ABSTRACT
         This document contains two papers on globalization versus
localization from ICCE/ICCAI 2000 (International Conference on Computers in
Education/International Conference on Computer-Assisted Instruction). The
first paper, "Implementing Modern Approaches to Teaching Computer Science: A
Cross-Cultural Perspective" (Jill Slay and Kam W. Li), examines techniques
that may be used to motivate and support computer science learning, focusing
on implications for Asia and particularly for mainland China. The second
paper, "Reflections on Educational Technology from Female Asian Faculty's
(FAF) Perspectives" (Doris Lee, Amy S.C. Leh, Mei-Yan Lu, and Mei-Yau Shih),
presents the perspectives of four panelists (four female Asian faculty
members) on how the instructional technology field has influenced current
faculty development, corporate training, in-service teacher education, and
pre-service teacher education. (MES)

ICCE/ICCAI 2000 Full & Short Papers (Globalization vs. Localization)

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Implementing Modern Approaches to Teaching Computer Science: A Cross-Cultural Perspective

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Implementing Modern Approaches to Teaching Computer Science: A Cross-Cultural Perspective

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Western research recognises [1] within the CS academic community pressure on its curriculum and teaching methodology brought about by the "evolutionary" nature of the discipline. This continuing need to avoid obsolescence in curriculum, which is produced by changing needs of industry and advances in research, is accompanied by other international and more local issue issues. Current research identifies several techniques which may be used to motivate and support CS learning in such an environment. This paper examines the implications of these findings to Asia, and particularly to mainland China, based on the personal reflections of this researcher on her own studies in China.

Keywords: **Computer Science Education, Cross-Cultural**

1 Areas of concern in Western CS education

Some modern issues of concerns in CS education [1] include attrition due to poor motivation/learning difficulty at CS1 level, dealing with students from a wide range of backgrounds with different learning styles and teaching the problem-solving and lifelong learning skills demanded by industry and research

2 Physical solutions

2.1 Providing Motivation Through Active And Participatory Learning

Active [2] and participatory learning [3] are techniques that are proposed to help motivate learners. Some methods which can be used include providing opportunities in "modified lectures" for paired response to questions posed by the lecturer or students discussing the notes they have taken during the lecture and helping to correct misunderstandings. Others have used role-play to demonstrate structures and protocols eg. arrays, linked lists or token passing protocols.

2.2 Learning programming through pattern recognition

In dealing with the learning of programming at the basic level, many researchers have examined the issues of teaching CS1. There is much interest in the use of patterns in aiding students' comprehension of basic programming and the integration of this knowledge [4 Clancy & Linn].

Clancy and Linn comment on the fact that design patterns are of great importance in software engineering and OO design and that to, to some extent, programming knowledge consists partially, at the cognitive level, as patterns (or schemas). However they show that, while the use of patterns is helpful in integrating knowledge, new programmers do not naturally infer patterns and sometimes find it difficult to understand "expert patterns". Clancy and Linn [4] and Johansson [5] advocate the use of a wide-range of contextualised examples and case studies to support the teaching of basic programming skills.

2.3 Adapting pedagogical styles to deal with social, cultural and gender issues

Research shows that students from different cultures or of different genders display different attitudes to computers and learning. In a two-year study of female and international CS students at Carnegie Mellon

University [6] issues which arose included the perception by some female students that the 'purpose' of computing needed to be defined within introductory CS courses. While they displayed a high-level of interest in the computing process they needed to be able to contextualise this process "within a larger purpose". They also displayed a lower level of "attachment" to their computers than did male students on the same course and expressed some relief as they discovered that CS education covered a wide-range of topics

Other research [7] [8] points out that there is a link between culture and learning style. Assertions made in this research indicate that Chinese students (studying overseas) would find it easier to understand and apply theoretical principles within programming than would a similar group of Western students. In their study, Fisher, Margolis and Miller [6] discovered that international female students on their course showed the least "attachment" to computers or computing and used pragmatic reasoning (such as employability) for their choice of major.

The conclusion here is that some allowance has to be made for cultural and gender preferences within the teaching of CS. While it is possible to provide an inclusive focus within lectures, there is, however, some may be a more pressing need to be able to adapt tutorial material for different styles and preferences.

