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The Role of E-learning for Faculty Development in China

Abstract

While discussion on faculty development in China has been increasing in recent years, our understanding of the strategy for the development remains limited. This study with a survey aimed to examine whether e-learning could meet faculty members' expectations for their professional development. Our findings suggest that e-learning is identified as a preferred means of opening new opportunities to meet the needs of faculty in China where faculty development still remains traditional training and it has bright prospects. The result also highlights individual perspectives as a critical factor shaping e-learning behavior, and provides implications for the policy of faculty development.

Keywords: e-learning, faculty development, individual perspective, China

Introduction

Research highlights how faculty development can provide a strategic lever for ensuring institutional excellence (Sorcinelli, Austin, Eddy and Beach, 2006). There are two major means to foster the development, namely faculty learning communities (FLCs) and faculty development programs (FDPs), both of which focus on fostering faculty members' teaching ability (Light and Calkins, 2008; Ward and Selvester, 2012). However, the developmental need for faculty members is not just improving teaching skills; it has evolved over time along with the development of higher education. Sorcinelli, Austin, Eddy and Beach (2006) chronicled the shifts in faculty development by identifying Five Ages in the USA, in which each era reflects changes in the emphasis

of faculty work, and the current phase might be characterized as the Age of Network. In addition, professional development needs differ depending on career stages (Opre, Zaharie and Opre, 2008; Toth and McKey, 2010). Thus, different types of development programs might be required based on the specific needs and priorities expressed by faculty members. While these studies show various developmental needs among faculty members and reveal that the content of programs needs to be adapted to these specific needs, little is known about the strategy faculty members prefer to achieve their developmental goals in various backgrounds of higher education. This incomplete understanding of the faculty needs may lead to insufficient programs for helping them develop. For instance, in China, limited program has been built for faculty development; moreover, the academic profession focuses on research versus teaching (Li, 2002; Qu and Feng, 2009). Therefore, we should explore other learning options for faculty development.

Recently, researchers have identified e-learning as an important approach for faculty to achieve their development goals (Alexander, Perreault, Zhao and Waldman, 2009; Cook and Steinert, 2013; Huang and Hsia, 2009; Schneckenberg, 2010; Villar and Alegre, 2008), since this learning approach can balance work demands and family responsibility, and keep up with the booming of knowledge (Sherer, Shea and Kristensen, 2003), and remedy the disadvantages of current faculty development which is reactive, unattractive and expensive (Lowenthal, 2008). This trend urges us to think about the role of e-learning in faculty development in China, where available programs are limited.

In the Chinese context, research on faculty development started only in recent years. Given the high demands for the training and knowledge refreshment (Li, 2012), the pace of the programs has not caught up with the expectation of the swelling faculty body. Most of new faculty members have no background in educational pedagogies; instead, a paucity of official faculty development centers was established in higher education institutions, and few workshops and seminars were made available for faculty development (Lin and Wu, 2011). In following years, colleges and universities put more emphasis on faculty teaching preparation than before. In most cases, training activities were organized for faculty members in accord with the doctrines of educational administration departments in conjunction with higher government authorities (Mohrman, Geng, and Wang, 2011). This one-fit-all approach does not meet faculty needs well. Consequently, faculty members have had little control over the progress of their development.

Nowadays, Chinese researchers have begun to address the influence of e-learning on faculty development via networked learning community as a carrier (Huang,

2009; Wu, 2013). However, little is known about faculty members' attitude and behavior toward e-learning. There are two main approaches in exploring faculty member's use of e-learning for their professional development. One is focused on the examination of faculty participation in online distance education as instructors (Huang and Hsia, 2009; Schneckenberg, 2010). Another explores e-learning performance regarding faculty members as learners rather than instructors. A few studies have found that an online staff development course is a learning format suited for teacher development (Alexander, Perreault, Zhao and Waldman, 2009; Sherer, Shea and Kristensen, 2003; Villar and Alegre, 2008) and a valuable adjunct to other forms of learning (Cook and Steinert, 2013; Lowenthal, 2008). As noted above, faculty members mainly concern research versus teaching in China; this characteristic makes our study emphasize on a path where faculty act as learners rather than instructors. Therefore, the major issue in this study is to explore whether faculty can get opportunities to advance knowledge of teaching and research in the e-learning environment, which makes up for the lack of faculty development programs in China. Specifically, the following research questions guided this study:

1. What are faculty members' priorities of supporting their development? Is e-learning most important for them?
2. How do faculty members conduct e-learning? What do faculty members think about e-learning formats?
3. What drives faculty behavior toward e-learning use?

