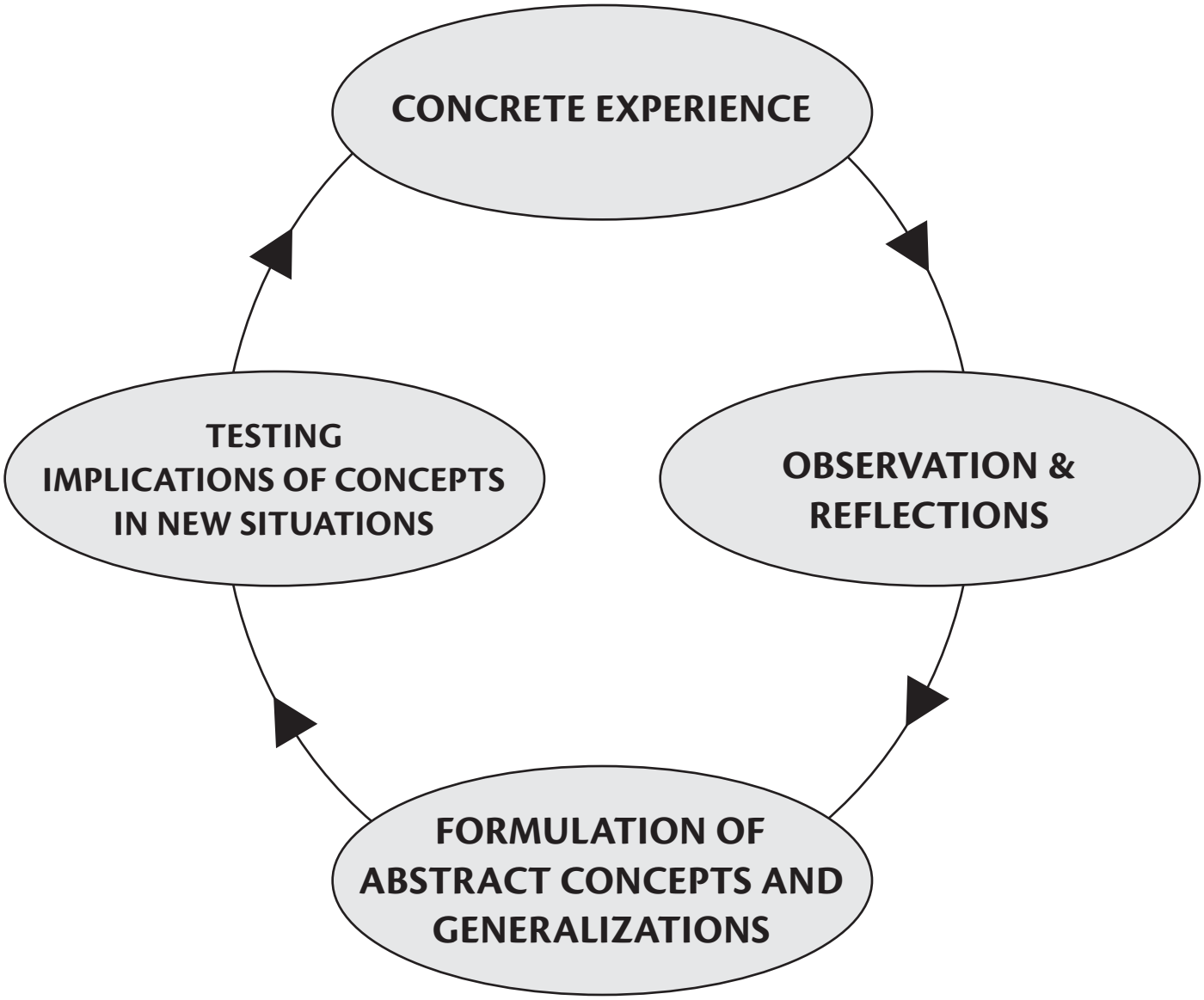
WORKSHOP FACILITATORS:

Jeanne L. Narum
Director
Independent Colleges Office & Project Kaleidoscope

Karen Nordell Pearson
Associate Professor of Chemistry
Lawrence University
Director of the Midstates Consortium for Math and Science

Kolb's Experiential Learning Cycle

AN AID TO REFLECTION



Experiential Learning Exercise

PRE-DINNER WELCOMING INITIATIVE

Time: 5:30 – 6:15 p.m. Date: Friday, July 13, 2007

One day Soshi was walking on the bank of a river with a friend. "How delightfully the fishes are enjoying themselves in the water," exclaimed Soshi. His friend spoke to him thus, "You are not a fish, how do you know that the fishes are enjoying themselves?" "You are not myself," returned Soshi, "how do you know that I do not know that the fishes are enjoying themselves?"

(Kakuzo Okakura, Japanese Philosopher)

How can we know if we do not ask? Why should we ask if we are certain we know? All answers come out of the question. If we pay attention to our questions, we increase the power of mindful learning.

— Ellen J. Langer, *The Power of Mindful Learning*. Addison-Wesley, 1997.

An experiential learning exercise is designed to help participants explore various aspects of leadership. The structure of the activity is modeled after insights about how people learn: that learning is most effective when students engage in an activity; look back and examine that activity critically; extract some useful insights from the analysis; and then determine how those insights inform their work in other circumstances. This is an inductive process, proceeding from observation rather than a "truth." The effectiveness of experiential learning activities is based on the fact that nothing is more relevant to learners than their own reactions to, observations about, and understanding of, an idea, concept, theory or practice.

PKAL has used many experiential learning activities over the past several years, recognizing their potential to help the larger STEM community gain a:

- big-picture orientation
- vision and clearly defined goals
- better understanding of the value of regular feedback in the process of leading a community toward change.

In various of these activities, further dimensions of leadership are explored, such as:

- shared leadership (followership)
- differences in leadership styles (directing, coaching, supporting, delegating);

...as well as the importance of being able to:

- communicate clearly
- listen well
- think problems through to solutions
- deal with ambiguity.

Dinner

POSITIVE DEVIANCE INTERVIEWS

Time: 6:30 – 7:15 p.m. Date: Friday, July 13, 2007

Clusters: Assigned tables of eight *(Resources Page 25)*

(These will be the cluster that you will work in throughout the weekend.)

Taking time— to reflect on one's own experiences and style, as well as on how colleagues have charted a meaningful scholarly career— is an important step for faculty at all career stages. The questions can be used for personal reflections and for connecting to colleagues. By exploring career-related issues, you can compare both your personal reflections and the responses received through interviews with colleagues. See if and how you can identify "…special practices or strategies…" that enable people to keep focused, asking the right questions, making a difference for their students, their scholarly field, and their campus community. Use these questions to interview someone on your campus to find models of "what works."

Positive Deviance (PD) is founded on the belief that, in every community, there are certain individuals/entities whose special practices or strategies enable them to find a better solution to a pervasive problem than their neighbors, who have access to the same exact resources. The PD design provides a tool to enable the community (here the engineering education community) to discover the Positive Deviant's uncommon, but demonstrably successful, strategies. The community then analyzes those strategies, retaining only those that are accessible to all of its members. Finally, the community designs an intervention, enabling all its members to access and practice the newly discovered PD strategies.

— Jerry Sternin, Visiting Lecturer, Friedman School of Nutrition Science and Policy— Tufts University.

Plenary Session I

INTRODUCTIONS, BEST IDEAS, AND NUTS & BOLTS

Time: 7:30 – 8:15 p.m. Date: Friday, July 13, 2007

THE PEER-LED TEAM LEARNING WORKSHOP MODEL (PLTL)

The PLTL Workshop model engages teams of six to eight students in learning sciences, mathematics and other undergraduate disciplines guided by a peer leader. The PLTL Workshop model:

- provides an active learning experience for students
- creates a leadership role for undergraduates
- engages faculty in a creative new dimension of instruction

Students who have done well in the course previously become guides and mentors, Workshop Peer Leaders. For the peer leaders, the experience of working with faculty and guiding their peers through a difficult course is rewarding and unforgettable, and can have a profound effect on their individual and professional growth.

— <http://www.pltl.org>

- Tables will report about one best idea for early-career faculty that emerged from the Positive Deviance interviews.
- Introductory remarks about the shape and goal of the weekend sessions.
- The concept and value of intentional planning.

8:30 p.m. S'Mores 101 *(Resources Page 29)*

We will explore a pedagogical approach using the basic scientific principles of s'mores making. Participants will work in small groups and will survey Peer-Led Team Learning (PLTL).

Plenary Session II

PANEL: EARLY CAREER FACULTY

Time: 8:30 – 9:30 a.m. Date: Saturday, July 14, 2007

Panel of the *early-career faculty* workshop alumni:

Given your experiences in your first year, recognizing the issues that this group of new faculty and postdocs brings to the table (getting organized as a teacher, balancing worklife and life beyond work, starting a research program etc) what advice would you give them? In particular, think about advice relating to something that you wish you had planned for BUT that should not eliminate the possibility of being open to all sorts of new opportunities (which of course you can plan for also).

It's up to you to carve out your place in the work world and know when to change course. And it's up to you to keep yourself engaged and productive during a work life that may span some 50 years.

To do all of these things well, you'll need to cultivate a deep understanding of yourself. What are your most valuable strengths and most dangerous weaknesses? Equally important, how do you learn with and work with others? What are your most deeply held values? And in what type of work environment can you make the greatest contribution?

…we will have to learn to manage ourselves. We will have to learn to develop ourselves. We will have to place ourselves where we can make the greatest contribution. And we will have to stay mentally alert and engaged during a 50-year working life, which means knowing how and when to change the work we do.

— Peter F. Drucker, *Managing Oneself.* Best of HBR, 1999.

7:00 – 8:15 a.m. Breakfast on your own

Assigned Consulting Pairs

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Time: 9:35 – 10:10 a.m. Date: Saturday, July 14, 2007

Certain qualities associated with a scholar's character are recognized by virtually all higher education institutions as consequential not only for the individual professor but for the entire community of scholars.

No statement of professional ethics fails to mention that professors have special responsibilities to their disciplines, their students, their colleagues, and their institutions…

Linking scholarship to personal virtues certainly is not a new idea. For example, Assyriologist Anne Draffkorn Kilmer, of the University of California at Berkley, said that the oldest known references to scholarship appear as inscriptions on forty-five-hundred year-old Sumerian tablets. Scholarship in those ancient days referred to the literary culture that students had to master in order to become scribes. The tablets provide sobering admonitions to the young: "Day and night you must concentrate," they say. "You must sit still for scholarship, you must be humble."

— Glassick, C.E., Huber, M.T., & Maeroff, G.I., *Scholarship Assessed: Evaluation of the Professoriate.* Jossey-Bass Inc., San Francisco, 1997.

First time for working in assigned pairs. The point of the 'pairs' is to have an on-site mentor/colleague with whom to work to advance the planning of one's next year as a scholar— modeling the kind of openness and value of sharing within a campus community.

Here first, however, the conversation should not be about specific things (I want to revise Bio 101)— which is a strategy toward a larger goal, but rather about a goal from which strategies can be derived. Examples of a goal would be: to understand the culture of my department in regard to pedagogical innovation in order to reflect and enrich that culture: (what is going on, what works, what does not….)

Time for informal break.

Plenary III

REPORTING OUT

TIME: 10:15 – 11:10 A.M. DATE: SATURDAY, JULY 14, 2007

Reconvene to have one-minute reports from each pair, with each individual reporting on one thing his/her colleague will be using as the goal against which strategies can be based.

A strategy is a plan to reach a goal cleverly. While it is sometimes possible to reach goals in a muddling and fatalistic way, there are advantages in thinking strategically, in using forethought, and in combining tactics as skillfully as possible… strategic planning is creative problem-solving oriented toward change.

If we are thinking about how to manage the future creatively, efficiently, and effectively, we must think about the role that strategy plays. First of all, as Adams suggests, strategic planning is in itself a creative act. For most of us, strategic thinking is not automatic. It is a divergence from business as usual and not easy, since it causes us to confront the large uncertainties associated with the future. Most of us are aware that we should be thinking strategically about our personal lives. Those of us who do tend to accomplish our goals more readily.

— James L. Adams, *The Care & Feeding of Ideas: A Guide to Encouraging Creativity.* Addison-Wesley Publishing Company, Inc., 1986.

Plenary Session IV

CASE STUDY: TEACHING AND STUDENT LEARNING

Time: 11:15 a.m. – 12:15 p.m. Date: Saturday, July 14, 2007

The two most basic roles of college professors— teaching and research— often conflict. One professor at a liberal arts college recalled that during graduate school at a leading public university, "I had to sort of hide under a rug, in a way, my desire to teach. I got a terrific graduate education there, but the down side was it was clear they didn't care one bit about teaching."

A study conducted in the 1990s showed that in all types of four-year institutions, the proportion of time dedicated to research rose and the time dedicated to teaching declined. Yet over two-thirds of the faculty outside research universities claim that they are more interested in teaching than research. It is obviously not the case that devotion to one's discipline has to conflict with doing good work as a teacher. Indeed, a teacher indifferent to their area of study is unlikely to engage students.

— Jeanne Nakamura & Mihaly Csikszentmihalyi, *Engagement in a profession: the case of undergraduate teaching*, Daedalus, Summer 2005.

Using a case study, we will be exploring the following issues:

- where does one find out about approaches that work
- how does one go about learning how to use and assess new approaches
- what would people see whey they walked into your classroom for the first time?

12:30 – 2:00 p.m. **Lunch & time for personal reflection**

Plenary Session V

BUILDING AN UNDERGRADUATE RESEARCH PROGRAM

Time: 2:00 – 3:00 p.m. Date: Saturday, July 14, 2007

Some of the issues to be addressed in the discussion include:

- how to get grants
- how to incorporate research into courses
- how to mentor and supervise undergraduate research colleagues
- what it means to prepare a paper for a disciplinary journal
- how to find mentors within your department/institution to help.

At most institutions from which faculty apply for research grants, [there are] a number of experienced investigators whose constructive criticism would be of considerable value to their colleagues, especially to the beginning investigator.

[We've studied] acceptance rates of scientific reports submitted for publications, and have documented a greater success rate when authors had their paper exactingly appraised by competent colleagues before submission….

— 1987 NIH Paper #13 on Research Applications.

Assigned Consulting Pairs

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Time: 3:00 – 3:30 p.m. Date: Saturday, July 14, 2007

There is no question that education students is the core challenge of the teaching profession. An engaged teacher enjoys and finds meaning in this central task, mediating between the students whose learning is the goal and the set of questions that animate the domain of knowledge.

Effective teachers choose pedagogies that allow them to enjoy the process and get their students involved. A teacher at a research university explained, "It's fun. In all my courses I try to do these sort of hands-on, more inquiry-based things. It keeps [the students] engaged."

A profession becomes a vocation when those doing it believe that its challenges matter, and when the work connects them to what they value most.

— Jeanne Nakamura & Mihaly Csikszentmihalyi, *Engagement in a profession: the case of undergraduate teaching*, Daedalus, Summer 2005.

What are the strategies that can advance one toward his/her goal?

3:30 – 5:00 p.m. Free time

Experiential Learning Exercise

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Time: 5:00 – 6:00 p.m. Date: Saturday, July 14, 2007

You should:

- know what is expected in scholarship and teaching
- take your teaching evaluations to your chair before your first formal
- review and go over them with him/her to see whether you are on track
- find out what support is available for you intramurally
- ask if you can expect a reduced teaching or advising load in your first year
- ask what funds are available for course development, attendance at professional meetings, lab equipment
- ask about policies on academic honesty for students— is the department hard-nosed or forgiving
- ask about the departmental culture in regard to conduct with students— are faculty and students on a first-name basis, or is the relationship more formal.

Anything you are not clear about is something you should be talking about.

— Gary Reiness, *A Letter to New Faculty: How to Talk with Your Department Chair.* PKAL Volume IV: *What works, what matters, what lasts,* 2004.

Plenary Session VI

CHALLENGES FOR NEW FACULTY

Time: 7:15 – 8:15 p.m. Date: Saturday, July 14, 2007

FIND THE RIGHT BALANCE.

Maintaining a sense of humor, establishing a good network of friends and colleagues, nurturing good relationships with one's students, and getting time for oneself may be key ingredients for flourishing as a leader in undergraduate education, while perched atop the tightrope. Given the nature of teaching and research, a faculty member stands the chance of being completely consumed by the work and risks losing contact with friends and family. Faculty at an early career stage should guard their personal time vigorously, lest they burn out and lose the energy and passion that brought them to academia in the first place.

KNOW THE RULES.

Find out the real rules for getting tenure at your place and follow them. You can't help reform the system if you're not in it. My hope is that even if the real rules are slanted too heavily towards research, your interest in teaching will remain alive and you can let it grow some more once you earn tenure.

— Jeanne L. Narum, *Balancing Career and Personal Life: Advice from Interviews with NSF Distinguished Teaching Scholars.* PKAL Volume IV: *What works, what matters, what lasts,* 2005.

Some of the challenges addressed:

- how to manage time
- how to say no
- how to follow your passion
- how to take risks.

We will revisit the insights and lessons learned from the interviews that each person did.

8:15 p.m. **Free time**
Time to work on agendas for action

Reporting Out: Clusters

TIME: 8:15 – 9:15 A.M. DATE: SUNDAY, JULY 15, 2007

Same clusters as Friday evening dinner

Each person has five minutes or so to present his/her plan and to have it critiqued by other members of the cluster. This is a very critical part of the weekend, in particular because it is of great value to have the insights of others on one's plan, because ideas are better when many people examine them, side from side, and see new kinds of possibilities.