2.4 Problem-solving for lifelong learning

It has been noted [9] that many students who have difficulties across the first year of CS as a whole do not know where to start with a task, regardless of the subject area.

Some effort has been made to incorporate training in problem solving skills and techniques in to early CS education to deal with this problem . This ranges from the use of Edward de Bono's tools for lateral thinking to the development of Polya's approach of Understand, Design and Review [9] for problem solving and offering courses in these techniques within, or parallel to, early programming subjects

2.5 Web-Mediated solutions

With the problems imposed by large classes, and the large range of individual approaches needed to deal with some of student learning issues raised above, CS academics have been some of the first to develop and use web-mediated learning environments for enhancing student learning in CS.

As I have pointed out ([8], [9]) the Web provides a vehicle for the development of the learning environment and teaching can be structured to develop lifelong learning skills and to cater for the expectations and learning styles of students from different cultures and backgrounds.

Early Australian examples of this style of teaching in CS education are many. Recent Australian examples of the use of the WWW in CS education abound. Boalch [10] provides an examination of the use of the WWW as a support medium for the delivery of a first year unit in Information Systems at Curtin University. He provides an evaluation of site utilisation and user feedback in the case where subject information and course details were provided on the WWW for students.

The Eklunds [11] examine the use of the WWW to supplement traditional IT teaching. They provide case studies of two examples of the re-structuring of traditional forms of IT course for Web-delivery. Jones [12] of Central Queensland University gives details of case study involving the design, presentation and evaluation of an undergraduate unit in Systems Administration taught completely via the WWW to on-campus and distance students.

3 Reflection on CS Education in Mainland China

The following two stories are taken from some interpretive tales which I wrote after two separate periods of studying and teaching in China. They draw a picture of the role of the computer on campus in Nanjing 1995) and in Jinan (1998).

A Visit To The Computer Centre 1995

I managed to pay a visit to the University Computer department (I was a Computer lecturer myself at the time in Australia). This was a definite culture shock. The computers, 386s and old at the time, were

kept in a special air-conditioned and carpeted room. People wore white coats and slippers if they wanted to use them. Most students (and only the best study computers) were doing basic Basic programming. I tried to investigate whether they used Windows, or anything modern, but the lecturer was only interested in the length of computer courses in Australia. There seemed to me to be no parallels in our courses at all. The students seemed only to learn Basic programming *[I wondered what job this would qualify them for!]* . It seemed to that things like word processing *[the Chinese have a special keyboard and it takes 5 keys together to create one character]* were a matter for female secretaries and did not enter the arena of the university. I tried to explain the issue of the 'computer as a tool' but I could see that the body language was saying 'Crazy Westerner!' when I tried to put across the concept of teaching less-able, or even all students, to use computers. Computers are for the young and highly intelligent in China.

A Visit to the Internet Centre 1998

It was surprised to find the computer was still as remote as ever from the everyday life of the average student. Computers, 486s by now, still lived in splendid isolation in carpeted rooms, and students still wore special slippers to use them. Still no Windows and still basic Basic.

I had imagined that the cutting edge of technology would be a little different to that which we had at home. I was a little surprised though to find out the process which I had inadvertently become involved with. I worked for six weeks with some highly creative young teachers to try and develop an intranet from an old CAD classroom (486s with no hard disks), one modern Pentium in a building several hundred metres away, one modem and a collection of legal and not-so-legal software. The Internet Centre turned out to be a heavily guarded room about the size of an average Western kitchen with a little row of computers along one wall, filled with a large collection of discarded technology and useful pieces of wire.

Major problems for the Chinese academics was their lack of ability in reading English as the 'install' dialogue boxes sped past on the screen. The problem for me was that I read Chinese much more slowly than they could read English. All the online-help in the world did not help us, installation was a slow process! We often laughed at the problems because we were all engineers and computer scientists. Not really the type of people who are famed for their linguistic abilities, but the monopoly of the Internet by the English language is certainly a problem in China.

I left before the networking was done. I did manage to complete a bilingual virtual library and an English home page for the Institute (with the help of some young teachers) and to teach a couple of them to use FrontPage. I gave lectures to many of the final year students and their teachers. Certainly no lack of enthusiasm here – just a lack of technology and English teachers!

