Keck/PKAL Facilitating Interdisciplinary Learning (FIDL) Project
Vision, Recommendations, Strategies & Practical Tips
DRAFT REPORT SUMMARY

INTRODUCTION

Teams from twenty-eight colleges and universities—representing the diversity of higher education in this country—participated in the PKAL Facilitating Interdisciplinary Learning initiative funded by the W.M. Keck Foundation. Over the course of the project, 250 faculty and campus leaders were engaged, participating in four national meetings, including two roundtables focused on assessment and leadership. Teams were surveyed at the beginning and the end of the project regarding institutional structures, barriers, climate and other issues. Teams also submitted annual reports as formative measures of progress. The recommendations and strategies in this draft report were drawn from conversations at institutes and roundtables, as well as from final team reports submitted in July 2010. Collectively, the efforts of these teams led to a vision for interdisciplinary STEM learning in the undergraduate setting. We present here that vision, in the context of capturing some of the experiences of the Keck/PKAL community, and invite you into this conversation.

> *Interdisciplinary thinking is rapidly becoming an integral feature of the research as a result of four powerful "drivers:" the inherent complexity of nature and society, the desire to explore problems and questions that are not confined to a single discipline, the need to solve societal problems….students, especially undergraduates, are strongly attracted to interdisciplinary courses, especially those of societal relevance.*
>
> —National Academy of Sciences (2004). *Facilitating Interdisciplinary Research*. Washington D.C.: National Academies Press.

The projects undertaken by the Keck/PKAL teams ranged from infusing ID STEM into general education and first year experience programs to shaping interdisciplinary courses in teacher education and majors programs in environmental science, neuroscience, and human biology. The culmination of the work of the campus teams led to drafting recommendations, defining successful strategies, and spotlighting practical tips in three key areas:

- Leadership and institutional change
- Interdisciplinary STEM learning and assessment
- Institutional vision, cultures, and practices

Vision and Dimensions of Interdisciplinary Learning in Fields of Science, Technology, Engineering and Mathematics

The overarching vision for facilitating interdisciplinary learning is an institutional culture in which there is clear and documented evidence that students are intentionally *engaged as integrative learners,* gaining skills and confidence in working at the interface and dissolving the boundaries between disciplines in exploring and addressing societal problems and research questions.

It is a culture in which there is visible leadership that ensures the intellectual, social, operational and physical infrastructures required to facilitate interdisciplinary learning over the long-term.

It is a culture in which all students, no matter their background, career aspiration, are attracted to and motivated to pursue learning experiences that turn them into interdisciplinary "thinkers."

LEADERSHIP FOR FACILITATING INTERDISCIPLINARY LEARNING

It should come as no surprise that leadership plays a critical role in facilitating interdisciplinary learning. It was one of the key themes that emerged through this initiative. As the project comes to a close, we seek broader input on recommendations and strategies that leaders should consider. Leaders in this context are grassroots student and faculty activists working to create ID programs and formal campus leaders who make decisions and turn important institutional levers. Leaders with responsibility for the quality of interdisciplinary STEM learning also include those in disciplinary societies, accreditation agencies, private foundations and industry. We want to stress that leadership within each of these levels and communities is essential if a shared vision for IDL for success in sustaining interdisciplinary programs is to be realized

At the Spring Keck/PKAL 2010 Leadership Roundtable, participants defined the role of leaders in this way, they must:

- Clearly communicate a rationale and vision for undergraduate IDL that is connected both nationally and locally relevant.
- Be knowledgeable about models and strategies for facilitating undergraduate IDL in their local context; understand that it is a developmental process and be able to deal with both negative and positive outcomes as the process unfolds.
- Know when success has been achieved, then reward and celebrate it.

> *The success of ID research groups depends on institutional commitment and research leadership. Leaders with clear vision and effective communication and team-building skills can catalyze the integration of disciplines.*
>
> —National Academy of Sciences (2004). *Facilitating Interdisciplinary Research.* Washington D.C.: National Academies Press.

Three critical strategies for successfully and sustainably undertaking the recommendations in this draft report are: i) start with broad and inclusive conversations, and keep them going, ii) engage both grassroots activists and institutional champions in working together toward shared goals, and iii) establish a culture of evaluation, reflection and continuous improvement.

