UNIVERSITY FACULTY MEMBERS' CONTEXT BELIEFS ABOUT TECHNOLOGY UTILIZATION IN TEACHING

Ahmed Yousif Abdelraheem
Assistant Professor of Instructional systems technology
Sultan Qaboos University
College of Education
P.O box 32, PC 123
Alkhod, Sultanate of Oman
Phone: 009689208407
Fax: 00968513817
Email: ahmedyar@squ.edu.om

Dr. Ahmed Yousif Abdelraheem earned his Ph.D. from Indiana university, Bloomington, USA is an assistant professor of instructional technology at the Dept. of C & I at the College of Education Khartoum University at Sudan and at Curriculum and Instruction, Dept. College of Education, Sultan Qaboos University at Oman. Dr. Abdelraheem was a former acting director of Faculty Development Center, Khartoum University and a former deputy Dean for Basic Education Program at College of Education, Khartoum University. Dr. Abdelraheem's area of interest is instructional design and technology application in teaching. He published many articles in instructional development area in general and technology enhanced learning environments in particular. He presented many papers at regional and international conferences.

ABSTRACT
This study examined the context beliefs of Sultan Qaboos University Faculty Members (SQUFMs). Beliefs about teaching with technology instrument developed by Lumpe and Chambre was used with modifications. It was found that SQUFMs held positive beliefs with varying degrees. Enabling factors have higher degrees than likelihood factors. In addition it showed a significant difference between SQUFMs beliefs about teaching with technology according to their experiences. SQUFMs at science camp held higher context beliefs than those who on the art camp and there was a significant difference in context beliefs of SQUFMs about teaching with technology according to their academic ranks. The researcher recommends that more studies be conducted in the area of environmental and personal factors affecting teaching with technology.

KEYWORDS: Faculty Beliefs, Technology utilization, Context beliefs

BACKGROUND:
The role of beliefs as an indicator of teacher behavioral change has received increasing attention among researchers and educators over the last thirty years. A substantial body of literature and evidence has emerged during this time suggesting that teachers' beliefs play critical and important roles in adopting instructional pedagogy (e.g., Pajares, 1992; Richardson, 1996). To make an observable progress in teaching practices, teachers' beliefs should be dealt with and taken into consideration seriously (Hart, 2002). According to Pajares (1992), beliefs about teaching, which include perceptions about what it takes to be an effective teacher, are formed before a student enters college. These beliefs are either challenged or nurtured during the period of apprenticeship of observation, which occurs throughout the teacher training program. It is clear that teachers have certain beliefs regarding the use of technology and these beliefs are most likely formed during school times. The practices and experiences of the teachers help them to develop beliefs system that may or may not be in agreement with the best practices. Indeed it seems that *"beliefs are far more influential than knowledge in determining how individuals organize and define tasks and problems and are stronger predictors of behavior" (Pajares, 1992, p 311).*

It is important to describe how beliefs are understood. An individual's beliefs are understood as his subjective, experience-based, often implicit knowledge and emotions on some matter or state of art. In the literature, the term conception is often used as parallel to beliefs. Conceptions are considered as conscious beliefs, i.e. they form a subgroup of beliefs. In the case of conceptions, the cognitive component of beliefs is stressed, whereas in subconscious_beliefs the affective component is emphasized. The spectrum of an individual's beliefs is very wide, and they are usually grouped into clusters of beliefs. Some beliefs depend on other ones for the individual more important beliefs. Thus, beliefs form belief systems that might be in connection with other belief systems or might not. The affective dimension of beliefs influences the role and meaning of each belief in the individual's beliefs system. Beliefs represent some kind of tacit knowledge. Every individual has his own tacit knowledge which is connected with learning and teaching situations, but which rarely will be made public. Beliefs differ from scientific knowledge (objective knowledge) that can be expressed with logical sentences.

