IMPLEMENTATION STRATEGIES: WILL TEACHERS USE EDUCATIONAL COMPUTING?

(keywords: Innovation, Adoption, Infrastructure, Compliance, Dependency)

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GOALS for YOU

Hopefully, by reading through parts of this presentation you will be informed about the notions surrounding adoption of innovations. The outline of the strategic plan may be useful to you in your own planning.

ORGANIZATION

This is a presentation in two parts. Read the Summary for an overview. Part 1 is the body. Read Part 2 for a detailed discussion of the implementation plan.

OUTLINE

Predictors of Use of EC

- *Variables.*
- *Subjective Norms.*

New Consideration

- *Changes, but…Still Motivation.*

Implementation of Motivational Strategies

- *Subjective norms: Adoption.*
- *Compliance: Infrastructure.*
- *Creating Dependency: Infrastructure.*
- *The Need for Training.*
- *Motivate to Learn, Learning Motivates to Adopt In Return.*

DISCUSSION

Considerations

- *Innovation & Adoption*
- *Compliance & Infrastructure.*

Relationships and Status of an Object or Process

- *Dependency.*
- *Loss of Control? & Administration.*
- *Decisions about Technology: Hierarchy or Consensus?*

Other Speculations about the Nature of Infrastructure and Adoption

- *Fear, Reluctance, Skepticism, Regression, Protection of the Infrastructure.*
- *Monotony and Innovators.*
- *Personal infrastructure, motivation, and learning.*

Part 2—Implementation plan

SUMMARY

You may be concerned with encouraging faculty to use technology in teaching. There are somewhat different strategies for encouraging faculty to use educational computing depending on whether technology is an innovation or a part of the infrastructure. This is because the relationships are different for either status: we adopt innovations, we comply with infrastructure. A very effective strategy that is widely used (but seldom in education) is the creation of dependency on technology while it is still an innovation. Creating dependency promotes the evolution of an innovation to the infrastructure which changes the user-relationship as well. The effect is the creation of motivation to participate in training—to learn about the technology.

Another strategy discussed draws from “subjective norms,” which emerged as the best predictor of computer use among teachers in a series of studies. Implementation of conditions that would respond to teachers’ sense of subjective norms include communicating the expectations for computer use by those influential in the teachers’ professional context. These were the administration, colleagues, students, and learned societies. The result of creating a dependency and appealing to subjective norms is the same: faculty will be motivated to use technology. The methods differ in implementation; creating a dependency requires logistical and physical machination, while appealing to subjective norms emphasizes communication. Because of these differences, one method may be more appropriate than another in a given setting. Or, a combination of methods may be used. Both necessitate learning.

These topics are presented and discussed. There is also an authentic strategic plan for the encouragement of faculty to adopt a web-based course manager.

The Short Answers

1. Will teachers use educational computing?

Yes, they will if they perceive that to do so is expected by those who are influential in their work context.

2. Can you manage conditions to encourage faculty to adopt educational computing?

Yes. There are two sets of conditions that can be managed. First, there needs to be a common expression expecting teachers to use educational computing by certain members of the professional context.

Without addressing individuals *per se*, you can also manage conditions to change the status of an innovation to the infrastructure. To accomplish this, create a dependency on the innovation.

TERMS & LIMITATIONS

For the sake of consistency, the term educational computing is used herein to replace the term microcomputers which, though it was used in the studies, is no longer commonly used. Also, educational computing is a broad term that includes the variety of media formats managed by a desktop computer. And, the intention in of this presentation is to refer to the variety of capabilities of the sort of desktop computers that would be typically available in a school setting.

One important area that influences the adoption of an innovation is the perceived ease of its use. The focus is on the user and the forces that act upon the user in establishing a relationship with an innovation. I recommend Donald Norman’s book, “The Invisible Computer” (MIT Press, 1999), for an examination of the characteristics of innovations that facilitate adoption.

There is a call at the end for insights from other fields. I suspect that there is much replication of effort and that we can learn from business and marketing, public management, etc. I acknowledge my own limited understanding of these areas.

PART 1—INTRODUCTION & OVERVIEW

Purpose

This presentation is intended to inform you about the conditions that predict the adoption of educational computing. For your consideration, there is also the outline of a strategic plan developed to encourage faculty members to adopt a course manager (software that organizes information put on the web).

Finally, I hope to arouse your curiosity about the nature of user-relationships with technological things and processes.

