

Women's Technology Acceptance of Mentoring on the Internet

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Abstract

Online mentoring, also known as Internet mentoring or e-mentoring, is an emerging technology which improves the education, communication, and coaching of women professionals, particularly women entrepreneurs, who may not be able to avail themselves of traditional modes of mentoring. However, like other new technology, online mentoring programs can be expensive to develop and implement. Thus, determining the significant technology acceptance factors related to Internet mentoring can improve the appeal of these programs to women professionals. This study used a 2007 survey of 312 women professionals in the Southwestern Pennsylvania area, including a group of 115 entrepreneurial women, and examined both demographic factors and attitudinal acceptance factors suggested by the Davis technology acceptance model and the Rogers diffusion of innovations theory. An analysis comparing the acceptance of Internet mentoring by entrepreneurial women and non-entrepreneurial women showed that entrepreneurial women were more likely to adopt Internet mentoring. This result has important implications with regard to the development and implementation of online mentoring programs for women entrepreneurs and non-entrepreneurs.

Keywords: online mentoring, e-mentoring, technology acceptance, diffusion of innovations theory, women entrepreneurs

1. BACKGROUND

Developing and implementing emerging information technology, such as online mentoring (also known as Internet or e-mentoring) can provide a challenge for universities and organizations that actively promote the coaching, training, and education of professional women. Online mentoring is the practice that allows mentors and mentees (the mentored) to communicate by using the Internet on a one-to-one basis. Reasons for this activity include discussing problems related to one's job, family, school, work, or other issues. In general, mentoring can be categorized in two ways: (a) career

mentoring which includes sponsorship, exposure and visibility, coaching, protection, or providing challenging work assignments and (b) psychosocial mentoring which includes role-modeling, acceptance and confirmation, counseling, and friendship (Jandeska and Kraimer, 2005). Mentoring also develops a nurturing and enduring relationship between a well-established professional and a more junior colleague (Ridout, 2006; Sparrow, 2006). A lack of a mentoring relationship has been cited as one of the largest obstacles to women's progress in their careers (Vonk and Kestin, 2007). It has been suggested that online mentoring may now be replacing the traditional form of mentoring,

that is, face-to-face mentoring, for many women professionals (Ridout, 2006). Because of time constraints and the lack of female mentors, women entrepreneurs, in particular, are now availing themselves of new online resources, including online mentoring, in order to improve their chances of a successful enterprise. In contrast, a reason for women non-entrepreneurs to adopt online mentoring could be to improve their chances of success in the workplace (Perren, 2003).

Both women entrepreneurs and non-entrepreneurs are now participating in mentoring programs. Traditional mentoring and online mentoring programs are currently being developed and implemented for different professions by several professional organizations, such as the Society of Women Engineers, the Service Corps of Retired Executives (SCORE), and the Women in Engineering Program Advocates Network (WEPAN), and universities, such as Northeastern University and the University of Vermont (Kasprisin, Single, Single, and Muller, 2003). Sponsors of these formal mentoring programs provide access to professional networks and some degree of traditional face-to-face mentoring.

Costs of online mentoring can include the sponsoring organization's expenses associated with the professional time of the mentor and of the information systems personnel, and costs of any computer equipment, software, and Internet set-up. The mentor also invests his or her personal time at home in securing a good relationship with the mentee (Boneva, Kraut, and Frohlich, 2001; O'Neill, Wagner, and Gomez, 1996). There are also costs to the mentee, possibly in terms of her personal and professional time and of her expenses associated with computer equipment and Internet setup.

The purpose of this study was to identify the factors that relate to or influence women professionals, particularly women entrepreneurs, to accept online mentoring and to determine whether women entrepreneurs would be more inclined to accept online mentoring than women non-entrepreneurs. If that is the case, and the factors that influence online mentoring adoption for both groups are known, then a university or organization could use this information to better develop and implement formal mentoring

programs. In addition, using these factors to tailor online mentoring programs to both women entrepreneurs and non-entrepreneurs could improve the chances that these programs will be successfully marketed.

Demographic factors examined in this study included age, income, profession, and mentoring-related factors which pertained to how the mentee or potential mentee was being mentored, such as her number of mentors, her mode of mentoring, her preferred mentoring site, and her computer usage. This study also considered the attitudinal factors suggested by the Davis (Davis, Bagozzi, and Warshaw, 1989) technology acceptance model (TAM) or extensions thereof, and the Rogers (2003) diffusion of innovations theory. These attitudinal factors included the perceived usefulness, perceived reliability, perceived risk of the new technology, and the ease of use of the new technology.

No studies to date have been performed regarding acceptance factors for online mentoring adoption for either men or women. It should be pointed out that much of the recent literature pertaining to women entrepreneurs' and non-entrepreneurs' adoption of online mentoring relates mostly to the effectiveness, as opposed to the acceptance, of the online mentoring programs for women professionals (Perren, 2003).