A case study approach to the use of computers by four special education teachers found that for the most part they adapted computers to meet their overall goals and fit their routines with their beliefs and attitudes strongly influencing how the computers were used (MacArthur & Malouf, 1991). Loucks-Horsley, Hewson, Love, and Stiles (1998) argued that teachers' beliefs are critical components of program planning and should be carefully considered by professional development designers. They state, "*Beliefs are the ideas people are committed to sometimes called core values. As designers clarify and articulate beliefs, these beliefs become the "conscience" of the program. They shape goals, drive decisions, create discomfort when violated, and stimulate ongoing critique (p. 18")*. Marcinkiewicz (1994) also reported that teachers' use of computers for teaching was related to their belief in their ability to do so. This means that self-efficacy plays an important part in technology adoption, in that teachers are not likely to make the changes necessary to their teaching practice if they do not feel competent to do so. Norum, Grabinger and Duffield (1999) studied the thoughts, perceptions, beliefs, experiences, knowledge, and growth of practicing teachers studying and attempting to integrate the use of computers in their classrooms. The overarching theme they found running throughout their research was teachers' strong assertion that they needed to change personally and take on new roles if technology was to be effectively integrated into their classrooms. Thus, most of the teachers involved in their study saw themselves as the place where change efforts needed to begin. Using survey methodology, Kersaint and collogues (2003) examined the beliefs and practices of mathematics teacher educators (MTEs) regarding the integration of technology in their teacher education programs. In addition, the relationship among MTEs' beliefs about the importance of technology, their comfort with using and teaching with technology, and the degree to which they have implemented technology within their mathematics teacher education programs were also examined. MTEs were consistent regarding which technologies they believed were important for teachers of mathematics at the elementary, middle, and high school levels.

Today's world has witnessed an increasing utilization of information and technology at all levels and aspects of life. Schools and universities are the first to call for implementing and adopting the new technologies, because of the pressure from the society, but they are the last to adopt and implement technology. There are many factors affecting technology adoption and implementation at schools and universities. Among these factors are: funding, training, infrastructure, teachers' resistance, and so on. Research surveys show conflicting findings concerning technology utilization in teaching, while some report positive attitudes towards technology integration others report negative ones (Laffey & Musser, 1998 and (OTA, 1995).

Although, a great amount of money, efforts and time are being expended on the use of technology at higher education institutions, some university faculty members seem reluctant in integrating technology i.e. being able to use an array of technologies to gather information and communicate with others, into their teaching. The reasons behind that behavior could be attributed to several factors. Some of these factors are environmental (incremental, institutional) while others are personal and fundamental. Environmental factors could be managed and solved while personal factors are tough to deal with. There are many barriers to successful technology integration but one of the most difficult to change is the mindset of the teachers and their deeply held beliefs about the nature of teaching, learning and technology itself (Sandholtz, Ringstaff, and Dwyer, 1997). Ertmer (1999) distinguished between two types of barriers to technology integration. First order barriers, which include access to hardware, access to software, time to plan instruction, technical support, and administrative support, are extrinsic to teachers. Second order barriers are the underlying beliefs of teachers about teaching, learning technology, organizational context and unwillingness to change. Honey and Moeller (1990) found that teachers with student-centered pedagogical beliefs were successful at integrating technology except in cases where anxiety about computers prevented them from using the technology. In contrast, teachers with more traditional beliefs faced much greater change in their practices in order to integrate technology.

Effective technology utilization requires a combination of pressure and support. Pressure refers to expectations that faculty will integrate technology into their classrooms. Support encompasses human and technological infrastructure that facilitates technology utilization. Fullan (1991) explains that pressure without support leads to resistance and alienation, while support without pressure can lead to drift or waste. So, a good balance of pressure and support is needed for technology utilization. Strudler and Wetzel (1999) stated that "*professors must see the fit between their philosophies of teaching and learning and technology applications(p. 73)"*. In their interviews they found many instances in which faculty used technology in their course when it matched or enhanced their beliefs. Czerniak, Lumpe, Haney and Beck (1999) found that "*teachers share the belief that educational technology enhances student learning and that the integration of technology in their teaching is both desirable and needed. They added that teachers do not perceive that sufficient support structures are in place to enable them to achieve the outlined technology education standards(p.10)"*. Cope and Ward (2002) used a phenomenological research approach to examine the importance of high school teacher perceptions on the integration of learning technology in the classroom and concluded that "*teacher perceptions of learning*