Technology Is Woven in the Fabric of Our Lives

We are keenly aware of technology, especially communication and computing technology (Is there a distinction?). It seems to be mentioned continuously and pervasively. Part of our awareness includes the anticipation of newer, and always better, versions of our technology. We invent technology for our needs and desires. We create it and we use it whether it refers to cars, music playback equipment, communication devices, or computers. Naming computers as a separate class is done deliberately and with acknowledgement that the first three classes all include computers. The computers I mean are the ones that are still most common—the desktop variety. And even the desktop variety is mentioned with the recognition that there are powerful movements to introduce an "appliance" class and wireless class of computers.[1] If that represents a change, we should not be surprised because isn't the dizzying and expensive rate of technological change one of its fundamental characteristics? It may be the pace of change that sorts us into varying relationships as users of it. Imagine that we are motes of iron filings near the hub on a centrifuge and technology is the hub. If the wheel barely spins, we remain closer to the hub. As the pace of the centrifuge increases, so does our dispersion away from it until the point that if it spins fast enough, we iron filings are quite removed from it. If, on the other hand, we are the same iron filings dispersed on the centrifuge and the hub of technology is now magnetized—there is some common meaningful, elemental relationship between the iron and the hub—we are drawn closer. The question of use has very much to do with change and the status of the innovation.

Everybody vs. Teachers

Practice vs. Interest. In an environment occupied by people and the technology they use, it would be reasonable to expect that certain technologies would be commonly, if not unquestionably, used. In schools, teachers would be using computers in their teaching. Or, would they? Even as recently as 10 years ago, educational computing was novel to educational systems. It was an innovation, and it was not widely available. Microintensity data from 1987[2] was 36.8 pupils per computer while recently it was reported as 5.7:1.[3] (The Educational Testing Service reports it at 10:1 for the same period. [4]) So, on the one hand, because there were few computers in schools— microintensity levels were low—it would have been unreasonable to expect teachers to use computers for teaching. At the same time, there was great interest in educational computing among researchers, policy makers, and certain practitioners. This contrast between the interests of one set of educators and the practice by schools underscored the status of educational computing as an innovation.

Underutilization…Model of Instructional Transformation. At the same time, underutilization was a common occurrence where it was sometimes reported that equipment was available but was occupying closet space. (Of course, this was likely an exaggeration.) These discrepancies of interest and use caught the attention of Paul Welliver and Lloyd Rieber, and later Simon Hooper[5], who observed that the varied use of educational computing by teachers could be described as a predictable progression of stages which they proposed as the model of "Instructional Transformation.[6]"

Pioneering Practitioners. Combined with underutilization and the disparities in interest and implementation was the observation that there were certain practitioners who were pioneers, the early adopters, the ones using the educational computing when it was not a common practice. This group included people like Dave Popp, a personal friend, who had strung together all sorts of

telecommunications equipment to offer calculus and mathematics-based physics to students in sparsely populated rural areas of western Pennsylvania many years ago. You may know people like Dave or you may be one like him. These isolated innovating practitioners also highlighted the status of educational computing as an innovation.

Questions Form. Such was the state of educational computing use among teachers, a dynamic melange of discrepancies where the innovative users kept rising to the top like cylinders in a maelstrom of change. The explanation for cylinders rising in an eddy is in the science of physics. But, what about people using educational computing? Why would early adopting teachers expend the effort to use educational computing in their teaching? Why would they rise to the top in use? There was no biological mandate. Was there a psychological one? Armed with a scale [7] that I had developed with Paul Welliver to identify one dimension of the model of Instructional Transformation, I sought answers to the questions concerning identifying factors that could be used to encourage the use of educational computing among teachers—"What predicts teachers' computer use?" and later, "How can we plan to encourage teachers to use computers in teaching?"

Background & Rationale

Motivation. Decidedly, the teachers who did use educational computing were motivated to do so. Sheingold and Hadley's [8] national study was key in describing the motivation to use educational computing among pioneering educators who were early adopters in the midst of the discrepancy between interest and practice. The character of their activities reflected conventional indicators of motivation. In particular, they sustained effort and expense of time in learning to use educational computing. In order to understand the conditions under which teachers would adopt innovation, it would be necessary to study their motivation to use the innovation.

