

PROJECT TITLE: Teaching and Learning with Technology: An Assessment of Best Practices

PROJECT CATEGORY: Scholarship of Teaching and Learning with Technology Grant

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CAMPUSES AND DISCIPLINES INVOLVED:

Project team members will be from the University of Massachusetts, Amherst Departments of Nutrition and Kinesiology, working in consultation with Continuing and Professional Education and the Center for Teaching. Data will be collected from departments across the Amherst campus.

TOTAL AMOUNT OF FUNDS REQUESTED: \$7,994.25

PROJECT SUMMARY

UMass-Amherst (UMass-A) has a long history with online education. Student-based assessments of online courses have been conducted; however, there has been no systematic instructor-based review of pedagogical practices used in these courses. Such a review would be invaluable for new faculty to learn about best practices and incorporate them into the development of their online courses. The purpose of the proposed study is to describe experiences of UMass-A instructors teaching completely web-based courses, focusing on pedagogical practices, teaching styles, and lessons learned. Also included will be an examination of instructors' perceptions of their students' learning styles and strategies used to address learning needs of culturally diverse audiences. The following specific aims will guide the research:

1. Identify, through individual instructor interviews:
 - a) key pedagogical practices;
 - b) perceptions of students' learning styles and needs of diverse audiences;
 - c) lessons learned.
2. Assess instructors' teaching styles.
3. Use interview/survey data to develop a "best practices" matrix.
4. Prepare a manuscript for publication.
5. Prepare a grant application to support validation of the matrix.

A purposive sample of 20 instructors will be identified from UMass-A campus. Project Directors and Heads/Chairs of departments offering totally web-based courses will be asked to identify instructors to participate in a qualitative interview (30-45 minutes) and teaching style survey (10-15 minutes). Participants must be UMass-A employees and must have taught at least three completely Internet-based courses. Interviews will provide insight into teaching practices and strategies, and will be used with survey data to develop a "best practices" matrix.

SIGNATURES:

Nancy Cohen, PhD, RD, LDN
Head, Department of Nutrition

Patty Freedson, PhD
Chair, Department of Kinesiology

John Cunningham, PhD
Dean, School of Public Health and Health Sciences

Charlena Seymour, PhD
Provost, University of Massachusetts, Amherst

PROJECT NARRATIVE

There is no denying the exponential growth in use of the Internet in higher education. Online students now represent approximately 17% of all higher education students (1). The number of students taking at least one online class rose from 1.6 million in the fall of 2002 to 3.2 million in the fall of 2005 (a growth rate of 35% from 2004) (1). UMassOnline provides online courses, certificates, degree programs, and corporate and professional education opportunities across all five campuses. It was created in 2001 and has experienced continued growth since its inception. At the University of Massachusetts, Amherst (UMass-A), online education is supported through Continuing and Professional Education (CPE). At UMass-A alone there was a 34% increase in the number of courses offered and a 25% increase in the number of seats (student enrollment in a single class) in fully online classes between the 2003 and 2004 academic years (2).

As online education evolves, faculty are challenged to design quality online courses. Indeed, an increasing number of faculty are expected to teach online, despite the fact that they may have little or no teaching experience in traditional or online formats. At UMass-A, 210 instructors were teaching fully online courses in the 2004-2005 academic year (2). Notably, by the summer of 2007, there will be more than 30 faculty teaching online for the first time due to a concerted effort to grow online offerings at UMass-A (personal communication, Renee Fall, Academic Programs Coordinator, UMass-A CPE, February 21, 2007).

In concert with this trend is a growing body of literature indicating the need to prepare the next generation of faculty in specific competencies related to the changing teaching environment (3-8). A meta-analysis by Cyrs (9) identified four areas of faculty competencies required for quality online education: course planning and organization, verbal and nonverbal presentation skills, collaborative teamwork, and questioning strategies. Ryan et al (2005) (10) developed a Model for Faculty Teaching Online, naming several important strategies to

address these competencies, including the need for collaboration/planning, rethinking faculty roles/redesigning courses, developing online communication techniques, and maintaining/revising the course.

Numerous references and workshops are available to assist online instructors with issues related to logistics, technology, design, management and evaluation of online courses. In fact, many universities around the world have developed their own training materials, including the University of Southern Queensland (11) and the Australian Catholic University (12), to name just two. At UMass-A, instructors are referred to the *Teaching and Learning Online Handbook for UMass Faculty* (13), as well as *You Can Teach Online* (14). These materials provide helpful guidance for online teaching and assessment. The Center for Teaching (CFT) and Office of Information Technology (OIT) at UMass-A also provide individual assistance and group training workshops.