Still another widely observed trait may be labeled flexibility. It is perhaps best seen in what has been called the playfulness of the man of originality. He will toy with an idea, "try it on for size," look at it from a dozen different angles, argue to himself that it is true and then argue that it is untrue. Unlike the rest of us, he does not persist stubbornly and unproductively in one approach to a problem. He can change directions and shift strategies. He can give up his initial perception of a problem and redefine it.

The individual of high originality, having opened himself to such a rich and varied range of experience, exhibits an extraordinary capacity to find the order that underlies that varied experience, I would even say an extraordinary capacity to impose order on experience. And, as MacKinnon has suggested, it may be that the creative individual could not tolerate such a wild profusion of ideas and experiences if he did not have profound confidence in his capacity to bring some new kind of order out of this chaos.

— John W. Gardner, *Self-Renewal*. Harper & Row, 1964.

7:00 – 8:15 a.m. **Breakfast on your own**

9:35 a.m. **Check out of your room**

Plenary Session VII

REPORTING OUT: BEST IDEAS

Time: 9:50 – 11:00 a.m. Date: Sunday, July 15, 2007

A GUIDE TO EFFECTIVE EDUCATIONAL PRACTICES

The following teaching and learning practices have been widely tested and have shown benefits for college students, especially those from historically underserved backgrounds.

Because they feature various forms of active learning, these innovative educational practices also are especially well suited for assessing students' cumulative learning. However, on almost all campuses, these practices remain optional rather than essential.

- First-Year Seminars and Experiences
- Common Intellectual Experiences
- Learning Communities
- Writing-Intensive Courses
- Collaborative Assignments and Projects
- "Science as Science Is Done"/ Undergraduate Research
- Diversity/Global Learning
- Service Learning, Community-Based Learning
- Internships
- Capstone Courses and Projects

— AAC&U, *College Learning for the New Global Century*. <http://www.aacu.org/advocacy/leap/documents/GlobalCentury_final.pdf>

Reporting out from each of the five clusters the general sense of the plans of individuals— and the best idea from a plan that reflects some consensus of the group about the best idea from the sessions during the weekend.

Concluding remarks:

Jeanne Narum & Karen Nordell Pearson

Personal Reflections

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Personal Reflections

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Personal Reflections

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Personal Reflections

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Personal Reflections

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Table of contents

First Name	Last Name		Institution
cluster 1		pairs	
Janet	Davis	A	Grinnell College
David	Bunde	A	Knox College
Benjamin	Newton	B	Beloit College
Pedro	Teixeira	B	Knox College
Britt	Scharringhausen	C	Beloit College
Steve	Freedberg	C	St. Olaf
Ron	Peck	D	Lawrence University
Tracy	Gartner	D	Carthage College
cluster 2			
Stephen	Sieck	A	Grinnell College
Stefan	Debbert	A	Lawrence University
Steve	Remillard	B	Hope College
James	van Howe	B	Augustana College
Paul	Savariappan	C	Luther College
Shannon	Hinsa-Leasure	C	Grinnell College
Demetrius	Gravis	D	Beloit College
Deborah	Tobiason	D	Carthage College
cluster 3			
Deanna	Byrnes	A	Carthage College
Paul	Hutchison	A	Grinnell College
Erik	Tou	B	Carthage College
Luis	Melara	B	Colorado College
Ben	DeRidder	C	Grinnell College
Edmir	Wade	C	Colorado College
Kristopher	Keuseman	D	St.Olaf
Tricia	Humphreys	D	Grinnell College
cluster 4			
Jessica	Armenta	A	Beloit College
Jin	Jin	A	Grinnell College
Sarah	Lovern	B	Augustana College
Stacey	Stoffregen	B	Macalester College
Janice	Pellino	C	St. Olaf College
Launa	Lynch	C	Grinnell College
Roberto	Pelayo	D	Colorado College
Jennifer	Hampton	D	Hope College
cluster 5			
Ekta	Ahuja	A	University of Chicago
Stephanie	Strand	A	Washington University
Erika	Eggers	B	Washington University
Rifat	Hasina	B	University of Chicago
Isaac	Skromne	C	University of Chicago
James	Beck	C	Washington University
Xiangning (Jenny)	Wang	C	Washington University
cluster 6			
Kevin	Braun	A	Beloit College
Rajneesh	Bhutani	A	Washington University
Neelu	Puri	B	University of Chicago
Moriah	Beck	B	Washington University
Kelly	Barton	C	Washington University
Ben	Kolber	C	Washington University

New Faculty Workshop			
Last Name	**First Name**	**Institution**	**E-mail**
Ahuja	Ekta	University of Chicago	eahuja@uchicago.edu
Armenta	Jessica	Beloit College	armentaj@beloit.edu
Barton	Kelly	Washington University	kabarton@artsci.wustl.edu
Beck	Moriah	Washington University	mbeck@wustl.edu
Beck	James	Washington University	beck@biology.wustl.edu
Bhutani	Rajneesh	Washington University	rbhutani@gmail.com
Braun	Kevin	Beloit College	braunk@email.unc.edu
Bunde	David	Knox College	dbunde@knox.edu
Byrnes	Deanna	Carthage College	dgp33@cornell.edu
Davis	Janet	Grinnell College	davisjan@grinnell.edu
Debbert	Stefan	Lawrence University	stefan.debbert@lawrence.edu
DeRidder	Ben	Grinnell College	deridder@grinnell.edu
Eggers	Erika	Washington University	eggers@vision.wustl.edu
Freedberg	Steve	St. Olaf	freedber@stolaf.edu
Gartner	Tracy	Carthage College	tgartner@carthage.edu
Gravis	Demetrius	Beloit College	gravisd@beloit.edu
Hampton	Jennifer	Hope College	hampton@hope.edu
Hasina	Rifat	University of Chicago	rhasina@bsd.uchicago.edu
Hinsa-Leasure	Shannon	Grinnell College	hinsa@msu.edu
Humphreys	Tricia	Grinnell College	humphrtl@grinnell.edu
Hutchison	Paul	Grinnell College	hooch@umd.edu
Jin	Jin	Grinnell College	jinegg@yahoo.com
Keuseman	Kristopher	St.Olaf	keuseman@stolaf.edu
Kolber	Ben	Washington University	kolber_b@kids.wustl.edu
Lovern	Sarah	Augustana College	sarahlovern@augustana.edu
Lynch	Launa	Grinnell College	launalynch@gmail.com
Melara	Luis	Colorado College	lmelara@coloradocollege.edu
Narum	Jeanne	P-Kal & ICO	jlnarum@ico-dc.com
Newton	Benjamin	Beloit College	newtonb@beloit.edu
Nordell-Pearson	Karen	Consortium Director	nordellpearson@hope.edu
Peck	Ron	Lawrence University	ron.f.peck@lawrence.edu
Pelayo	Roberto	Colorado College	roberto@caltech.edu
Pellino	Janice	St. Olaf College	j-pellino@northwestern.edu
Puri	Neelu	University of Chicago	npuri@medicine.bsd.uchicago.edu
Remillard	Steve	Hope College	remillard@hope.edu
Savariappan	Paul	Luther College	sprajamanickam@yahoo.com
Scharringhausen	Britt	Beloit College	scharr@beloit.edu
Sieck	Stephen	Grinnell College	sieckste@grinnell.edu
Skromne	Isaac	University of Chicago	iskromne@uchicago.edu
Stoffregen	Stacey	Macalester College	sstoffre@iastate.edu
Strand	Stephanie	Washington University	strand@borcim.wustl.edu
Teixeira	Pedro	Knox College	pteixeir@knox.edu
Tobiason	Deborah	Carthage College	d-tobiason@northwestern.edu
Tou	Erik	Carthage College	Erik.Tou@gmail.com
van Howe	James	Augustana College	jwv9@cornell.edu
Wade	Edmir	Colorado College	edmir.wade@coloradocollege.edu
Wang	Xiangning (Jenny)	Washington University	wangx1963@yahoo.com

Augustana College * Beloit College * Carthage College * Colorado College
Grinnell College * Hope College *Knox College * Luther College * Lawrence University
Macalester College * St. Olaf College * University of Chicago * Washington University

Midstates Consortium for Math and Science

Connecting campuses to promote excellence in math and science
Established by the Pew Charitable Trusts

www.mathsciconsortium.org

Faculty Development Workshops

Faculty development workshops are opportunities for faculty to coordinate and/or participate in meetings with topics ranging from disciplinary curricula and research, uses of technologies and instrumentation, field work, grant writing, and career development. Workshops can be used to connect faculty at consortium campuses to disseminate products or ideas produced with other funding, to share best practices related to pedagogy, curriculum development or undergraduate research programs, or to establish disciplinary or interdisciplinary collaborations.

Most workshops start with a dinner on Friday evening and end Sunday around noon and often occur during the academic year although summer workshops are possible. Workshops are held at any of the consortium campuses and the director's office usually helps coordinate the logistics of travel, lodging, and meals. The workshop's faculty hosts help coordinate the program and invite the speakers or facilitators. The budget per workshop is generally limited to $15,000.

Each summer the Consortium hosts a new faculty workshop that includes new hires, faculty who have completed their first or second years of a new appointment (term or tenure track) and postdocs interested in teaching at a liberal arts college. The *New Faculty Workshop* is usually held in mid-July

Recent Workshops

- *Computer Science in the Decade Ahead* (Hope College, '02)
- *Big News About Small Science: Integrating Nanoscience and Nanotechnoloy Into Physical Sciences Curricula* (Lawrence University, '04)
- *Effective Use of a Field Station For Undergraduate Education in a Changing Liberal Arts College* (Knox College, '05)
- *Interdisciplinary Science Education: Institutional Examples, Lessons Learned and Challenges* (St. Olaf College, Feb '07)

Undergraduate Research Symposia

Each fall the two research universities in the Consortium, Washington University in St. Louis and the University of Chicago, host meetings designed for undergraduates to present the results of their own research projects to their peers and some consortium faculty. Washington University and the University of Chicago alternate hosting these meetings for students whose research involves the biological sciences and psychology and students whose work falls under the broader umbrella of physical sciences, mathematics and computer science. Students present in both oral and poster sessions. In the past few years both meetings have attracted nearly 100 students and more than a dozen faculty each.

Upcoming Undergraduate Research Symposia

- *Biological Sciences and Psychology*, hosted at Washington University, November 2-4, 07
- *Physical Sciences, Mathematics and Computer Science*, University of Chicago, November 9-11, 07

Speaker Series

The Consortium has a database of speakers who are willing to visit other consortium campuses to give a colloquium. Consortium funds are available to pay for travel, lodging, and meals and the online application process is simple.

Recent Visits

- David Bunde, Professor of Computer Science at Knox College spoke at Grinnell College "Power-Aware Scheduling"
- John Bleeke, Professor of Chemistry at Washington University spoke at Carthage College "Metallabenzenes and Other Aromatic Metallacycles"
- Tonnis TerVeldhuis, Professor of Physics & Astronomy at Macalester College spoke at Grinnell College "Beyond the Standard Model"
- Erin Flater, Professor of Physics at Luther College spoke at St. Olaf "Fractional Properties of the Molecularly-thin Organic Coatings: Discovering the Fundamental Mechanisms of Friction"
- Karen Shuman, Professor of Mathematics and Statistics at Grinnell College spoke at Macalester College "Game Theory"
- Mark Levandoski, Associate Professor of Chemistry at Grinnell College spoke at Colorado College "Molecular Hide and Seek: Finding Nicotinic Acetylcholine"

Short Term Consultations

The purpose of the Short Term Consultation (STC) is to encourage and support collaborations involving two or more individuals at different Consortium campuses. Projects might involve sharing information, instrumentation and facilities or expertise among the faculty members of the Consortium. The STC grants fund faculty and students in a particular area to visit a member campus for many reasons including consultation on curriculum, collaboration on research projects, participation as an outside examiner in a senior thesis exam, demonstration of a laboratory technique suitable for an undergraduate laboratory or advising faculty or departments on proposal writing or project assessment. The STC also allows faculty to visit another Consortium institution with highly sophisticated research equipment to have a sample tested, learn a new technique, or visit a field station or library.

The Short Term Consultation Program (STC) will fund an average of three visits per year per institution, including travel, hotel and meal expenses for no more than three days, and host expenses. Awards for $1,000 or less will be approved by the Director within one week of receiving the application. The Executive Committee will review proposals for $1,000 to $5,000.

Recent Short Term Consultations

- Linda Collins, Department of Statistics, University of Chicago and Shonda Kuiper, Department of Math and Computer Science, Grinnell College, have consulted twice about their NSF-funded curriculum development project.
- Lawrence geology faculty member Marcia Bjørnerud and her student, Noah Planavsky, took stromatolite samples to Washington University to conduct geochemical analyses with Dr. Zhan Peng.

Consortium Administration

Karen Nordell Pearson, Associate Professor of Chemistry at Lawrence University, on leave at Hope College, assumed the Consortium Directorship in August ’06. She will complete visits to all 13 member campuses by summer 2007. If you’ve got questions or ideas, please call (616-395-7217) or email at nordellpearson@hope.edu.

Marlene Field is the Consortium’s Program Assistant. Her office is in the Hope College Math Department (616)395-7494, fieldm@hope.edu.

WORKSHOP LEADER TRAINING EXERCISE

A Sample Chemistry Workshop Activity that tastes good

Purpose

The purpose of this exercise is to provide a tangible demonstration of the chemical principle of the Limiting Reagent. The composition of the S'mores represents the combining ratio of reactants relative to the formation of one unit of product. Limiting the quantities of ingredients to full boxes reiterates the mole concept (dozen ⇔ mole; dozen ⇔ Avogadro's Number). Students are led to express the (ingredients ⇔S'mores) relationship in a form analogous to a chemical equation. This sample workshop activity is an adaptation of an idea taken from Moog and Farrell, Chemistry: A Guided Inquiry (Preliminary Edition, 1996).

The Activity

Introduction

A delicious treat known as a **S'more** is constructed from the following ingredients:

2 graham crackers
1 chocolate bar
4 bite-sized marshmallows.

Suppose we find that these ingredients are available only in full packages, each of which contains one dozen of the item. The packages of ingredients have the following weights:

graham crackers	1 lb.
chocolate bars	4 lb.
marshmallows	¼ lb.

Start-up Exercise

Each group will build S'mores out of the packages of ingredients that you receive from your leader. Build as many S'mores as you can from one dozen of each of these ingredients. Please do not eat the S'mores yet!

Questions (You may use your S'mores to help you visualize these problems)

1. Using S as the symbol for the S'mores, G for the graham crackers, C for the chocolate bars, and M for the marshmallows, develop an equation that would represent the production of S'mores from the starting materials.

2. Based on the information given, which of the three ingredients weighs the most? Which weighs the least? Explain your reasoning.

3. If we have 12 graham crackers (one package), how many chocolate bars and how many marshmallows do we need to make S'mores with all the graham crackers?

4. How many S'mores would we be able to make?

5. Suppose we have one package of each of the ingredients. How many S'mores can we make? Will any of the ingredients be left over? How much?

6. Suppose we have 4 lbs of each of the ingredients. Which item do you have the most of? The least? Explain your reasoning.

7. If we make S'mores from the materials described in #5, which ingredient will you run out of first? (This item is known to chemists as the **limiting reagent** because it is the reactant that limits the amount of the final product that can be made)

8. How many dozen S'mores will you have made?

9. Is it correct to say that if we start with 4 lb each of G, C, and M, we should end up with 3 x 4 = 12 lb of S'mores? If not, why not?

10. Suppose we have one ton (2,000 lb) of each of the ingredients. What weight of S'mores can we make? How many dozen S'mores is this?

Follow-up Exercise

Now let's apply the same concepts to a chemical situation:

Ammonia (NH_3) can be formed from the elements N_2 and H_2 , as shown below. Model this process using any unused S'mores ingredients to represent the reactants. For example, let graham crackers be N atoms and marshmallows H atoms. Improvise!

N_2 + 3 H_2 ---------- > 2 NH_3

How many moles of ammonia can be made from one mole of N_2 and 3 moles of H_2 ?

Suppose we had 3 moles each of the N_2 and H_2 available to react. Which of the reactants would be the limiting reagent?

How many moles of ammonia could we make? Would any of the reactants be left over? How many moles?

How many moles of ammonia could we make from one mole each of N_2 and H_2 ?

What weight of ammonia could we make from 100 grams each of N_2 and H_2 ?

Jeanne Nakamura & Mihaly Csikszentmihalyi

Engagement in a profession: the case of undergraduate teaching

"When I was at Yale, I overheard a conversation between two famous senior professors. The two were talking about the fact that they did not like teaching undergraduates and preferred to teach graduate students, and to do research. They were exchanging pointers on how to get out of undergraduate teaching. One of them was saying that he taught them badly: he reused his lecture notes and didn't try to put anything into it.

Jeanne Nakamura is research director of the Quality of Life Research Center and director of the GoodWork Project's research group at Claremont Graduate University. The coeditor of "Supportive Frameworks for Youth Engagement" (2001), she is currently leading research projects on the pursuit of good work in the American college and in mentoring.