3.1 Chinese Teaching Practice and Computer Based Education.

The combination of a Confucian philosophy and commonly accepted teaching models means that, in universities and colleges, all subjects are taught lecture-style to large groups. However to a Western none of the common CS teaching problems established above is observed in daily teaching and research.

From a Western perspective motivation remains very high among students as they strive to master modern hardware and software. Gender issues and the ability to attract female students do not appear to be a great concern and classes appear to display a balance between males and females. Learning problems do not appear to be the major difficulty experienced and researched in the West.

The major problem appears to be curriculum. The Chinese system has been one that has relied on a national curriculum in all sectors of education and changes in the software and hardware used and taught have not been allowed. During April 1998 (China Daily, 1998) the Ministry of Education announced major adjustments in the University system with corresponding changes to the High School curriculum and schoolbooks, which provide some hope that this issue will be addressed.

A national curriculum which has not kept pace with changes computing practice in Chinese industry and commerce, and even the home, has caused a demand for Western computer manuals in Chinese translation and the increase in number of private providers offering training in modern computer applications and the Internet. Many young teachers and their students are becoming competent users of modern software (eg Windows 98/NT, Office97, object-oriented software) which is not available within the Higher Educational system by turning to these private providers. This leads to disaffection and difficulties for both teachers and their students.

3.2 The Future

As well as the obvious improvements to connections, access speeds and call charges which are currently being made by CERNET, wider issues to be faced are the development of Chinese language software and WWW pages to improve the take-up of the Internet in China as a whole. This is being carried out in an environment of large-scale educational reform which will need to take into account the effect of the Internet on accepted Chinese teaching practice and pedagogy.

4 Conclusions

It is hard to imagine that, even within the next ten years, the Chinese economy might begin to develop and maintain a systemic hardware and software infrastructure within higher education. While it is easy to envisage the limited availability of the Internet for research students, and especially in the nationally funded universities and those around Beijing, the provincial lecturer has the doubly difficult task of persuading the older and therefore more powerful academics to accept new technology and to make drastic changes to their teaching style to incorporate it.

I have proposed elsewhere [9] that an effective conceptual framework for the development of an online learning environment might be one which.is based on expected pedagogical outcomes. Therefore one model for China would be to concentrate on the development of online teaching content which would be a resource for guided and collective discovery learning (see above). This might begin with the development of Chinese language link pages to English language resources such as comprehensive virtual libraries and databases.

Academic staff development in technology is both very easy and very difficult. Young Chinese academics are as adept as their Western counterparts in their understanding and use of cutting-edge technology. Their progress is however hampered by their English language skills. This is especially apparent when one is made aware of the lower standards of English language required for technical subjects and the datedness (or nonexistence)of the technical vocabulary taught at university level. This appears to be one of the most pressing problems for the Chinese universities to grapple with and solve.

CS education research has shown a need for pattern recognition, motivation and problem solving skills as aspects of life-long learning. These can be supplied through the medium of web-mediated adaptive tutoring which can be used to augment face-to-face teaching but great efforts will need to be made to use these effectively within the current Chinese pedagogical framework.

References

[1] Tucker, A.B. "Strategic Directions in Computer Science Education". ACM Computing Surveys, 28(4), (1996).

[2] McConnell, J.J. "Active Learning and its use in Computer Science." Integrating Technology into C.S.E. Barcelona, Spain, (1996).

[3] Jenkins, T. "A Participatory Approach to teaching Programming." *ITiCSE*, Dublin Ireland, (1998).

[4] Clancy, M.J. & Linn, M.C. "Patterns and Pedagogy." SIGCSE, New Orleans, USA. (1999)

[5] Fisher, A., Margolis, J. & Miller, F. "Undergraduate Women in Computer Science: Experience, Motivation and Culture". SIGCSE97. (1997)

[6] Cobern, W.W. "World view theory and science education research." NARST Monograph No. 3. Manhattan, KS: National Association for Research in Science Teaching. (1991)

[7] Slay, J."Unpublished Ph.D thesis". Perth,WA: Curtin University of Technology. (2000)

[8] Slay, J. "Using the WWW to Create an Effective Cross-Cultural Learning Environment. Hong Kong Web Symposium 98, Hong Kong University. (1998)

[9] Slay, J., "Using the World Wide Web to Create Foundations for Lifelong Learning - An Australian Perspective." Teleteaching, IFIP World Computer Congress98, Vienna. (1998).