Despite the availability of these supportive services, there is limited information on how instructors have been using these resources to enhance the design, delivery and evaluation of their courses. Student-based assessments of online course offerings have been conducted; however, to date there has been no systematic instructor-based review of key pedagogical practices utilized in these courses. These data are vital to create mutually successful online learning environments. Indeed, the UMass-A Center for Education Policy and Ad Hoc Committee on Online Learning have identified the need for quality indicators and online pedagogy training, further calling for information and dissemination of 'Best Practices' to support online faculty (2,15).

Another critical issue in online teaching is addressing the challenge of an increasingly diverse student population. Looking at learning styles and language issues specifically, factors that negatively effect students' level of success in an online environment include difficulty with content, lack of connection between content and the students' needs, poor communication skills, and having English as a second language (16-20)

UMass-A has undergone significant changes in the cultural and ethnic background of its student body; between 1988 and 2006 the percentage of non-white Hispanic students increased from 20-34% (21). Faculty new to online teaching may be unaware or lacking necessary skills to address this issue. Thus, attention must be given both to assessing instructors' perceptions of their students' learning styles and to evaluating successful strategies used to meet the demands of the diverse online learning environment.

The purpose of the proposed study, therefore, is to describe experiences of UMass-A instructors teaching fully online courses, focusing on pedagogical practices, teaching styles, and lessons learned. Also included will be an examination of instructors' perceptions of their students' learning styles and any specific strategies used to address the learning needs of culturally diverse audiences. The review outlined in this proposal would be invaluable for new faculty to learn about best practices and incorporate them into the development of their online courses.

Specific Aims

The overall goal of this study is to identify "best practices" of instructors teaching purely online courses. The following specific aims will guide the research process:

3. To identify, through individual interviews with instructors teaching completely web-based courses:
 - d) key pedagogical practices
 - e) perceptions of their students' learning styles, with a specific focus on strategies used to address learning needs of diverse audiences
 - f) lessons learned from teaching online courses.
4. To assess instructors' teaching styles, using the Trainer Type Inventory (TTI) survey and compare these data to instructors' perceptions of their students' learning styles.

5. To use interview and survey data to develop a matrix of "best practices" to explain the experiences of instructors teaching online courses.
6. To prepare a manuscript for publication in a peer-reviewed journal.
7. To position ourselves to submit a follow-up grant application that will support validation of the matrix.

Proposed Methods

This study will be exploratory and descriptive in nature to provide a picture of the phenomena in naturally occurring situations (3). This method, which utilizes a primarily qualitative approach, has been used to describe current practices and determine what an identified group is doing in relation to selected phenomena (22). A purposive sample of 20 online instructors will be identified from across the UMass- A campus, as it has been shown that collaboration across departments and programs can capitalize on instructors' expertise and maximize instruction resources and strategies (23, 24). Instructors will participate in a brief qualitative interview (30-45 minutes) and survey (10-15 minutes). Interviewees will be recruited through program directors, heads and department chairs. In addition, CPE at UMass-A will assist the team in identifying instructors teaching fully online courses. Letters of support from CPE and several departments who have already agreed to participate are included with this proposal. Eligibility requirements will be: 1) must have been a UMass-A employee for at least one year; and 2) must have taught at least three fully online courses (those who have taught two online courses and are in the process of teaching one will still be eligible to participate). Interviews will be conducted with experienced instructors in order to gain a comprehensive insight into teaching practices, strategies and lessons learned.

Interview questions will be designed in consultation with the Center for Teaching (CFT) and Dr. Patsy Beffa-Negrini, an expert in the field of distance education. Questions will be based on a theoretical and conceptual framework from several fields. Questions related to pedagogical practices will be developed using key principles of adult education as the framework (25), including constructs of engagement, accountability, praxis, sequence and reinforcement, immediacy, and respect for learners. Bloom's Taxonomy of Educational Objectives (26) will also be used to formulate questions related to assessment of students' cognitive functioning and critical thinking skills. Finally, a series of open-ended questions will be used to identify lessons learned. The Kolb Learning Style Inventory (27) and work by Felder (28) will be used to develop questions related to instructors' perceptions of their learners' needs. Because matching learning style and teaching style is thought to increase student achievement and satisfaction when using new technologies, (29, 30) we will examine instructors' teaching style, using the Trainer Type Inventory (TTI) developed by Wheeler & Marshall (31) and compare that to instructors' perceptions of their students' learning styles. The TTI asks respondents to read 12 words or phrases and rank them on a four-point scale (1 = least like their training style; 4 = most like their training style). A copy of the TTI will be included in the proposal materials sent by mail. Informed consent will be obtained from participants and all procedures will be approved by the UMass-A Human Subjects committee.