Theoretical Framework

Liaw, Huang and Chen (2007) stated that e-learning provided faculty members with additional learning opportunities through self-directed learning; and underscored that the effectiveness of e-learning use depended on users' attitudes. As a result, e-learning behavior was predicted and improved by individual attitudes. In addition, they constructed faculty members' e-learning attitudes from three major measurements: affective, cognitive and behavioral, which are based on the research of Liaw (2002).

More specifically, in this study, the individual attitude is constructed on the basis of perceived satisfaction (affective measurement), perceived self-efficacy and usefulness (cognitive measurement), and behavioral intention to use e-learning (behavioral measurement). Besides the attitude, demographic variables are also regarded as important predictors of faculty's e-learning behavior on the basis of the framework of Villar and Alegre (2008). This study assumes: (1) e-learning is

an important method for faculty members to develop; (2) faculty members have a positive attitude toward using e-learning; (3) e-learning use is predicted by individual attitude. The hypothesis will be tested and discussed in detail in the next section.

Methods

Measures

A survey instrument (a questionnaire) was designed to collect information for the research. The instrument was developed by review of the available literature (Opre, Zaharie, and Opre, 2008; Liaw, Huang and Chen, 2007) and 10 exploratory interviews with faculty members in China; then it was translated and screened by a 5-member panel of professors and administrators in higher education.

The questionnaire contains three sections: Faculty Development Approach (FDA), Faculty Attitude to E-learning (FAE), and Faculty Action of Using E-learning (FAUE). The FDA included 10 questions concerning respondents' preferences to support their development. They were first designed based on the available scale 'Strategies Supporting Professional Development' (SSPD) (Opre, Zaharie, and Opre, 2008), then presented to the advisory panel for interview and discussion, and finally adjusted to be suitable to the circumstance of higher education in China. The FAE includes 8 items of the attitude toward e-learning, selected and modified from the scale by Liaw, Huang and Chen (2007) and built upon the development of research questions which measure and identify some factors related to faculty attitude toward the value of e-learning. Liaw, Huang and Chen (2007) set scales of e-learning for learners and instructors separately. The scale for learners is more suitable for our study, teaching elements should be also included in the scale since faculty has the occupational attributes of teaching. Consequently, the FAE is an integration scale which combines items selected from the scales for instructors with the ones for learners. The FAUE includes 7 questions regarding experience with using e-learning. The questions were designed by researchers and verified by our panel members. In addition, the final portion of the survey also captured respondents' demographic details, including (a) gender, (b) age, (c) educational degree, and (d) rank.

All the questions in the FDA, the FAE and the FAUE are 5-point Likert scales. After validation, the questionnaire was tested for clarity by a pilot group of 20 faculty members, who were excluded from the final sample collected. Finally, the responses of the subjects were entered in SPSS to calculate the alpha coefficient in

order to determine the reliability of the questionnaire. The Cronbach Alpha coefficients for the first, second and third sections are 0.851, 0.857, 0.814 respectively, indicating that the internal consistency of the scale is acceptable.

Participants

A total of 600 faculty members in China were invited to participate in our study, working at 7 universities in the city of Changsha. This sample was stratified by gender, rank, institute type, depending on the proportion of faculty members in these 7 universities. The response rate for the survey was 71.17%. A sample of 409 was valid, where 260 participants were from comprehensive universities (63.6%) and 149 ones from research universities (36.4%). The demographic distribution of the collected data is shown in Table 1.