technologies are likely to be key factors in the successful integration of learning technologies" (p. 72). They further noted that successful integration is more likely to occur when "*teachers perceive learning technologies as part of a student-centered /conceptual change teaching approach" (p. 72).* In the past, the failure of new technologies being integrated in education has been blamed on the teacher's inability to adapt the new technology to his or her teaching style (Cuban, 1986). Research has suggested that there is a tendency for teachers to stay with instructional strategies with which they are familiar and comfortable and are the accepted status quo at their schools (Tobin & Dawson, 1992). Albion and Ertmer (2002) discuss the connections between teachers' beliefs, self efficacy, and their willingness and ability to integrate technology into their teaching. Pointing to research that demonstrates that technology use and the adoption of constructivist teaching practices tend to occur concomitantly, the authors contend that in many cases, technology use may require changes in teaching styles and teachers' beliefs. In the survey by Galloway (1997), it was found that most teachers who committed to using technology in their instruction were also committed to using technology in their personal lives. To be able to effectively integrate technology with instruction, teachers need to be able to integrate technology with their personal lives as well. So technology integration to enhance teaching is a multifaceted process that takes time, support, and collaboration.

Examining the perceptions and beliefs of a target audience is a widely used strategy based on the premise that perceptions and beliefs matter and often influence behaviors. This approach has been used to study faculty perceptions of distance education (Belcheir & Cucek, 2002). It seems that a greater understanding of teachers' beliefs is essential to the improvement of educational practices. In recent years there have been numerous efforts to organize beliefs into types and examine their impact. *The study of educational beliefs of teachers has been strongly advocated for the simple but powerful reason that teachers' beliefs guide the decisions they make and the action they take in the classroom, which in turn have an impact on students (Pedresen and Liu 2003, p.60).*

The focus on information technology (IT) in education has shifted towards curriculum integration. Teachers should possess both skills in the use of IT and belief in their capacity to integrate IT into teaching. Self-efficacy beliefs can provide a measure especially in the context of preparing teachers to teach with technology (Albion, 1999). Personal experience and experiences with schooling may affect the development of beliefs more than formal pedagogical knowledge gained from courses (Richardson, 1996). Ford (1992) mentioned that contexts in education can be broadly classified into three environments: designed environment, which includes buildings and equipments; human environment which includes students, faculty and parents and sociocultural environment which includes policy and cultural norms. Adamy (2000), in his study of technology using teachers, reports that the ways in which the members of a community viewed technology and its use had a strong influence on teachers' professional development goals and their integration of technology into classroom activities. Ross, Hogaboam-Gray & Hannay (1999) found that, after large-scale technology infusion, one of the few factors affecting teachers' confidence in their ability to use computers in the classroom was a shared sense of purpose in their schools and larger communities. The only factor they found more significant was teacher attitudes and beliefs, a factor which is clearly influenced by local cultures. Problems in access to technology, along with other conditions such as class sizes can also influence the use and infusion of technology into the curriculum. Leigh (2003) mentioned that "*instructors who are committed to the use of instructional technology often have to struggle against barriers set by budget cuts that lead to increased class sizes and other environmental constrains" p.78.* According to Lumpe, Haney and Czerniak (2000) the context belief construct goes beyond simply defining the connection between a person's actions and the context's response to the action. They include the role of the entire context in meeting desired goals. Snider (2002) states that "… many pre-service teachers, mentor teachers, and university instructors may need to revise their practices as well as their fundamental philosophies regarding teaching and learning" (p. 231). . Thus, technology integration can prove to be extremely challenging, in that "…at least some beliefs about the nature of teaching are formed over many years of experience as a student and are resistant to change because they have been supported by strong authority and broad consensus" (Albion & Ertmer, 2002, p. 35).