However, many studies have been performed recently pertaining to new technology acceptance. The theoretical model that has been used most frequently in these studies is the technology acceptance model (TAM), or some modified version of the TAM (Davis et al., 1989). The diffusion of innovations theory or DOIT (Rogers, 2003) has also been utilized in a number of studies (e.g., Lichtenstein and Williamson, 2006). These models suggest attitudinal factors, such as perceived usefulness of the technology, perceived risk, compatibility (with user values), and ease of use of the technology. The TAM and DOIT could be considered to be widely accepted as tools to analyze the problem of why end-users accept available systems, even if the models are applied to different technologies. Utilizing these models is consistent with prior research in user acceptance and is appropriate as long as the general characteristics of the technology in-

roduction and usage processes (for example, training and voluntariness of use) of the different technologies are comparable (Venkatesh and Morris, 2000). Research topics applying either the TAM or the DOIT, or both, recently have focused on the acceptance of various forms of technology including mobile chat phones (Nysveen, Pedersen, and Thorbjornsen, 2005) and online banking (Gibson, 2007; Hogarth, Kolodinsky, and Gabor, 2006; Kolodinsky, Hogarth, and Hilgert, 2004; Lee, Lee, and Eastwood, 2003; Lichtenstein and Williamson, 2006).

The research questions that were addressed in this exploratory study were as follows: (1) What are the significant factors that influence the acceptance of online mentoring by women professionals, in particular, women entrepreneurs and women non-entrepreneurs? and (2) What are the differences in these factors between these two groups? Based on prior findings of the acceptance studies of online technology (Gibson, 2007; Hogarth, et al, 2006; Kolodinsky, et al, 2004) and of entrepreneurial attitudes (Perren, 2003; Peterman and Kennedy, 2003), the following hypotheses were proposed:

H_1 : Women entrepreneurs with less education would be more likely to accept online mentoring than women non-entrepreneurs.

H_2 : Younger women entrepreneurs would be more likely to accept online mentoring than women non-entrepreneurs.

H_3 : Women entrepreneurs with exposure to online mentoring and organized online programs would be more likely to accept online mentoring than women non-entrepreneurs who had no exposure to online mentoring.

H_4 : Women entrepreneurs would perceive less risk in using online mentoring than women non-entrepreneurs.

2. RESEARCH METHODOLOGY

A quantitative approach which had been successful in previous U. S. studies (Gibson, 2007; Hogarth et al, 2006; Kolodinsky et al, 2004) was employed using a survey designed to assess the impact of both

demographic and attitudinal factors on the acceptance of online technology. A total of 312 women professionals from seven different women's professional groups, of which 115 were members of an entrepreneurship initiative group, in Southwestern Pennsylvania between August and November, 2007 participated in this project. The women completed a self-administered survey by either online (86%) or hard-copy (14%) method.

The three dependent variables that addressed the research question were: (1) the likelihood to use online mentoring informally, (2) the likelihood to use online mentoring formally, that is, with the sponsorship of a company or organization, and (3) the importance of online mentoring to the mentee in choosing a sponsoring organization. This study provided for multiple values based upon a 7-point Likert scale response to the questions corresponding to the likelihood of online mentoring use and a 5-point Likert scale to the response to the question corresponding to the importance of online mentoring use. The responses ranged from *definitely will not* or *not important at all* to *definitely will* or *most important*.

Demographic and attitudinal factors were measured with the survey instrument developed by the Survey Research Center at the University of Michigan in 1999 and 2003 and used in subsequent online technology studies (Gibson, 2007; Gibson, 2008; Hogarth et al, 2006; Kolodinsky et al, 2004). There were 16 independent demographic factors examined in this study. The demographic variables included (a) seven standard demographic, such as income, age, and marital status, (b) four mentoring-related, such as the number of mentors at home or work, site, and (c) five Internet/PC-related, such as Internet access and connection. In addition, responses to 17 attitudinal statements and their relationships to the dependent variables were examined. One-way ANOVA was used to test for relationships between the demographic variables and the dependent variables, and correlation analysis followed by multiple linear regression was used to test for the relationships between the attitudinal variables and the dependent variables.

3. RESULTS

Demographic data (Table 1) were collected from both women entrepreneurs and women non-entrepreneurs. The most significant differences between the two groups were in the highest level of education achieved and the age of the participants. Approximately 25% of women entrepreneurs did not have a college degree, versus only 5% of the women non-entrepreneurs, and 35% of the women entrepreneurs were under age 45, versus 60% of the women non-entrepreneurs.