Mihaly Csikszentmihalyi is C. S. and D. J. Davidson Professor of Psychology and Management at the Drucker School of Management at Claremont Graduate University, director of the Quality of Life Research Center, and cofounder of the positive psychology movement. His books include "Being Adolescent" (1984), "Flow" (1990), and "Good Business: Leadership, Flow, and the Making of Meaning" (2003). He has been a Fellow of the American Academy since 1997.

And so the dean didn't make him teach that course very often.

I found myself getting very angry at hearing this, but I couldn't quite understand why it mattered to me what these guys did in their teaching. And then I realized that I had [formed a conviction] that pedagogy was fundamentally important, especially at the undergraduate level. At that moment, something in me said, 'I don't want to be like them.' It was then that I decided I would think about teaching at a small college."

This event, described as a graduate-school epiphany by an engineer who went on to become an outstanding teacher at an outstanding college, illustrates the lack of support for taking undergraduate teaching seriously and aspiring to excellence in it. Yet isn't it worrisome that few college teachers would find the vignette surprising?

Unfortunately it is not only university teaching where the central purpose of the profession appears to be compromised. Physicians find themselves increasingly in the role of administrators rather than healers, and lawyers complain about not being able to serve clients with the personal attention they expected to be able to give when starting their careers. In most professions, practitioners rarely spend more than a quar-

ter of the time on the job doing what they see as their main task. For instance, physicians treat and talk to patients about 23 percent of their working time; the rest is spent talking to coworkers, reading, writing, filing, and doing a host of other activities that are less and less related to their training and purpose. What makes this state of affairs difficult to understand is that the professions are supposed to be the most free and most satisfying ways to make a living. If doctors, teachers, lawyers, and engineers all have trouble doing the work they are meant to do, what about the great majority of people who work in even more constrained settings?

There are basically two threats to the professions. One is subjective, involving a loss of motivation and commitment. As long as workers experienced their jobs as callings, they were motivated to listen to the voice that pressed them to do their best. But who is calling them now? That voice has become a barely audible whisper, obscured by stentorian calls to do what's best for one's comfort, bank account, or social influence. Members of a profession can be compelled or intimidated into doing work that meets standards of quality and codes of ethics. But they cannot be forced into feeling *engaged*. It is when they enjoy and care deeply about the work they do, and wholeheartedly value the people and the ends it is meant to serve, that they are most likely to aspire to excellence and principled conduct.

The second threat to professional conduct involves more objective factors. For example, it has been argued that the diffusion of the automobile, which resulted in suburban sprawl, has made it uneconomical for physicians to make home visits. This has moved the interaction between doctor and patient from domestic to more impersonal settings, contributing to the compartmentalization and bureaucratization of medicine. For each profession, dozens of similar factors have transformed how the work is done. Some of the time the resulting change in practice is sensible, even inevitable. Other times it is not – and professionals and the public they serve are the worse for it.

Engagement in a profession: the case of undergraduate teaching

Consider the case of just one class of modern professionals: those who teach undergraduates. Undergraduate teaching is a profession that influences all others. Medical schools shape future doctors; law schools shape tomorrow's attorneys. Those responsible for undergraduate education touch the lives of students who go on to enter *all* the professions. As a result, undergraduate teachers potentially have a much wider impact on the future well-being of the professions and, through them, society as a whole. The point is not that undergraduate education lays the groundwork for absorbing a body of professional knowledge, or that it initiates students into a field's distinctive code of ethics. Rather, at its best, undergraduate education plays a special role in encouraging each student's engagement with a discipline and, in this respect, in preparing all students to do work that is 'good.' For while finding enjoyment and meaning in one's undertakings may be the most durable basis for good work, how to find them is not taught in graduate and professional schools.

We recently interviewed about a hundred leading teachers and administrators at ten highly regarded schools, including liberal arts and community colleges, research universities, and a major for-profit institution.[1] The picture of the

1 These interviews were conducted as part of the Study of Good Work in Higher Education supported by the William and Flora Hewlett

profession that emerges from these interviews is an ideal that hardly represents what the job of teaching is like at most of the nation's colleges. But unless we occasionally examine what ideal professional conditions entail, it is unlikely that we will be able to improve the condition of the professions more generally.

Unrepresentative though they may be, these engaged teachers and administrators illustrate how it is possible to derive satisfaction from a profession today. One professor told us, "If I won the lottery, I would still be coming back here to do my job. There is nothing else I can imagine I would rather be doing." Such deep absorption is most likely to occur when the work holds clear challenges that fully utilize capacities without overwhelming them, when the rules of engagement are unambiguous, when actions receive timely feedback, and when it is possible to shape the process as it unfolds. A teacher who can still vividly recall her own teachers' infectious enthusiasm explained, "They put things in manageable pieces for you so you could understand it. And then as you gained some skill with it, you started to become passionate about it, to get excited about it, and it became fun." When the work's challenges are not only well defined and demanding but also aligned with what the individual values, the profession becomes a source of meaning as well as enjoyment.

Like any profession, undergraduate teaching offers several ways to become engaged in the job. For undergraduate teachers, four areas of possible engagement are key: educating students; preserving and advancing a specific domain of knowledge; serving the needs of the institution; and responding to the needs of the broader society. Teachers become engaged in their work to the extent that they find enjoyable challenges in one or more of these areas, and to the extent that they find that those challenges are in line with their values. In what follows, we will explore the experience of teachers at outstanding colleges in each of these areas.

There is no question that *educating students* is the core challenge of the teaching profession. An engaged teacher enjoys and finds meaning in this central task, mediating between the students whose learning is the goal and the set of questions that animate the domain of knowledge.

Effective teachers choose pedagogies that allow them to enjoy the process and get their students involved. A teacher at a research university explained, "It's fun. In all my courses I try to do these sort of hands-on, more inquiry-based things. It keeps [the students] engaged."

A profession becomes a vocation when those doing it believe that its challenges matter, and when the work connects them to what they value most. As a teacher at a community college told us, "Education is supposed to be inspiring. It's supposed to be exciting. It's supposed to change your life. If education can't enrich, why bother?" The challenges of teaching are infused with meaning when the teacher cares about the students and about helping them meet their educational goals. "I don't know of anything that really gets my engine going more than watching the light come on for a student," one professor told us. Another said, "To see a student suddenly begin to question his own assumptions – not desperately, but excitedly – and with tools to understand. To see that same student come back the next year and seem to have grown five years

Foundation, the Carnegie Corporation of New York, and the Atlantic Philanthropies.

older in terms of who that student is as a human being – that does it for me. It's exciting, it's unendingly exciting." Many teachers – particularly those working with disadvantaged students – are profoundly moved to see their students receive their diplomas, and speak with pride about students who return years after graduation to share their accomplishments and express their gratitude.

While such rewarding experiences should be sufficient to keep professionals focused on their primary task, many obstacles may interfere. When a teacher is expected to face five hundred young people in an introductory class, for example, it is almost impossible to see an individual student question his own assumptions, or to see the light of understanding dawn in his eyes. Also, while some teachers love engaging underprepared students who are eager to learn, others feel frustrated about not being able to overcome the chasm separating too many students from the expectations of higher education. As in other professions, numerous obstacles make it difficult for teachers to be continuously engaged, even with the core aspects of their task.

The challenge of *preserving and advancing knowledge* provides a second form of engagement for college teachers. In this case, they are rewarded by knowing that through them something of value survives as a living part of the culture. "I just always loved learning. I loved school," a professor told us. "It was the place in my life where I always felt most at home. [The university] just seemed to me a wonderful place to be and a wonderful way to live, constantly reading and asking complicated, deep, unanswerable questions." Especially at research institutions, faculty may find excitement in researching and writing in their disciplines, or in the life of the mind more generally.

True, the two most basic roles of college professors – teaching and research – often conflict. One professor at a liberal arts college recalled that during graduate school at a leading public university, "I had to sort of hide under a rug, in a way, my desire to teach. I got a terrific graduate education there, but the down side was it was clear they didn't care one bit about teaching." A study conducted in the 1990s showed that in all types of four-year institutions, the proportion of time dedicated to research rose and the time dedicated to teaching declined. Yet over two-thirds of the faculty outside research universities claim they are more interested in teaching than research. It is obviously not the case that devotion to one's discipline has to conflict with doing good work as a teacher. Indeed, a teacher indifferent to his area of study is unlikely to engage students.

Serving the needs of the institution is an important element in any profession: doctors may become devoted to their hospitals, lawyers to their firms, journalists to their newspapers, professors to their colleges or universities. A distinguished scientist assumed the presidency of her research university to a large extent because of "a deep love of this institution." She explained that "it would not have occurred to me to think about this job at any other institution. You have to fundamentally care about a university that you lead because it's too much work if there isn't a real passion." She traced her own passion to "the respect with which [the institution] treats ideas, treats excellence, treats people ... I deeply admired the way in which [my predecessor] ran the university based on a core set of values and principles that we were going to try and live up to. I think it made me al-

ways proud to be a member of the community." When professionals find a place in an organization that shares their values, a sense of vocation is more likely to flourish. A clearly defined institutional mission provides a compelling compass for action and a basis for judging if one is doing good work. The presence of such a mission is a sign that an ethos genuinely exists within the institution – an ethic that expresses the defining spirit and values of the community.

Although such commitment is common at outstanding colleges, the wider field is virtually silent about the rewards of engaging challenges of an institutional nature. In the Carnegie Foundation's widely cited 1989 survey, faculty members were asked, "Do your interests lie primarily in research or in teaching?" – the survey did not measure administrative or institutional interests at all. The same survey revealed that "faculty identify strongly with their academic discipline, less so with their department, and still less with their institution." Shaping a collective enterprise and participating in a community is perhaps the least recognized source of joy in academic life. Even to use a term such as 'joy' seems a stretch for a set of challenges that most teachers view at best as duties and at worst as outright burdens.

Enhancing the well-being of an institution one loves can of course become an end in itself; and efforts to burnish its reputation, build its coffers, or otherwise enhance it can come to be an enjoyable way of using one's skills as a leader, fundraiser, or strategist. Service to the institution acquires meaning because of the values the institution represents. Good work gets done when serving the institution advances the profession's core purpose of educating students.

The fourth area of engagement for teachers involves *serving the needs of the broader society*. Many teachers hold values that shape their educational goals. When, for example, a faculty member describes the challenges and rewards of fostering diversity and openness to the perspectives of others, he or she is seeing beyond the classroom or institution to the society as a whole. An environmental studies professor we interviewed counts preserving the natural environment among her overarching goals. As she put it, "I realized that if I was worried about the trends in the environment ... [and] if I was going to make a difference, it would be that I need to be back in the classroom and talk to people about what was happening with the environment." Many teachers engaged by social and cultural issues such as war and peace, globalization, and poverty share this belief that the classroom constitutes one front in a larger battle.

This kind of engagement can be consistent with one's professional commitments but lie outside one's daily job – as when doctors volunteer in such organizations as Doctors Without Borders, or when lawyers do pro bono work. For some professionals, such outside engagement may become the most meaningful part of working life. Of course, an activist approach to the profession can also be a detriment, as when a teacher uses his bully pulpit to indoctrinate students in partisan causes.

Most undergraduate teachers participate in the four key areas of possible engagement – educating students; preserving and advancing knowledge; serving the needs of the institution; and responding to the needs of the broader society – without necessarily deriving the same amount of enjoyment and meaning from each of them. Indeed, the very

effort required to negotiate multiple sets of challenges can diminish one's ability to engage any of them fully. Nevertheless, some rare individuals find all four sets of challenges to be a source of significant meaning and enjoyment.

One such individual is John T. Scott, who has taught at his alma mater, Xavier University in Louisiana, for thirty-five years. A historically black, Catholic college renowned for its success in training future doctors and scientists, the school has struggled with limited resources to serve underprepared students. As an art teacher, Scott has also had to struggle to interest Xavier students in his field of expertise. Yet he describes undiminished absorption in the challenges of pursuing his craft as sculptor and printmaker ("I am still discovering things and expanding the language of my craft"); helping students learn ("I developed this love for sharing information ... teaching is as much a creative challenge as being in my studio"); sustaining the culture of his institutional home ("'Pass it on' – that is the philosophy here. And I think I'm one of the ones who continues that tradition"); and serving the broader community ("As a visual artist, part of my job is to be a spokesman for the community that I'm part of"). During his years of teaching, he built a foundry from scratch, constructed the critically acclaimed African American pavilion for the 1984 World's Fair, and garnered such honors as the 1992 MacArthur "genius" award.

How has he remained engaged despite the obstacles? His approach on all fronts creates the conditions for intense involvement, or 'flow.' His goals have a fine clarity. His nonnegotiable standard is excellence ("'Good enough' is never good enough. If it's not the best you're capable of, you're being dishonest"). He regards hurdles as challenges ("An obstacle should not be something that slows you down, but [that] teaches you how to jump high"). Scott's work is also *meaningful*: each set of challenges matters to him; each endeavor connects him to something beyond himself. Making art, teaching students, meeting institutional challenges – each is at the same time a way of taking on challenges facing the human community in general and the African American community in particular. Through his teaching he aims to prepare students for life ("They [should] leave here with a sense of purpose – what they want to do with their lives – [and a recognition that] life is not separate from the community of humanity that you're a part of"). By serving Xavier University, he supports an institution he loves ("This place has been more like a family than like a school") with a mission in which he believes ("The success of Xavier has been that the student has been the focus for so many years").

Scott's case illustrates one way of being fully engaged by all four sets of challenges without feeling pulled in four different directions. For some, taking all four sets of challenges seriously could amount to a draining exercise in juggling, multitasking, and negotiating trade-offs and compromises. The resulting risk: all of the challenges may be met less well and provide less fulfillment than when a single one is engaged alone. For those like Scott, by contrast, it can mean that the effort invested in any of the four challenges also serves to meet the requirements of the other three.

A sense of vocation is critical to teachers' own well-being and to the continued vitality of higher education. When college teachers are uninspired, they may dishearten future professionals of all kinds. Conversely, when undergraduate teachers experience their work as a vocation, they may have a positive impact on

Jeanne Nakamura & Mihaly Csikszentmihalyi on professions & professionals

the next generation of workers in *all* the professions. To inspire passion, one must feel it oneself. An outstanding teacher in our study remembers college "classes that I absolutely loved that had nothing to do with what I was studying. But I loved the class because the teacher was so excited about it .... If you don't live it, it's hard to teach it." Engaged teachers are likely to find ways to draw students into the excitement of learning.

More broadly, they provide a model of engaged adulthood for their students. They show that it is possible to experience work as a calling rather than merely as a job. One of the teachers in our study suggested that ultimately students have only one question of their teachers: are you happy enough that I can stand to be like you? Through their conduct, engaged teachers answer the question affirmatively. Young people often see status and wealth as keys to adult happiness. Engaged teachers present a vision that grounds happiness in the pursuit of broader goals. For thirty-five years, John Scott's students have watched him engage his profession as a way of life, approach it with intensity, rise to its challenges, and, through it, serve the communities to which he belongs. Undeterred by lack of resources and repeatedly achieving extraordinary results despite steep odds, Scott and his colleagues – like his own teachers at Xavier – present students with a model of work that contrasts sharply with the prevailing one of "getting a job and making a whole lot of money."

Students respond to teachers' genuine interest in the subject they are teaching, and to teachers' interest in the students themselves. Most students quickly catch on if a teacher is bored by what he is saying, or if he has little respect for the class. As one teacher notes, "They will put up with all sorts of stuff if they believe that you have their best interests at heart – [and] they are very good at detecting whether you do."

At the same time, teachers need to introduce students to the broader institutional framework that may nurture a lifetime passion for learning. To succeed, learning must be embedded in a network of stable and significant relationships. Teachers bring students into the learning community through various routes, establishing communities in their own classrooms and taking the most engaged students to professional meetings. More broadly, they may help create a sense of intellectual community in the institution as a whole by establishing common curricula, setting aside time for the exchange of ideas outside of class, designing spaces that encourage interaction, and supporting the negotiation of differences through dialogue. At many universities, of course, the great majority of students display with pride the bumper stickers and other paraphernalia of the school's football team, but are effectively strangers to the world of knowledge the school is supposed to represent. One of the main tasks confronting higher education is to engage young people not just with ideas, but also with a fellowship of knowledge seekers.

Teachers heighten student engagement when they can show their students that what they are learning might make a difference outside the domain of knowledge and the field of scholarship. Good schools set ambitious goals for their students: to become community leaders, champions of the oppressed, protectors of the environment. When teachers care deeply about such goals and can provide credible solutions, the aim of serving social ends through knowledge becomes compelling to students. For example, one professor told

us her work is "not a job at all; it's a call to contribute to the world." She framed the challenge for her students in the same terms: "We want [the students] to go out there and participate and be leaders in the community, to excite them, to engage them! We want to engage them so that they become engaged with the community .... professional life is to be viewed as a life of service .... I think all of us try to share that, and instill it in our students."

Undergraduate teaching in the United States today may be extreme if not unique among the professions in the divergent visions of service it encompasses. However, it is not unique in the varied forms of engagement it affords, nor in privileging one set of challenges – the form of service to others that defines the profession – over the other challenges that members of the profession may find engaging. Good work can be threatened if secondary tasks actively compete or conflict with the profession's raison d'être – for teachers, the education of students. However, good work may be more likely if engaging the challenges of domain, institution, or broader society serves or complements that central purpose.

In addition to being typical of professions in this general sense, undergraduate teaching has a special, underappreciated relationship to all the professions: if work is enhanced or compromised there, it will cause ripples throughout the professions for which an undergraduate education is a prerequisite, and affect all the knowledge workers on whom the future of society depends. If good work is threatened in the colleges, we suggest, it is at risk everywhere.