An interview guide will be developed and the same question format will be used each time. All interviews will be audio-taped with permission of participants and will be conducted by a trained graduate assistant using the interview guide. Interview data will be transcribed verbatim by a professional transcriptionist.

Data Analysis

Qualitative interview data will be independently coded by project team members and emergent themes will be identified by consensus, in a process previously used by the PI (32-34). The interview guide will facilitate analysis by providing a structured framework to systematically review the data and to analyze the interview content. Content analysis refers to the process of identifying, coding, and categorizing primary patterns in the data (35). Following this initial step, a more in-depth inductive review of the data will be conducted through

multiple readings of the transcripts to identify subtle, emerging themes and dominant trends (issues that appeared repeatedly). Once completed, these trends will be used to confirm initial findings and inform the development of a matrix that will be created using each theme as a core category to provide structure to explain the experience of instructors teaching online at UMass-A. Quantitative data from instructors' TTI survey will be compiled and summed to determine which of the four trainer types (listener, director, interpreter, and coach) is most dominant for each individual instructor. Highest scores will indicate the most dominant trainer characteristics, as well as the type of learner most effectively taught by an individual with those characteristics. TTI data will be compared to instructors' perceptions of their students' learning styles.

The matrix of "best practices" developed in this study will serve as the foundation for a follow-up validation study. Potential extramural funding sources include the US. Department of Education and International Society for Technology in Education, which support distance education initiatives.

PROJECT DELIVERABLE

A matrix of best practices will be developed for publication in a journal such as: Higher Education; American Journal of Distance Education; Journal of Research on Technology in Education; Distance Education; or Quarterly Review of Distance Education. All of these are peer-reviewed publications that publish qualitative study findings of this nature.

DISSEMINATION OF PROJECT RESULTS

Project findings will be shared with participating UMass departments. The research team will also work with the CFT and CPE to establish effective campus-wide dissemination strategies, such as new faculty orientation.

PROJECT BUDGET

A. Personnel Salary and Wages:

- The PI will devote 8% time (summer salary) to direct the study; train the student; oversee all data collection and management procedures; participate in data analysis; and oversee development of the matrix, questionnaire, and manuscript. Funding for one year is requested at **\$2,157.00**.
- The Co-PI will devote 8% (summer salary) to complete human subjects materials; coordinate data collection and management; participate in data analysis, development of the matrix, questionnaire, and manuscript; and take the lead in preparing the interim and final reports. Funding for one year is requested at **\$1,545.00**.
- Dr. Beffa-Negrini has extensive experience developing, teaching and evaluating online courses. She will assist the team in the development of the qualitative interview guide and matrix. Funding is requested at **\$500.00** for summer salary.
- One graduate Research Assistant will be hired and trained to work 5 hrs/week over the summer to conduct the qualitative interviews and implement the TTI survey (5 hours/week x 14 weeks @ \$17.60-\$18.31/hour) = **\$1,325.00** [Range of hourly rate reflects expected increase in July 2007.]
- A professional will be hired to transcribe the qualitative data verbatim from audio tapes. Estimating no more than a 45-minute interview per participant x 20 participants = 900 minutes (15 hours). Using a rate of \$30.00/hour and a calculation of 4 hours of transcription time per 1 hour of interview (\$30.00 x 60 hours), funding is requested at **\$1,800.00**.

B. Fringe Benefits:

Fringe for senior personnel will be charged at \$91.00 (2.45%) and at \$454 for the student. Total Fringe Benefits for the project is **\$545.00**.