[10] Boalch, G. "WWW as an Educational Support Medium: An Australian Case Study." Paper presented at AusWeb96, Gold Coast, Australia, (1996).

[11] Ecklund, J. & Ecklund, P. " Integrating the Web and the teaching of technology: Cases across two universities." Paper presented at AusWeb96, Gold Coast, Australia. (1996).

[12] Jones, D. "Solving some problems of University Education: A Case Study." Paper presented at AusWeb96, Gold Coast, Australia. (1996).

Reflections on Educational Technology from Female Asian Faculty's (FAF) Perspectives

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Four panelists in this panel session will briefly present their perspectives on how the instructional technology field has influenced current Faculty development, Corporate training, In-Service teacher education, and Pre-service teacher education. Presenters will address their challenges as female Asian faculty in Faculty development, Corporate training, In-Service teacher education, and Pre-service teacher education. Suggestions and solutions will be discussed during the panel session.

Keywords: **Faculty development, Corporate training, In-Service teacher education, Pre-service teacher education, reflection, and perspectives**

Introduction

Each panelist will offer their unique perspectives in the field of instructional technology. Our focus questions are:

1) Has instructional technology field influenced current:
* Faculty development (Dr. Mei-Yau Shih)
* Corporate training (Dr. Doris Lee)
* In-Service teacher education (Dr. Amy S. C. Leh)
* Pre-service teacher education (Dr. Mei-Yan Lu)

2) What are the challenges do female minority faculty encounter in:
* Faculty development (Dr. Mei-Yau Shih)
* Corporate training (Dr. Doris Lee)
* In-Service teacher education (Dr. Amy S.C. Leh)
* Pre-service teacher education (Dr. Mei-Yan Lu)

Reflections on Educational Technology from Female Asian Faculty's (FAF) perspectives on In-service teacher education (Dr. Amy S.C. Leh)

Technology advancement is altering our society and our education. New technology standards grant opportunities, and policy reflect the change currently happening in our education. In September of 1997, the National Council for Accreditation of Teacher Education (NCATE) released a report addressing the importance of integrating technology into instruction. New technology standards clearly indicate that teachers must be competent of using technology in their teaching. Moreover, the Department of Education (DOE) has spent millions of dollars on grants to support teachers' training. The grants have brought many

university faculty members, school district administrators, and school teachers together to work on the task—technology integration. In the annual conference of Association for the Advancement of Computing in Education (AACE) 2000, Tom Carrell, director of PT3 grants addressed the influence of technology on our education and the need for organizational change. Some schools, for example, decided to only hire teachers who are competent of the use of technology.

At present, training teachers the use of technology has become a strong nation-wide movement and in-service teachers are expected to become technology literate through in-service training. The strong demand of teachers' training has invited many international scholars to participate in the movement of training US teachers the use of technology. The international scholars were mostly born outside of the United States, came to the USA for their higher education, e.g. Ph.D. degree, and are currently university faculty members at US universities.

The international faculty' participation brought new blood and tremendous strength into US in-service teacher education due to their educational experiences in both the USA and their native countries. Their experience with both educational systems allows them to compare how students learn in two different nations and to employ the strengths of each nation in the USA. For example, how an Asian student learns math is different from how a student in the USA. Asian students' math practice involves word problems (concepts) while the USA students' practice focuses on page after page calculation. An Asian Mathematics faculty, who was differently trained, might use a variety of effective teaching strategies due to the exposure to different ways of learning. Similarly, international Instructional Technology faculty may provide different perspectives in in-service teachers training. Because they are foreigners in the USA, they encounter challenges, especially international female faculty. Reports show that the percentage of female faculty in higher education is low. Some reports even indicate that they encounter more challenges than male faculty, e.g. in promotion. In this case, international female faculty would be minority within a minority and consequently encounter greater challenges. Below are examples of challenges:

"I felt that my viewpoints were not valued." (from an international male faculty)

"I felt that I was transparent in many meetings. They didn't seem to see my presence." (from an international female faculty)

"She [an international female faculty] couldn't get tenured because she was a foreigner." (from a US female faculty)

"You [an international female faculty] are double minority. You're female and foreign..You need to be firm and stand up for yourself." (from a US female faculty)