WHAT WORKS - A REPORT

A LETTER TO NEW FACULTY– HOW TO TALK WITH YOUR DEPARTMENT CHAIR

Gary Reiness
Dean of Science
Lewis and Clark College

For some new faculty, an essay with the title "how to avoid talking with your department chair or dean" would probably hold greater appeal. I want to convince you, however, that it is both desirable and possible to talk frequently with these individuals, that doing so will help you succeed in your scholarly and teaching career. I also want to convince you doing so will increase the possibility that you can structure your day-to-day working environment in order to increase your work satisfaction. Talking with your department chair (and dean) is necessary for many reasons: to obtain resources needed for your teaching and research, to determine whether you're making satisfactory progress toward promotion, and to negotiate the various aspects of faculty life: what you'll teach and when, what service you'll be asked to give, what your advising load will be, etc.

SOME ANSWERS TO QUESTIONS YOU MIGHT HAVE

What should you be talking with them about?

Just about anything. One mistake most of us make is assuming that our new institution is basically the same as other colleges and universities with which we've been associated. That isn't true. All campuses have much in common, but each has a unique history, mission, and institutional culture. You need to discover what those unique characteristics are in order to work effectively within your new environment.

First, you need to be clear about expectations for new faculty from both the departmental and institutional perspective, and your department chair is usually the best source for this. (There will be written documents spelling out such expectations, but, like the U.S. Constitution, they require skilled interpretation to be understood properly.)

You should:

- know what is expected in scholarship and teaching
- take your teaching evaluations to your chair before your first formal review and go over them with him/her to see whether you are on track
- find out what support is available for you intramurally
- ask if you can expect a reduced teaching or advising load in your first year
- ask what funds are available for course development, attendance at professional meetings, lab equipment
- ask about policies on academic honesty for students– is the department hard-nosed or forgiving
- ask about the departmental culture in regard to conduct with students– are faculty and students on a first-name basis, or is the relationship more formal.

...A LETTER TO NEW FACULTY– HOW TO TALK WITH YOUR DEPARTMENT CHAIR

Anything you are not clear about is something you should be talking about.

When should you be talking to your department chair?

Start as soon as you accept the position, and don't stop until you retire. Keeping him or her abreast of your activities will smooth your path because chairs (and deans) hate surprises. Finding out what they are up to enables you to coordinate your plans and activities with theirs. Remember though, like you, they are very busy people. So keep your meetings with them short and structured so you do not waste their time (or yours). At a liberal arts college, fifteen minutes a week is not too often to talk with your chair, apart from the chats you may have in passing at the coffee machine. For talking with your dean or divisional chair, you will have to gain a sense of the institutional culture about the timing and scope of such visits, but at least once a year is appropriate.

How should you talk with your chair?

It is best to adopt a respectful tone, but not an obsequious one. That is, let them know at first that you think they have something to offer you, and that you hope they'll be willing to do so. They almost always will be. As time goes on, you and they will find that you have much to offer them in return. What you're trying to do first is to become well-informed about the explicit and implicit expectations of the department (and institution); you will also be making allies of your chair (and dean), so that they will be advocates for you as your career evolves.

Many interactions with your chair will involve your asking him or her for something. Maybe you want to teach in a different classroom or lab. Maybe you think it is time to overhaul all the introductory course labs. Maybe you would like to try out a seminar in your specialty. Maybe you'd like to equip a new advanced lab course. Most of your requests will require at least the forbearance of your chair and senior colleagues, if not their outright collusion.

SOME TIPS

How can you talk with them in ways that maximize your chances for success?

Following are some tips from my long-awaited (by my mother) manuscript, "The secret lives of administrators." Keeping these points in mind while talking with your chair will maximize your chances for a successful outcome to the discussion when you find yourselves of like minds on an issue-. It will also help to smooth the differences when you do not.

Department chairs (and deans) are human.

Really. Of course, that's good news and bad news. The good news is that they can be helpful, supportive and encouraging. If that describes your colleagues, be grateful and take advantage of their willingness to help. However, even the best department chair can have a bad day (as we all do), and if yours seems grumpy on a particular occasion, come back when they are in a better mood. Years ago, early in my career, someone advised me always to have two issues ready to discuss (one hard, one easy), and to read the lay-of-the-land quickly upon entering the chair's office in order to know which issue to put on the table at that time. Do the quick and easy stuff on a bad day, and save the harder ones for clearer weather.

The down side of being human is that humans in positions of authority can also be petty, jealous, spiteful, and self-centered, and that's just for starters. If that describes your situation, then you need to find others to talk with and depend upon. Other senior colleagues in your department and/or politically-savvy members of the faculty can be surrogate mentors and guides into the institutional culture. But sometimes you have no choice but do deal with the "boss" directly; surprisingly however, the means for succeeding with poor and good administrators are much the same, even though the former require more tact and patience on your part.

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Volume IV: What works, what matters, what lasts
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...A LETTER TO NEW FACULTY– HOW TO TALK WITH YOUR DEPARTMENT CHAIR

You should first realize that:

Department chairs and deans receive more requests to support good ideas than they have resources to support those good ideas.

That's a basic tenet of economics– resources are always limiting. No matter how rich the institution, there will not be enough money or time to do all the worthwhile things that could be done. This means that inevitably an administrator has to make choices– supporting some ideas and not others. Choosing between a good idea and a bad idea is easy, but choosing between good ideas is difficult; that's not a job most people relish (which is why administrators are rich and respected, or at least why they should be.) When confronted with difficult choices:

Department chairs and deans are most likely to support the options that advance their own agenda.

That's why you need to know what the institutional mission is, and what the agenda of your senior administrators is. If your chair– and your department– wants to develop more student-directed research projects in the introductory course laboratories, they will likely be more receptive to your request to attend a workshop on revitalizing introductory labs. You'll likely be more successful if you structure your requests in ways that can be seen as helping your chair and your department achieve their aims, as well as helping to advance your career. In addition, note that:

Department chairs and deans are more likely to endorse requests that come from groups of faculty rather than from individuals.

Again, this is simple economics. One can please more people and have a greater probability of success by supporting groups. This means that it is usually wise to line up some support from colleagues before you approach an administrator with a request for support. For example, suppose you told your dean that you think it would be nice to have monthly discussions about teaching among the science faculty. Most any dean would think that's a great idea, and would probably offer you "best wishes" for success. But suppose that six faculty members came to the dean and said, "we'd like to hold monthly discussions about science teaching and we think we could attract other faculty if we had a small budget to buy lunches for everyone and to bring in an occasional guest speaker from a nearby college." Hardly any dean or department chair could refuse such a request, and you'll probably leave with both "best wishes" and a commitment of some money. However, no matter, how good your ideas or how well they match larger agenda's, or how many of your colleagues support the proposal, sometimes your request will be turned down.

Because:

Someone will be offended by any decision made, no matter how sensible it may seem.

If the chair increases the budget for Bio 101, whoever teaches Bio 102 will think they deserve more money also. If the dean okays a new position in chemistry, the physics department will say they had a better case for a new position. (If that's not Murphy's Law, it should be.) So sometimes you will get turned down, not because you do not have a worthy proposal, but because supporting your request would subject your dean or chair to a backlash that might interfere with other goals he or she is trying to achieve. So, if you do get turned down, try to find out why and figure out what to do to succeed in the future. If the problem is just bad timing, you'll just have to wait. Waiting can be a virtue because:

The first thing learned in administrator's school is not to make snap decisions.

What they teach us to say is. 'If you want an answer right now, the answer is 'no.' If you can wait until I think over the ramifications of this request and talk with others about it, the answer might be 'yes." So sometimes you must just lay your cards on the table and sit tight, perhaps occasionally sending a polite reminder that you hope things are moving forward on your request In our increasingly fractious time, politeness is too seldom in evidence, so recall the advice of your first grade teacher:

DON'T FORGET TO SAY "PLEASE" AND "THANK YOU."

Many requests come to department chairs and deans in the form of demands– or worse, a kind of blackmail. "If you're really serious about having strong science programs, you'll buy us a new NMR (electron microscope, computing facility, whatever)." Some administrators may be bullied by such an approach, but most will just be offended. Better to

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...A LETTER TO NEW FACULTY– HOW TO TALK WITH YOUR DEPARTMENT CHAIR

speak softly, "I know you've been very supportive of the science programs and we all appreciate. Unfortunately all our competing schools have new NMRs for their chemistry programs, while ours is so old that we are losing our capacity to offer students the best education, as well as losing students to better-equipped programs. Without a new NMR, we are quickly falling behind, despite all our efforts. Is there any way you can help us solve this problem?" As mentioned earlier, almost anything a dean or chair does for you and your group will annoy someone else, so let them know you understand the political cost for supporting you, and that you appreciate their willingness to pay that price on your behalf. And remember also that:

When a department chair or dean does something for you, they'll expect something in return.

The quid pro quo expectation holds in academia as elsewhere. So be thinking about what you would be willing to do in return that fits your own agenda. Decide on which possible service activities mesh with your career objectives and which do not. Then when the dean calls to say he needs a left-handed scientist to serve on the institutional Parking/Transportation Task Force, you can say, "That's not something I'd be interested in doing, but I understand you're also looking for someone to run the summer student research program and that is somewhere I think I can make a real contribution." They will expect something from you, but try to pay them back in a coin that you choose. Finally,

Don't make every conversation with your department chair or dean a request for something.

Otherwise you'll soon discover that they are not available when you come calling. If the only time your students came to see you was to ask for a letter of recommendation or to complain about a grade, it would take a lot of the fun out of your life. It's not much different for chairs and deans; they like to hear some happy news about what is happening in your classes or in your research lab. Make sure you drop by to update them on the results of some project they supported, to offer your services, to thank them for their help, to congratulate them on a personal achievement, or just to show them your new bike.

If you follow the tried and true political advice, "talk earlier and talk often," if you offer as well as request help, if you are respectful even if you disagree with your department chair or dean, you will be likely to find that you have a friend and a supporter for life. Isn't that a fair recompense for a bit of talk? ■

Volume IV: What works, what matters, what lasts
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WHAT WORKS - A PKAL RESOURCE

BALANCING CAREER AND PERSONAL LIFE

For faculty at an early career stage, it is difficult to figure out how to balance responsibilities for research and teaching while having a personal life; any advice– for them and for faculty at any stage?

- **MAKE TIME FOR WHAT MATTERS.** One of my best post doc mentors took me aside and asked, *when you are on your death bed, is it more likely that you will wish you had written another few papers or had spent more time with your kids?* This is essential, life-altering advice. Scientists begin with simple curiosity and it grows into a motivating, rewarding, and sometimes, consuming passion. Unfortunately I know a few who turned their backs on their humanity along the way.

  Balance is essential, but the professional pressures all go the wrong way. Universities ask more and more of faculty, and the best departments can create a culture of ambition and competition that is corrosive. Careers have an arc, and everyone is quick to point out if someone seems to have slowed their ascent. Academics are intensely self-motivated, and it doesn't take much of this external "fuel" for balance to be lost entirely.

  That's the bad news. The good news/advice I give is that you can and should make your own path. Write fewer but stronger papers. Think outside the "box" of your discipline from time to time. If teaching inspires you, do it; you will get your reward from all the lives you touch. Let your sense of balance be a positive on any dysfunction you may have in your own academic setting. Never neglect family and friends; if you are like most scientists, you owe them an enormous debt. My favorite scientists are also excellent human beings.

- **UNDERSTAND CAREER STAGES.** How I have spent my time has evolved substantially over the course of my career, as research and teaching opportunities and family circumstances have changed. At different career stages I have spent different relative amounts of time on research, education, and my personal life. I have been fortunate to belong to a department, campus, and discipline that have been supportive of my diverse interests and their evolution over time.

- **AIM HIGH.** It is a risk, especially in the context of an institutional culture when anything you do that takes you away from research is a risk. This has to change. My advice: whatever you are doing– in research or in education– do it extraordinarily well. Make it high quality. Make sure what you do is documented to make you visible as a valuable faculty member. The quality of your work is the key.

Advice from *Interviews with NSF Distinguished Teaching Scholars by Jeanne L. Narum:*
http://www.pkal.org/template2.cfm?c_id=279

KEY ISSUES

Advice on balancing a career and a personal life:

- Make time for what matters
- Understand career stages
- Aim high
- Learn to say No
- Find the right balance
- Enjoy what you do
- Know the rules
- Understand the system
- Make a plan.

BALANCING CAREER AND PERSONAL LIFE

- **LEARN TO SAY NO.** There will be times when you will have to say "no" even to attractive opportunities because they conflict with other commitments. There will be times when you discover yourself to be over-committed. Then you have to reconcile yourself either to doing a job that is not what you had hoped it would be or to negotiate your way out of one of the commitments. Those are both important strategies and far superior to beating yourself up or getting anxious and frazzled. One last trick I learned, perhaps specific to the sciences, is that by using the research in the teaching and vice versa, you gain time. Give the students in a course a project assignment in which they work in small groups and write a group report. This gives them practice in group activities, develops their ability to critique written work, and results in fewer papers that need to be graded! And if the projects are related to literature that you want to learn about for the research effort, so much the better.

- **FIND THE RIGHT BALANCE.** Maintaining a sense of humor, establishing a good network of friends and colleagues, nurturing good relationships with one's students, and getting time for oneself may be key ingredients for flourishing as a leader in undergraduate education, while perched atop the tightrope.

Given the nature of teaching and research, a faculty member stands the chance of being completely consumed by the work and risks losing contact with friends and family. Faculty at an early career stage should guard their personal time vigorously, lest they burn out and lose the energy and passion that brought them to academia in the first place. Each must determine for her- or himself what that balance might be (given institutional tenure requirements, etc.), but– when signs of stress begin to appear (difficulty sleeping, loss of concentration, or anxiety, for example)– one has probably crossed the threshold. I seriously doubt that the "balance" is a fixed value, so we should assess how we're doing on a regular basis throughout our careers, which will hopefully evolve and keep us challenged and productive. Indeed, some faculty at later stages in their careers may be less concerned with balancing career and personal life than they are with declining enthusiasm for their work.

Having been around faculty who have been teaching and doing research for over thirty years and who continue to be energized by their work, several of my suggestions for junior faculty may apply to more seasoned faculty, particularly maintaining a network of friends and colleagues, maintaining the sense of connectedness with others who share a commitment to education and research. Further, working to be integrated into one's scholarly societies and professional organizations, as well as to contribute as educators and researchers, can be very powerful salves for waning career interest.

Energy and passion are infectious. Friends and colleagues will often generously share theirs to give a much-needed boost to those of us who are feeling less than enthusiastic about our careers. A phone call to an old friend-and-colleague can be a very important first step in getting us out of a career slump.

- **ENJOY WHAT YOU DO.** Only that the personal life is very important and should not take a back seat to the pressures of getting tenure. One should be a professor for the love of teaching and research. If one is working too hard to enjoy it then something is wrong.

- **KNOW THE RULES.** Find out the real rules for getting tenure at your place and follow them. You can't help reform the system if you're not in it. My hope is that even if the real rules are slanted too heavily towards research, your interest in teaching will remain alive and you can let it grow some more once you earn tenure.

Volume IV: What works, what matters, what lasts
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WHAT WORKS - A PKAL RESOURCE

BALANCING CAREER AND PERSONAL LIFE

- **UNDERSTAND THE SYSTEM.** The bottom line with respect to promotion to tenure at a major research university is the unequivocal demonstration of accomplishment and potential for continued excellence in research. What this means is that a junior faculty member must be careful not to ignore this reality and avoid giving up energy and resources that will endanger the ability to achieve an excellent research component to his/her tenure dossier. Teaching performance is considered an important component of the dossier, but is not likely to compensate for an undistinguished research performance. Thus, good mentoring is required for the untenured faculty member, not only on how to balance teaching versus research, but also to understand what is expected of them.

- **MAKE A PLAN.** It has always struck me as odd that faculty never or rarely miss a class, yet will often pass up on research commitments and scheduled reading and writing. Even though research productivity is rewarded and expected for professional advancement, it is the case that many faculty will only schedule their teaching.

  Block out time every day for writing and doing research. Just as teaching commitments get scheduled and have to be met, so too should writing, reading, and researching be scheduled, with those commitments taking priority over any unscheduled activities. I am not advocating a lack of flexibility, but establishing a priority system aligned with the reward structure of an academic institution. ■

WHAT WORKS - A PKAL ESSAY

GETTING SUPPORT AND BUDGET FOR YOUR GREAT IDEA

Peter A. Facione
Provost
Loyola University Chicago

This essay is about how to successfully translate your enthusiasm for a new project into dollars you can spend on it.

The situation: You have a great idea for a new course or curricular program; you want a new pedagogical approach, or put on an academic event, or engage students in a worthy service learning project; or perhaps you need a new piece of research equipment, etc. In the press of daily duties, instead of sitting down with your chair to explain how this new idea will be good for you and for your students and colleagues, you dash off an excited and hurried e-mail.

And almost instantly by return message your department chair says that unfortunately the department simply has no money for your project. Discouraged, you wonder what has become of the department's budget. And then you think perhaps you should be going straight to the dean or the academic vice-president with your idea. After all, they might fund it!

Well, maybe, but not likely. At least not right off.

Yes, the chair probably was the right person to start with. But, perhaps you made the wrong approach, or perhaps not. Maybe the chair had not yet learned how best to assist colleagues to succeed in situations like this.

