Cohort-Based Technology Training: A Collaboration with Faculty Grounded in Diffusion of Innovation and Faculty Learning Community Theories

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Abstract

Librarians excel at teaching patrons how to use resources for their research and learning needs. Librarians can introduce these skills into faculty technology training since faculty research needs often intersect with their technology interest, be it mobile devices, technology-enhanced teaching strategies, or tools that support their research. The purpose of this paper is to explore a framework for collaboration in technology training through the lens of a "faculty learning community" and a "diffusion of innovation theory." This will be examined through a case study of the author's library, where a multi-year intentional and systematic collaboration with instructional design and Information Technology (IT) staff led to the library taking on a leadership role in technology training at its institution.

Keywords: Faculty; Diffusion of innovation; Faculty learning community; Technology training; iPad

Introduction

While public libraries have an established role in many communities offering formal technology training,[1] academic libraries have a more ad hoc role. There have been calls for formal technology training for library staff [2] and innovative techniques in library instruction, but few initiatives focused on faculty technology training. In some institutions faculty technology training is the domain of IT and in others faculty development centers provide technology training. Because resources are limited in small institutions,, most technology training focuses on critical tools such as the learning management system.[3] Sometimes, faculty are expected to experiment with technology on their own time if they want to use it in their teaching and research. However, many faculty avoid learning new technologies on their own due to lack of time, self-confidence, or technology anxiety.[4] A key way to reduce this anxiety and provide a support network in technology adoption is through "faculty learning communities." This paper explores a collaboration between the library and instructional design staff in increasing technology adoption at a small liberal arts college through the understanding of "diffusion of innovation theory" and the application of experiential faculty learning communities.

Faculty Technology Adoption

Colleges and universities are similar to other organizations in technology adoption. Every organization is made up of formal and informal networks that impact change. Everett Rogers' "diffusion of innovation model" presents a framework for understanding how innovations like technology tools are adopted by a network. An "innovation" is defined as an idea, practice, or object that is seen as new by the individual, and "diffusion" is how it is adopted through the social system.[5] Rogers further describes how individuals in a social system adopt innovations at different rates along a bell-shaped curve, with innovators (2.5%) and early adopters (13.5%) leading innovation adoption, followed by the early majority (34%) and the late majority (34%)

after others have paved the way, and lastly the laggards (16%) adopting an innovation when social pressures from the network are too great to resist.[6] It is this social network pressure that ultimately drives innovation adoption, whether it be driven from the top or arises from the ground up in an organization.
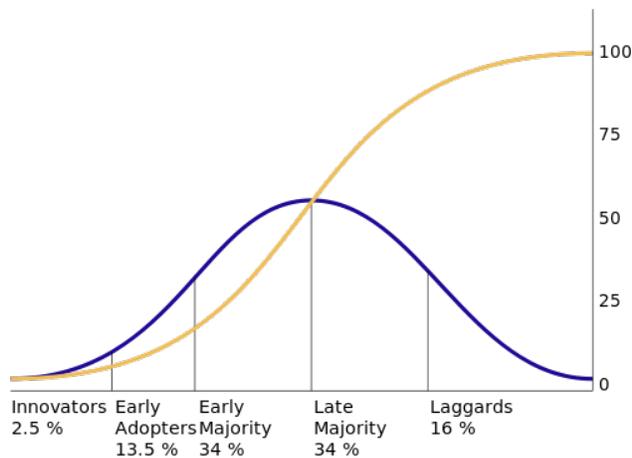

Figure 1: Adopter Categories Based on Innovativeness[7]

Researchers have applied this model to faculty and found that they generally fall within these categories at the same levels, and that training and development needs are different for each group.[8] Innovators and early adopters are self-sufficient risk takers who like to be connected to members across the organization instead of limiting themselves to their immediate departmental group. Majority adopters prefer proven applications, need more formal support, and are problem oriented.

In addition, there are some unique characteristics of how faculty approach technology adoption. While rank was found to be unimportant in determining willingness to adopt technology, young faculty and those in technical disciplines were more likely to be earlier adopters.[9] Another study showed that collegial communication was central to faculty technology adoption.[10] This finding is echoed in Roger's theory where the earlier adopters have stronger social networks.

Encouraging cross-departmental communication is key to wide-scale faculty technology adoption, but is challenging in many institutions.