Other Research. Everett Rogers' research [9] on adoption behavior has resulted in a familiar normal curve and terminology of the progressive stages of adoption. His research validated the popular observation that not all people will adopt an innovation at the same pace. An application of this model would be to identify the adoption category of a group of individuals towards an innovation and vary encouragement tactics as appropriate to the group. For example, early adopters of computing technology tend to be attracted to the technology for its own sake [10]. Earlier research had also been concerned with various user responses towards novel behaviors and objects. For example, the reluctance of corn farmers [11] to use a new hybrid seed that had been proven to be more efficiently productive. As in most studies of adoption, people would not do something that might have been expected of them, even if they knew it to be beneficial. We do not have to look far to see that this phenomenon is one that still baffles us. We do not always act in what we know to be the appropriate way. This observation about human nature also causes us to distinguish between knowing and doing—cognition and performance. Just because we know to do something, we will not necessarily do it. Perhaps motivation lies between knowing and doing.

Motivation in the Context of Competence. The focus of this research was the vast area of motivation. This seemed to be the most likely area from which the predictors of teachers' educational computing use would be identified—the psychological mandates that underlie the sustained effort of adopters would emerge. In addition to motivation, there are likely a variety of conditions that combine to influence computer use. The practical need of narrowing the area of research together with an appreciation for the complexity and abundance of factors that contribute to user-relationships with innovation made Thomas Gilbert's model [12] very useful. The model was an elegant proposal. It established a context and it

captured within three categories the major variables most suspected to influence competent behavior. The three categories include equipment, information, and motivation. The categories are divided according to their external and internal aspects. The result is six cells of conditions that combine to contribute to competent behavior. This scheme was concise and tenable and it depicted the dependent relationships among the categories.

I have learned that there is a parallel to the three categories of conditions that is used by the criminal justice community in describing the antecedent of a crime: there needs to be a means, opportunity, and motivation.

Predictors of Use of Educational Computing

Variables. The variables of motivation reflected elements of expectancy theory discussed by Vroom [13]: valence, instrumentality, and competency. Briefly stated, expectancy theory accounts for motivation depending on whether one values an outcome such as improved student learning due to the use of educational computing (valence), feels that one's behavior would contribute to the outcome such as by learning how to use educational computing for teaching (instrumentality) and that one feels it within one's capacity to learn how to use educational computing for teaching (competency). These variables are also reflected in parts of Keller's ARCS model [14] of motivation (Attention, Relevance, Confidence, and Satisfaction). The variables studied were self- competence in the use of educational computing, perceived relevance of the use of educational computing, innovativeness, teacher locus of control together with the demographics of age, gender, and years of experience with computers. Later, subjective norms was included.

Subjective Norms. [15] The best predictor of the use of educational computing among teachers was subjective norms. There are several conditions to this variable. It is a perception that other people expect you to use educational computing. The other people must be influential to you all ready. Also, you must normally act according to their expectations of you. The influential groups in this study were the administration, colleagues, learned societies, and one's students. Subjective norms functions similarly to peer-pressure or to responding to fashion.

New Considerations

Changes, but…Still Motivation. This inquiry has yielded a bounty of new questions, answers and thought-provoking suggestions for application. The conditions originally studied have changed. When the research began, teachers' use of educational computing was studied. Educational computing was considered an innovation and the user-relationship was the adoption of innovation. Since then, educational computing has evolved from an innovation into the infrastructure providing another way to consider the user-relationship. Besides adoption of innovation, there is compliance with the infrastructure. In addition, the notion of infrastructure has brought into consideration the process of creating dependency to evolve an innovation to the status of infrastructure. Still, the goal of increasing faculty use of educational computing has remained the same, as has the source of the variables studied—motivation.

Implementation of Motivational Strategies

Subjective norms: Adoption. The results of the studies on adoption of innovation suggest that appealing to a teacher's sense of subjective norms is the most predictive variable. To convert this result into a strategic implementation means to communicate the expectation for using educational computing by the

various influential entities within a teacher's professional context. Specific suggestions have been detailed in the Implementation section.

Compliance: Infrastructure. The evolution of educational computing into the infrastructure requires a consideration of compliance as a user-relationship. An initial implementation of a compliance strategy would be to determine whether faculty are meeting (complying with) the expectations of them. There is a difference in promoting compliance depending on whether you are dealing with incoming members to your institution or with existing members. The obvious advantage of expecting incoming personnel to comply with your system's infrastructure is that the decision about whether to comply can be made before entry into the system. Compliance may be a condition of employment. An incoming professor can choose not to enter or be denied entry to the institution because of the requirement to comply with the use of educational computing. Once a faculty member enters an institution or if infrastructure has been changed and is expressed as policy and procedures after faculty have been hired, the strategy for encouraging use of educational computing would be the same as that for adoption or creating a dependency. There is no different strategy for encouraging use among the existing body of faculty. Also, it is unproductive to force compliance because it results in pro forma use. [16] Of course, in the extreme, personnel can sometimes be given the opportunity for career changes for refusals to comply with the infrastructure.

