A Catalyst for Collaboration: Supporting Technology in Teaching through Partnerships.

The Web-based Catalyst Initiative was created at the University of Washington (UW) to support innovation in teaching through technology. The approach utilizes participatory design techniques in the development of next generation technologies in order to scale beyond early to second wave adopters. Catalyst is the product of a support strategy that has centered on collaborative partnerships with campus teaching practitioners--learning, technology, and teaching research centers, libraries, and departments--to leverage resources and spread promising practices throughout the University. The strategy behind the Catalyst Initiative assumes no finality. Through its origins in partnerships and near constant collaboration, the Catalyst Initiative is and will continue to be a work-in-progress to reach UW's "wary adopters." This paper discusses the origins and work process behind the Catalyst Initiative, emphasizing elements of the support strategy that obtain beyond UW. (AEF)
Abstract

The Web-based Catalyst Initiative was created at the University of Washington (UW) to support innovation in teaching through technology. The approach utilizes participatory design techniques in the development of next generation technologies in order to scale beyond early to second wave adopters. Catalyst is the product of a support strategy that has centered on collaborative partnerships with campus teaching practitioners—learning, technology, and teaching research centers, libraries, and departments—to leverage resources and spread promising practices throughout the university.

Introduction

By now all institutions of higher education are grappling with instructional technologies, in part spurred by the explosive growth of Internet technologies in everyday life. To support technology in teaching, many campuses have established a faculty technology center, offered training to interested educators, supported faculty technology projects and the transformation of particular courses, and/or implemented off-the-shelf courseware. These efforts have generally targeted early adopters who are eager and willing to teach themselves how to use and
implement new technologies. Most support staff, however, now face the challenge of moving beyond the small core of early adopters to the wary adopters, the vast majority of faculty who look for easy ways to bring technology into their teaching but are unwilling to match the time commitment of the pioneers.

As noted in a recent National Learning Infrastructure Initiative white paper, this second wave of wary adopters shares a commitment to quality learning with the early adopters but is much more risk averse and unwilling to experiment or invest significant amounts of time to integrate technology. Moreover, there is no magic-bullet solution that will meet the needs of all or even most wary adopters. To reach its own second wave of wary adopters, the University of Washington chose to forego courseware or unitary solutions in favor of a support strategy, the Catalyst Initiative, grounded in partnerships and collaboration with campus teaching practitioners—learning, technology, and teaching research centers, libraries, and departments. This strategy leverages and scales the ideas and developments of many different innovators and support staff, allowing faculty to pick and choose technologies and support options that suite their particular needs from a much more rich and diverse palette of resources.

Just 18 months old, the Catalyst Web site is widely used by UW faculty. On an average fall day, approximately 600 instructors use the original content on Catalyst to help them integrate technology with their teaching. Over 1350 instructors have created 3416 implementations of Catalyst Web tools; and this fall, more than 700 students use Catalyst Web tools every day as a part of some learning activity. Clearly, the Catalyst Initiative has helped reach the wary adopters. This paper discusses the origins and work process behind the Catalyst Initiative, taking care to emphasize elements of the support strategy that obtain beyond the University of Washington.

Partnerships as a Support Strategy

In 1994, three top-level administrators at the University of Washington were charged by the Provost to "do something about technology." They redirected resources from their respective units and worked with faculty to launch a small pilot project to provide 65 freshmen with laptops and training in technology and information literacy. Collaborating with other faculty, librarians, technologists, and students, they quickly moved beyond this initial pilot, rounding up more partners and gathering resources from wherever they could to focus on bringing technology into the service of teaching and learning in a more systematic way through the Center for Teaching, Learning and Technology (CTLT), established in 1996.