Experienced chairs, upon hearing a good idea, often suggest how your idea might be expanded and massaged from *yours* to *ours*. The experienced chair may suggest ways that your idea links with departmental priorities; and she or he might then explore with the dean how your idea might become part of the forthcoming year's budget proposals. The chair's problem-solving skills and dispositions, creativity, institutional knowledge, and leadership are critical here, particularly when it comes to assisting newer and less experienced departmental colleagues.

(Comprehensive faculty development offices collaborating with wise deans offer a variety of ways to develop professionally in that role. But, department training for chairs is a topic for another essay!)

Three questions

If your approach to your chair is not successful–for whatever reason, then who might you approach for guidance before going directly to the dean or VP, or returning to talk with the chair? Might it be:

- the associate academic dean or associate vice president for new program development
- the director of the faculty development office
- the director of pre-award research service
- the director of the office on your campus that works on corporate and foundation giving.

WHAT WORKS - A PKAL ESSAY

GETTING SUPPORT AND BUDGET FOR YOUR GREAT IDEA

And, when you go to talk with these people, how much money should you ask for? None.

Ask them instead for advice about how you might make your idea fundable. Often their knowledge of institutional support systems, the connections they can help you establish with other faculty with similar interests, and the experience these colleagues have with funding sources and with tapping into them, is far more valuable than any amount of money they may be able to give you from often meager budgets.

There are some exceptions to this, of course. For example, an academic administrator responsible for curriculum development, research stimulation, or community service projects may have a budget specifically for projects like yours. But often those pots are limited and the amount you can receive might not be enough to really make your idea fully successful.

So be ready and eager to listen to their advice. Oh, yes, do accept the money, if it is offered.

Further, what do you need to know that will help you be more successful in eliciting the right advice and securing needed resources?

Understanding the responsibilities and the range of fiscal authority available to a typical chair, dean, or academic vice president can increase your chances of gaining support from an administrator at one of those levels.

For example, when you understand the fiscal authority, you will be better able to suggest one or two realistic ways an administrator at a specific level might be able to support your idea. The, *my-idea-is-so-great-you-must-fund-it* approach is not an optimal starting point; nor is the *I-been-done-so-much-wrong-by-you-and-your-kind-that-now-you-owe-me* approach. Administrators know there always are more good ideas than resources to support them. Priorities have to be set, comparative evaluations made, and many worthy things left unfunded.

How then will you bring your good idea forward in a way that encourages the right administrator with the right degree of discretion and financial wherewithal to become committed to the development, support, and success of your idea?

Knowing about the roles and responsibilities of administrators at different levels can be quite helpful to you. Let's start with the department chair.

The chair

The chair's job is to focus on curricular quality of approved courses and programs. This means the chair has to worry about staffing all the necessary sections of departmentally offered courses, providing for the equipment and supplies needed to teach those courses, and being sure that adjuncts and full-time faculty are following the approved course syllabi and exercising good judgment in their approach to pedagogy and grading. Naturally, to achieve academic excellence in all its programs and courses requires the chair to worry about how to support faculty in their professional development as teaching-scholars.

In public and private liberal arts colleges and at regional comprehensive universities (but more so in publics) the typical department chair has control of two small, highly regulated budgets:

- the part-time faculty budget for hiring adjuncts to cover classes
- the non-salary operating budget.

The part-time faculty budget: Deans give chairs a specific amount of money to use to hire part-time faculty for purposes of covering expected student demand for sections of departmental courses. A lot of the chair's time is spent identifying good candidates, training them in what is expected of instructors in your department, and monitoring and evauating their performance. The part-time salary budget is often a little short of what the chair might think is really needed. But that is because the dean is stretching part-time faculty salary dollars to cover student demand in other parts of the school or college. There are always negotiations going between chairs and deans over the needs of one department as opposed to another for more part-time faculty.

Faculty: (Hiring new long-term full time faculty is perhaps one of the most centrally important and expensive duties of a department chair and of the school dean, who controls the hiring of full-time faculty. However, everything from drafting the job description to conducting the search and interviews to recommending candidates for full-time positions is the responsibility of the chair.)

The chair effectively controls the part-time hiring only, but is heavily involved in all of the department's hiring. If the

Volume IV: What works, what matters, what lasts
http://www.pkal.org/template2.cfm?c_id=1429

WHAT WORKS - A PKAL ESSAY

GETTING SUPPORT AND BUDGET FOR YOUR GREAT IDEA

department is conducting a national search, the chair may be seeking additional funding from the dean to cover the search expenses, and perhaps, negotiating to secure from the dean a special start-up expense fund or course releases in order to recruit the new hire. The first question the VP will ask is how much is the dean and the chair putting in to sweeten the pot. The goal in these budget decisions for the chair and for the dean is to attract to your department and your school the best possible new faculty colleague.

But what if there are funds left over in the department's part-time faculty budget? Could the chair not use these to support you? Often the answer is no. For example, deans watch very closely how the adjunct part-time faculty budget is used. Hiring more adjuncts than authorized by the dean or granting course releases that reduce a faculty member's teaching responsibilities without the dean's approval is not allowed on most campuses.

What else do chairs worry about fiscally?

The non-salary operating budget: This is intended to cover the day-to-day costs of departmental activity, including postage, phones, copier usage, supplies, faculty and staff professional travel, new and replacement lab/studio/office equipment, and the like. And in some institutions the chair may not be allowed the discretion to move dollars from one of those non-salary accounts to another; although thankfully, such an extreme degree of regulation is less and less in vogue. Yet, even in normal times this non-salary operating budget is typically not more than adequate. And chairs generally are not allowed to move dollars from the part-time faculty budget into any other budget category.

If lab supplies for instruction are consumable and enrollments are growing, this can severely limit what a chair may have left in the non-salary operating budget to use for other things. In many institutions the costs of consumable instructional supplies are shifted off the department's operating budget by means of course fees. That way the students who use those consumable supplies pay for them and the expense can be predicted to be directly proportional to the enrollment.

The current practice in the great majority of colleges and universities is that toward the end of the fiscal year, unexpended departmental funds are *swept up* by the dean and then again by the central administration for other priority uses. These might include covering unexpected cost overruns in other academic or non-academic departments, uncollected tuition or other expected but unrealized revenues, or emergency repairs to buildings or boilers or major equipment. It is the rare school or department that can actually carry forward surpluses into the next fiscal year.

Chairs and deans working in a *spend it or lose it* budget system will have committed their non-salary operating funds early in the fiscal year to support departmental or school projects, special events planned last year to be presented this year, equipment upgrades, faculty professional travel, student assistants, or other things they know will be needed as the year goes along. Even if there is money in the budget, it is highly unlikely that the chair or the dean has not already spent it in his or her own mind. (As a provost I worry when they have spent it twice over in their own minds!)

Depending on the time of the year when you ask, the chair may be worried about over-committing. Prudent budget administrators at all organizational levels track their month by month rate of expenditure:

- A departmental budget being spent down too quickly is a red flag for upper administration because there simply are not the dollars in the dean's or vice-president's office to bail out departments that over-spend.
- Some deans put selective freezes on departmental budgets or withdraw authority from the chair to spend out of the budget if the rate of expenditure is too high.
- Some deans penalize departments that overspend by taking the over-spent amount out of their next year's allocation or out of their gift accounts.
- As a positive incentive, some deans add back into the departmental budget in the next year the amount that the department chair under-spent. Budget administrators at higher levels have both the authority and the responsibility to disapprove of expenditures and to extract funds from lower level budgets in order to fulfill their fiduciary obligation to balance the budget of their school or their division of the institution each fiscal year.

WHAT WORKS - A PKAL ESSAY

GETTING SUPPORT AND BUDGET FOR YOUR GREAT IDEA

Thinking about all of these pressures on the chair or on the dean of a small school, it is not surprising that she or he might reach the end of the budget year without enough money to cover all of the professional travel expenses of the faculty. It is not surprising either that most chairs and directors of programs find new ideas at once exciting and frustrating. They are exciting because they suggest new possibilities; frustrating because, quite frankly, few have the budgetary wherewithal and flexibility to support an unplanned new endeavor.

Yes. But what chairs do have to offer you is a good sense of what the dean, the academic vice president, and the president are saying that is important. And this can be very valuable intelligence. At times the best thing most chairs can give you is an accurate, up to date, and operationally-understandable sense of what higher-ups are calling their strategic goals for the school, the academic division, and the university.

Your challenge, with the help of your chair, is to be able to explain in a realistic and understandable way how what you want to do advances what they want to do.

But, your bottom line question is: can I ever get money from a chair?

Yes. Typically you can get some. Propose that:

- he or she allocate to your uses the money which otherwise would have been spent on you anyway, e.g. your proportional fair share of the department's travel dollars or student assistant dollars or copier dollars or replacement equipment or new equipment dollars or staff support dollars. This approach requires that you agree to forgo such reimbursements or services this year in order to direct those dollars toward your new idea.

- perhaps there is a gift fund (many of which do not expire at the end of the fiscal year) with enough flexibility in its charter to allow some of its funds to be directed toward your project just to get you going.

The approach here is not to secure permanent funding for your idea, but simply to give you a little support to get things started–one-time seed money.

Alternatively, you might propose:

- some release from your normal teaching or departmental duties. This might give you the time for putting the necessary effort to move the development of the project forward, closer to the point where some external agency or some higher administrative office will fund it. You need the time to engage in these early setup or pilot activities. A course release is one way.

- the creative shifting of your teaching responsibilities. Maybe you can teach an extra course this semester in order to have one fewer next semester. Or maybe you can move a couple of courses you would otherwise be teaching during the academic year into the summer program and teach them without pay in order to have the time during the academic year to write a grant proposal for a May or June deadline.

- The chair can guide you toward the programs, if any, in your institution that support summer stipends or research releases. Writing a proposal to do a pilot project supported by internal institutional funds coming from the dean or VP level is often an excellent first step toward writing a successful proposal for a much larger externally funded grant. That you were funded internally to get started demonstrates to external funding agencies that your project was deemed to have merit and to have the support of your institution.

Remember the conversation with a good chair is not going to be limited simply to moving your particular project forward.

Deans

In smaller institutions, some public comprehensives, and in those schools not organized into traditional departments, what is true about chairs is true about deans. Budgetary discretion does not allow moving funds at that level between personnel accounts and non-salary operating accounts. Budgets are limited and must be focused on supporting already-approved programs and services - not all new things. Rules limiting what deans and chairs can or cannot do with the money, especially in some of the more *command-and-control* style administrations, are extensive.

All that being said, possibilities still exist.

WHAT WORKS - A PKAL ESSAY

GETTING SUPPORT AND BUDGET FOR YOUR GREAT IDEA

Roles and responsibilities of the dean

If the chair's job is to focus on curricular quality and staffing all the necessary sections of courses, then one might think of the dean's job as making it possible for the chair to do that - by providing the chair with high quality full-time and part-time faculty and with the budget needed to support at least the instructional, if not the service and research missions of the department. The dean is the one most directly responsible for hiring and evaluating the faculty, even if the dean is advised in this by the recommendations of departmental and school committees and chairs, and is guided in this by written documents expressing standards and procedures. For faculty not yet tenured, the dean's decision whether or not to issue a new contract for subsequent service is critical to shaping the quality of the instructional experiences for the great many students taught by part-time and/or full-time non-tenured faculty. The dean, by word and action, makes faculty evaluation standards operational. She or he:

- establishes starting salaries and recommends raises
- when necessary, makes the critical recommendations to the vice-president regarding disciplinary action
- creatively assists tenured faculty to move professionally in those directions where they will be most successful and most useful at different times in their careers, whether that is toward more teaching, more research, or more service or administrative work at any given point along the way.

So when you approach the dean with your good idea, you should keep in mind that this is not a singular interaction in isolation from all that has gone before or will come after. The dean probably knows you and your work better than you might realize. The dean probably has in mind some notion of your progress toward tenure, your next promotion, or your future as a leader among your peers at the school or the departmental level. Thus, the dean's conversation with you may not be limited to this particular project.

She or he will want to hear how you see this fitting into your long-term program of teaching and scholarship, how you see this advancing yourself professionally so that your success can bring greater credit to your department and your school and institution, and how you see this work supporting the curricular mission and initiatives of the department or the school or the university. Putting your idea into the context of the bigger picture, not just for you alone but for your institution, is an important part of making this conversation a positive and successful experience for you.

Good deans remember people who have good ideas and show initiative and energy, even if the dean cannot support the person at that moment and in the way the person is asking. Good deans are talent scouts and coaches, mentors and leaders. They are always looking for motivated people whose work and vision they can use for the betterment of that person and of the school.

Yes, you can be successful in getting money and time from the dean and substantial political support too. Or not.

A dean can usually do literally ten times more by way of dollars than a chair can do. They also have the resources in most cases to fund course releases, or the authority to approve non-standard teaching load distributions. Some deans can do more, for example, those who have their own school-level alumni and advisory boards, who are managing their own continuing education programs and retaining some of the excess revenues, or who are deans of schools whose faculty secure substantial external funding each year. (And, given how budgeting works in most institutions, some academic vice presidents can do ten times more by way of dollars than a dean.)

Beside hitting their revenue targets and doing so within the limits of their expense authorizations, most deans have the additional responsibility of developing new programs and initiatives in keeping with the strategic goals of the president and with their own strategic goals for the school.

Strategic planning at the school level can include focusing on new academic majors and degree programs, creating collaborative centers to focus the energy of scholar teachers on research or service activities of significance to the mission and identity of the school, or establishing new academic ventures aimed at increasing educational opportunities for current or new groups of students (e.g. study abroad programs, continuing education and adult learning programs, e-learning initiatives, clinical internships and community-based service-learning opportunities, and partnerships with K-12 schools).

WHAT WORKS - A PKAL ESSAY

GETTING SUPPORT AND BUDGET FOR YOUR GREAT IDEA

When you talk to the dean about your idea, one thing a good dean will be doing is trying to figure out whether your idea connects to a project already moving forward or in the works. If your new idea, no matter its objective merits, does not connect, it is simply not going to get the dean's attention, energy, or financial support. Deans do not decide between good ideas and bad ideas; they decide which of the good ideas connects with their strategic goals and which does not. It's not about you. It's about the limitations of what any one organization and its leadership can do at any given time.

Actually most deans will try to find a bit of money to support a good idea. But where do deans look when they are *trying to find* money? Apart from gift funds and the indirect-cost returns, possible through grant awards, deans tend to look in two other places–lapsed salary dollars and year-end sweep-ups:

- **Year end sweep-ups** are the dollars left in various program budgets and accounts at the end of the fiscal year. Often these are very small amounts, but there are many budgets and accounts. When one sweeps these dollars together in the eleventh month of the fiscal year, one can accumulate a nice little pile. Even after he or she puts some money aside to cover the normally expected expenses for the final month of the fiscal year and the problems which occur because a few accounts are going to be in deficit, there should be some left.

  The larger the organization and the more budgets and accounts it has, the more predictable from year to year these sweep-ups can become. If the organization offers a positive incentive to chairs to stay within their approved expense budgets, then they and the dean will have even more money to work with when the year end sweep-ups are gathered.

- **Lapsed salary dollars** are the dollars that come free when a full-time faculty member goes on leave without pay; takes disability leave; retires and is replaced with a person at lower pay; or is funded in whole or part by an external grant. Most universities back each faculty line in the budget with sufficient dollars to pay that person their salary for the academic year. This is known as a fully-funded position control system. So if part or all of a given person's salary does not have to be paid by institutional dollars for whatever reason, then those dollars can be used within that fiscal year for some other purpose.

  Yes, there are often rules about this. For example, sometimes the vice president gets to use those dollars, not the dean. Sometimes a dean who can access those dollars is permitted to use them only to hire other temporary faculty – which means to fill courses with needed instructors and to pay for course releases. Vice presidents are often granted greater discretion, including in some institutions, the authority to move those dollars within a given fiscal year into staff salaries, scholarships, physical facilities project, or non-salary operating budgets.

It is fiscally risky for an administrator regularly to fund basic on-going year-to-year operations by relying on the availability of sweep-ups and lapsed salary dollars. Yes, statistically that risk can be mitigated somewhat with a prediction formula. And, yes, occasionally during tough budget years one might have to fund things in this way just for a short time. But in the end, budgeting this way is like paying for Tuesday's dinner with Saturday's dinner allowance and hoping the family will not be hungry at the end of the week. So most fiscally prudent deans and vice presidents wait to see how much year-end money materializes, and then they use those funds for one-time expenses, such as hiring temporary faculty or staff and supporting particular events or projects that will be completed within a given year, equipment purchases, capital project budget supplements, scholarships, travel reimbursements, consultants, or additions to the institution's investment pool.

That said, when you have a project that connects with a strategic goal, you are more apt to be able to secure funding for expenses that do not require the dean or the vice president to make a commitment that extends beyond the current fiscal year. Think of which expenses those might be before you go into the meeting with the dean. Be ready to suggest how the dean can become an enthusiastic supporter of your project, and your partner, patron, and sponsor, by offering two or three ideas for things that you can make happen this year if the dean can *find* one-time money.