Reflections on Educational Technology from Female Asian Faculty's (FAF) perspectives on Corporate Teaching (Dr. Doris Lee)

Today, employees in the corporate settings operate in a rapidly changing, high tech environment. Each employee, in order to accommodate the increasingly rapid rate of technology change, must continually re-tool and upgrade his or her skill sets through life-long learning. The delivery medium for life-long learning, most likely, will use instructional technologies. Instructional technologies refers to computer technologies that can integrate texts, graphics, audio, video, animation, or film clips for the creation of instructional or training packages. Recently, instructional technology also includes the use of the World Wide Web, WWW, in which instruction can be delivered over public or private computer networks and can be displayed by a web browser. Dr. Doris Lee, one of the panelists has taught corporate trainers for more than 10 years in the areas of instructional technologies and design and development of computer-based and web-based training. Based on such an experience, Dr. Lee's discussion in this panel will focus on the impact that the instructional technologies have on corporate training, and what are the challenges and perspectives that she faces as a female instructor for corporate trainers. Below details her experiences and views on these topics.

Generally, most corporations believe that the use of instructional technologies would provide an additional tool to the face-to-face training, can be designed to integrate multiple options including video, audio, and text to accommodate employees' preferred learning styles, and is valuable in providing consistent and current training to employees. In addition, the use of instructional technologies to deliver training can be time and place independent and therefore, costs associated with employees' travel and classroom training can be reduced. However, some companies express concerns in using instructional technologies. These concerns include employees' lack of computer and/or Internet skills, the design and development issues, and the software and hardware limitations.

To convince my students, who are corporate trainers, to consider all the important organizational factors and design issues while using instructional technologies is the biggest challenge. Most of the corporate trainers are female and work in a male-dominate environment. It is imperative for a female faculty to emphasize the importance of front-end analysis even if the analysis is not desirable by their male supervisors. When a company is considering using instructional technologies, a female trainer should never feel intimated to ask important questions including human, machine and political readiness. Questions such as, are the employees comfortable with computers and are they ready to learn, need to be asked. Next, technology readiness is another factor. Hardware, software, and the availability of a technical support staff are some examples of the areas that need to be evaluated. Also, financial readiness pertains to budgeting for upgrades to hardware and software, the purchase of courseware, and developing staff. Plus, political readiness concerns the support of instructional technologies by upper management, middle management, employees, and the training department. Finally, skill readiness looks at whether the staff involved with supporting and developing the training has the skills necessary to do so.

Reflection on educational technology from female Asian faculty's (FAF) perspectives on Pre-service Education (Dr. Mei-Yan Lu)

Educational technology has played a major role in influencing pre-service education. For example, In the 60s, 70s, it was the audio-visual education. In the 80s it was computer assisted instruction (CAI), BASIC programming and Logo programming. In the 90s, it was multimedia, web-based learning.

As a female Asian faculty who has taught in major teacher training Institutes, I would like to share some of the unique challenges for preparing future teachers (per-service teachers) the past 16 years.

Challenge no. 1: Most pre-service teachers are young female white adults. Many of them do not have experiences in working with Asian faculty. For example, a typical K-12 school in San Jose, California, has mainly white teachers/administrators, in many cases, 100% white teachers/administrators while many of their students are from a diverse cultural background. Sometimes, a school student body is from 72 different language and cultural background.

Challenge no. 2: Most teacher preparation institute has mainly white faculty. For example, in the College of Education at San Jose State University which graduate, on the average, 600 credential teachers annually, has about 110 full time faculty. Out of the 110 full time faculty, only 6 are Asian faculty (Chinese, Japanese, and Korean).

Challenge no. 3: Most Asian female faculty are "foreign born'. The fact that we are different can offer unique perspectives to our students and colleagues. However, sometimes, our background and cultural differences can be barriers as well. For example, the accent issue. Some students and faculty complain that Asian faculty have heavy accent. However, they rarely complain the European Born faculty who has heavy European accent. Many times, they found European accent charming, while Asian accent distracting.

Challenge no. 4: The field of educational technology generally does not pay attention to solutions and strategies in designing instruction for audience from diverse cultural background. For example, in 1999 AECT convention, there were only two presentations in the entire conference program addressed the issue of designing for international and diverse cultural audience. As one of the popular instructional media – World Wide Web and distance learning is gaining more attention, we as instructional designers/faculty should pay more attention to the international audience.