The CTLT served as a drop-in center where faculty could work and receive one-to-one assistance in a uniform and familiar environment of standard software and hardware. The Center tailored custom solutions to faculty needs, often working closely with support staff from a client's home department. Staff also gave frequent workshops on basic applications and technology skills. This support model required significant staff time and creating the expectation of continued, intensive support (for relatively few clients). By 1998, drop-in visits to the CTLT had increased dramatically, seriously taxing staff resources. At the same time, however, the absolute number of instructors assisted by CTLT staff was relatively small, a few hundred early adopters over the course of the academic year. The need to expand support to a much wider audience—and to do so without a major infusion of new staff or relocation to a larger facility—was clear. How to do so was not.
At this point, staff entered into an intense period of assessment and wide ranging conversations with the major partners behind the CTLT, campus stakeholders, faculty focus groups, and campus support staff. What emerged from these conversations was a clear set of requirements for supporting wary adopters: (1) the initial foray into educational technology must be smooth and easy; (2) flexibility is critical to meet the both the changing needs of instructors as well as evolving technologies; and (3) campus-wide, scalable resources are a must. Not only did these conversations forge a consensus among campus educators about what needed to be done, but the new support framework that resulted—the Catalyst Initiative—explicitly met the needs expressed by faculty, librarians, instructors, and teaching assistants.

Lessons Learned: Among the early collaborators supporting educational technology were the Office of Undergraduate Education, the University Libraries, the Office of the Provost, Computing and Communications, and a number of faculty drawn from many disciplines. Later, the Office of Educational Partnerships, Educational Outreach, and the Office of Educational Assessment joined the mix. What has proven critical to UW's success in supporting educational technology is that all the units that should have been shaping technology integration were shaping technology integration. The initial partnership established an ethos of multi-unit, results-oriented collaboration that has persisted. This has produced a support strategy owned by all the players, avoiding the tensions inherent in top-down mandates for integration and bottom-up demands support.

Scaling Innovation through the Catalyst Initiative

The concept was simple: provide examples, promote good teaching practices, build technology skills, and make technology easy for instructors to use. These are the tenets of the three-tiered Catalyst Initiative, a support framework that provides anytime-anywhere resources via the Catalyst Web site. Catalyst places good teaching and student learning at the forefront, treating technology as a means to these ends. The resources on the Catalyst Web site shape and inform the other two tiers of the Catalyst Initiative: redesigned workshops and one-on-one consulting delivered through the CTLT. This interlocking support strategy ensures that campus educators receive clear, consistent help for integrating technology into their teaching.

A great deal has been written about the creation of the Catalyst Web site, but it is worth reemphasizing here that its homegrown content is built solely through collaborative partnerships with campus teaching practitioners—learning, technology, and teaching research centers, libraries, departments, and faculty. A look at the six major content categories on Catalyst makes clear the close connections to campus practitioners:

- **Profiles** tell the stories of educators who are using technology in teaching—the challenges they face, the pitfalls they encounter, and the successes they achieve. This section allows faculty who use technology to share what they are learning and doing with their colleagues from across campus, breaking through traditional disciplinary boundaries.

- **Teaching** lets instructors explore the ways that technology can help achieve specific teaching and learning goals. These pages were created input from teaching research centers and point faculty to these centers.
• **Action Plans** are "road maps" for particular tasks, such as creating a class web site or setting up electronic discussion. Many of these draw on existing campus computing resources or rely on information gathered from technology centers.

• **How-to** pages take users step-by-step through specific tasks needed to make technology work. The range of applications covered here mirrors the range of applications available in the many different computing environments throughout UW. Indeed, numerous *How-to* documents were created in collaboration with department of unit support staff.

• **Learning** offers information on CTLT workshops and other campus activities related to teaching with technology.

• **Web Tools** (discussed in detail below) is a gateway to Web-based software and also links to innovative uses of Catalyst Web tools by UW educators, again helping to spread good practice beyond disciplinary boundaries.

These resources easily meet the three requirements for supporting *wary adopters*. First, the varied stories of teaching with technology, the step-by-step instructions, and the best practices make an educator's initial foray into educational technology smooth and easy. Second, Catalyst is extremely flexible; faculty needs and wants vary markedly across departments, disciplines, and course types, but Catalyst allows them to pick and choose support options that suit their environment and needs. Finally, Catalyst is a campus-wide resource, available 24-7, which scales local solutions throughout the campus teaching community.