WHAT WORKS - A PKAL ESSAY

GETTING SUPPORT AND BUDGET FOR YOUR GREAT IDEA

Deans, contrary to popular belief, are human. And once they start giving to the cause, it is easier to get them to contribute again in future years. And, like other modes of charitable giving, contributions tend to increase over time if the person or agency receiving those gifts consistently demonstrates that the support is appreciated–not taken for granted– and that the money is always being used prudently and effectively. If you are arrogant, condescending, or antagonistic toward administrators, if you express openly all your unresolved issues with authority, if you act as if the dean owes you the money, or if you communicate that the dean should simply put blind trust in whatever it pleases you to do, then I would bet against your receiving a gift from that donor, oops, I mean a budget to support your great idea from that dean.

We sometimes think of alumni and university friends as important benefactors, worthy of careful treatment. But for chairs and faculty within the organization, the dean, the vice president, and the president are the three most important benefactors for your program. As your development office will tell you, prudent stewardship and respectful cultivation are the watchwords of good fundraising. Ultimately, in external fundraising, people give to people. Benefactors give to winners not whiners. They give to people who will make happen what they would like to see happen. And all the same basic human truths about external fundraising apply inside the institution. Deans want to be partners and benefactors in making good things happen; they do not want school resources used on losing propositions or projects with no apparent connection to larger values and goals.

Academic vice presidents

The job of the academic vice-president is fourfold:

- make happen whatever the president wants, e.g. achieve the goals of the institution's strategic plan
- keep the academic support systems (academic budgeting, information services and library, enrollment management, admissions, financial aid, student information systems, faculty personnel services, academic advising and student support services, faculty governance, curricular review and accreditation processes, research services and compliance, interface with housing and student affairs, interface with facilities and physical plant operations, etc.) running smoothly and in the background
- hire, evaluate, mentor, and fund the work of deans and academic directors, and assist them in charting out how each of their units can contribute to the overall good of the institution
- establish the official budget and enrollment targets for revenues and the official limits of the allowable expenses for each school and large administrative unit within the academic affairs area, and within this, approve proposals to fill vacant and new faculty and staff lines and to undertake new major strategic initiatives.

The academic affairs area generates 80 percent or more of the annual revenue for the great majority of universities and colleges. That means that the academic affairs division carries the rest of the campus. This revenue comes largely from enrollments in the form of tuition, fees, and in the case of publicly-supported institutions, enrollment-based governmental allocations. If the institution's budget is properly built at the macro level, then each year when the institution hits its enrollment targets, the revenues are there to support everything that had been built into the expense budget of academic affairs and the rest of the university or college as well.

So, if your project is not one of the things that a dean or director had anticipated and had built into his or her budget, are you out of luck? No.

There is one more possibility. A dean or a director or the vice-president may have put aside money specifically for the good ideas that she or he knew were going to come along during the year. This may be in the form of a budget for special projects, new initiatives, strategic objectives, targets of opportunity, internal grants, discretionary funds, contingency fund, curriculum development, or research support. The closer your idea connects with one or more of the strategic goals or objectives of the institution - the better.

WHAT WORKS - A PKAL ESSAY

GETTING SUPPORT AND BUDGET FOR YOUR GREAT IDEA

But do not underestimate the notion that for a vice president or dean revenue generation is a strategic objective. If your idea offers the reasonable prospect of generating more revenue than it will cost to continue in operation, then it could be a winner. This might mean that you will have to make the credible and truthful case that a bit of support now can move you toward a lot of external funding or new tuition revenue later. For example:

- your project might improve student retention, thus building enrollments and equating with greater tuition or state allocation revenues
- it will help the institution attract new groups of students
- it will fill the institution's recreational or theatre facilities with community members, build good will, and improve town-gown relations
- it will be a service-learning project improving the students' understanding of the world and contributing to greater justice or better services to the community
- your project would be of interest to a given individual or group of external benefactors who might wish to partner with the institution to see to it that the project and the institution which supports it continue to flourish.

One last thought

I've been a chair, division director, dean and provost in public and private institutions for 29 years–but who's counting. And one test I have seen administrators use at every level in deciding whether or not to support an academic idea is whether the person who brings it forward is willing to become its champion. So I end by asking you: Are you willing to do the hard and not often glorious work it will take to move the idea from concept to reality?

Each year people suggest things that it would be good for someone else to do. While we appreciate the advice, we are not too likely to leap at these kinds of proposals. If it is not something you feel passionate enough about to put your energy and effort into, how do you hope to persuade others to make it a high priority on their lists of far too many good things to do? ■

Volume IV: What works, what matters, what lasts
http://www.pkal.org/template2.cfm?c_id=1429

WHAT WORKS - AN ICO/PKAL ESSAY

ROLES AND RESPONSIBILITIES OF ACADEMIC LEADERS

Jeanne L. Narum
Director
Project Kaleidoscope

At the Departmental Level

1. Have clear departmental goals that reflect:
   - the current state and the future direction of the discipline
   - your understanding of your students: their backgrounds, learning styles, career aspirations
   - the institutional mission and identity.
2. Have periodic departmental discussions about how those goals play out in:
   - faculty hiring, promotion and tenure decisions
   - plans by faculty for engagement in individual scholarly activities
   - shaping departmental courses (major's sequences, programs for general students)
   - linking departmental efforts to inter/cross-disciplinary programs
   - decisions about securing, allocating and reallocating departmental resources, including space, equipment, leaves, office support, etc.
3. Understand that developing people is not only hiring right, but also getting everyone to blossom. Understand the value of having a clear departmental sense of the scholarly pursuits and interests of individual faculty, including where s/he is:
   - on the review and tenure agenda
   - on the sabbatical timetable
   - in his/her research (at an early stage in a new project, finishing up an extended project), with a communal awareness of what is needed to bring that project to its next stage
   - in exploring and implementing new approaches in classroom and lab, with a communal awareness of what is needed to advance that work
   - engaged in off-campus collaborations.
4. Be certain adequate resources are in place to support efforts of faculty to build and sustain their scholarly careers, including:
   - mentors within and beyond the department
   - internal faculty development funds
   - assistance from colleagues and from the grants office in identifying potential sources of support and preparing competitive proposals.

WHAT WORKS - A PKAL ESSAY

BUILDING AND SUSTAINING FACULTY CAREERS: NUTS AND BOLTS FOR DEPARTMENT CHAIRS

5. Take time to:
    - encourage individual faculty to write down something s/he would like to accomplish in the next three years (in classroom/lab/research agenda/collaborations/etc.)
    - work with individual departmental colleagues to figure out what is needed to make that happen (time, money, visits to library, travel abroad, etc.) and make it happen
    - take collective pride in the individual accomplishments of faculty
    - listen to and respect all voices in the department
    - engage in discussions about the purposes of education in a changing world
    - get as many people involved as possible in discussions about scholarly plans of individual faculty.
6. Also take time to:
    - make certain that the administration recognizes how the department (people and program) serves the larger institutional mission.
    - talk about emerging ideas about new directions in research, in pedagogical approaches
    - meet with colleagues outside the department
    - celebrate and build upon the achievements of departmental colleagues
    - understand the wide range of resources available for departmental colleagues to support their ideas (federal grants, internal grants, etc.).

At the Administrative Level

1. Generate community-wide understanding of critical questions that need to be asked of individuals in the process of building and sustaining a vital scholarly career:
    - how does the work you plan for the coming year fit into your long-range scholarly plans?
    - what do you need— time, money, connections, other resources— to undertake your plans?
2. Send signals:
    - that ideas matter: keep intellectual issues on the table in campus discussions
    - that the institution recognizes its responsibilities and opportunities in regard to sustaining faculty vitality:
        - with adequate policies, programs, and structures in place to support the generation, discussion, and development of good ideas and the translation of those ideas into projects
        - with time taken to meet with selected faculty individually, perhaps at a regular stage in regard to their sabbatical eligibility, career trajectory, etc.
        - that individual faculty are encouraged to maintain active connections to scholarly communities beyond the campus.
3. Understand the impact of an investment in building and sustaining a vital faculty:
    - how it has an impact on institutional culture and climate
    - how it helps leverage internal dollars with external dollars
    - how it leads to visibility within the larger academic community for the quality and character of scholarly work accomplished by faculty. ■

THE PROPOSAL

The first draft

1. GOAL: What do I or we intend to accomplish?
2. NEED/OPPORTUNITY: Why does this have to be done now or why can this be done now?
3. CONTEXT & CREDIBILITY: How does this project relate to external realities?
4. PLAN OF ACTION: What are the steps through which I/we intend to accomplish these goals?
5. RESOURCES: What will be required in people, time, expertise, to move ahead successfully?
6. EVALUATION: How will I/we be able to determine if our goals have been met?
7. DISSEMINATION: Who needs to know about this work, and how will they know?

Whether referred to as "grantsmanship" or "researchmanship," the scholarship required for a successful research-grant application is as demanding as that for a lecture, a report for publication, or a textbook. Preparation of a grant application is a scholarly endeavor that combines the values of a scientist and the skills of a scholar: dedication, enthusiasm, standards of excellence, intellectual honesty, ethicality, disciplined thinking, and clear writing.
— George Eaves. *Preparation of the Research Grant Application*: NIH (1989).

NARUM'S TEN AXIOMS

1. Proposals that are not written and not submitted are not funded.
2. 50% of funded proposals are resubmissions of previously rejected proposals.
3. The smell of a submitted turkey lasts a long time.
4. The old French proverb: "the future belongs to those who build bridges" is true.
5. Deadlines are like taxes; you will have repeated opportunities to give.
6. Few proposal writers take advantage of all the help that is available.
7. Writing the second proposal is easier than writing the first.
8. A good idea will make a difference somehow, even if a grant is not awarded.
9. Proposal writing is like baking bread; you have to give it time to let everything get set. You have to knock the hot air out of it periodically.
10. If you are not in it for the long-term, don't start. Have the courage to fail.

Selected Reviewer Comments

GENERAL

- "The hypotheses and objectives— are closely reasoned and follow upon the background material. The protocols are presented in admirable detail. The presentation was exemplary in terms of the adequacy, appropriateness, and completeness of the methodology proposed. The very thoroughness with which the proposal was prepared and presented provides further evidence of their capability. Although these are young investigators, without extensive experience, they appear to be eminently qualified to undertake this research— if the care with which they have prepared this application is any indication."
- "It would have helped to have an annotated bibliography, or to have major scholarship discussed within the proposal. I had no sense as to how this project related to work done by others."
- "The proposal outlines activities that are simply too ambitious for the time. It is too broadly defined."
- "I find the array of topics to be covered so broad as to ensure superficiality. The proposal presents a grab-bag list of activities to be done during the grant period."
- "The proposed research, presented in exhaustive detail, is certainly of appropriate significance, but is too ambitious for the time. My question would be answered if a focused timetable were presented, perhaps with a more limited set of objectives. I do appreciate that research at undergraduate institutions should be MUCH more than 'Comparison of Spectral Properties of Wines,' but I feel that the present proposal may be at the other end of the spectrum."
- "With a sharper focus on the more doable parts of the proposed research, as well as some more homework about what others are doing, this could turn into a fundable project. Is it possible to limit the scope without sacrificing the integrative approach? Would shortening the time period to be covered be a better way to limit the project?"
- "This project is not only scientifically valid and timely, but is ideally suited to undergraduate research students. The intellectual challenge of the chemistry involved is a very important teaching tool."
- "...Some of the evaluators were not persuaded by the argument on the need for a translation of... They could not envisage an audience beyond specialists in the aforementioned areas."
- "I have serious reservations about the narrow focus and the narrow goals outlined in this proposal...This project will not have as broad an impact as others under consideration in this review cycle. Although I see much merit in this proposal, others made a more compelling case for funding at this time."

NSF/DUE REVIEWER COMMENTS: WHAT WORKS

- FACULTY IS ABLE TO CARRY OUT PROJECT
    - "Faculty expertise is fine; formal education in area, publications are congruent with proposal; obviously the PI is up to date regarding the goals of undergraduate education."
- PROOF OF INFORMED AND REALISTIC PLANNING
    - "This project has success written all over. [The faculty] have already started their efforts. Previous years of pilot work show strong desire of faculty to accomplish the work."
    - "The thorough preparation for the realistic use of the proposal equipment makes this proposal stand out."
    - "The faculty appears to be well on their way to preparing laboratory exercises that are on the cutting edge of today's technology."
    - "An excellent curriculum already exists in a remarkably focused department. Proposal represents an appropriate NSF request to expand and upgrade the existing structure. Student research as well as faculty expertise is well documented and gives evidence of optimum implementation of funds. Requested equipment is well integrated into existing supplies."

- "FUND IT! The development plan is exceptionally well presented and integrated into a research education program with a lot of excellent institutional support and recognition."

NSF/DUE REVIEWER COMMENTS: WHAT DOES NOT WORK

- NO PROOF OF INFORMED AND REALISTIC PLANNING
  - "As for the budget, it is much too ambitious and overblown. They could do the same for almost half the funds requested."
  - "...specific details are lacking which would allow evaluation of effectiveness of the plan...Teaching strategies should have been discussed...An outline should be included giving plans for each of the disciplines that are involved...Samples of proposed lessons are not included."
  - "Unclear why groups of seven students are used: seems like it may be too large a group, some students may just 'roost.' How will test groups be chosen? Is your nonrandom selection process biasing the study? How will students for traditional groups be chosen?"
  - "Lacks clarification of student outcome assessment."
  - "Diffuse proposal. There is no development plan. What courses will be first? What will be done in these?"
  - "What skills will be introduced, how and at what levels? While faculty expertise is clear and the college will support curricular development, the college needs also to provide for faculty/computer center time to configure the lab facility."
  - "It is difficult to assess several aspects. What is the content of the course? What are the minimum goals of the open-ended learning mode? How will the assessment of what students are gaining be made? It is good to have them learn 'process,' but at some level they need a basic array of facts or contents from which to build."
- PLAN IS NOT A LOGICAL STEP TO TAKE AT THIS TIME
  - "Seems an equipment replacement either for something that is already sufficient, or something which is too sophisticated. Resubmit with more details of needs for this machine for use in undergraduate program."
  - "Few statisticians would recommend that undergraduate majors in the social or biological sciences begin their study of statistics with statistical theory."
  - "It is not clear who is going to do what. Are the faculty supported by this grant proposal developing the modules or are mechanisms being set up to make it easy for ordinary faculty to instantly create lessons to meet the individual demands for a particular class?"
  - "If students are weak in statistics, perhaps greater emphasis should be placed on an introductory statistics course."
  - "...absolutely no indication of how this would improve [the institution], let alone improve science education."
- PROJECT WILL NOT LEAD TO OUTSIDE APPLICATIONS
  - "...this could not serve as a national model. A program that is a national model should be readily exportable. There should be reasonable expectation that this program could be incorporated into any curriculum without respect to financial status of the institution or student."
  - "A big question is whether this will be a model. It could, but in a labor intensive approach that will work best in a small school, not in one with 900 students or so."
  - "This approach is not completely novel— it has been used in physics and something similar has been developed [elsewhere]."

NSF PROPOSAL REVIEWER COMMENTS: *WHAT WORKS*

- "The curricular project has been well planned and thoroughly piloted. There is a realistic development plan, the equipment requested is appropriate to and adequate for the project and institutional support for the project is very strong. The faculty have already begun disseminating the results of their pilot project."
- "It is not clear why so many different software packages are in use. The PI's might consider, in particular, whether they need MacMath and MatLab for differential equations and linear algebra. Wouldn't Mathematica, a package the students have already used in calculus, be sufficient?"
- "This is an extremely well thought out and researched plan. I am very impressed with all aspects of the Calculus proposal. It is exciting and deserves funding. Everything is in place but the computers. The DE and Lin Alg portions are less developed, but I'm willing to buy into them based on the track record of the PI's. Four out of seven faculty are involved, the model math program has been spread to the local high school. The university faculty spent a summer remodeling a classroom for a lab. The pedagogical basis is impeccable. The implementation process is well planned. My only reservation is the proliferation of software packages: True Basic Calc, Mathematica, Mac Math, Matlab, TrueBasic; five packages for nine courses. Is it necessary to put this burden on students? And are Mac Quadra's really justified? But overall, an excellent project."
- "The faculty are capable and have clearly demonstrated the requisite expertise and commitment to implement this project. They clearly have institutional support. They have an awareness of the current educational issues. They have been careful to investigate currently available materials and try out those which seem most suitable. They have made use of available computer resources first to be sure that their program was effective before seeking more expensive equipment. They have proposed a well thought out implementation plan. The Calculus in Context materials and the software packages are appropriate. The dissemination plan is strong especially with the teacher training in the local high schools."
- "I am impressed by everything which has been done and by the careful and prudent manner in which they have proceeded at every step of the way."

NEH CHALLENGE GRANTS REVIEWER COMMENTS : *WHAT WORKS*

- "The project is entirely focused around language learning, funding staff, curriculum development and equipment. It is likely to have strong benefit to humanities teaching at the college though perhaps not as much for any external programming. The establishment of a new minor in Asian studies will fit in very well with long-standing curricular emphases. The college has an impressive record in these fields, graduating numerous students who become active in language-based public service and educational programs (e.g. Peace Corps, UN, Fulbright). It is a good use of challenge grant funds to endow funds for ongoing equipment upgrade since hardware changes rapidly and it is too easy, with some grant projects, to end up with outdated "orphan" labs and not way to upgrade. It seems odd that there are no teaching faculty mentioned among the grant project directors. The institutional readiness and backing for a successful project is strong, judging by the outline of the existing curriculum, budget and other resources. There are at least two other large foundation grants in the works to support this project. The college has demonstrated success with three previous NEH challenge grants (this could also be a reason to say that other institutions should be allowed their turn); and there have been several successful capital campaigns that have raised monies both for operations and endowment."