Recently, Sultan Qaboos University (SQU), the only one national university at the Sultanate of Oman, invested a good amount of money for purchasing educational technology software and hardware (WebCT, Blackboard learning systems, Computer labs, Computers at every teaching room with different projectors) to be used in teaching and learning. Centre for educational technology at SQU conducts a series of professional development workshops for faculty members to help them in integrating technology in their teaching. All these efforts are expected to increase the productivity of the instructional process and the overall educational outputs of the university. Faculty members are the ones who are supposed to use these technologies in teaching and encourage their students to use them in the learning process. Simply having the technology resources in the school does not necessarily mean that the staff will use them in their teaching. Educational planners wishing to increase the use of technology by students in their learning of the new concepts may need to account for teachers' images and

beliefs about teaching and learning. Almusawi and Abdelraheem (In press) indicated that WebCT faculty users at SQU are not up to the required level, and WebCT is not used to the maximum of its potentialities. Since faculty members' context beliefs about technology utilization play a critical role in the implementation of such technology, it seems essential that SQU faculty members' context beliefs about technology utilization be examined. The findings of this study can help policymakers and instructional developers recognize some of the factors that can affect how faculty members use technology in their teaching. With this concern in mind this paper addresses the following questions:

1/ What context beliefs do Sultan Qaboos University Faculty members hold about technology utilization in teaching?

2/ Do these beliefs vary according to Faculty Members':
- Teaching Experiences
- Specialization
- Academic rank

3/ Is there any difference between Faculty Members responses of enabling factors and likelihood factors?

4/ Is there any correlation between
- Enabling factors and likelihood factors?
- Enabling factors and the total context beliefs?
- Likelihood factors and the total context beliefs?

DEFINITION OF TERMS

Context beliefs:

Context beliefs are those beliefs about the ability of external factors or people to enable a person reach a goal plus the belief that a factor is likely to occur (Lumpe & Champer 2001). In this study it will be represented by faculty members' response to the instrument (Beliefs About Teaching with Technology).

Technology:

Galbraith (1967) defines technology as *" the systematic application of scientific or other organized knowledge to practical tasks" (Galbraith,1967, p.12).* In this study it means the use of a wide range of educational technologies (computers, video, print, manipulative and projectors with accompanying instructional materials) in teaching to promote student learning.

METHOD

Population and Sample

The population of this study consists of all SQU faculty members. Their total number is 531 according to the statistics office at the personnel affairs department. Those faculty members are from different colleges with different experiences, academic ranks and nationalities. Table (1) shows the total number of faculty members at SQU and their distribution according to their academic rank per college.

Table 1: Total number of faculty members at SQU and their distribution according to their rank per college

College	Professor	Associate Prof.	Assistant Prof.
Art and social sciences	9	30	76
Education	7	10	59
Science	7	37	83
Medicine and health sciences	14	19	37
Engineering	2	18	47
Commerce and economics	5	9	31
Agriculture and marine sciences	5	16	25
Total	49	124	358

From SQU faculty members only 250 responded to the instrument.

Instrument

To measure faculty members' context beliefs about technology utilization in teaching, an instrument, which was developed by Lumpe and Chambers (2001) with some modification to fit the practice and culture at SQU, was used. This instrument is called instrument for measuring Beliefs about Teaching with Technology (BATT)

(Appendix 1). It consists of two sections. The first part is about demographic information such as college affiliation, teaching experience and academic rank. The second part consists of thirteen items with two subscales for enabling factors and the corresponding likelihood factors. It was developed initially by asking SQU faculty members to respond to open questions about the environmental or personal factors that help and / or encourage them in using technology in teaching or hinder this use. Then the responses were converted to the instrument items which were very similar to Lumpe and Chambers (2001) instrument. Reliability coefficient is .89 for the whole scale as measured by Alpha Cronbach internal consistency coefficient. Respondents indicated their beliefs on a scale of strongly agree (5) to strongly disagree (1). They were also asked to indicate the factor's likelihood of occurrence. The possible range of the context belief total score is 26 – 130. Higher values show more positive beliefs.