One of the trickier aspects of leadership for ID learning is being able to acknowledge and embrace the necessary tension between the "bottom up" and "top down" leadership of the campus. Both are important and each can support the other in different ways. For example, the dean, provost and/or president can give credence and validity to division/college/campus discussions regarding IDL by sanctioning and attending the meetings. Faculty can lead by documenting and disseminating program successes, raising grant or other external funding, and realizing campus priorities through IDL courses, programs and projects. Campus leaders have a responsibility to involve faculty leaders in a collaborative way, and faculty leaders have a responsibility to communicate project/program progress to campus leaders. Obtaining buy-in from the middle layer of the institutional leadership structure (department chairs, deans) may be the most difficult. They need to be engaged early in the conversation. Ultimately, an ID program's success and sustainability will depend upon how well it addresses the needs of all STEM students, as well as the institution as a whole. Therefore, students must be included as partners in the formative process of program development.

The focus of the October 15-16, 2010 National Colloquium is leadership. Our aim is to engage a broader community in conversation regarding what we have learned, seek their feedback as we collectively develop an action agenda for leadership in interdisciplinary STEM.

The Final Report: Post-2010 Colloquium

The final report will include case studies from individual campuses to provide specific examples of experiences in exploring and setting learning goals, undertaking strategic contextual steps, documenting what works — and why for their community. In addition, there will be interviews with key leaders and references to some of the project activities and many resources used by the Keck/PKAL campuses during the three-year project, 2008-2010. The project was also reviewed by a team of external evaluators, whose findings will be incorporated into the final report. The final project report will be made available online and in print in early 2011 at http://www.aacu.org/pkal.

Continuing conversations in 2011

January 26-29, 2011 at the AAC&U Annual Meeting in San Francisco:
http://www.aacu.org/meetings/annualmeeting/index.cfm

March 24-26, 2011 at the AAC&U-PKAL Engaged STEM Learning conference in Miami:
http://www.aacu.org/meetings/stem/index.cfm

Participating Campuses

- Agnes Scott College
- Beloit College
- Bradley University
- Calvin College
- Canisius College
- College of St. Benedict and St. John's University
- Davidson College
- DePauw University
- Florida A&M University
- George Mason University
- Grinnell College
- Indiana University at Bloomington
- Jacksonville University
- James Madison University
- Lafayette College
- Moravian College
- Nazareth College of Rochester
- New York City College of Technology
- St. Lawrence University
- SUNY Oneonta
- The Ohio State University
- Union College
- United States Military Academy
- University of Richmond
- Wabash College
- West Virginia University
- Whittier College
- Willamette University

PROJECT RECOMMENDATIONS

Specific Interdisciplinary STEM Learning Objectives

These specific learning objectives, distilled from campus reports, set the stage for discussing the recommendations, strategies, and practical tips that will inform future work—within and beyond the Keck/PKAL community—to facilitate interdisciplinary learning, shape interdisciplinary integrative thinkers in undergraduate learning communities across the country.

As a result of intentional interdisciplinary learning experiences, students will be able to:

- Recognize disciplinary strengths, process, limitations, and perspectives.
- Purposefully connect and integrate knowledge and skills from across disciplines to solve problems.
- Synthesize and transfer knowledge across disciplinary boundaries, even beyond the STEM disciplines, in the context of novel situations.
- Be agile, flexible, reflective thinkers who are comfortable with complexity and uncertainty, and can apply their knowledge to respond appropriately and positively.
- Understand that other factors– cultural, political, ethical, historical, and economic– must be considered when addressing the complex problems of this century.
- Understand the universal nature and deep structure of science, as well as the relationship of STEM disciplines to other disciplines.
- Prepare for future learning as lifelong learners in their careers and as citizens.
- Apply their capacity as integrative thinkers to solve problems in ethically and social responsible ways.
- Think critically, communicate effectively, and work collaboratively with others within diverse cultures and communities.