My goal is to prepare technologically competent teacher candidates that are also culturally sensitive to work with diverse student population. With this goal in mind, I like to recommend:
1. Increase the representation of diverse student body in the field of educational technology both within the United States and outside of the United States.
2. Recruit more faculty of color. Therefore, students will have opportunity to work with both faculty and students from different cultural background.
3. Look beyond the "accent" issue. The point that I am trying to make is that more of the main stream Americans have no trouble "comprehend" accented English. They just do not like the way it "sound". In addition, people who speak with an accent are capable of speaking more than one language and be able to function effectively in another culture. Why not take their unique experience and learn how to design instruction for an international audience?

4. Encourage more educational technologists to research the cultural issues in designing instruction such as in the area of World Wide Web and distance learning.

Reflections on Educational Technology from Female Asian Faculty's (FAF) perspectives on Faculty Development (Dr. Mei-Yau Shih)

The use of instructional media in the classroom has long been identified as a "fourth revolution" in education (Ashby, 1967). It has the potential to reshape the role of the instructor from a knowledge conveyer to a guide and coach, while students take a more active role in the learning process. No longer are the textbook and instructor the sources of all knowledge; instead, the faculty member becomes the director of the knowledge-access process (Heinich 1996 et al,). Instructional technology refers not only the actual use of technological tools it also stresses the importance of the process of developing overall goals and strategies for enhancing teaching and learning. At its best, technology-based learning can help teachers support a wider range of learning styles, facilitate active learning in the classroom, use faculty time and expertise more effectively, and familiarize students with technology that will be vital for their futures in the world of work.
In our experience, university faculty are both greatly excited and daunted by the promise and power of teaching technologies. Our students have grown up in a "high technology" environment and are well adept at the use of TV, videotape, computers, and the Internet as information exchange tools. Many faculty, on the other hand, struggle to learn new technologies and to see how they might be useful to them as teachers (Shih & Sorcinelli, 2000). . The higher education is encountering the new trends of the changing student body, teaching practices, and the new roles and identities of faculty in universities. It is imperative, therefore, to remains a holistic view while helping faculty develop their technological skills with an understanding of the educational values and systems where the teaching and learning take places.

The perspectives from a foreign born female faculty developer, whose first 20 years of educational training differs massively from the majority of US university faculty on educational technology, reflect not only a personal challenge, they also underscore the important tasks of any faculty develop who serves as the chang agent in helping the transformation of teaching practice with instructional technology. These tasks include, first, effectively represent the instructional technology to faculty to help them see the integration of technology involves more than physical setup and technical support; it requires some curricular modifications and instructional strategy shifts; second, take in the cultural and educational differences in educational systems to design the strategies in energizing faculty and inspiring them trying innovative ways of teaching, and made them conscious about their purposes in the classroom; third, establish credibility and earn trust of the faculty to represent effectively the benefits of using technologies for teaching and learning; forth, remain alert and sensitive to the campus culture to help enhance the collegiality on campus, and maintain a supporting network of "exemplars" who would be eager to take risks and become "mentors" to colleagues who express interest in instructional technologies. Of most importance task as an Asian, female developer working for rising faculty technological skills is to help faculty recognize the diversity in college classroom, to make them conscious of the various student learning styles, ages, genders, race and ethnicity, and digital have's and have-not's issues in classroom. Effectively carry out these tasks is the means to the ends to help best researchers use and understand the instructional technologies to become a better and effective teacher in the 21st century.

REFERENCES

[1] Ashby, E., (1967). "Machines, Understanding, and Learning Reflections on Technology in Education." The Graduate Journal, 7, pp. 359-373.
[2] Heinich, R., Molenda, M., Russell, J. & Smaldino, S. (1996). Instructional Media and Technologies For Learning. 5th Edition. Englewood Cliffs, New Jersey. Prentice-Hall, Inc.
[3] Shih, M. Sorcinelli, M.D.. (2000). "TEACHnology: Linking Teaching and Technology in Faculty Development." To Improve the Academy. V(18). POD Network. Anker Publishing Company, Inc. Bolton, Massachusetts.