- "The endowment would advance Cross-Cultural Studies at the college, especially in language training. Like a number of institutions, the college is revamping its area studies programs to make them more comparative and interactive. The college has already received a grant to develop new courses and course modules for these purposes. An advantage of the proposal is that it builds on already-existing programs in area studies. It is clear the college has made a commitment to this program. The college has already secured start-up funds to complement existing resources. I like the team-teaching approach, and the faculty noted in the grant application are first-rate, especially historian Clifford Clark. The college has received three previous NEH challenge grants, the last in 1990 and they have, apparently, worked out well. The fund-raising potential is more problematic in that the college is in a post-campaign fund raising mode. The applicants hope that NEH funds will sustain momentum, and I will give them the benefit of the doubt on this as they have a very good track record."
- "A solidly prepared and designed project with links to new program development at this institution. However, we find the Cambodian component of some concern. A revised project which focuses on only a single country, Sri Lanka, would make this a more viable project. We would also suggest stronger engagement with local schools, teacher, and other organizations which would benefit from this project."

A CHECKLIST: DEVELOPING A COMPETITIVE PROPOSAL

1. Begin with an idea; toss it around with colleagues on your campus and elsewhere. (*Without a good idea, no proposal is competitive.*)
2. Write a one-paragraph goal statement: What would you like to have accomplished in the next three years/five years?
3. Consider issues of timing; is this the right time in your professional life, for your personal life? (*With a three- to five-year plan, you can consider options and opportunities.*)
4. Think about what will be needed to realize this anticipated future. (*What does your resumé look like now?*)
5. Write a one-paragraph need statement: What needs to be different in the classroom, in the lab, in your research? (*Again, as with #2, an undertaking that duplicates what you are already doing in respect to your scholarly endeavors.*)
6. Begin a portfolio into which everything related to your idea, goals, and plans is collected. (*At some point in the process of developing the proposal, you will need to document how and why this project will make a difference, and to whom.*)
7. Rewrite statements of goal and of need; share with colleagues. (*Proposals are reviewed by colleagues; the process of developing a proposal should also involve colleagues.*)
8. Review those statements, and prepare a draft plan of action for the proposed project. (*There comes a point, after thinking about goals and needs, when it is important to think about specifics…to move beyond vision to plan.*)
9. Think about the larger context for your project. (*Again, the specific plan must be contextual: Why does this have to be done, be done now, to whom will it make a difference, and how will they know?*)
10. Prepare a timeline for proposal preparation, including:
    - identifying who can provide what assistance on your campus.
    - identifying colleagues elsewhere who will have valuable advice and counsel
    - reviewing materials from funding agencies
    - contacting and working with funding agencies
    - drafting and vetting each section of the proposal
    - determining what appendices/supporting documents will be needed
    - understanding institutional policies for proposal submission and grants administration.

(*It should take about six months to come to this point: wrestling with an idea, sharing with colleagues, thinking about timing and context.*)

11. Think about what will happen after the grant is awarded, after the project is completed, after the grant period. (*Any single project should make sense in relation to the professional and personal futures for those to be involved.*)
12. Identify potential funding sources and study guidelines. (*The "driver" for the project should be the idea, not what agencies are funding, yet it is critical to know about agency priorities, programs, and policies.*)

13. Prepare first complete draft:
    - goal: what you intend to accomplish
    - need: what problem you propose to address, what questions to ask, hypotheses to explore
    - a plan of action: aims and methods to achieve goals
    - evaluation: how you will know if you succeed or not; if you will have made a difference
    - dissemination: who needs to know about your project and how will they know
    - budget/timetable: what will it take to achieve the goals, in money and time.

(*If the process has worked to this point, some of the above already exists in embryonic form; the process of proposal development is, in part, putting on paper some of the dreaming and discussing that has already taken place.*)

14. Bake bread. (*A metaphor for taking time to pause and reflect— on vision and need, plan and priorities.*)
15. Review specific sections (budget, evaluation, dissemination) with on-campus experts. (*Few people take advantage of all available resources to develop a competitive proposal.*)
16. Assemble appendices/supporting documents. (*These are activities that often are left to the last minute, but in reality require much thought and time.*)
17. Reread guidelines; contact agency staffers. (*A proposal that does not follow the guidelines goes immediately on the "no" pile; agency staffers can become colleagues in the process of translating an idea into a meaningful project.*)
18. Prepare final draft; get wide vetting. Ask for comments from colleagues who have fresh view on the project. (*Now the work becomes serious, and significant time needs to be set aside.*)
19. Diagram the relationship between the parts, using a grid, 3x5 cards, your computer. (*Make certain that there is a visible "thin-red-line" of clarity and intent that links goals, aims, and objectives, strategies and steps, budget, and time-table.*)
20. Bake bread. (*Understand the value of letting the text sit, of reviewing as if it were a piece of scholarly writing.*)
21. Reread proposal; get all ducks in a row. (*What are the potential red flags, in regard to agency priorities, institutional/departmental priorities, relationship of this work to that of others— on your campus and beyond?*)
22. Ask yourself questions that reviewers will be asking. (*Does this project fit into our agency priorities? How does it relate to the work of others? Are the right questions being asked? What are the evidence that these are the right questions?...*)
23. Judge the writing as though it were an essay presented by a freshman student. (*Does the care with which the proposal is presented reflect the capacity of the proposers to undertake quality work?*)
24. Mail and celebrate the completion of a scholarly endeavor.

There are no solitary, free-living creatures: Every form of life is dependent on other forms… We should go warily into the future, looking for ways to be more useful, listening more carefully for the signals, watching our step, and having an eye out for partners.

— Lewis Thomas, Phi Beta Kappa oration, Harvard University

Handbook on Teaching Undergraduate Science Courses: A Survival Training Manual

Gordon E. Uno

GENERAL TEACHING PHILOSOPHY

First, you need to know what works and what doesn't so that you can emphasize beneficial activities and avoid the pitfalls that plague novice instructors. Remember, you should not fill up your class time just by talking. In fact, lecturing is the least desirable method of teaching. The following is a generalization of how most people learn:

10% of what we read
20% of what we hear
30 % of what we see
50% of what we see and hear
60% of what we write
70% of what is discussed
80% of what we experience and
95% of what we teach

The figures above suggest that you will learn much more about the subject you teach than you will any of your students. Recall how much you learned as you prepared a seminar for your department. If you ask your students simply to read assignments in the text and to listen to you lecture and watch films, then they won't be learning much or remembering much of what they read, hear or see. So how can we get our students to learn as much as possible about the subject we are teaching? We must get them involved with the subject, engage them in hands-on and minds-on activities, and get them to learn from each other. Again, think about your own experiences-will you ever forget how you conducted the experiments you designed for your dissertation work? Probably not because you were actively engaged in the investigation. You must also provide students with opportunities to discuss their ideas, to reveal their misconceptions, and to clarify their understanding. The key to successful science education is getting students to experience science as a process and to discuss the information about which they are thinking.

REASONS NON-SCIENCE MAJORS DO POORLY IN INTRODUCTORY BIOLOGY COURSES

Based on teaching nearly 6,000 undergraduates, I have found that freshmen often do poorly in introductory biology classes because of:

1. A lack of a solid science background;
2. an inability to think critically;
3. a negative or indifferent attitude toward science; and
4. a lack of self-discipline and study skills. (Uno, 1988)

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Your students may not possess any of these problems; however, you should realize that they are not like you. Few students learn about science the way you do, are as interested as you are, or have the background that you have (or expect them to have). The key then is not to teach the course as if you are talking to yourself. You must identify what problems your students possess, and then adapt your methods of instruction to meet their needs, experiences, and interests. You should think about how you will promote self-discipline and learning skills in your students, how to broaden student perceptions of and improve your students' thinking skills, and how to organize your course so that students leave with a solid background in the major biological sciences.

CHARACTERISTICS OF EFFECTIVE TEACHERS

The following is a list of characteristics that students identify with good teachers. How many of them do you possess? How many of them could you cultivate in yourself if you tried?

1. Alert, appears enthusiastic.
2. Appears interested in students and activities.
3. Cheerful, optimistic.
4. Self-controlled, not easily upset.
5. Has a sense of humor.
6. Recognizes and admits own mistakes.
7. Is fair, impartial, objective, and patient.
8. Is knowledgeable.
9. Shows understanding in working with students and is sensitive to student's personal and educational problems.
10. Is friendly and courteous to students.
11. Commends effort and praises work well done.
12. Encourages students to do their best.
13. Organizes classroom procedures well, but is flexible with over-all plan.
14. Stimulates pupils through interesting and original materials and techniques.
15. Conducts practical demonstrations and gives clear explanations and directions.
16. Encourages students to work through their own problems and evaluate their accomplishments.
17. Disciplines in quiet, dignified and positive manner.
18. Gives help willingly.
19. Foresees and attempts to resolve potential difficulties.
20. Is an effective questioner and listener, encouraging widespread response for students.

Handbook on Teaching Undergraduate Science Courses: A Survival Training Manual

Gordon E. Uno

INSTRUCTIONAL RESPONSIBILITIES

Consider the following responsibilities of an instructor to his/her students. Instructors should:

1. Define a body of content that meets curricular needs with the Department, but that is also attractive to students outside your Department. (Ask faculty and students what they would like to see included in the course, and to review goals, objectives, and course materials that have been assembled for the course.)
2. Describe for students in clear and concise terms what they are expected to learn throughout the course. (Share with students the instructional objectives you have developed for the course and for them.)
3. Develop and implement course activities (e.g. lectures, labs, student assignments, etc.) that encourage active learning and motivation for learning in your students and that enable students to meet course objectives. (Continually refer to course objectives when developing and conducting class activities, and ask students for feedback on the effectiveness of instructional activities.)
4. Help students determine their progress in accomplishing course objectives by continually monitoring student understanding. (You might do this formally by asking students for self-assessments of their progress, and formally through exams, quizzes, and other graded activities.)
5. Develop and implement evaluation procedures that measure the extent to which students have mastered the course objectives. (Use a variety of evaluation procedures, and match test items to the course objectives.)
6. Provide a supportive environment in which all students have the opportunity to succeed. (Maintain a class atmosphere that is open and informal, and provide ample opportunity for out-of-class contact.)
7. Demand excellence from students, and communicate these high expectations to them—if you don't, you're shortchanging them. (Set high, but attainable standards for classroom performance.)
8. Prepare your students to learn by helping them see the difference between memorizing and understanding information, and emphasize the importance of time and effort spent on learning. (Help you students develop their decision-making and critical thinking skills.)
9. Encourage student-faculty contact in the classroom and encourage cooperation among students. (Respect diverse talents and ways of learning and try to accommodate the diversity in your class by teaching the same subject in different ways.)
10. Present information clearly and effectively, and make it meaningful and relevant to your students. (Adapted from Davidson and Ambrose, 1994;Jensen, 1994)

Handbook on Teaching Undergraduate Science Courses: A Survival Training Manual

Gordon E. Uno

WHAT BIOLOGICAL EDUCATION SHOULD ACHIEVE

Education in biology should sustain students' interest in the natural world, help students explore new areas of interest, improve their explanations of biological concepts, help them to understand and use inquiry and technology, and help them make informed personal and social decisions. Students should learn and understand how to use biological information in their daily lives. The following paragraphs outline six goals for biology and science education.

MODELING EXCELLENT TEACHING

The role of the teacher is to facilitate learning, to help students get excited about learning, and to promote understanding of concepts. Teachers should interact with students enough to recognize what students think, what students know, and how they know what they know. Exemplary teachers actively monitor student behavior by moving around the room and speaking wit students, maintaining control at a distance over the entire class (Tobin, Tippins, and Gallard, 1994). The key to teaching with understanding is verbal interaction with students. Exemplary teachers use a range of verbal strategies, including using asking questions to stimulate thinking, probing student responses for clarification and elaboration, and offering explanations to provide additional information.

Excellent instructors emphasize inquiry rather than facts, and foster student independence and curiosity. They use concrete examples to illustrate abstract concepts, and analogies and examples from outside the classroom to facilitate understanding. These instructors anticipate areas of content likely to give students problems, and at he conclusion of a lesson, they highlight and reinforce the main points of the class. Exemplary teachers have extensive knowledge of how students learn as well as what to teach and how best to teach it; these teachers understand the content of their discipline—in fact the result of an instructors lack of content knowledge results in an emphasis on students memorizing facts instead of understanding the processes of science.

Think about the best teachers you ever had and the best courses you ever took. What was special about them? Consider the following list of characteristics of excellent instructors as you think about how you might modify your own teaching style. If you have never seen yourself teach, one of the best exercises you can do is to videotape yourself as you teach a class. Review the tape with your mentor or with someone on campus who is qualified to do so. Whatever you decide to do, work to correct your weaknesses, feature your strengths, and don't try to teach in a manner that is completely foreign to your own personality. You will teach best when your teaching capitalizes on your skills and attributes.

Handbook on Teaching Undergraduate Science Courses: A Survival Training Manual

Gordon E. Uno

CHARACERISITICS OF EXCELLENT INSTRUCTORS

Based on a number of evaluations of instructors of different disciplines by students from many backgrounds, there are six characteristics that students constantly express as desirable in their instructors. Theses six are:

1. Being prepared and organized;
2. being enthusiastic about teaching;
3. presenting information clearly;
4. being able to stimulate students' thinking;
5. being knowledgeable; and
6. enjoying teaching and working with students.

These six characteristics are interconnected, but they seem to be related mostly to being prepared to teach and liking what you do. If you are prepared to teach and you can present the information clearly and appear knowledgeable, and you can think about ways to stimulate your students to think. In addition, if you are prepared, you will also be more enthusiastic about teaching and will enjoy it more because of the positive feedback you receive from students. But, one of the most difficult parts of a new position is keeping ahead of the game. So, try to do as much as you can before the school year begins—once it starts, your time will be eaten up by more responsibilities that you can imagine.

Developing a Rapport with Your Students

Related to the above six characteristics, the following is a list of characteristics of outstanding professors in the classroom that helps them develop a rapport with their students. Such behaviors include:

1. being strongly interested in students as individuals and sensitive to subtle messages from them concerning the way they feel about the material or the presentation;
2. acknowledging students' feelings about class assignments or policy and encouraging them to express their feelings and viewpoints;
3. encouraging students to ask questions;
4. communicating both openly and subtly that each student's understanding of the material is important; and
5. encouraging students to be creative and independent in dealing with the material to understand and formulate their own views.

Handbook on Teaching Undergraduate Science Courses: A Survival Training Manual

Gordon E. Uno

HELPING STUDENTS BECOME SELF-DIRECTED LEARNERS

One of the goals of your teaching should be to help your students become lifelong learners. Grow (1991) suggests that this process has four steps or stages, and that different kinds of teaching can facilitate the movement of students through these stages.

Stage 1: Students are dependent learners and teachers are coaches. Dependent learners need an authority figure to give them explicit directions on what, when and how to do something. Learners at this stage respond best to instruction that is clearly organized and laid out for them.

Stage 2: Students are interested learners and teachers motivate and guide students. Here, students respond to efforts from instructors to motivate them. These learners respond positively to personal interaction from the teacher who persuades students to participate and achieve, while being highly supportive and reinforcing students' willingness to learn and their enthusiasm.

Stage 3: Students are involved learners, and teachers facilitate their learning. Here students begin to see themselves as participants in their own education and to realize that they can learn from interacting with others. Students at this stage respond to a teacher who guides them through unfamiliar territory, offering appropriate methods for investigation, listening, encouraging and supporting student's efforts.

Stage 4: Students are self-directed learners, and teachers are consultants. At this stage, students set their own goals and standards. Here the instructor does not teach subject matter, but cultivates students' ability to learn and select problems for investigation, monitoring progress, making suggestions and giving feedback.

Writing a Statement of Teaching Philosophy

Fashioning a Framework for Your Classroom

Brian P. Coppola

Writing a statement of teaching philosophy is a cornerstone of reflective and scholarly practice in teaching and learning. A strategic set of practical and philosophical guidelines, including a definition, elements, and structure of a statement of teaching philosophy, is presented for experienced and novice educators to craft such a statement.

All those who enter a classroom or other teaching situation have a philosophical framework (a teaching philosophy) that guides their practice, so it is ironic that writing down a statement of teaching philosophy outside of a job search is a relatively new practice in higher education. Significant publications on this topic did not appear until the 1990s (Goodyear and Allchin 1998; Chism 1997–98).

As with other scholarly practices, committing your ideas to writing requires an added degree of reflection on your purposes and intents. By writing a statement of teaching philosophy, you also make your thinking public, open to discussion or comment. This is a good thing. Whether you are an experienced faculty member or a graduate student who is preparing materials to apply for your first faculty position, writing your statement of teaching philosophy codifies your thinking at a particular time.

The teaching statement gives you a starting point for examining your teaching practices, allows you to share your ideas with others, and allows you to monitor the progress of your own development as a teacher. Additionally, a teaching statement is a great organizer for a course, curriculum, or teaching portfolio, where you explain details about your teaching practices and your students' learning (Seldin 1997; Cerbin 1996; Hutchings 1996; Eichinger and Krockover 1998).