Table 1. Demographic variable

		n	%
Gender	Male	266	65.0
	Female	143	35.0
Rank	Asst. Professor	152	37.2
	Assoc. Professor	152	37.2
	Professor	105	25.7
Age	<= 30	40	9.8
	31-45	281	68.7
	>= 46	88	21.5
Degree	Bachelor's	43	10.5
	Master's	142	34.7
	Doctorate	224	54.8

Note: n is count,% is percentage out of 409

Data Analysis

Data were analyzed at three basic stages: (1) a descriptive stage in which the basic mean for the data of the faculty development approach survey with the FDA and e-learning behavior survey with the FAUE were described; (2) a multivariate inferential analysis stage in which the differences in faculty members' demographic variables were examined with the analysis of variance (ANOVA) and t-tests, and the predictors of faculty members' behavior toward using e-learning were identified; (3) a regression analysis stage to test the predictors of independent variables. Statistical significance was determined at the 0.01level.

Research Results

E-learning as an approach toward faculty development

Ten survey items address preferences of faculty members' development approaches. The mean results from the survey data indicate that the most popular approach is access to prestigious scientific publications ($M = 4.38$), followed by using e-learning ($M = 4.33$), and the least popular option for learning is taking short-term training classes ($M = 3.48$). Additional learning ways faculty members prefer include attending academic conferences ($M = 4.14$), designing and coordinating grants ($M = 4.14$), debating academic topics ($M = 4.12$), engaging scientific partnership with practitioners ($M = 4.09$), visiting foreign/local universities ($M = 4.04$), and using modern teaching equipment ($M = 3.96$). The least preferred option is taking further study for a degree ($M = 3.49$). Therefore, it is clearly shown that faculty members have more interest in self-education than formal training as a means of faculty development, and using e-learning is a very popular approach.

ANOVA results show differences regarding using e-learning in terms of age ($F = 11.508$, $p = 0.000$) and educational degree ($F = 10.460$, $p = 0.000$). It is concluded that younger members ($M = 6.85$ under 30) and Bachelor's degree holders ($M = 6.65$) are more interested in this approach than older members ($M = 4.11$ for the age of 31–45, $M = 3.89$ for the age over 46) and advanced degree bearers (Master's ($M = 4.13$), doctorates ($M = 4.01$)).

Faculty members' e-learning behavior

In the descriptive analysis of using e-learning actions with the FAUE scale, using search engines obtained the highest score ($M = 4.25$), and taking long-distance education obtained the lowest score ($M = 2.79$) (cf., Table 2). There are meaningful differences regarding these e-learning experiences by demographic variables: age, educational degree, and rank. ANOVAs show differences in terms of age regarding the use of BBS ($F = 10.613$, $p = 0.000$), and instant-messaging software ($F = 8.707$, $p = 0.000$); in terms of educational degree on using e-mail ($F = 6.571$, $p = 0.002$), using BBS ($F = 7.989$, $p = 0.000$), using instant-messaging software ($F = 7.506$, $p = 0.001$), taking long-distance education ($F = 7.157$, $p = 0.001$), using a professional blog ($F = 13.967$, $p = 0.000$), using online personal knowledge management ($F = 10.355$, $p = 0.005$); in terms of rank on using search engines ($F = 5.989$, $p = 0.003$), using BBS ($F = 10.992$, $p = 0.000$), using instant-messaging software ($F = 22.809$, $p = 0.000$), taking long-distance education ($F = 11.302$, $p = 0.000$), using a professional blog ($F = 16.907$, $p = 0.000$), using online personal knowledge management ($F = 7.522$, $p = 0.001$). The mean values indicate that faculty

members with lower degrees or ranks, and younger ones, use various patterns of e-learning more frequently.

Table 2. Mean of items of learning behavior

E-learning Action	Mean	SD
Using e-mail	3.70	1.148
Using instant-messaging software (msn, facebook)	3.24	1.218
Using a professional blog	3.40	1.199
Using BBS	3.11	1.115
Using search engines	4.25	1.016
Using online personal knowledge management (tag, Diigo)	3.06	1.084
Taking long-distance education	2.79	1.103

Faculty members’ e-learning attitude

Eight items were used to survey faculty members’ attitude toward e-learning with the FAE scale. Three factors emerged from factor analysis (KMO = 0.722, $p < 0.001$) (cf., Table 3): perceived satisfaction of e-learning environment, perceived self-efficacy and usefulness, and behavioral intention to use e-learning. Their mean results show that the faculty respondents appreciate self-efficacy and