Learning Goals from Lafayette College

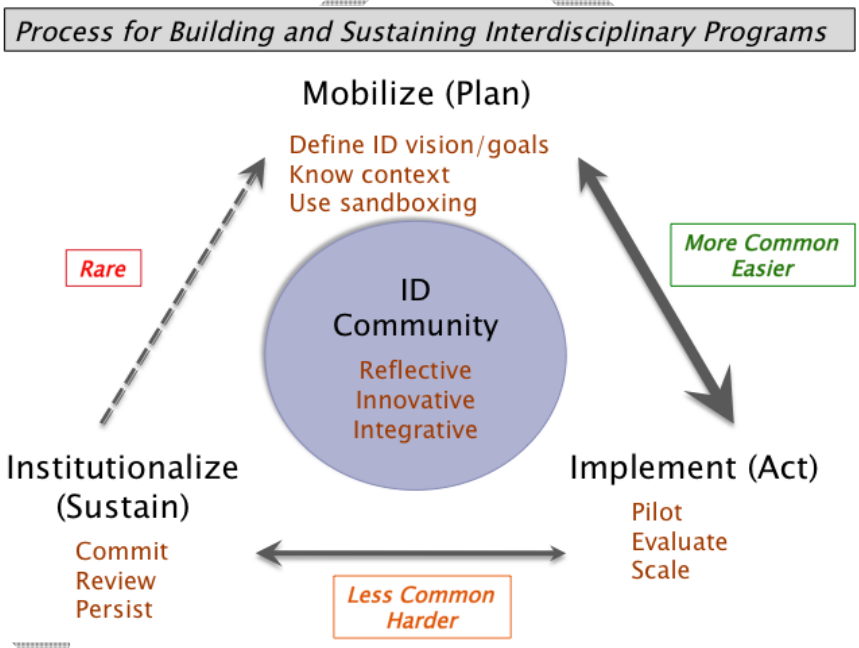
1. Students will have an exceptional educational foundation in the natural sciences, humanities, social sciences, and engineering in the context of life, the earth, and the environment. This includes, but is not limited to, historical information, the scientific process, scientific literacy, and ethics.
2. Students will acquire skills necessary to integrate information from the natural sciences, humanities, social sciences, and engineering related to life, the earth, and the environment. Students will come to understand the growing importance of interaction among scientists, engineers, physicians, humanists, and policy makers. This includes, but is not limited to, using problem-based learning experiences to examine problems from multiple perspectives and solve problems using multiple approaches.
3. Students will be trained and given opportunities to express themselves through a range of communication skills. Thus, graduates will have the skills necessary to be active participants in initiating and promoting change related to life, the earth, and the environment.

Overall Process

The graphic below illustrates the three main steps in the process of building and sustaining interdisciplinary programs, as informed by the work of this project's campus teams as well as work by Kezar and Lester.[1]

It begins with *mobilizing* a team of faculty and campus leaders to plan the program or project. Critical steps at this stage are: defining the interdisciplinary vision and goals (including specific student learning outcomes), knowing the institutional context (including student interest, faculty expertise, local opportunities, funding opportunities, etc), and using a sandboxing approach that provides an experimental space for idea generation and the testing of new ideas. Communication, inclusiveness across disciplines and transparency of process are important factors during this stage, which can take at least 3 months and up to 6-12 months.

Once planned, programs are *implemented*, starting small with pilot programs that are tied to deliberate assessment methods that will measure the initial success and point to places for improvement and scale up begins. The process of piloting, evaluating and scaling can take from 1-3 years, depending on campus processes, resources (including faculty and funding), and institutional context and readiness. These first two stages are also facilitated by the infusion of external funding. It is in these two stages where campuses usually spend most of their time.



The final stage, *institutionalization*, is the most difficult. Fewer of the campuses participating in this project were at this stage in their efforts. It involves having the campus commit to the program, reviewing the evidence of its success then refining infrastructure and resource requirements, and persisting in supporting it over the long haul. Even in the toughest budget times, campuses can move programs forward – perhaps on a modified time scale – as long as they remain focused. Lastly, we assert that campuses must connect back to their original vision and goals periodically to ensure that programs are meeting their goals. This step in the process may be the most rare, especially given turnover in campus leadership that may shift institutional priorities and plans.

This whole process is mediated by an interdisciplinary community of faculty, students, staff and leaders that employ reflective, innovative and integrative thinking as they work toward program sustainability. Leadership on campus and from external stakeholder groups is required throughout the process, asserting influence and providing support in different ways along the cycle.

[1] Kezar, Adrianna and Jamie Lester (2009). *Organizing Higher Education for Collaboration: A Guide for Campus Leaders.* San Francisco: Jossey-Bass.