H_1 and H_2 proposed that younger and less-educated women entrepreneurs would be most likely to accept online mentoring. These hypotheses were not supported. Results indicated that for the women non-entrepreneurs, only youth was significantly related to the likelihood of formal use of online mentoring, $F(4, 160) = 4.05, p < .01$. The two younger groups (18-24 and 25-34 years-old) had mean scores of 3.19 and 3.31, whereas the eldest group (55+ years-old) had a mean score of 2.10.

H_3 proposed that women professionals with exposure to online mentoring, particularly online mentoring programs, would be most likely to accept online mentoring. This hypothesis was also supported. One-way ANOVA (Table 2) indicated that the mean scores associated with the likelihood of formal use of mentoring and the importance of use of mentoring were significantly higher for women entrepreneurs who had participated in online mentoring programs. Mean scores for women entrepreneurs ranged from 5.53 to 5.69, indicating that women entrepreneurs were likely to use online mentoring.

H_4 anticipated that the entrepreneurial women would perceive less risk in accepting online mentoring than non-entrepreneurial women. This hypothesis was supported by both results of correlation analyses, which supported the significance of all attitudinal factors suggested by Davis and Rogers, and stepwise multiple linear regression (Table 3) showing that entrepreneurial women were more comfortable than non-entrepreneurial women in providing information online. In particular, the attitudinal factor *perceived risk/security*, was associated with the statement, "I would feel comfortable providing information online."

It should be pointed out that in conducting this analysis, other attitudinal factors suggested by the Davis and Rogers acceptance models were also more important to women entrepreneurs than to women non-entrepreneurs. These factors included *perceived reliability*, associated with the statement, "Many people are mentored online" and *observability*, associated with the statement, "I have seen how others are mentored online." It is also important to note that other factors, such as *perceived use*, could be more important to non-entrepreneurial women than to entrepreneurial women. This factor was associated with the statement, "Online mentoring would help me better to solve my problems."

4. CONCLUSIONS AND RECOMMENDATIONS

Recent actual usage of online mentoring programs by women entrepreneurs was highly associated with the acceptance of online mentoring and thus is a consideration in the marketing of formal online mentoring programs. Recent actual usage was directly related to the prior use of online technology, a variable considered to be the most significant factor in previous studies of online technology (Gibson, 2007; Hogarth, Kolodinsky, and Gabor, 2006; Kolodinsky, Hogarth, and Hilgert, 2004). Prior use of online technology was also suggested as being an important factor in online mentoring studies (Johnson and Daire, 2007). As actual usage of online mentoring increases, one can predict that women entrepreneurs in particular will become more comfortable in providing personal and business information online.

This significance of this factor also suggests that the marketing of online mentoring to women entrepreneurs who had not participated in online mentoring will be considerably more difficult than to those women who had been mentored online. It is important to note that the most likely users of a formal online mentoring in the next year among this group are women who have been in a formal or organized online mentoring program in the past year. This is not surprising; however, it is important to note that these women entrepreneurs who are already satisfied with the program could promote it to

other business women who have not been in a formal online mentoring program.

The findings pertaining to attitudinal factors important to both non-entrepreneurial and entrepreneurial women were consistent with the theories and models developed as part of the TAM and DOIT. These factors should be carefully considered in marketing online mentoring programs. It should be pointed out that a comparison of these significant attitudinal factors with previous studies produces mixed results. Perceived usefulness, perceived risk/security and perceived reliability demonstrated significance in several technology acceptance studies (Davis, Bagozzi, and Warshaw, 1989; Gibson, 2007; Hogarth, Kolodinsky, and Gabor, 2006; Lee, Lee, and Eastwood, 2003; Lichtenstein and Williamson, 2006; Kolodinsky, Hogarth, and Hilgert, 2004; Venkatesh and Davis, 2000) and were suggested by online mentoring studies (Jandeska and Kraimer, 2005; Knouse, 2001; Miller and Griffiths, 2001; Woodd, 1999). Perceived ease of use also demonstrated significance in technology acceptance studies (Gibson, 2007; Hogarth et al, 2006; Kolodinsky et al, 2004) and was also suggested as a factor in an online mentoring study by Woodd (1999). However, trialability demonstrated significance only in the studies by Gibson (2007) and by Lee, Lee, and Eastwood (2003).

A successful implementation of online mentoring programs should also consider several attitudinal factors and statements that demonstrated statistical significance in this study. For example, the significance of perceived ease of use, associated with the statement "Being mentored online seems to be convenient," suggests that the promotional material or website pages for online mentoring should emphasize that use of the technology will be free from effort. This can be particularly true for working women and mothers (Lichtenstein and Williamson, 2006). In addition, the design of the online program should allow for (a) easy-to-use technology, such as a portable lap-top computer with high speed Internet access, and (b) a systematic matching of mentor and mentee in order to make the program more convenient for the user. In addition, usability studies would be beneficial to the implementation of the online mentoring programs.