Table 3. Factor loading of e-learning attitude

Item	Factor 1	Factor 2	Factor 3
I intend to gather information for teaching and research in the e-learning environment	.742	-.053	.151
I can learn actively in the e-learning environment.	.418	.112	.457
I feel confident in using e-learning in my teaching and research	.356	.452	.097
I intend to share experience and findings on teaching and research on the internet	.633	.401	.060
I intend to participate in peer-to-peer co-learning activities in the e-learning environment	.787	.178	-.123
I am satisfied with the Web-based learning environment in my institute	-.059	.079	.903
E-learning can enhance my learning motivation	.162	.816	.209
E-learning improves my teaching and research quality	-.001	.836	-.046

Extract Method: Principal Component Analysis
 Rotary process: Orthogonal study with Kaiser
 Matrix of rotation: Rotary convergence after 5 iteration

usefulness of e-learning ($M=4.28$), and they are ready to take action on using e-learning ($M=4.25$). In contrast, the faculty members are not quite satisfied with the e-learning environment in their institutes ($M=3.53$). The “confident in using e-learning in teaching and research” answer ($M=4.57$) is mostly adopted by the participants, followed by “e-learning can enhance my learning motivation” ($M=4.28$); the answer “I am satisfied with the Web-based learning environment in my institute” ($M=3.77$) is the least chosen one.

ANOVAs were performed to check the differences on 3 factors: age, education and rank. There are differences on the scores of behavioral intention by age ($F=7.433, p=0.001$), educational degree ($F=10.507, p=0.000$) and rank ($F=6.346, p=0.002$). However, there is no significant difference on the scores of perceived self-efficacy and usefulness or satisfaction of the e-learning environment among the demographical groups.

The predictors of faculty members’ e-learning

In order to explore what drives faculty members to use e-learning, a regression analysis was used to test the predictors of e-learning usage. Firstly, independent variables, including demographic variables and factors of faculty members’ e-learning attitude, were tested to identify powerful potential predictors of dependent variables. Based on whether statistical significance occurred in the Tests of Between-Subjects Effects, one demographic variable and two e-learning attitude factors were selected: age ($F=3.103, p=0.048$), and perceived self-efficacy and usefulness ($F=6.228, p=0.000$) and behavioral intention ($F=3.699, p=0.002$). Secondly, these predictors were entered into a linear regression model for analysis. Table 4 below reports the results of the regression analysis for the dependent variable of “faculty members’ behavior of using e-learning”.

Table 4. Linear regression results for dependent variable: behavior of using e-learning

		First Model	Second Model
demographic variables	Age	-1.685***	-1.058*
e-learning attitude	perceived self-efficacy and usefulness		2.172***
	behavioral intention		3.358***
F		12.438***	41.158***
R2		0.03	0.234
ΔF			53.901***
$\Delta R2$			0.204
N= 326		P<0.05*	P<0.01**
			P<0.001***

The results of the linear regression analysis reveal that both models are statistically significant. When age is the only predictor in the first demographic model ($(B) = -1.685^{***}$), the regression coefficient indicates that younger members use various patterns of e-learning more often. The age predictor remains significant, but weakens its power in subsequent models once the e-learning attitude variables are introduced ($(B) = -1.058^*$). After we stabilize demographic variables, the analysis shows that the e-learning attitude variables are significant factors for explaining faculty members' e-learning use ($\Delta F = 53.901^{***}$), the attitude contributes up to 20.4% of the total variance in the behavior of using e-learning. Specifically, the odds ratios suggest that faculty members who get higher scores on the perceived e-learning self-efficacy and usefulness more likely use e-learning for their development ($(B) = 2.172^{***}$). The extent to which faculty members' behavioral intention significantly increases the odds of their e-learning use ($(B) = 3.358^{***}$).

Discussion

This study indicates that faculty members use e-learning as a preferred approach for their professional development. Firstly, e-learning has wide appeal in China, as shown in this study. Secondly, it reveals that faculty members show more interest in self-education than classroom training as a means of their development. Self-direction is the most distinguishing characteristic of e-learning according to the measurement method in this survey. Thirdly, e-learning supports other self-directed forms of learning. For example, using internet search engines can conveniently support faculty members' access to prestigious scientific publications, which is one of the most popular approaches for faculty development. On the contrary, this study reveals that short-term training class and further study for a degree are less in demand. This finding is also confirmed by the survey results of e-learning behavior, which manifests that faculty prefer using search engines rather than taking long-distance education. Yet, training classes and seeking additional education through degree programs are the primary ways of faculty development in China. Therefore, more development opportunities should be established that align with faculty needs and interests.