C. Total Salaries, Wages, Fringe Benefits is \$7,872.00

D. Permanent Equipment - None

E. Supplies

Operational: Twenty-five audio tapes will be ordered to record qualitative interviews (\$0.89/60-minute tape) at \$22.25. Funds for miscellaneous research supplies and back-up tapes are requested @ \$100.00. Copies of TTI surveys are free with permission for educational purposes. **Subtotal \$122.25.**

TOTAL COST:

\$7,994.25

PROJECT TIMETABLE

TASK	SUMMER 2007	FALL 2007	WINTER 2007	SPRING 2008
Hire student	X			
Train student	X			
Conduct interviews	X			
Transcribe data	X	X		
Analyze data		X		
Interim report			X	
Develop matrix			X	
Final report				X
Prepare manuscript				X

PRINCIPAL INVESTIGATOR, PARTICIPANTS AND QUALIFICATIONS [CVs of the PI and Co-PI will be included in the proposal materials sent by mail.]

The Principal Investigator (PI) will be **Dr. Elena Carbone** who is an Associate Professor of Nutrition. Her research interests focus on nutrition education, health communication, and adult education to better understand how people attend to and process health information and make behavioral decisions as a result of the information they receive. She has authored numerous articles on teaching and learning, as well as a book chapter on adult education published by Jossey-Bass (2003). Dr. Carbone is a Certified Master Trainer and was a participant in the CFT's Teaching and Learning in the Diverse Classroom program. She has been awarded the College Outstanding Teacher Award and is a current nominee for the University Distinguished Teaching Award. Dr. Carbone has experience using interactive video-teleconferencing and the Internet in her classroom teaching. She is currently PI on three Federally-funded grants applying principles adult education to effectively communicate with diverse audiences, including special needs students; under-educated/limited English-proficient school food service personnel; and 11-to 14-year old Latino and white children. Past grant activities include serving as online seminar participant for an interactive Cyberseminar teleconference and Program Evaluation Coordinator for the resulting computer-based teaching modules.

Dr. Kristen Polzien will serve as Co-Principal Investigator (Co-PI). Dr. Polzien is an Assistant Professor of Kinesiology whose research agenda includes exploring the feasibility and efficacy of e-health technologies, including the Internet and objective physical activity monitors, to support and deliver behavior weight control interventions. She recently submitted a faculty research grant and guided her graduate student in the application of an American College of Sports Medicine research grant. Both proposals explore strategies to enhance Internet-delivered weight loss interventions. Her research is also focused on evaluating the role of psychosocial factors in the adoption and maintenance of physical activity in overweight, sedentary populations. Previously, Dr. Polzien served as an interventionist and project coordinator of a NIH R01 funded grant examining the role of exercise in the prevention of weight gain. Dr. Polzien is also interested in examining

strategies to enhance online teaching and learning practices. In her first year as a faculty member, Dr. Polzien has volunteered to teach a fully online course in Exercise Physiology for Health and Human Performance. She has also engaged her face-to-face course in the pilot online learning management system program, SPARK.

Other participants in the proposed project will be Dr. Patricia Beffa-Negrini who is a Lecturer in the Department of Nutrition at UMass-A and an experienced online educator. She will assist in the development of the interview questions and the matrix. Since 1996, Dr. Beffa-Negrini has contributed to the instructional design, implementation, and evaluation of Internet-based nutrition courses for 250 undergraduate and graduate students. In addition to these online credit courses, she has offered post-graduate training via the Internet to about 900 teachers and health professionals. Her work teaching an undergraduate online course, *Nutrition for Health Online*, was recognized at the Summit on Best Practices in Dietetics Education at the American Dietetic Association's annual conference in 2000.

Dr. Mathew L. Ouellett, Director of the Center for Teaching (CFT) at UMass-A, will help facilitate development of the interview questions and matrix, and will help disseminate findings. Dr. Ouellett works closely with students, faculty, department chairs, and deans on teacher development and assessment issues in the diverse classroom. He is also the President of the Professional and Organizational Development Network in Higher Education (2006-2009) and past president of the New England Faculty Development Consortium. He serves as a summer lecturer on social work at the Smith College School of Social Work, and a lecturer at the UMass School of Education, where he regularly teaches [*EDUC 595K: Introduction to College Teaching*](#). In addition, he presents faculty development workshops related to diversity issues both nationally and internationally. Dr. Ouellett's research interests and publications focus on multicultural organization development in education settings and social justice and equity issues for teachers.

References

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LETTERS OF SUPPORT - Kristen it might be good if we listed all of the names and titles/affiliations of our letters b/c we have so many

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