A central focus in faculty technology adoption is its integration into course design either to ease or enhance teaching.[11] A major barrier to adopting technology innovation is faculty time. In particular, curricular change involves a great deal of time to learn the new skill, design the course, teach with the new technology, assess results, and revisit the course design. Any competency development requires time and commitment, and faculty frequently either lack the social support, institutional support, or intrinsic motivation to adopt change on their own.[12] In technology adoption, the reliability of the tool and easy access to support also impact faculty persistence.[13]

Based on this research, faculty technology adopters are best supported by a combination of social support, communication, training resources, and designated time to learn and reflect. This is where faculty learning communities lend their support.

Faculty Learning Communities

Faculty learning communities (FLC) are small groups of cross-disciplinary faculty engaged in a time-based program focused on improving teaching and learning.[14] FLC theory was developed by Milton Cox, Director for Teaching Effectiveness at Miami University. The FLC framework was developed based on theories of student learning communities and experiential learning, taking into consideration the unique environment of academia and the nature of faculty work.[15] Faculty work is often solo and isolating, so FLCs provide a key role in connecting faculty across disciplines who have similar interests, and giving them a support network for trying new things in their teaching.[16] Generally,

FLCs are based on a specific issue, such as teaching methods or research, or they may be cohort-based, involving junior faculty or a neglected group in the organization.[17] FLCs require a designated time commitment, such as a semester or academic year, and offer a program of activities that provide learning, development, and community building.[18] While they are issue or group oriented, rarely is an external outcome forced on the group; instead the FLC develops its goals and outcomes based on the needs of the individuals. FLCs rely on the social aspects of building community where members achieve their desired ends.

FLCs rely heavily on David Kolb's experiential learning theory where individuals create knowledge through transforming their experiences into existing cognitive frameworks that cause persons to change the way they think and behave.[19] Learning is derived from and continuously is modified in this framework, and developed through four phases: 1) Concrete Experience where the learner engages with the world, 2) Reflective Observation to contemplate and observe their experiences from multiple perspectives, 3) Abstract Conceptualization where observations mesh with logically sound theories, and 4) Active Experimentation where the theories developed can be tried and used to solve problems.[20] Faculty utilize experiential learning to both engage in the cohort experience and address the FLC learning outcomes. It is this reflective learning and consciously created learning environment that allows FLCs to thrive and be successful.

FLCs have been successfully used to address a wide variety of faculty needs. While initial adoption of FLCs revolved around age or tenure-based cohorts, the vast majority are now focused on teaching and learning issues.[21] They have been used to promote teaching strategies in the sciences,[22] to increase adoption of assessment strategies,[23] and to encourage the adoption of online learning and technology teaching tools.[24] FLCs have become a preferred method to introduce new tools and teaching methods to faculty that preserve the self-direction of the faculty body yet allow administrators to introduce and guide change in the academic unit. In this way, they serve as a way to identify and support innovators and early adopters in Rogers' diffusion of innovations network. They allow administrators to help accelerate the rate of adoption in a way that promotes buy-in from interested faculty, and by diffusion through the social network, to their colleagues.
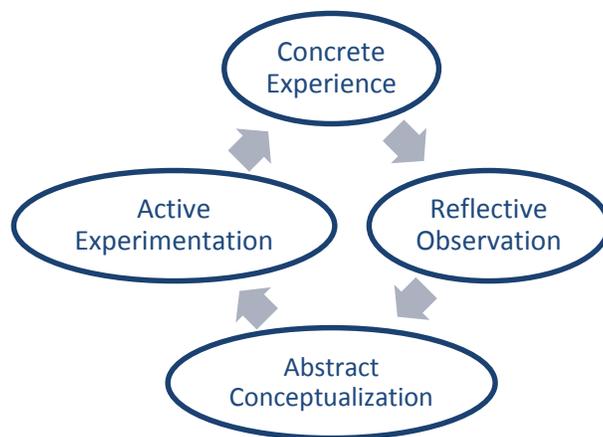

Figure 2: Kolb's Experiential Learning Cycle

Faculty Technology Training at Viterbo University

Viterbo University is a Catholic, Franciscan institution in La Crosse, WI with approximately 2200 FTE. There are 120 full-time faculty in undergraduate and graduate programs, as well as 300 to 400 adjunct faculty depending on the time of year. In 2010, the Todd Wehr Memorial Library underwent strategic planning, and set a goal to highlight the professional skills of the library staff to campus constituents. The library had a great reputation for helping students, but faculty generally did not consider them a resource for themselves. As one way to increase visibility, the author initiated a "Learning and Fellowship Program" aimed at highlighting library technology and the knowledge of instruction librarians. The library approached the faculty development officer to coordinate schedules, and modified the series slightly to help meet shared learning goals of the library and faculty development. The Learning and Fellowship series covered topics that surfaced in faculty development surveys such as tools for collaboration and copyright in the digital age. This focus on faculty development laid the foundation for the wider faculty training collaboration.