Contributing to this finding is the idea of collaboration and communication in faculty development (Sorcinelli, Austin, Eddy, and Beach, 2006). Similarly, studies in China underscored the value of collaboration to faculty development (Li, 2008; Qu and Feng, 2009). At the Age of the Network of faculty development, reaching-out learning strategy is necessary in order to obtain the leading edge of information

free of the restrictions of space and time. Benefited from its flexibility and low cost, e-learning promotes communication and collaboration among faculty members. Therefore, e-learning could be found more valuable to faculty development than some traditional classroom training.

It is found in the investigation of faculty's e-learning behavior that any kind of e-learning is generally appreciated by faculty members. Yet, the building and improvement of an e-learning environment is relatively neglected by colleges and universities. As highlighted by this research, faculty members have a lower degree of satisfaction of the e-learning environment in their institutes, with no differences among gender, age, rank, educational degree groups.

Differences in e-learning attitudes and behavior are evident based on demographic variables. The data analysis has found that younger faculty and those with lower degrees or ranks express more interest in using e-learning and use various patterns of e-learning more often. These differences indicate that e-learning will be used more and have greater significance in the future with more new faculty members entering academic workforce.

The trend of e-learning use among faculty members can be predicted by the regression model. The results suggest that attitude variables are dominant predictors for positive faculty e-learning behavior, which is confirmed by the previous study of Liaw, Huang and Chen (2007). Furthermore, as the above analysis indicated, the predictors show high scores. It can be stated that e-learning is an ideal approach to faculty development and has great potential for growth and expansion. Demographic variables, including gender, educational degree, and rank, were insignificant in the first model (cf., Table 4), which is consistent with the previous study by Villar and Alegre (2008) and suggests that faculty's involvement in e-learning does not expand with the academic career ladders.

Blackburn and Lawrence (1995) developed and validated a theoretical model to explain the factors determining faculty members' behavior, in which two sets of most contributing variables were self-knowledge and social knowledge. Individual and environment factors, represented by the self-knowledge and social knowledge respectively, significantly account for explaining faculty work. The e-learning attitude items in this paper can be divided into these two sets of factors, individual and environmental. The former set consists of significant factors in e-learning behavior, including perceived self-efficacy and usefulness, and behavioral intention. The latter set indicates faculty perception of e-learning environment. A surprising finding is the insignificance of environment factors; the degree of satisfaction with learning environment does not appear to negatively affect e-learning use. The reason for this finding is not clear. Perhaps the particularity of e-learning use behavior is

a reasonable excuse. This finding, however, singles out the individual willingness as a prominent factor in faculty members' e-learning use.

Conclusions

This article focuses on e-learning as an approach for faculty development in China. The results reveal that faculty members prefer self-education to formal training; and e-learning is a key means by which they develop their profession.

The findings in this study indicate that given the status and the future of e-learning, it is practicable for colleges and universities to embed more development opportunities via electronic means to fill the gap in faculty development in China where the current setting is traditionally classroom routine and hardly meets the needs of faculty members. Faculty's individual perspective should be the most critical factor. More effort should be made to make sure that the development opportunities provided meet faculty's needs and willingness. Perhaps this is a major implication of these findings for policy and practice.

There is an implication of theory in this study. The survey results reveal that individual factors have a highly effective influence on faculty e-learning use, but the environment factors do not, which has been validated in the model of Blackburn and Lawrence (1995). This disparity may result from some intermediate factors between environment factors and e-learning behavior, such as individual willingness. Moreover, the insufficient variables for environment factors in this study partly account for the theoretically incomplete interpretation. It would be useful to suggest further empirical research to explore the issue in two steps: (1) constructing environment factors in a measurement taking into account other variables, with an expanded sample size; (2) examining if and how environment factors drive to e-learning behavior via media factors.

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