SPECIFIC RECOMMENATIONS, STRATEGIES AND PRACTICAL TIPS

#1. Start with the intent to achieve and articulate a common understanding of STEM ID learning goals that will drive the cycle of curricular innovation, development, assessment and improvement.

- **Strategy 1.1:** Have discussions at various levels, in a timely and appropriate manner, about what students should know and be able to do as a result of their undergraduate STEM ID learning experiences; keep all stakeholders informed about the process and outcome of those discussions; connect ID learning goals to institutional vision, mission and strategic plans.

- **Strategy 1.2:** Solicit and utilize insights from alumni, employers, and other stakeholders about the value-added perceptions of and/or experiences with ID learning and learners.

- **Strategy 1.3:** Examine current/anticipated curricular and pedagogical approaches to determine relevance/potential to serving established ID learning goals.

- **Strategy 1.4:** Survey existing campus resources/practices for assessing student learning to determine relevance/potential for supporting efforts to facilitate ID learning and aid in institutionalizing ID learning.

- **Strategy 1.5:** Anticipate via *Backward Design*[2] both formative and summative assessment practices of ID learning goals throughout the ID change/renewal process and establish mechanisms required to insure the timely deployment of assessments.

- **Strategy 1.6:** Stay informed of national trends, relevant resources, projects of peers to ensure the latest methods and metrics are being employed, as well as to build from the work of colleagues.

> *At the heart of interdisciplinarity is communication—the conversations, connections, and combinations that bring new insights to virtually every kind of scientist and engineer.*
>
> —National Academy of Sciences. (2004). *Facilitating Interdisciplinary Research.* Washington D.C.: National Academies Press.

- **Strategy 1.7:** Try something new as a pilot (e.g., the "sandboxing" approach) for exploring new curricular/pedagogical approaches that serve specific ID learning goals and for exploring how to develop a feedback loop between program planning and assessment planning.

- **Strategy 1.8:** Monitor, at every step of the process, the valued-added aspects of interdisciplinary learning for continuous program improvement and/or "sunsetting," to ensure relevance and efficacy.

- **Strategy 1.9**: Don't forget that it is all about the student as learner.

[2] Wiggins, Grant and Jay McTighe (2001). *Understanding by Design.* New Jersey: Prentice Hall.

Practical Tips from Campus Teams

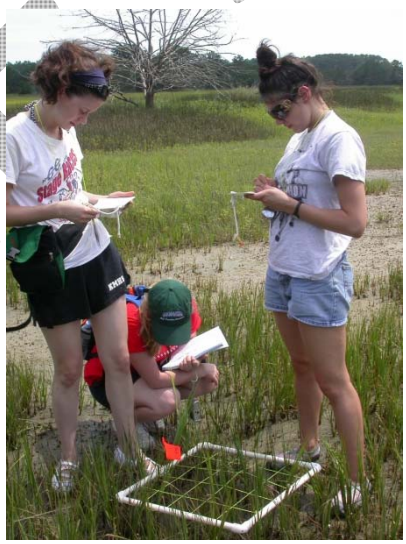
- PT 1.1: Use both formal and informal campus structures to have conversations and communicate about IDL – department meetings, committees, research groups, professional development workshops/programs, reading groups, websites, and student organizations. Do a SWOT analysis as part of the planning process.

- PT 1.2: Connect IDL efforts to program review or campus-wide accreditation or other initiatives (undergraduate research, planning for new or renovated spaces, service learning) when possible.

- PT 1.3: Connect ID learning goals to other learning goals – quantitative reasoning, critical thinking, personal and social responsibility; particular attention must be paid to the balance between breadth and depth when planning ID learning experiences.

- PT 1.4: Hire tenure track faculty in science education with expertise in learning and assessment.

- PT 1.5: Include non-STEM faculty and administrators in the conversation to provide broad perspective and gain buy-in from other, possibly unanticipated, corners of the campus.



- PT 1.6: Conduct an informal campus survey of faculty, staff and students to gain broader feedback on program goals and/or activities.

- PT 1.7: Send faculty and staff to conferences, meetings and workshops related to teaching, learning and assessment – AAC&U, PKAL, CEDD were mentioned as useful resources for project teams.

- PT 1.8: Realize that the first step, setting appropriate and relevant learning goals, takes time (months!), especially across departments, disciplines and other campus units; be patient with the process of dialog and discovery.