Along with a curriculum vitae, a research statement, and a cover letter, a statement of teaching philosophy is becoming an increasingly important piece in the materials that represent you as a faculty member (or a future faculty member). While this article is meant to assist experienced, inexperienced, and future faculty with writing their teaching statements, there are a couple of important caveats to consider. This guide is neither comprehensive, prescriptive, nor the last word. Indeed, a statement of teaching philosophy is an extremely personal text, and it should reflect and represent its author as an individual. I hope that these guidelines and suggestions will help authors of teaching statements organize their thinking in useful and strategic ways (see "Web Resources," page 451).

Brian Coppola is an associate professor, department of chemistry, The University of Michigan, Ann Arbor, MI 48109-1055; e-mail: bcoppola@umich.edu.

What Is a Teaching Philosophy?

Just because you have never written a statement of your teaching philosophy does not mean that you do not have a teaching philosophy. If you engage a group of learners who are your responsibility, then your behavior in designing their learning environment must follow from your philosophical orientation. A written teaching philosophy answers a direct question that has multiple facets, namely, what is teaching and learning to you? This complex question can be broken down into the following categories, accompanied by a set of appropriate questions to help direct your thinking.

Theoretical Framework

How does learning take place? This question should feel like a challenge because it is. Most faculty members do not have any background in educational theory. Indeed, faculty can be disdainful and suspicious of discussions about educational theory because it is so out-

side of their experience. Fortunately, you can still write your teaching statement if you are in that group.

First, think deeply about more and less productive episodes of learning (not teaching) that you have been a part of, and then try to capture the essence of those experiences to guide your thinking about designing instruction. Many people find it useful to think of a metaphor that can capture the spirit of a successful learning experience. Are students empty vessels into which instructors pour well-organized information? Are students members of the learning team in which instructors are the coaches? In any case, be prepared to add a sentence or two of explanation about your metaphor so that readers get the sense of what you mean.

A theoretical framework can have multiple targets. For instance, one statement might assume an individual learner is its focus, while another might proceed from the idea that groups of learners are key. Alternatively, an institution's mission and how it allocates its resources might be the framework selected by someone else.

Goals

Instructional goals are an important starting point in your instructional design. Goals are often construed naively as a syllabus of topics ("Students will learn the Crossed Cannizzaro reaction during lecture number 24," for instance). In your statement of teaching philosophy, you should not only consider examples of what subject matter items you think students should learn, but also some of the broader issues that add value to the education students can be expected to obtain by working with you. You might also consider the question of why these goals are important. It is useful to think in terms of three levels of educational goals represented by these three questions.

- What goals do you have for students as learners in the specific subject matter?
- What goals do you have for students as learners in chemistry, as a science, and as science learners in general?
- What goals do you have for students as learners in general, within the liberal arts educational framework where chemistry sits?

Design and Implementation

Design and implementation are different. You can have a good plan (the skill) but still not be able to enact it (the will) (Paris and Cross 1983; Paris et al. 1983; McKeachie 1994). This is because teaching is a complex social activity that requires physical and emotional behaviors in addition to just a good idea. A smoker who decides to quit for lots of good reasons demonstrates the skill, or understanding, of what to do, but this alone does not constitute the behavioral will to enact the plan.

Once you have constructed your instructional goals, you need to address how you think you can help students accomplish them. This is the first time when your reader will look for congruence, or alignment, in your thinking. Your design and implementation plans should clearly reflect and be informed by your goals. If your goals emphasize higher-level learning but your design looks like a plan for students to memorize and feed back large amounts of factual information, then your reader might conclude that you have not thought deeply about your ideas. A short narrative of a teaching situation can be quite effective in revealing your thinking about instructional design and implementation.

- What kinds of learning environments do you think can accomplish your goals?
- What is your role, and that of your students, in this design?
- What sorts of technological requirements come with your plan (from classroom laboratory design to computational infrastructure)?
- What does it look like when you implement your design?

Assessment and Evaluation

Instructors collect (assess) information from students in order to judge (evalu-

Teaching is a complex social activity that requires physical and emotional behaviors in addition to just a good idea.

Photos by Mike Olliver

ate) it. When an evaluation is summative, it results in rankings of student performance (e.g., grades) and certifies a level of competence against some standard. When an evaluation is formative, it feeds information back to students and instructors during the teaching and learning process so that corrections and improvements can be made. Summative and formative evaluation are complementary goals of assessment. No single assessment strategy can reveal all aspects of teaching and learning comprehensively, so many approaches are necessary.

Your instructional design should achieve your instructional goals, and the assessment methods you use should measure how well you have accomplished this. Readers will notice if you have congruence between your instructional goals, your instructional methods, and your assessment program. Attending to this alignment in your statement can also have an impact on the way you think about your own practice. Do you think that you should only give multiple-choice exams after each unit without collecting intermediate feedback? If so, does this follow from your teaching methods and your goals? Can you support this position with examples from your experience?

In this section as well as the "Design and Implementation" discussion, separating your comments into categories might be useful. Some faculty see clearly different demands coming from introductory undergraduate teaching, upper-level undergraduate teaching, undergraduate research, graduate teaching, graduate research, and so forth.

- What kinds of classroom assessments do you use, if you do, and why are these effective for you?
- How do students developing self-assessment skills play out in your assessment program?
- What is your experience or position on conducting classroom research on student learning?
- What are your principles for creating good examinations (and other assessment tasks), and how are these aligned with your goals and methods?
- What is your basis for assigning grades?

The teaching statement gives you a starting point for examining your teaching practices, allows you to share your ideas with others, and allows you to monitor the progress of your own development as a teacher.

Documentation and Reflection

Documentation of teaching and learning, usually via a portfolio, is relatively new in higher education. However, it is a cornerstone in the scholarship of teaching and learning (Shulman 1999; Hutchings and Shulman 1999). Increasingly, interviewees need to present evidence from their graduate teaching experiences while looking for jobs, and most assistant and associate professors need to do this for promotion.

Documentation should be gathered over time with a sense that the narrative you are constructing gives evidence of your goals, methods, and assessments. An important text piece is the running commentary, or reflection, that you should keep on your experiences and your practices. By annotating the artifacts that you collect in the context of your overall instructional plan, you can build a case for the strategies you use and simultaneously identify targets for improving your work. As with a laboratory notebook, the notes you keep about your teaching are used precisely to preserve crucial information and ideas that can be too soon forgotten when the time comes to modify or repeat an experiment.

- What have you learned about your own teaching or about student learning from examining or analyzing student work that you have woven into your instructional practices?
- What have been some of the most profound impacts on you as an educator and how have they affected your teaching?

How Is the Statement Used?

A statement of teaching philosophy has many uses, and these depend on why the statement is being written, who requests it, and who might eventually read it. As with any piece of writing, your teaching philosophy will reveal you as a person, your values, your style, and your experience. Are you sincere? Do you have integrity? Are you dogmatic and opinionated? Are you thoughtful and fair? A well-crafted statement will reveal your character.

A statement of teaching philosophy is:

- *Personal*. It should give the reader a glimpse into your motivations and practices as an instructor, your sense of values regarding teaching and learning; it should do this honestly and sincerely.
- *Political*. You should be able to defend any assertion or idea in your statement if called upon to do so.

Your institution might also begin to require these statements as part of your annual review process, or as a way to build a more comprehensive sense of a faculty about teaching and learning.

- *Metaphorical*. When you do not have the breadth of shared experience, or even the language, to describe something to an unfamiliar audience, metaphor is a useful strategy. Because your writing will reveal your self to a reader, searching for a shared cultural experience will allow your reader to connect with your thinking.
- *Professional*. Documentation of your scholarly progress in thinking about teaching and learning issues is becoming an expected part in the life of a faculty member. A statement of teaching philosophy is the most common organizer used to introduce a course or teaching portfolio.
- *Pedagogical*. By externalizing your thinking, and particularly by sharing it with others, you are compelled to think differently about your teaching. Resolving internal inconsistencies and clarifying your thinking always happens when you write down your ideas (this is why we value the role that editors and other reviewers have on our work). Once you have a statement, it will inevitably begin to shape the discourse in your classroom. As you write down and refine your thinking, you will want to share these ideas with students so that they can understand better your goals, your methods, and your mode(s) of assessment.
- *Reflective and Iterative*. Inevitably, you will have cause to return to your statement, perhaps because you are asked to by your department or administration, perhaps you will simply need to modify your statement as a normal consequence of reflective practice.

What Is the Structure of the Statement?

There is no consensus about the structure and content of a statement. Some institutions are providing their faculty with guidelines, while others leave it to the sensibility of the author. The following guidelines have been crafted by examining the literature on teaching philosophies and analyzing a large number of statements that are available.

A statement of teaching philosophy should be:

- between one and two pages long;
- a personal narrative;
- evidence of your sincerely held beliefs;
- representative of your experience and practice;
- a showcase for your strengths;
- a place that points to directions in your future growth; and
- an effective abstract for your teaching portfolio.

If you answer the questions detailed in the earlier sections, you will end up with more than one to two pages of text. That is good. You can use this long document as the starting point and edit it back to a reasonable length. You will want to try to keep all of the information, but that will not be possible within the constraint of one to two pages. Study the information, draw together parts that fall under the same principles, and begin to see the commonalities in your work that you might not have otherwise known existed.

The following elements are suggested as a starting point for a statement of teaching philosophy.

Title. Identify yourself and the document, even if it is "Statement of Teaching Philosophy for Professor Leslie Jemail." You might also use a creative title that represents your philosophy, such as "The Value of Teaching in Learning: A Statement of Teaching Philosophy by Professor Leslie Jemail." If you publish your statement on a website, it is a good idea to include your institutional and contact information.

Quote (optional). A well-selected quotation can provide the reader with an early insight into your thinking, and this can be as powerful as a good metaphor. The quotation can be either an aphorism (proverb, maxim, saying, etc.) or a longer passage from another text that has inspired you or which represents a useful insight into your principles. You should include enough of a citation so that the reader can identify the source.

Thesis statement. In one to three declarative sentences, set out your principles. Like a good thesis statement, the rest of your statement should be geared toward reinforcing these principles as a matter of evidence and example. Sometimes it makes sense to set out your propositions as questions. If so, you must make sure you answer them clearly.

Narrative. Depending on how you see the answers to the questions in the first part of these guidelines, there are different organizational styles that you can use to tell your story. For example, you could elaborate on the three to six different principles on which your thesis statement is based. Restate the principle in basic terms and then explain what it means to you. Try to think of a

Web Resources

In writing this article, I accessed actual statements of teaching philosophy that were published by individual teachers on the web. These were uncovered by searching "teaching philosophy" on the Infoseek search engine (*www.infoseek.com*) and are representative.

- Feldman, J. (English Department, University of Virginia): *www.trc.virginia.edu/*
- Gamamick, A. (Chemistry Department, University of Maine): *oldblue.umeche.maine.edu/alla_tch.html*
- Jambekar, A.B. (Business and Economics Department, Michigan Technological University): *www.sbe.mtu.edu/abjambek/phil.html*
- Powell, R. (Biology Department, Avila College): *www.avila.edu/departments/biology/Bobweb/2powtch.htm*
- Reimer, J.A. (Chemical Engineering Department, University of California–Berkeley): *reimer2.cchem.berkeley.edu/teach98.html*
- Wallace, R.L. (Biology Department, Ripon College): *www.ripon.edu/Faculty/WallaceR/teach.html*

discipline-based example that illustrates each principle, perhaps a short snippet from a classroom event, perhaps a passage that comes from your reflective writing. Include, as needed to make your point, the kinds of assessment, documentation, and reflection that follow from or support the teaching principle that you are advocating.

You could also use the categories discussed in the first part of these guidelines (Theoretical Framework, Goals, Design and Implementation, Assessment and Evaluation, Documentation and Reflection). Yet another style might be to integrate these under categories of instructional interventions (introductory undergraduate teaching, upper-level undergraduate teaching, and so forth).

Remember that a reader is interested in understanding you and your position, in language that is accessible, and with examples that make good sense. Readers will also look for alignment, or congruence, in the different parts of your statement as a way to judge your own internal consistency, the thoughtfulness with which you have constructed your statement, and as a clue to the sincerity with which you take your teaching.

Summary. Reflecting back from the thesis statement and through the evidence you provide in the narrative, the reader should now have a rich understanding of your teaching philosophy. What are the one to three main messages that you hope a reader of your statement will take away? Here is the opportunity to make the point that will stick in the minds of your readers.

What Is Good Advice for Writing a Statement?

Build your general literacy about teaching and learning. Many books and articles are written about education, and specifically about science education. Among many, I think the books by Brookfield (1990) and Weimer (1993) are an excellent starting point, while Palmer (1998) is a provocative starting point for faculty to begin to think of themselves as more whole and well-rounded people. The disciplinary societies have publications, journals, and conference venues for discussing issues in education (see "Professional Resources"). For readings and advice about higher education in general, there are many national organizations to consider: American Association for Higher Education, The Association of American Colleges and Universities, and The Preparing Future Faculty Program are all useful resources.

Consult with a teaching and learning center. Centers for teaching and learning or teaching excellence can be found on most campuses today. They can provide numerous resources to individuals, often including the opportunity to set up campuswide workshops on writing statements of teaching philosophies.

If your campus does not have such a resource, or even if it does, you can also find a variety of useful online resources provided by teaching and learning centers at most of the major institutions in the world.

Read some teaching statements. As described earlier, some of these guidelines were developed by examining and analyzing actual statements written by faculty members who had published them on their websites.

Share and critique. Do not work in isolation. Share your statement with others. If you are not part of a group that is willing to do this with each other, then rely on friends whom you trust to give you honest, constructive feedback. If you work in an open intellectual environment, ask permission to visit classes led by others (faculty and graduate students alike), then take notes and create questions for that person. Invite

Professional Resources

The following journals and professional organizations are of interest to science education and higher education in general:

- *Journal of College Science Teaching* (National Science Teachers Association): *www.nsta.org.*
- *Journal of Chemical Education* (Chemical Education Division of the American Chemical Society): *jchemed.chem.wisc.edu/*
- *The Chemical Educator* (Springer-Verlag): *journals.springer-ny.com/chedr*
- *American Journal of Physics* (American Association of Physics Teachers): *www.amherst.edu/~ajp/*
- *Physics Education News* (American Institute of Physics): *www.aip.org/enews/pen/*
- The American Association of Higher Education (AAHE): *www.aahe.org/*
- The Association of American Colleges and Universities (AACU): *www.aacu-edu.org/*
- The Carnegie Foundation for the Advancement of Teaching (CF): *www.carnegiefoundation.org*
- The Preparing Future Faculty Program (PFF): *www.preparing-faculty.org/*

them out for coffee and ask them your questions.

Write more than you need and edit. With the goal of one to two pages, your statement might start out as eight to ten pages if your answer thoroughly all of the questions posed earlier in these guidelines. Answer all of these questions in the first round of writing and edit a copy of the document. You will find that the longer answers and examples can be a good starting point for other writing and thinking about your teaching.

Write in a personal way. Your statement is a first-person narrative, not a journal article on teaching and learning. Make sure your readers are able to understand you.

Do not try to be perfect or complete. A statement of teaching philosophy is always a work in progress. Every new teaching and learning situation has the opportunity to impact your statement because of the new experience. Your statement should be a simple, declarative position statement of who you are as a teacher at the moment you write it.

Include the future. Everyone should acknowledge areas where they need to learn and grow. Do not hesitate to include any new actions and areas of interest that have resulted from your experiences. Be careful, though, not to overemphasize your ignorance of something that might be a reasonable expectation for you to know. Addressing the future is best in terms of an action plan.

Be informed about your audience. This simple principle of good writing cannot be ignored. The statement you write for a job application might differ from institution to institution depending on the aspects of yourself you want to emphasize. Certainly, constructing a statement for personal use will differ from one that is requested from the institution for whatever political purposes are operating.

Consider "hot button" areas carefully. Be aware that departments and individuals may have had varying levels of success with novel teaching strategies such as group learning, teaching modules, instructional technology, and the lecture-less classroom. As in research, if you choose to highlight your advocacy for controversial ideas, you should also be prepared to polarize some audiences and engage in some lively discussions with your detractors.

Avoid technical terms and jargon. Be aware that most of your audience will not have a background that will allow you to use many terms from educational psychology or educational theory. If you do, be sure that you know what the ideas are and explain them carefully as part of your text.

The most important audience for your statement of teaching philosophy is yourself. Because we all have teaching philosophies, writing these down makes us understand ourselves better and can hopefully improve and refine our skills as educators. If you can share your statement in an open, critical environment, then it can also become a catalyst for meaningful conversations about teaching and learning in your discipline and in your institution.

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The Independent Colleges Office (ICO) provides services directed toward assisting its member institutions to be competitive in the search for grants from federal agencies for faculty and curriculum development, and institutional renewal. The ICO recognizes the value of peer institutions working collectively to develop and maintain critical Washington contacts and connections in the arena of proposal development and grants administration.

The Midstates Consortium for Mathematics and Science was founded by the Pew Charitable Trusts in 1989. The Consortium seeks to improve undergraduate science and mathematics education by providing high-quality and flexible professional development opportunities for students and faculty at the member institutions. Major activities include two annual symposia on undergraduate research hosted at Washington University and the University of Chicago, faculty development workshops, and exchange programs that support visits of students and faculty members to other member schools to give presentations or to enhance research collaborations.

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The Independent Colleges Office
1730 Rhode Island Avenue, NW - Suite 803
Washington, DC 20036
202-232-1300 ■ Fax: 202-331-1283
Email: ico@ico-dc.com ■ http://www.ico-dc.com