RESULTS AND DISCUSSION:

Concerning the first question which is about context beliefs of Sultan Qaboos University Faculty members (SQUFMs) about technology utilization in teaching, the results are indicated in table 2 below:

Table 2: Means and standard deviations of SQUFMs context beliefs about technology utilization in teaching

factors	Means of Enabling factors	Standard deviations of Enabling factors	Means of Likelihood occurrence	Standard deviations of Likelihood occurrence
1	4.39	.50	4.00	.72
2	4.85	.37	4.00	.72
3	4.38	.49	4.00	.72
4	4.53	.50	4.00	.72
5	4.22	.43	4.00	.72
6	4.56	.50	3.42	1.19
7	4.56	.50	4.00	.71
8	4.56	.50	4.10	.70
9	4.55	.53	4.01	.14
10	4.55	.51	4.01	.11
11	4.86	.38	3.17	1.01
12	4.84	.45	3.92	.27
13	4.84	.48	3.94	.25
total	4.59	.23	3.90	.14

It is clear from the above table that SQUFMs hold varying beliefs about teaching with technology with means from 4.22 to 4.86 for enabling factor and from 3.17 to 4.10 for likelihood occurrence. This result indicates that these thirteen items of contextual factors influencing SQUFMs beliefs about technology utilization. It is clear that SQUFMs show positive beliefs for most of the items. This result is similar to Lumpe and Champers (2001) who found 14 factors with similar results.

In terms of the second question of the study whish states "Is there any difference between SQUFMs responses of enabling factors and likelihood factors?". Paired sample t test was used to test for the difference. The results are shown in table 3.

Table 3: Paired Samples t test Statistics

	Mean	N	Std. Deviation	t	df	correlation
Enabling	4.5911	250	.2336	47.42*	249	.30*
likelihood	3.8911	250	.1393			

* sig. At alpha = .01

The table indicates that there is a significant difference between SQUFMs beliefs about enabling factors and likelihood factors in favor of enabling factors. Among context factors that showed big difference between enabling and their likelihood beliefs are: funding, training on teaching with technology, smaller class sizes, teaching devices and sufficient well prepared labs. This demonstrates that for SQUFMs there was a belief that these factors would help but they generally did not believe that they actually occur at SQU. These results are similar to Lumpe, Haney and Czerniak (2000).

The results for the third question of this study which states "Do these beliefs vary according to Faculty Members':

- Experiences
- Specialization
- Academic rank"

are shown respectively in the following tables. First concerning SQUFMs experience, the results are indicated table (4).

Table 4: ANOVA of the experience variable of SQUFMs

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.175	2	8.753E-02	3.831	.023
Within Groups	5.643	247	2.285E-02		
Total	5.818	249			

Table (4) shows a significant difference between SQUFMs beliefs about teaching with technology according to their experiences. Scheffe's pairwise comparison revealed that faculty members with long experience hold higher positive beliefs than their counter partners. This result is natural because experienced faculty members know the educational environment and how to deal with it and know SQU culture and how to approach it.
Concerning the second part of the third question which examines the academic specialization differences in context beliefs table (5) shows a significant difference in favor of those in scientific colleges i.e. SQUFMs at science camp hold more positive context beliefs than those who are on the art camp.

Table 5: t test for specialization variables

specialization	N	Mean	Std. Deviation	sig	t	df
Sc.	169	4.31	.12	.00	16.60	248
art	81	4.08	7.571E-02			

This result could be attributed to the fact that the nature of their subjects forces them to use technology in teaching since science and technology are two faces for the same coin.

The third part of the second question examines the differences in beliefs according to the academic ranks. ANOVA analysis showed the following results.

Table 6: ANOVA for academic rank variable

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.66	2	.33	15.86	.00
Within Groups	5.16	247	2.087E-02		
Total	5.81	249			

It is clear from the above table that there is a significant difference in context beliefs of SQUFMs about teaching with technology. Scheffe's pairwise comparison indicated that professors and associate professors hold more positive beliefs than assistant professors. In addition, there is no significant difference between professors and associate professors. It is well known that academic ranks depend on research publication and teaching quality. This means that a good researcher could be a good teacher. A good teacher is the one who knows how to use available learning resources and technologies. This result shows that faculty members with higher ranks hold higher context beliefs than those with the beginning ranks.
The fourth question of the study is about the correlations between enabling factors and likelihood factors, enabling factors and the total context beliefs, and likelihood factors and the total context beliefs. The results indicate significant and positive correlations of .30, .68 and .90 respectively. This result provides more evidence for the construct validity of the BATT instrument