- PT 1.9: Make the case for ID learning in the context of the changing nature of the scientific research in the 21st century (more interdisciplinary and focused on addressing real world problems) as well as workforce development needs.

- PT 1.10: Collect student feedback early and often – they are key stakeholders whose opinions should be part of the planning and review process of interdisciplinary programs.

- PT 1.11: Don't wait to determine the resources and support needed for program success; think about this from the outset.

#2. Use the practice of assessment to connect interdisciplinary learning goals with program structure, content and pedagogy, paying attention to students as individual learners, who come with diverse backgrounds, experiences and expectations, career aspirations and goals.

- **Strategy 2.1:** Accept that assessment is a dynamic and continual process that occurs over time.
- **Strategy 2.2:** Understand what works in assessing ID STEM learning with respect to particular learning outcomes and goals; determine and adapt what works best for your community.
- **Strategy 2.3:** Use or adapt existing instruments – don't reinvent the wheel—unless absolutely necessary (see box).
- **Strategy 2.4:** Work with colleagues within and beyond the campus to explore, design, and pilot assessment approaches; participate in building a broader, informed community of assessment practitioners, locally and nationally.
- **Strategy 2.4**: Disseminate results of your assessment within and beyond the campus; document and publicize the impact of your efforts on student learning.
- **Strategy 2.5:** Weave ID assessment tools and approaches into on-going campus-wide program review, assessment and accreditation efforts.
- **Strategy 2.6:** Include students as collaborators in the processes of designing ID pedagogies, assessment methods and curricula.

Some assessment Instruments referenced in campus reports

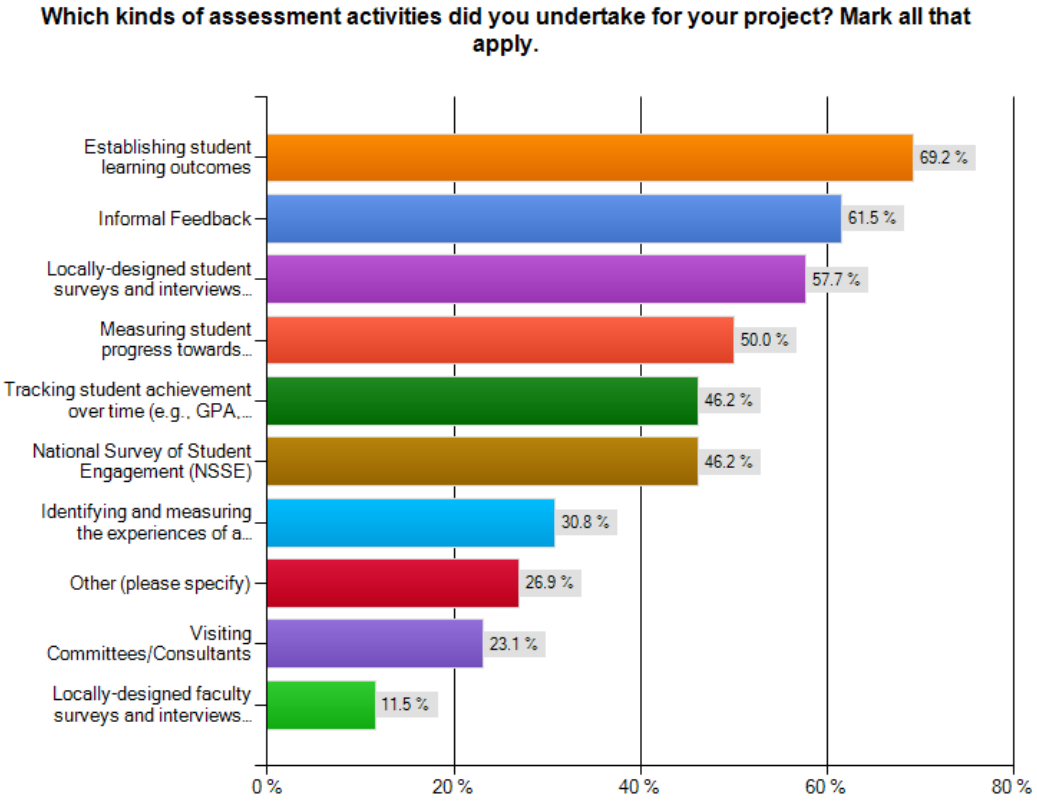
- National Survey of Student Engagement (NSSE)
- Faculty Survey of Student Engagement (FSSE)
- CLA (Collegiate Learning Assessment)
- Association of American Colleges & Universities (AAC&U) VALUE rubrics
- SURE and RISC (Lopatto, et al.)
- SALG (Student Assessment of Learning Gains)
- FLAG (Field-Tested Assessment Guide)
- VASS (Views about Science Survey)
- Course evaluations/student evaluations of faculty
- Embedded exam questions
- Other institutional data (course/program retention, HEDS)
- Biology Self-Efficacy Scale, Science Literacy Scale, Self-Determination Scale