Creating Dependency: Infrastructure: Promote the evolution of an innovation to the infrastructure by creating a dependency for the innovation. This can be accomplished by making systemic changes in the infrastructure until the innovation is embedded in it. The United Parcels Service Company (delivery service) is practicing this strategy: "Logical prowess is only part of what UPS is all about. It wants to use its technology to embed its systems into those of its customers. The strategy: Improve delivery service while making it more difficult to quit using UPS…." [17]

The Need for Training. When you motivate faculty with the strategies of creating dependency or communicating the commonly held expectation for them to adopt, you also create the demand for training. This is because these motivational strategies create a need to be a part of the infrastructure. Once a person has been motivated to adopt, he or she will require training to satisfy the need. The third category to satisfy is availability of equipment; all three categories are predicted by Thomas Gilbert's model of Human Competence.

Motivate to Learn, Learning Motivates to Adopt In Return. The strategies suggested are motivational and they necessitate training. Training can also be motivational. As people learn more about an innovation that they want to adopt, their commitment to it grows. This observation is being heavily implemented by a host of companies who are expecting to develop loyal customers because they know that if you learn their product, you will adopt it to the infrastructure of your home or other personal use. They also know that changing the infrastructure in a system is slow, if not unlikely. Think of the likelihood of you changing your system for money management—your bank, or your system for creating text—your word processing program. Chances are, such changes would not be too likely because they are too sweeping. As you learned to use your word processor, you used it more often and for a greater variety of processing work—you adopted it into your system. To promote your commitment to a product in one of your own life systems, companies are offering training to you. For example, Intel and Microsoft have initiated a program to train 400,000 teachers worldwide to learn how to use software for the Windows operating system for teaching. [18] Their expectation is to train the teachers in their products, which has the effect of the teachers adopting the product into the infrastructures of their system. The company

notHARVARD.com is in business to develop online customer training for companies such as Ask Jeeves, Inc., Bloomberg.com, Jobs.com, and Motorola/Metrowerks. [19] The dependency and adoption strategies motivate and beget the need for training, which in turn strengthens the adoption or dependency.

Could these strategies be used in learning for math or language classes? Are they being used for these purposes?

DISCUSSION

Considerations

Innovation & Adoption Innovation is a process or thing that is not a part of your use. When you start to use or do something new you are beginning a relationship with the thing or process. This relationship, adoption, has some characteristics that can be used for prediction. First, people vary by the rate of their adoption. This was an important outcome of Everett Rogers' research. Secondly, an implication of the first point is that adoption does not occur immediately. At least, not for most people. Why, then, do people adopt? Under what conditions do people adopt? These were the dimensions I hoped to study by looking at motivation. Third, adoption occurs in stages as were described in Welliver and Rieber's model of Instructional Transformation. Fourth, we go through a process of adoption because an innovation is novel. What is it about newness that affects our relationship?

Compliance & Infrastructure. At some point, an object or a process may be adopted to the degree that it has been incorporated into the infrastructure of a system. The test for whether the innovation has evolved into the infrastructure would be a subtraction. By that I mean remove the innovation from the system and see whether a function related to the innovation can operate as usual. If it can, then infrastructure status has probably not been achieved. On the other hand, if business cannot go on as usual, then the innovation is likely part of the infrastructure. This was the criterion that Paul Welliver offered when we were developing a scale for computer use. In the model of Instructional Transformation there are five stages of adoption of educational technology described. The third stage, integration, is determined by this test. It did not occur to us at the time, but what he and Lloyd Rieber called integration referred to integration into the infrastructure of a system.

Relationships and Status of an Object or Process

Dependency. To promote the evolution of an innovation to the infrastructure, create a dependency for the innovation. As it is written, this process seems to hold the opportunity for malice. It is probably susceptible to malice, but, in itself, creating a dependency among people is to address an aspect of our nature. To discuss creating dependency in its extreme forms is not the point or recommendation of this presentation.