**Lessons Learned:** Excellent support resources and exciting teaching practices using technology are found all across campus. Very few people, however, have knowledge of resources and practices beyond their own departments. The Catalyst Initiative was created exactly to make these resources and practices visible, scaling innovation across campus through collaborative partnerships. Not only does this strategy leverage resources, but it also forges both a sense of ownership and a measure of comfort with educational technology among faculty and support staff who come to see themselves in the offerings on Catalyst.

**Participatory Design & Catalyst Web Tools**

Since early 1996, the CTLT had worked one-on-one with *early adopters* to create interactive, Web-based course material. This approach, while time consuming, worked well when dealing with a few highly motivated instructors. Faculty demand, however, quickly overwhelmed developer supply, yet the tools were not moving beyond the *early adopters*. Still, most of the functionality requested by faculty was similar in nature—a few simple modifications to an existing program made it work for another instructor—a hopeful condition for producing easy to use, flexible, and scalable Web-based applications.

Refocused development efforts settled on two guiding principles: (1) most instructors know what they want from technology and have great ideas about how they want to use it, especially if they are given a bit of help; and (2) instructors should be able to "use" technology, i.e., easily configure and customize it from wherever they do their computing. Thus began a development model rooted in participatory design to create Web-based applications that meet
general instructional needs shared by early and wary adopters, not just the specific needs of early adopters.

The first principle is truly the key to the success of Catalyst Web Tools. Instructors really do know what they want from technology, and in keeping with the ethos of multi-unit, results-oriented collaboration that has marked UW technology support efforts, faculty from across campus have been integral to the design process. The first step in the Web Tools development cycle is to meet with instructors both formally in needs assessment groups and casually as they work in the CTLT. Individual instructors regularly come to the CTLT with an idea in mind or a project to complete that they wish to discuss with staff. Developers then work with other instructors to see if the need is widespread and transform the individual needs into a cross campus educational solution.

In a world where off-the-shelf software solutions are often developed simply to take advantage of a new technology, Catalyst developers are more concerned with building tools that instructors need, not with tools that reflect the latest and greatest trends. Faculty typically have specific needs and ideas about how to integrate technology, and their reasons for wanting to use technology in lieu of other teaching methods are generally well-formed. Consultation with instructors lets staff focus on core pedagogical goals before considering technological solutions.

Once a decision is made to develop a particular Web Tool, usability studies commence. Interested instructors are invited to review the designs and screen mock-ups as if they were using the tool, and staff closely monitors participants as they walk through the screens. Without fail, the usability studies uncover issues concerning terminology, process, and features that developers had not anticipated. Through this intensive needs assessment and usability testing process, instructors become participants in the design, assist in determining product features, and specify functionality, leading to Web Tools that really are a by-product of collaboration.

Mindful of the risk averse wary adopters, Catalyst Web Tools have a user interface which lets both early and wary adopters use the technology while retaining control of it. With its limited set of simple interface elements—a series of HTML forms—the software is easy to learn, configure, and use. In fact, the set-up process is a lot like shopping online. Developers err on the side of a reduced feature set for improved usability and simplicity, yet the Web Tools still provide as many options as possible to leave the instructor in full control. Moreover, because the applications are accessed via the Web by both faculty and students, users can count on a consistent interface and functionality no matter the platform (Macintosh, Windows, Unix, etc.) and no matter the browser (Internet Explorer, Netscape, Opera, etc.).

With the Web as the medium for Catalyst Tools, developers have worked in partnership with Computing and Communications (C&C) to maintain a centrally hosted code base on systems maintained by C&C staff. This means there is no need for instructors to fiddle with downloading, installing, and configuring software on their own machines. The software is in essence transparent to the user and accessed simply by going to a specific URL, another plus for wary adopters. This model is extremely flexible and scalable, making Catalyst Tools available both on campus and off, allowing instructors and students to work from home, the office, or even a remote site while traveling.