Practical Tips from Campus Teams:

- PT 2.1: Be certain you have started with well-defined, measurable learning outcomes.
- PT 2.3: Take small steps – focus on measuring one learning outcome first, reviewing the data and making improvements on that outcome before attempting to measure and adjust others.
- PT 2.4: Use a sampling approach when monitoring populations of students over time. It isn't always necessary to measure the learning of every student all the time.
- PT 2.5: Hire/utilize faculty in science education with expertise in learning and assessment.
- PT 2.6: Seek external funding to support initial phases of planning and assessment; once program is up and running, ensure that it becomes institutionalized throughout appropriate campus processes and structures.
- PT 2.7: Use an external evaluator to help monitor program progress, when funds and expertise exist.
- PT 2.8: Seek collaborations and partnerships with other institutions sharing common programmatic

issues or goals; it may also be useful to have comparative programmatic data to inform program improvement.

- PT 2.9: Support and reward faculty work in assessing and improving ID courses, programs and student experiences.



Results from post-project survey of campus teams (July 2010).

#3. Build a critical of mass of faculty, from within and with new hires, that assumes leadership responsibility in the iterative process of shaping interdisciplinary curricular and co-curricular approaches and in assessing the impact of those approaches on undergraduate STEM learners.

- **Strategy 3.1:** Seek new faculty lines that target areas of teaching and research at the interface of more than one discipline, in the context of an anticipated ID initiative.

- **Strategy 3.2:** Create faculty review, promotion and tenure policies to recognize and reward faculty efforts toward engaging students in interdisciplinary learning in STEM fields.

- **Strategy 3.3:** Promote formal and informal conversations (within divisions, through learning/teaching centers, within campus committees, during retreats) that offer recurring opportunities for collective discussions about the value of interdisciplinary learning for the students for whom they have common responsibility.

- **Strategy 3.4:** Promote formal and informal conversations between ID faculty as mentors and advisors with students pursuing and exploring interdisciplinary learning opportunities.

- **Strategy 3.5:** Remember money matters. Provide timely incentives and make targeted support available for ID faculty, staff and students, including funds for travel, program development and improvement efforts (course release, supplies for initial course offerings, sabbaticals, etc.).

Practical Tips from Campus Teams

- PT 3.1: Start small and work within campus cultures and environments to create the appropriate level and scope of interdisciplinary learning, e.g., freshmen seminars, linked courses, clusters of electives, gateway and capstone courses, and minors.

- PT 3.2: Use Council of Environmental Deans and Directors (CEDD) documents on hiring and promoting interdisciplinary faculty.

- PT 3.3: Include a phrase about "interest in ID programs" in disciplinary job advertisements; include related questions during the interview process.

- PT 3.4: Create campus faculty development opportunities to ensure competence in developing, assessing and teaching in ID learning environments; promote faculty learning community around ID learning goals, program planning, and assessment.

> *We overcame most departmental turf barriers by having education research specialists from most the STEM departments on the leadership team along with a central member from the Office of the Dean of research… Co-teaching and course buy-outs were one of the biggest barriers for us that we did not overcome. However, based on success at gaining NSF funding for an interdisciplinary faculty development workshop, we have renewed interest in integration across introductory biology, chemistry and mathematics to a level beyond the scope of our PKAL project.*
>
> — Keck/PKAL Campus Team Report (2010)

- PT 3.5: Engage early career faculty at all levels. They have fresh, relevant ideas and experiences, especially in the research realm.

- PT 3.6: Consider the adjacencies of faculty offices and gathering spaces for students; determine if they promote ID interactions among faculty and students, and between faculty and students.

- PT 3.7: Offer workshops and programs through campus center for teaching and learning that focus on ID learning outcomes and assessment.