This practice is used regularly to market innovations to us. The best marketers use the most dependable forms of behavioral psychology to reintroduce old innovations by using variable schedules. One way to do this is by offering "sales." A sale is the presentation of a part of the infrastructure under a variable schedule. That is, we do not know when to expect a sale. So, we may choose to buy the re-presented innovation. Creating a dependency gradually can be very effective in evolving an innovation.

Loss of Control? & Administration. Once during a presentation, I correctly suspected that some of the terms I used would be interpreted by some members of the audience into their own professional situations. Specifically, the thoughts of "compliance" or "dependence" were threatening to faculty

members' sense of control of their work. This sense is not limited to encouraging faculty to use educational computing. It is shared by the public as evidenced by the case of the United States Department of Justice against Microsoft who are accused of conducting a monopoly. A monopoly, in one sense, is an infrastructure of great magnitude. The public accepts the system of roads in a country which are built in a monopolistic way. The difference between a government's building of infrastructure and a private company's may lie in that in country's like the United States the work of the government is an expression of most of the people. Whereas, the building of infrastructure by a commercial enterprise is not considered an expression of most of the people. Even if most people use a particular operating system, the formation of the company that controls it was not an expression of the public. What about faculty using educational technology? What if an administration intends to implement a strategic plan using the strategies discussed? It can be expected that the same concerns discussed during my presentation will arise among faculty and other members of an institution. These concerns hinge on the sense of control over one's own work. Even though faculty will adopt when you appeal to their sense of subjective norms or create a dependency, it is civil and sound practice to involve the people who will are expected to adopt in other aspects of the adoption process such as the initial planning and identifying the outcomes. Recall the forced adoption results in pro forma use.

Decisions about Technology: Hierarchy or Consensus? Administrators should recognize that loss of control could be a concern among faculty relating to the use of educational computing, just as it would be for administrators if some part of their infrastructure were changed too swiftly or without their buy-in. These kinds of situations often raise the question of how institutional decisions should be made. One useful suggestion was presented by Steve Gilbert of the American Association of Higher Education when he conducted a presentation about Teaching, Learning, & Technology Roundtables at our university. They are summarized here. Note that the reference is to a slide show presented at another university, but that is available at the AAHE web site.[20]

Hierarchy	Consensus
Urgent	Not urgent
Need compliance	Need wide commitment
Not controversial	Controversial
Focus or avoid risk	Share risk
Apply simple rules	Complexity
Need clarity	Ambiguity OK
Chair	Co-chairs

Other Speculations about the Nature of Infrastructure and Adoption

Fear, Reluctance, Skepticism, Regression, Protection of the Infrastructure. Changing the infrastructure is daunting. That may be the principal reason why it is a tyrant. We do not flippantly change the infrastructure; otherwise, life would not be the same. And the worst fear is the possibility that changes to the infrastructure may be detrimental. At least, they will require effort. Consider the changes involved in repainting your home. It is our nature to protect the mainstream. It is well established that when we select mates for the purpose of propagation, we select individuals whose looks are closer to the average. This is a kind of regression to the mean for preservation of the species or life, as we know it. We guard the

mainstream with skepticism and caution. The consequences of tampering with the mainstream may out balance the expected benefits. Protecting the infrastructure or questioning attempts at changing it is a justification for conducting research. One reason why there have been so many media comparison studies is that the wholesale change of medium or method would change the infrastructure.

The fact that subjective norms was the best predictor of using educational computing can be interpreted to mean that we do adopt changes to the infrastructure if we are given assurances by those in the given context of schools that the use of educational computing would eventually be an appropriate addition to the infrastructure. The expressed expectations of those who influence us reduce our skepticism and our caution.

Monotony and Innovators. Maintaining the infrastructure of a system may be characteristic of human nature, but then so is the seeking of the new or different. At the very least, we lose interest due to boredom when the infrastructure is entirely predictable. This is a paradox; we take assurance from the infrastructure, but are also excited about departures from the infrastructure.

Personal infrastructure, motivation, and learning. Motivation and learning are interwoven. One is not a substitute for the other. Communicating expectations to adopt to an infrastructure are motivating. Becoming dependent as changes are embedded in an infrastructure is also motivating. Both of these strategies result in the motivation to learn which will enable a person to participate in the infrastructure. Can these strategies be used for learning in other areas? Can we frame learning for language, history, maths, or sciences as an adoption process? Can we embed changes in some infrastructure in such a way as to create a dependency on learning? Which infrastructure should be targeted? Commercial enterprises are targeting the infrastructures of people's personal systems. Is this a legitimate concept? Do individuals have personal systems for learning with infrastructures into which dependencies for learning can be embedded? Is literacy an example of the latter? We can survive in society without being literate but we cannot enjoy even a modest quality of life. How do we present school subjects as innovations and appeal to learners' senses of subjective norms to encourage them to adopt the subjects? How do we make learning a motivating process?