The iPad Initiative

Another technology-based initiative arose fortuitously over the same time period as the Learning and Fellowship Program. In spring of 2011, Apple invited presidents and chief academic officers from members of the Council of Independent Colleges to attend an education summit at their headquarters in Palo Alto, CA. Apple's education division showcased how learning could be enhanced by using devices in the classroom. Viterbo University's president and vice president of academic affairs (VPAA) attended this event, and returned intending to bring devices to campus in some way. As a member of the Deans Council, the author heard of this plan and began discussing potential ways of using iPads

with the faculty development officer. After presenting some initial ideas to the VPAA, the author, faculty development office, faculty representatives, and IT representatives were invited to a meeting with the president to discuss options, questions, and concerns. At that meeting, it was decided that there would be an initiative to encourage iPad use by faculty instead of a one-to-one student initiative.

The author was named the leader of the iPad initiative, which included a leadership team of the faculty development officer and the instructional design support specialist, who reported to the VPAA, and the help desk manager, who reported to the Director of IT. The leadership team designed the structure and outcomes of the initiative using the Faculty Learning Community framework with the understanding that the first group would fall into the innovator or early adopter category of the diffusion of innovations theory. Since the individuals in the group would have a significant influence on adoption rates by future faculty, there was a sense of needing to structure the experience to meet the university outcomes and to give faculty enough flexibility and freedom to decide to use and implement the innovation. Further, since each faculty member would receive an iPad for their use during and after the year-long initiative, as well as a $100 gift card to the app store, the university wanted to see results.

The team settled on a two-semester structure; the first semester would focus on learning and experimentation, dubbed "mischievous exploration" by the VPAA. The work of the facilitators during the first semester would be to solve technical issues and to present a few use cases for apps and hardware. Cohort members would be asked to bring their questions, concerns, and findings to the group in a casual sharing session of cohort meetings. This supported the member-driven nature of issue-based FLCs. In the second semester, faculty would be required to implement at least one iPad-based teaching

strategy in one of their classes, to tie that activity to the existing learning outcomes of their class, and to identify some method of assessing the results. The leadership team was careful to state that if their initial plans did not work out, they could try something different. This tied into the institutional culture of assessment of learning activities and provided a tangible goal that faculty members could achieve. Leadership team members would also observe teaching sessions to provide support, advice, and to document the initiative through video and text comments.

The leadership team also devised a communication and meeting strategy to support the iPad initiative of the FLC. Meetings were set for twice a month, quite a time commitment for the faculty involved but necessary to ensure that members were making progress in using the iPads. A blog was set up where meeting and app summaries were posted to keep the conversation going in-between meetings. Faculty members could contribute to the blog if they wanted, or could simply read and absorb. Each member of the leadership team was assigned a group of cohort members to assist, though members could seek out individuals based on their need whether it be technical support, teaching advice, or app suggestions.

Twenty faculty members were nominated by their deans for participation in the cohort and began their work at the beginning of the fall 2011 semester. The cohort experience largely went as planned. Faculty members were driven to discover tools to help themselves, and readily shared their discoveries with each other during meetings. The leadership team presented some content, but mostly encouraged open discussion and collaboration based on participant questions. Almost all faculty members met the goals of the cohort. At the end of the academic year, all members were still participating fully, had taught using the iPad in at least one spring semester class, and wrote reflective annual reports to synthesize their learning. Despite the external

pressure for a documented outcome, unusual for most FLCs, the cohort members clearly addressed their individual goals and teaching needs, and used Kolb's four-stage cycle to experiment, reflect, and assess their learning.

Moodle Migration

As the first year of the iPad initiative was concluding, the instructional design specialist was gearing up for a summer 2011 migration to the Moodle learning management system. This presented a further opportunity to engage in cohort-based technology training. The migration represented a major shift for faculty, who had been on one version of Blackboard for six years. Based on the successful collaboration during the iPad initiative, the VPAA formed a migration team to address technical and training issues. The author, the instructional design specialist, help desk manager, two faculty members and a dean were placed on the team. The author requested and received permission to add the instruction and electronic services librarian to the team who was in charge of creating help materials for online resources for library patrons. During the formation of this group, the faculty developer left the institution and the position was not replaced, so did not participate in the migration process.