Finally, it should be noted that the development cycle for a particular Catalyst Tool never closes; new ideas and suggestions arrive daily from the Catalyst Email Help-line or from clients who drop into the CTLT. Developers also teach Catalyst Tools workshops, which serve as an invaluable source of instructor perspectives. Significant feedback also comes from collaboration.
with the Technical Communication Department. Their graduate course in usability testing has tested several Catalyst Web Tools and the Web site itself. The recommendations from these usability classes have been extremely valuable. This ongoing feedback ensures that Catalyst Web Tools retain their pedagogical utility and flexibility to meet campus-wide teaching needs.

Lessons Learned: Focusing on pedagogical needs expressed by numerous faculty and developing software to meet these needs, Catalyst developers create applications with an instant market that meet very specific teaching needs on campus. With their low entry costs and collaborative origins, these are tools of and by wary adopters and thus scale easily. The constant consultation with users and many feedback channels guarantee that the tools remain current and easy to use, avoiding some of the problems posed by static off-the-shelf software solutions.

Building Catalyst through Co-Branding

Last February, the Catalyst Initiative celebrated its first anniversary, having survived initial growing pains to produce some very formidable gains in campus technology support. Rechristened the Educational Technology Development Group, the staff responsible for Catalyst was now ready to make use of the results-oriented, multi-unit collaborative ethos critical to the formation of Catalyst to help grow the initiative. Co-branding efforts focused on formalizing existing but piecemeal partnerships with campus teaching practitioners—learning, technology, and teaching research centers, libraries, departments, and faculty—to generate new ideas, content, and tools for the Catalyst Web site. Resources and materials generated from these partnerships are placed on Catalyst and co-branded, giving credit to the partners who helped create them.

Co-branding allows staff to maintain current and innovative resources on Catalyst, while alleviating the burden of generating new materials whole cloth. Among the most notable results of these co-branding partnerships are:

- **MyClass:** C&C has recently created MyUW, a personalized Web portal for UW students and is working on portals to meet the needs of each segment of the UW community. C&C is currently working with the Ed-Tech Development Group to create MyClass, the personalized teaching portal for UW instructors. This portal will integrate Catalyst Tools with course and student information systems, online grading capabilities, and applications that let instructors post content directly to the Web. In part, MyClass is designed to reach wary adopters, bringing useful Web-based course administration tools together with a simple interface for creating online course materials.

- **CONTENT:** With its Digital Initiatives Program, UW Libraries is building an online multimedia collection that showcases print, photograph and textual materials through the CONTENT digital asset management system developed at UW’s Center for Information Systems Optimization (CISO). Librarians, working with scholars who wish to digitize their own materials, design the individual CONTENT databases within the Digital Initiatives collection. The CTLT now houses two CONTENT digitization and acquisition stations, and the Ed-Tech Development Group is working with CISO staff to create instructions and support materials which, once housed on Catalyst, will permit faculty to create CONTENT databases themselves.
• **Task Consultant:** This Catalyst Web Tool, currently being co-developed with the School of Library and Information Science (SLIS), meets a need frequently voiced by faculty—how to guide students in the formation of research papers and projects. Building on a core strength of the SLIS program, models for information problem solving, the interactive Task Consultant will help students sharpen research topics, structure arguments, determine appropriate levels bibliographic information, and create a project timelines.

• **Turning Your Course into an Online Course:** This new workshop series, co-developed with Educational Outreach, aims to help faculty create courses that have distance-learning or online components. After the first series of workshop materials, Ed-Tech Development staff will transform workshop materials into new Catalyst content, making these resources available to all instructors.

Not only do these partnerships lead to new Catalyst resources and Web Tools, but they also scale resources that might otherwise remain underutilized, like CONTENT, or spark exciting new campus-wide developments in educational technology such as MyClass.

**Lessons Learned:** Anytime-anywhere support resources must be renewed and refreshed to keep pace with changing faculty needs and new technologies. Charging one unit, in this case the Ed-Tech Development Group, with uncovering, capturing, and disseminating innovation has proven essential to accomplishing this end at UW. Yet the success of co-branding owes a great deal to the founding partners behind the CTLT and Catalyst. The fact that all the units that should have been shaping technology integration were shaping technology integration sets an expectation that teaching practitioners should continue to collaborate on Catalyst, and their willingness to do so is further buttressed by giving credit where credit is due on the Web site itself.