IMPLEMENTATION PLAN

The goal of the plan was to encourage faculty to adopt a course manager using a strategy for subjective norms. A secondary expectation was that faculty would integrate instruction with technology in the process.

Introduction

Research into Practice. There was an opportunity to put into practice the results of the research on teachers' use of educational computing. Preparing and following through on a strategic plan that draws from one's own research are not typical. But more than being infrequent events, working on the strategic plan would provide me with first-hand verification of the utility of what was interpreted from the research. It is likely that many professionals are either researchers who inform practitioners or practitioners who are informed by researchers. I was able to draw from my own research and apply it on an institution-wide scale. The good fortune of this occasion was not lost on me. I was well prepared to develop an implementation plan because I had been equipped with a background on technology integration.

Differences. It needs to be mentioned that the studies were done with elementary school teachers and the strategic plan was prepared for university professors. This was not an impediment to the planning in any way. Another difference was that the strategic plan referred to the use of particular kind of software—a course manager for the worldwide web—rather than for the use of microcomputers.

A Plan for Faculty to Adopt the Use of Course Manager.

Outline. This is a summary of the questions, concerns, insights, assumptions, and the implementation plan to encourage faculty to integrate instruction with technology. This section is the outline version of a PowerPoint presentation and is also available for display in that format.

The Goal. Faculty members will adopt the use of a course manager. It will be integrated into their instruction.

Assumptions about the Character of User-Relationships. The following were based both on the results of the research conducted as well as on insights gained during the planning process.

We adopt innovations.
We comply with the infrastructure.
To promote use of educational computing, treat the innovation as if it were a part of the infrastructure.

Questions.

1. Why will faculty members adopt a course manager if it is not part of the infrastructure? In other words, if it is still an innovation.
2. How can faculty members be encouraged to do so?

General Strategies—Interpreting the Results of the Research. The best predictor of computer use was subjective norms. The problem was to translate this into a plan to encourage the use of a course manager. The nature of subjective norms would suggest that there would have to be the expectation that faculty members use the course manager. The expectations would have to be expressed by the influential members of the institutional context: the administration, colleagues, learned societies, and students. Expressing these expectations would address how to motivate faculty members. The plan also drew from the other categories of Gilbert's model of human competence. The main strategies were…

Make the use of educational computing a part of the infrastructure
Express expectations and provide training & placement.
Provide equipment and adapt for physical capacity.
Provide incentives and encourage internal motivation.

Cause the perception that all members of the system expect teachers to use educational computing. Empower faculty. Return the responsibility to faculty to meet the expectation for integration of the course manager into their instruction.

Cause "dependency" to systemic changes.* Improve parts of the current system with new educational computing while making it less efficient or less effective not to use educational computing.

The term "addiction" was used to describe the strategy used by the United Parcel Service to integrate its services beyond delivery of parcels and thereby creating a need for its services among its customers. (*Forbes, January 10, 2000; "UPS Company of the year.")

Tactics

Varied Training

1. Offer a matrix of training sessions.
2. Form special interest groups.
3. Conduct weeklong institutes.
4. Conduct a yearlong training for new faculty.
5. Offer a "master" teacher program.
6. Offer a variety of asynchronous training for teaching opportunities.

Communication

1. Distribute and refer to a faculty teaching handbook.
2. Publish a newsletter using faculty writers.
3. Publish a "How to" or "FAQ" column in the university newsletter.
4. Post campus-wide e-mail announcements.
5. Offer e-mail help that is faculty staffed, if possible.

Empower Faculty Members

1. Faculty participate in technology decisions.
2. Faculty participate in training colleagues.
3. Faculty are encouraged to take risks with innovative applications.
4. Faculty lead in promoting integration.

Technology

1. Faculty reconfigure the course manager to fit overall university needs.
2. Faculty develop unique uses.

Endnotes

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[20] From a slide show of the TLT group by Steve Gilbert at University of Washington, February 12. http://www.aahe.org.

Home Page at http://itech1.coe.uga.edu/itforum/home.html