CONCLUSION AND RECOMMENDATIONS:
This study is meant to examine the context beliefs of SQUFMs. It was found that they held positive beliefs with varying degrees. Enabling factors have higher degrees than likelihood factors. In addition it shows a significant difference between SQUFMs beliefs about teaching with technology according to their experiences. SQUFMs at

science camp hold higher context beliefs than those who on the art camp and there was a significant difference in context beliefs of SQUFMs about teaching with technology according to their academic ranks. The researcher recommends that more studies be conducted in the area of environmental and personal factors affecting teaching with technology. Such studies will hopefully encourage teachers to explore the potential of technology in teaching and consider their individual beliefs, group dynamics of the staff, and structural factors that support the instructional process. Other factors like the types of beliefs, resources, and assessment criteria that exist in a school may be addressed too.

REFERENCES

Adamy, P. (2000) The influence of organizational culture on technology integration in teacher education. *Paper present at the annual meeting of the American Educational Research Association, New Orleans*.

Albion, P. (1999). Self-efficacy beliefs as indicator of teachers' preparedness for teaching with technology. *Paper presented at the 1999 annual Society for Information Technology in Teacher Education Conference. San Antonio, TX. Available at* http://www.usq.edu.au/users/albion/papers/site99/1345.html

Albion, P. R., & Ertmer, P. A. (2002). Beyond the foundations: The role of vision and belief in teachers' preparation for integration of technology. *TechTrends, 46*(5), 34–37.

Almusawi, A., & Abdelraheem, A. (in press). The effects of online instruction on the achievement of Sultan Qaboos University students and their attitudes towards it. *The Educational Journal*. Kuwait: Kuwait University, Academic Publication Council.

Belcheir, M. J., & Cucek, M. (2002). *Faculty perceptions of teaching distance education courses. Research Report 2002*. (Boise State University Institutional Assessment Report 2002-02). Retrieved oct. 9, 2003, from http://www2.boisestate.edu/iassess/Reports/RR%202002-02.htm

Cope, C., & Ward, P. (2002). Integrating learning technology into classrooms: The importance of teachers' perceptions. *Educational Technology & Society 5*(1) 67-74.

Cuban, L. (1986). *Teachers and machines: Uses of technology since 1920,* New York: Teachers College

Erter, P. (1999). Addressing first and second order barriers to change: Strategies for technology integration. *Educational Technology Research and Development*, 47(4), 63-81

Ford, M. (1992). *Motivating humans: Goals, emotions, and personal agency beliefs.* Newbury park, CA: Sage

Fullan, M. (1991). The new meaning of educational change (rev. ed.) New York : Teacher College Press

Galloway, J. (1997). *How teachers use and learn to use computers: SITE '97* Indiana University Northwest.

Hart, L. (2002). Preservice teachers' beliefs and practice after participating in an integrated content/methods courses. *School Science & Mathematics,* 102, 4-14.

Honey, M., & Moeller, B. (1990). *Teachers' beliefs and technology integration: Different values, different understandings*. (Technical Report 6): Center For Technology in Education.

Kersaint, G., Horton, B., Stohl, H., & Garofalo, J. (2003). Technology Beliefs and Practices of Mathematics Education Faculty. *Journal of Technology and Teacher Education 11*(4), 567-595. [Online]. Available: http://dl.aace.org/13580

Laffey,J. & Musser, D. (1998). Attitudes of pre service teachers about using technology in teaching. *Journal of Technology and Teacher Education,6*(4),223-242.

Leigh, P. R. (Winter 2003). Infusing technology in educational foundations: Does PowerPoint Count? *Journal of computing in teacher education*,20(2), 71-79.

Loucks-Horsley, A., Hewson, P., Love, N. and Stiles, K. (1998). *Designing professional development for teachers of science and mathematics.* Thousand Oaks, CA: Corwin Press.