**Co-Branding with the Program for Educational Transformation through Technology**

To bring together the practice of educational technology with the science of teaching and learning, Catalyst partners with the Program for Educational Transformation through Technology (PETTT). The primary goal of PETTT is to enhance the effectiveness of teaching and learning at UW by promoting, assessing, and disseminating effective uses of technology, paying careful attention to exemplar projects. This goal is predicated upon one observation: many faculty wish to utilize technology in education, but the effort necessary to integrate is often prohibitive because there is so little information about how to change pedagogical practices to incorporate new technologies or about the effectiveness of doing so.

PETTT addresses this information gap through research and development efforts carried out in the context of exemplar projects. Two exemplar projects in particular that will feed content to Catalyst are the Arthritis Source and the Computer Science and Engineering (CSE) Tutored Video Instruction Pilot (TVI) projects, representing informational Web sites and multimedia-enhanced distance education, respectively. Working with exemplars, PETTT avoids the often-lengthy period associated with the initial design and debugging of new technologies by assisting with development. Moreover, because the exemplars are developed by UW educators, they fit within the constraints and particularities of the UW educational environment and thus scale much more readily.

By working with the Arthritis Source exemplar, for instance, PETTT has developed an information design format for educational materials that can be disseminated on the web, in the
classroom, or through informational brochures. This format treats different components of the materials as elements of a database, which facilitates indexing, editing, and access using a wide variety of devices, such as personal digital assistants, personal computers, and soon digital phones. Additionally, by working with the CSE-TV! pilot project, PETTT has identified both specific uses of video technology that promote learning and productive interactions between students and teachers as well as specific impediments to learning not otherwise obvious to the instructors. As a result, we have created recommendations for training small group facilitators who work with tutored video instruction and for redesigning video-based instructional materials.

Each of these models for teaching with technology is extremely scalable and thus suitable for dissemination via the Catalyst Web site. Among the teaching and learning guides for Catalyst that have been crafted from these two projects and from PETTT's other research activities are:

- **Conducting a Log file Analysis**, a guide that synthesizes literature on log file analysis, presents information on a variety of analysis tools, and gives recommendations about how to use the results of a log file analysis.

- **Conducting an Online Survey** proposes guidelines for designing on-line surveys that characterize Web site users and effectiveness. This guide will also contain pointers about the overall design process, expectations for time requirements, and information about possible outcomes.

- **Learning about an Educational Technology by Interviewing the Designer** describes the possible outcomes of interviewing educational technology designers, potential questions to ask during an interview, and various aspects of designing and analyzing an interview.

- **Effective Facilitation of Online Discussions**, a guide for increasing student interaction using Web tools such as Catalyst's Epost.

- **Authoring and Presenting Streaming Video** details the process of creating, capturing, editing, and streaming video and multimedia via the Web utilizing.

In the near future, PETTT will also concentrate its research efforts on effective uses of Catalyst Web Tools, generating insight that will surely prove invaluable to the developers.

**Lessons Learned**: For campus-wide integration to be truly successful, the evolution of educational technology must be coupled with the evolution of educational practice and educational science, informing one another in a continuous cycle. The Catalyst Initiative is fortunate to share a close relationship with PETTT that provides for this continuous cycle, leading to rich Catalyst content on how to incorporate educational technologies into pedagogical practices and the effectiveness of doing so—two resources that are very important to wary adopters.

**Extending Integration through Outreach**

To reach instructors who do not know about Catalyst or who do not teach with technology and to keep current Catalyst users informed about new developments, Ed-Tech
Development staff engage in extensive outreach activities. These activities are essentially marketing efforts, some very general but most carefully targeted. The most general marketing tool is the CTLT Teaching with Technology Workshops brochure mailed to all instructors and teaching-related staff on campus. Ed-Tech Development staff teach a series of approximately ten free workshops five times per year, providing five opportunities to send out a new brochure. Each brochure, while written to sell the workshops, also refers back to the resources on the Catalyst Web site and the face-to-face help available in the CTLT, bringing together the three tiers of the Catalyst Initiative.