#4. Take interdisciplinary program needs to take into consideration in the process of campus governance and resource distribution – financial, personnel, equipment and spaces.

- **Strategy 4.1:** Align budgetary structures, allocation and re-allocation procedures to support ID programs, faculty, students, and spaces.

- **Strategy 4.2:** Align institutional fundraising initiatives, including the search for federal and private agencies, with support for programmatic and institutional goals regarding ID learning.

- **Strategy 4.3:** Integrate efforts to renew, recycle and renovate and create new learning spaces in the process of making decisions about institutional priorities and budgets.

- **Strategy 4.4:** Establish formal administrative structures and leadership positions in support of ID programs (e.g., Center for Interdisciplinary Studies; Dean of Interdisciplinary Studies; Center for Materials Science)

Practical Tips from Campus Teams

- PT 4.1: Ensure campus curricular approval and review processes enable the development of ID courses and programs.

- PT 4.2: Create a clearinghouse list of faculty whose appointments are exclusively or partially in ID programs.

- PT 4.3: Include development staff in planning meetings, or meet with them separately, to ensure ID learning and program goals are on the fundraising agenda.

- PT 4.4: Repurposing space, faculty lines, resources and other infrastructures allows institutions to creatively address needs for interdisciplinary learning in ways that aren't additive, which ensures more complete integration into institutional culture.

- PT 4.5: Overcoming departmental barriers is probably the biggest challenge to ID programs – create strategies for addressing these challenges early in the process; don't ignore departments in the process, but include them early on, especially the department chair or other department leaders.

> *… collaboration is extremely difficult because not only are our organizations based on principles and structures antithetical to collaboration, so are our larger systems of government, foundations, disciplinary societies, and the like. So, the challenges exist within all parts of the system. Leaders … will be more successful encouraging collaboration if they can acknowledge their own challenges in collaborating, learn from these experiences, and try to be role models for higher education – a system that is even more embedded in an ethic that prevents collaboration.*
>
> —Kezar and Lester (2009) *Organizing Higher Education for Collaboration.* Jossey-Bass.

- PT 4.6: Ensure ID programs have the same rights and responsibilities as disciplinary programs, from approval to program review; ensure that ID program faculty and/or directors are present at budget and other planning meetings; Create governance documents or MOUs to make explicit the support of ID programs.

- PT 4.7: Create/renovate spaces and facilities that promote IDL. New spaces aren't always required, and renovations offer an opportunity to consider revised spaces that will facilitate interdisciplinary learning.

- PT 4.8: Visibly support ID projects with travel funds, meeting space, course release/reassignment; ensure that formal campus leaders attend ID project/program planning meetings

- PT 4.9: Support ID faculty research alliances and partnerships; create visible mechanisms (funding, spaces, centers).

- PT 4.10: Create transparent financial policies, including criteria for how budgets are established and reviewed; align program aims with needed resources.

- PT 4.11: Consider mechanisms for ensuring that divisional or campus-wide voices are heard in tenure and promotion decisions as they relate to IDL.

#5. Ensure that interdisciplinary learning is aligned with the institutional vision, mission and identity, and that it is a critical consideration in strategic planning at all levels.

- **Strategy 5.1:** Identify current area(s) of strongest potential for facilitating interdisciplinary learning, seeking to leverage new programmatic development in terms of student interest and existing interdisciplinary activity through courses, curriculum, and/or faculty research.

- **Strategy 5.2:** Engage in a campus-wide conversation, including students, student affairs, admissions, advancement, facilities, etc., regarding ID learning to develop a shared vision; take a holistic view of student learning across their entire experience, inside and outside the classroom; connect ID learning goals to campus-wide student learning goals.

- **Strategy 5.3:** Be prepared to negotiate the difficult territory between the cultures of different campus units, departments, divisions, and colleges.

- **Strategy 5.5:** Create collaborations and partnerships – internal and external – focused on established interdisciplinary learning goals.

- **Strategy 5.6:** Use students as champions and advocates

Practical Tips from Campus Teams:

- PT 5.1: Start with targeted, strategic areas of science that relate to emerging research or industry trends (nanotechnology, sustainability, climate science).

- PT 5.2: A focus on global education may enable IDL in STEM, and bring in other disciplines for broader campus participation.