Successful implementation should also consider the observability and trialability of the online mentoring program so that potential users can observe other women professionals being mentored and experiment with the program on a limited basis. These factors can be addressed by first arranging for the potential mentee to observe other mentees communicating with their mentors. Later the potential mentee could be introduced to a temporary mentor and, along with this mentor, the mentee could participate in the online program for two to three weeks. After a few weeks, if the mentor and mentee agree that the program is beneficial, then the online mentor/mentee arrangement can become permanent. This service, which in a sense offers an introductory trial period for the mentee to test the program, could be emphasized on the website of the sponsoring organization or in its promotional materials.

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APPENDIX

Table 1: Demographics for Women Entrepreneurs and Women Non-Entrepreneurs

	<u>Women Entrepreneurs (N= 114)</u>	<u>Women Non-Entrepreneurs (N= 197)</u>
	<u>%N</u>	<u>%N</u>
<u>Age</u>		
18-34	13	40
35-44	22	20
45-54	44	21
55+	21	19
<u>Race/Ethnicity</u>		
Caucasian	80	88
Non-Caucasian	20	12
<u>Highest Level of Education</u>		
No Bachelor's Degree	25	5
Bachelor's Degree	41	40
Postgraduate or Prof. Degree	34	55
<u>Annual Household Income</u>		
\$ 0-29,999	12	18
30,000-49,999	15	12
50,000-99,999	40	39
100,000+	33	31
<u>Marital Status</u>		
Married	66	59
Separated/Divorced/Widowed	21	11
Never Married	13	30

TABLE 2: One-Way ANOVA Likelihood and Importance of Use by Age and Mentoring Related Factors for Entrepreneurial (E) and Non-Entrepreneurial (Non-E) Women

Demographic Factors	Group	Attribute	Likelihood Formal Use (LFU)		Likelihood Informal Use (LIU)		Importance of Use (IOU)		
			N	Mean	N	Mean	N	Mean	Score
<u>Online Mentoring in Past 12 Months</u>									
LFU: F(1,110)=9.89; p=.002 LIU: F(1,107)=17.48; p<.001 IOU: F(1,111)=5.66; p=.019	<u>E</u>	No	91	3.70	90	3.81	91	3.12	
		Yes	21	5.00	19	5.53	21	3.82	
LFU: F(1,190)=30.83; p<.001 LIU: F(1,189)=77.80; p<.001 IOU: F(1,192)=5.53; p=.020	<u>Non-E</u>	No	152	2.78	151	2.99	153	2.43	
		Yes	40	4.25	40	5.35	41	2.95	
<u>Organized Online Mentoring in Past 12 Months</u>									
LFU: F(1,51)=10.44; p=.002	<u>E</u>	No	37	4.03					
		Yes	16	5.69					
LIU: F(1,87)=37.21; p<.001 IOU: F(1,88)=6.29; p=.014	<u>Non-E</u>	No	71	2.93			72	2.50	
		Yes	18	5.22			18	3.33	

Table 3: Attitudinal Predictors from Regression Analysis of Likelihood and Importance of Use of Online Mentoring for Entrepreneurial (E) and Non-Entrepreneurial (Non-E) Women

Attitudinal Statement	<u>Entrepreneurial</u>			<u>Non-Entrepreneurial</u>		
	B	Std. Error	Beta	B	Std. Error	Beta
<u>Likelihood of Formal Online Mentoring Use</u>						
E: $R^2 = .21$; $F(2,94)=12.21$; $p<.001$						
Non-E: $R^2 = .17$; $F(2,168)=16.93$; $p<.001$						
I have the opportunity to be mentored online.	.56	.14	.38	.42	.10	.31
Online mentoring would help me better to solve my problems.				.45	.11	.33
I would feel comfortable providing information online.	.38	.17	.21			
<u>Likelihood of Informal Online Mentoring Use</u>						
E: $R^2 = .40$; $F(3,91)=19.79$; $p<.001$						
N-E: $R^2 = .30$; $F(4,166)=17.88$; $p<.001$						
I have the opportunity to be mentored online.	.36	.14	.25	.26	.12	.28
Being mentored online seems to be convenient.	.65	.21	.28	.43	.16	.19
I have seen how others are mentored online.				.42	.12	.28
Online mentoring would help me better to solve my problems.				.36	.15	.17
Many people are being mentored online.	.61	.19	.30			
<u>Importance of Online Mentoring Use</u>						
E: $R^2 = .19$; $F(2,95)=10.82$; $p<.001$						
N-E: $R^2 = .34$; $F(3,170)=29.76$; $p<.001$						
Online mentoring has many advantages that I can use.	.30	.13	.23	.41	.12	.26
Being mentored online is the wave of the future.				.37	.12	.23
Online mentoring would help me better to solve my problems.				.39	.11	.25
I have seen how others are mentored online.	.31	.10	.31			