This group organically developed into a self-designing team[25] with the ultimate outcome being a successful migration, but all the individual tasks, deadlines and design of activities were left up to the members of the team. The instructional design specialist and help desk manager solved technology issues, the author took charge of meeting minutes and documenting critical steps, and the instruction and electronic services librarian took charge of crafting documentation and a LibGuides-based resource site.[26] Each member of the team chose an area of concentration in Moodle in order that training tasks could be divided according to interest and need. Based on diffusion of innovations theory, the

group consciously chose innovative faculty to pilot in the summer, and sought out early adopters for the fall semester since all faculty had to use the system for the spring 2012 semester. Since the group was familiar with faculty innovators through the iPad initiative, trainers had the social capital to test the system with faculty willing to experiment.

The collaboration among instructional design, IT, library staff and faculty was extremely successful. The summer pilots went very well and faculty who had piloted the system agreed to be trainers and contacts for their faculty colleagues within their departments, further moving the innovation adoption forward. The use of Lib-Guides placed the library firmly in faculty minds as a resource for technology training, and the guide remains the most popular guide at the time of writing. The most notable outcome was that 60% of faculty adopted Moodle in the fall semester, a whole semester before they were required to do so.

iPad Initiative Year Two and Reporting Changes

The second year of the iPad Initiative began in fall 2012, in the end stages of the Moodle migration. Twenty-eight faculty were nominated by their deans to participate in this cohort year, and the leadership team, minus the unfilled faculty developer, began work. The basic framework was kept the same—a semester of exploration followed by a semester of teaching and reflection. It was apparent almost immediately that the second group of adopters consisted of the early majority; they had been influenced by their early adopter colleagues, but were very cautious in using the device. Instead of jumping in and experimenting, they expressed a clear preference to be taught how to use apps and the hardware. The leadership team focused more energy on teaching options for using the device, and faculty selected from this range instead of experimenting more broadly. The commitment level

of this group was notably less than the previous year as evidenced that faculty had difficulty making all the meeting times and they were reluctant to share their experiences. This commitment level led to a less cohesive FLC, since one of the key drivers of the success of an FLC is the commitment of members to the issue they are working to solve.

Despite these differences, most cohort members in this second group genuinely explored using the iPad in their teaching, and implemented a teaching strategy in their spring 2013 classes. The reflections were genuine and comparable to the first cohort, and informed the team leaders of how far faculty had come in their adoption of technology. The leadership team also took the opportunity to shift into a teaching and support mode, as opposed to having the process be mostly faculty-led. While the team leaders were concerned that the process had shifted away from the FLC model, participating faculty encouraged team leaders to take on these roles.

During the spring 2013 semester, the VPAA asked the author to integrate the instructional design function into the library. She cited the success of the two iPad initiatives, faculty training and the Moodle migration as primary reasons, but also noted that instructional design needed a home in the institution outside of the VPAA office. The author agreed and took steps to strengthen the tie between librarians and the instructional design support specialist, including cross-training on Moodle, librarians conducting technology training, and instructional design offering advice on library products and services.

iPad Initiative Year Three and Flipped Classrooms

Prior to the fall 2013 semester, the leadership team entered into discussions with the VPAA about the future of the iPad initiative. They noted the reduction in commitment and the

changes in cohort member behavior, and assumed that faculty would continue to become more passive as the adoption cycle moved into late majority. The team had also heard from some faculty members that they wanted to do something different, and iPads had become less exciting. The heady promise of deep student engagement and easy access to online content had given way to the reality of some strong apps for teaching and collaboration, but with the primary utility of an iPad as a device for personal productivity. Based on these observations, the team received permission to run two parallel initiatives: one focused on teaching with technology, and one focused on flipped classrooms.[27] A member of the chemistry faculty was already working with his department to flip their core curriculum, and volunteered to be a co-facilitator in the flipped classroom group. The leadership team appreciated his new energy and content expertise in "flipping pedagogy."

It was this cohort year that brought the realities of the diffusion of innovation cycle and FLC model into focus for the author. There were eight members in each cohort group, and the structure was the same as previous years. The flipped classroom cohort was a dynamic group that clearly set their own goals and became resources for one another in their experiments with classroom teaching. They formed a textbook FLC, complete with commitment, camaraderie, and strong impact on their teaching goals. They were also innovators and early adopters; there was no surprise to the author that a third of the driving members of the flipped classroom group were in the initial iPad initiative. They all completed their flipped classroom project, reflected on their experiences, and continued to use flipped classroom techniques in their teaching after the initial year.