- PT 5.3: Consider general education as a place to develop and implement IDL in STEM (and beyond); leverage existing general education committee and review processes in support of ID learning.

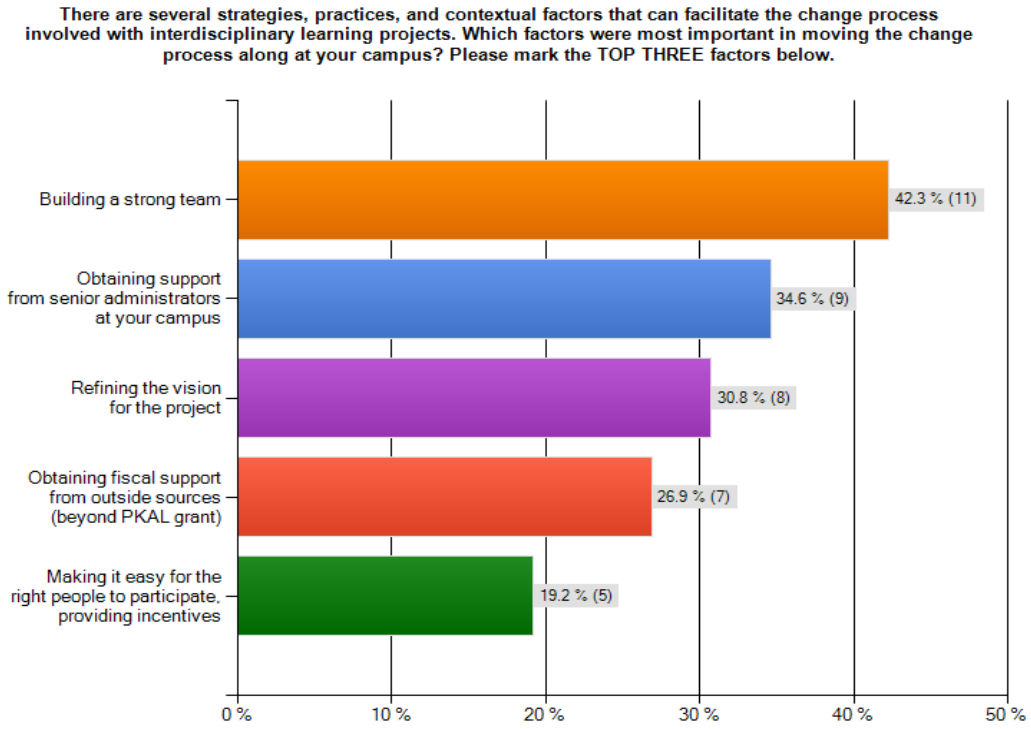
- PT 5.4: Make ID goals explicit in accreditation plans and reports.

- PT 5.5: Ensure teams have cross-disciplinary representation, as well as administrative representation.

- PT 5.6: Be prepared to talk openly about the disciplinary "territory" issues, and create mechanisms for dealing openly with them.

- PT 5.7: Pay deliberate attention to the development and support of emerging campus leaders with ID vision, interests and responsibilities.

- PT 5.8: Leverage existing program or research strengths to foster IDL (e.g., Marine Science program, ID research center, service learning program); take advantage of opportunities in the local community to create ID programs (e.g., study of a complex bioregion, environmental cleanup site, community organizations).



Results from post-project survey of campus teams (July 2010).

Reflections from PKAL's Past

The recommendations in this draft summary report are consistent with and reminiscent of PKAL's previous Leadership Initiative project (http://www.pkal.org/activities/LeadershipInitiative.cfm). A synthesis of insights from this project found that *what works* seems to be when there is:

- openness to change signaled by presidential vision and action which is evident in many ways.
- a sense of long-term stability with decisions made collectively and thoughtfully about each next step and new direction in the context of the institutional culture and mission, and where that approach to decision-making has contributed to a culture of trust.
- intentional weaving by leaders of a "tapestry of change," in some instances taking small steps and in others pursuing breath-taking and timely new initiatives.
- persistent attention to what students are learning and to the process of learning and teaching.
- visible evidence that "everyone is on board" in thinking about student learning— from facilities managers to library directors to assessment officers to faculty in all disciplines.
- visible evidence that the campus is intentional and sophisticated in identifying and adapting relevant work of peers, in order to be most efficient in regard to time and funds in the work of reform.