Staff also targets different groups with personalized letters and frequently updated promotional materials approximately four times per year. To reach the faculty leaders, letters go to Deans, Department Chairs, and members of Faculty Councils that deal with teaching or technology broadly. Next, we target the people who support instructors, like departmental technology support staff, teaching and research assistants, and librarians. Finally, we send letters to everyone who has visited the CTLT, taken a Catalyst workshop, or signed up for the Catalyst listserv. Every letter has three parts: (1) a general message announcing new Catalyst content, Web Tools, or special initiatives such as our current focus on streaming media, (2) a description of the three tiers of support available through the Catalyst Initiative, and (3) an offer to provide specialized workshops or presentations. These letters have had a very positive impact, creating a buzz about the Catalyst Initiative, leading to suggestions or ideas for new Catalyst content, and generating numerous requests for workshops or presentations. Indeed, this fall staff members have given over thirty specialized workshops or presentations to different units and groups, reaching approximately 500 people.

The most granular outreach efforts extend to very specific groups of faculty. Many of our practitioner partners who deal with faculty on a face-to-face basis, especially the learning, technology, and teaching research centers co-branded on the Catalyst Web site, refer their clients to Catalyst resources when appropriate. Ed-Tech Development staff also work closely with two programs coordinated by the Office of Undergraduate Education: The Institute for Teaching Excellence and the Collegium for Large Lecture Courses. These programs help faculty develop new curriculum and pedagogical strategies, and technology usually plays a substantial role in the revamped curriculum. Ed-tech staff can work with these faculty to think through the process of technology integration as these faculty build their courses anew. Finally, staff are beginning to assist faculty teaching large, introductory courses who wish to integrate technology. This fall, for example, the Ed-tech Development Group has helped faculty teaching courses in Physics, Communications, and Speech Communication, courses that reach hundreds of students, to integrate Catalyst Web Tools into the course design.

Lessons Learned: Simply providing good resources for faculty who wish to teach with technology is not enough. To reach wary adopters, support staff must evangelize, reaching out not only faculty but also those who support faculty. The Catalyst Initiative keeps growing exactly because staff are constantly getting the word out to new users and repeating the message to established users.

Conclusion

Ed-Tech Development staff are acutely aware that the Catalyst Initiative is not the be-all, end-all solution for reaching wary adopters. In fact, the beauty of the strategy behind the Catalyst Initiative is that it assumes no finality. Through its origins in partnerships and near constant collaboration, the Catalyst Initiative is and will always be a work-in-progress to reach UW's wary...
adopters. If there is anything that observers can take away from UW's experiences, it is likely to be found in these lessons:

- Make sure that all the units that should be shaping technology integration are shaping integration.
- Scale support through collaborative partnerships, making disparate resources and innovative practices visible and available to all.
- Create tools that meet pedagogical needs expressed by faculty and constantly engage with faculty to make sure the tools remain current and easy to use.
- Renew and refresh anytime-anywhere technology support resources by co-branding and co-developing them with campus teaching practitioners.
- Provide instructors with direction in how to effectively incorporate educational technologies into pedagogical practices.
- Evangelize and reach out to instructors in as many ways and as often as possible.

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3 http://www.catalyst.washington.edu


5 Currently, the Catalyst Web Tools suite consists of: E-submit—an electronic turn-in tool, WebQ—an online survey generator, Peer Review—an online collaboration tool, UMall—an anonymous email feedback tool, iSubscribe—a Web-based subscription form for listprocs, Epost—an online, threaded discussion board, and Catalyst Course Templates which allow instructors to easily create course Web pages. Planned for release during the next year are problem based learning tool, a significant upgrade to WebQ, and data collection and analysis software to facilitate group work on data outside of class time. To see the Catalyst Web Tools, visit: http://www.catalyst.washington.edu/catalyst/tools/

To learn more about PETT, visit http://depts.washington.edu/pett/ and read the first Annual Report.
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