By contrast, the teaching technology group had a low level of commitment to cohort meetings, wanted to be taught how to do everything, and,

with a few exceptions, took only small steps towards incorporating the iPad into their teaching. They also did not come together as a group, and were very focused on their own work as opposed to the work of others. This group clearly were late majority adopters, succumbing to the social pressure of colleagues and administration as opposed to leading or driving the change. Most of the members of the group completed a technology teaching project, and expressed positive feelings about the experience, but their work was not comparable to the scope and scale of previous groups.

Observations and Conclusions

FLCs and Technology Adoption

Through the three cohorts and Moodle adoption, it became clear that there was a close connection between innovation adopter status and the successful formation of a faculty learning community. FLCs are member-driven initiatives, and faculty are motivated to participate if they have a passion for the subject material at hand. Since most successful FLCs are oriented around faculty interests and late majority adopters are driven by outside pressures instead of self-motivated desires, it appears that the FLC model is not the best choice for later technology integration. The Moodle training group, in fact, found that after the innovators were identified, the early and late majority adopters preferred a training session instead of a learning community model to learn the technology. Further, as iPad adoption continued through the faculty, non-cohort members sought out library and IT staff for individual training and instruction, as they were singularly focused on easing their own productivity and teaching work.

The organizational goal tied to the training initiative is also an important consideration when getting involved in faculty training. Efforts with optional commitment, like the iPad initiative, will be well supported by innovators and early

adopters' participation in FLCs, but will likely not gain traction among majority adopters unless the early faculty report great success to their peers. At some point an organizational mandate or significant peer pressure pushes majority adopters, or the technology does not move beyond the initial core group. However, efforts like the Moodle migration, which had a clear and unambiguous institutional mandate, started successfully with a group of FLC-like innovators and shifted into a formal training and established service model on the part of instructional design. As the migration moved through the adoption cycle, the process was less driven by participating faculty and more by the technology training team.

Each model has its own success, but those seeking to be involved in faculty technology training should be keenly aware of the motivations of faculty and any institutional mandates when choosing a method. It's also important to not simply repeat a training strategy unless there is buy-in from faculty participants. Shifting to a new tool or new method as needs change is key to a successful faculty training strategy.

Formalization of Instructional Design in the Library

One major outcome of this collaboration in cohort-based teaching was the formal inclusion of Instruction Design within the scope of the library's responsibilities. Three main factors led to this integration. The first was the access the author had to information about campus initiatives in their formation stages. Participating on the Deans Council and having a strong relationship with the VPAA provided the author insight into what was important to administration and faculty. That allowed the collaborative discussions between the faculty development officer and the author to take place, which led to the first iPad initiative. While a matter of timing and fortune play into these kinds of initiatives, conscious re-

lationship building with administration and faculty leaders helped the author take advantage of the situation that presented itself.

The second factor was the successful delivery of the first year of the iPad initiative. The initiative required a great deal of time, effort, and careful facilitation in order for it to be meaningful to the participants and meet administration's expectations. The author dedicated about a quarter of her time to running the cohort, mostly focused on communication, one-on-one consultation with participating faculty, and reporting on results to the VPAA and president. In addition, the library ramped up its support of iPads and other technology, ultimately managing the checkout of fifty iPads to instructors in course packets or to students individually. While this took time away from other library initiatives, it paid off with additional resources, support of library issues, and visibility for the library among administration and faculty.

The third factor was the institutional need for coordination of faculty technology training in the light of more demands to use technology tools. Since the author joined in 2010, the institution has adopted online course evaluations, the Moodle learning management system, an online student retention tool, a streaming video tool, and Office365. This is a rapid adoption of new technology tools in a short amount of time, and faculty felt ill-equipped to incorporate these tools into their work. Further, the Instructional Design Specialist reported to the VPAA, which left them without a supervisor able to discuss daily troubleshooting needs. Combined with the library's success in establishing a role in technology training, it was logical to place the unit in the library.

Since the units have been combined and an Instructional Designer has been hired to support online programs and learning technologies, the library and instructional design team have found more synergies. Instructional design and

libraries share an orientation to helping the user where they are at and helping them meet their goals. In addition, both create tools and resources to help users navigate through research and technology tools more easily. Finally, both approach their work from a teaching framework, making our role and approach very similar.

Overall, the applications of diffusion of innovation theory and faculty learning communities have helped the library provide meaningful services to faculty while embracing the instructional design team as colleagues. The collaboration between IT, instructional design, and faculty development led to this infrastructure change, and continues to provide opportunities for working together in service of the institution.

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