Lumpe, A. and Chambers, E. (2001). Assessing teachers' context beliefs about technology utilization. *Journal of Research on Technology in Education, 34(1), 93-107*

Lumpe, A. Haney, J. Czemiak, C. (2000). Assessing teachers' beliefs about their science teaching context. *Journal of Research in Science Teaching, 37(3), 275-292.*

MacArthur, C. A., & Malouf, D. B. (1991). Teachers' beliefs, plans, and decisions about computer-based instruction. *The Journal of Special Education*, 25 (5), 44-72.

Marcinkiewicz, H. R. (1994). Computers and teachers: Factors influencing computer use in the classroom. *Journal of Research on Computing in Education*, 26 (2), 220-237.

Merseth, K. K., & Lacey, C. A. (1993). Weaving stronger fabric: The pedagogical promise of hypermedia and case methods in teacher education. *Teaching and Teacher Education*, 9 (3), 283-299.

Nespor, J. (1987). The role of beliefs in the practice of teaching. *Journal of Curriculum Studies*, 19 (4), 317-328.

Norum, K., Grabinger, R. S. & Duffield, J. A. (1999) Healing the universe is an inside job: teachers' views on integrating technology. *Journal of Technology and Teacher Education, 7, (3), 187-203*

OTA (Office of Technology Assessment) (1995). Teachers and technology: making the connection. Washington, DC, Government printing office (online): Http://www.wws.princeton>edu:80/ota/ disk1/1995/9541.pdf.

Pajares, M. F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research*, 62 (3), 307-332.

Pedersen, S. and Liu, M. (2003). Teachers beliefs about issues in the implementation of a student- centered learning environment. *Educational Technology Research and Development*, 52(2), 57-76.

Richardson, V. (1996). The role of attitudes and beliefs in learning to teach. *In J. Sikula (Ed.), Handbook of research on teacher education (pp. 102-119)*. New York: Simon & Schuster/Macmillan.

Ross, J. A., Hogaboam-Gray, A. & Hannay, L. (1999) Predictors of teachers' confidence in their ability to implement computer-based instruction. *Journal of Educational Computing Research, 21, (1), 75-97.*

Sandholtz, J., Ringstaff, C., & Dwyer, D. (1997). *Teaching with technology: Creating student-centered classrooms*. New York: Teachers College Press.

Snider, S. L. (2002). Exploring technology integration in a field based
teacher education program: Implementation efforts and findings.
Journal of Research on Technology in Education, 34(3), 230–249.

Strudler, N. & Wetzel, K. (1999). Lessons from exemplary colleges of education: Factors Affecting Technology Integration in Pre-service Programs. *Educational Technology Research and Development*, 47(4), 63-81

Tobin, K., & Dawson, G. (1992). Constraints to curriculum reform: Teachers and the myths of schooling: *Educational Technology Research and Development, 40(1)*, 81-92.

Beliefs About Teaching with Technology (BATT) Instrument

Beliefs About Teaching with Technology

Directions:

Suppose your goal is to effectively use technology in your classroom. Listed below are a number of school environmental support factors that may have an impact on this goal.

When responding to the list, please indicate in the first column the degree to which you believe each factor will enable you to effectively use technology. In the second column, indicate the likelihood that these factors will occur (or be available to you). Circle the corresponding descriptor that matches your belief

	Column#1 The following factors would **enable** me to be an effective instructor.. SA = Strongly Agree A=Agree UN = Undecided O=Disagree SO = Strongly Disagree					Column#2 How **Likely** is it that these factors **will** occur in the university? VL = Very Likely SL = Somewhat Likely N = Neither SU = Somewhat Unlikely VU = Very Unlikely				
	SA	A	UN	D	SD	VL	SL	N	SU	VU
1. Funding										
2. Training on teaching with technology										
3. Access to the Internet										
4. Quality software										
5. Suitable physical classroom structures										
6. Support from administrators										
7. Support from colloquies										
8. Technical support (technicians)										
9. Time to plan for technology implementation										
10. Time to let students use technology										
11. Smaller class sizes										
12. Teaching devices										
13. Sufficient well prepared labs										