China Agricultural University Faculty Perceptions about Barriers to Diffusion of Web-Based Distance Education

Yan Li
Department of Education
Zhejiang University
Department of Education, Zhejiang University
P.R. China, Zhejiang Province
Hangzhou City, Tian Mu San Rd. #148, 310028
Brillian_li@hotmail.com

James R. Lindner
Texas A & M University

Abstract

The purpose of this study was to investigate China Agricultural University faculty perceptions about barriers to diffusion of Web-based distance education (WBDE). Rogers’ (2003) diffusion of innovation theory served as the theoretical base for the study. Quantitative research was employed and the research design was descriptive in nature. Results of data analysis found that respondents tended to perceive WBDE program credibility, administrative support, planning issues, technical expertise, financial concerns, concerns about time, concerns about incentives, infrastructure, conflict with traditional education, and fear of technology as moderate barriers to diffusion of WBDE. Age, level of education, academic rank, teaching experience, and distance education experience had no significant influence on faculty perceptions about the ten barriers to diffusion of WBDE. Professional area and gender had no significant influence on faculty perceptions about nine of the ten barriers. They, however, had significant impacts on faculty perceptions about concerns about time as a barrier.
Web-based distance education (WBDE), as a state-of-the-art educational innovation, diffused rapidly worldwide in the last decade. It was introduced into China Agricultural University (CAU) in 2001 and at the end of 2003, there were about 70 faculty and nine majors involved in the WBDE program. Studies about WBDE indicate that increased availability of distance education technologies and WBDE programs do not automatically result in effective adoption by educators and learners. This is due, in part, to the fact that teaching and learning in WBDE programs differs dramatically from that in a traditional classroom (the Boyer Commission, 1998). Further compounding this problem is that lack of overall faculty support for and interest in distance education (Olcott & Wright, 1995). Faculty resistance to distance education programs and courses has been consistently identified as a barrier (Moore, 1994; Moore & Kearsley, 1996; Olcott & Wright, 1995).

To explore faculty perceptions about WBDE program, especially those barriers to diffusion of WBDE, is important because faculty were seen as a core factor in the transformation from traditional education method to distance teaching methods (Moore & Kearsley, 1996; Olcott & Wright, 1995). As Miller and Shih (1999, p. 55) mentioned, “It is ultimately the faculty who will be responsible for delivering qualified off-campus instruction. Faculty cannot be expected to do this successfully without support, however…faculty are key stakeholders in the educational enterprise, and their concerns about off-campus courses must be addressed if off-campus degree programs are to be of high quality.”

Theoretical Framework

The theoretical underpinnings of this study are based on Roger’s (2003) Diffusion of Innovations model and bounded by Muilenburg and Berge’s (2001) research on barriers to distance education. Research on faculty perceptions about barriers to diffusion of WBDE have uncovered the following faculty concerns: (1) lack of time; (2) interactions between and among faculty and students; (3) competencies to prepare and deliver curricular materials at a distance; (4) poor recognition and reward systems; and (5) lack of resources (Murphrey & Dooley, 2000; Wolcott, 1996; Rockwell, Schauer, Fritz, & Marx, 1999). Murphrey and Dooley (2000) summarized some other perceived weakness and threats influencing diffusion of distance education technologies. The weaknesses included: (1) limited incentives, development support, and funding; (2) limited knowledge regarding copyright and intellectual property; (3) weak communication channels; (4) slow action on critical issues; (5) lack of competence to develop and deliver distance education courses; and (6) loss of interaction. The threats included: (1) career and job security; (2) competition from private and public institutions; (3) dependence on others for technical support; (4) quality measurement issues; (5) using old models to develop new policies; (6) misinformation on the Internet.

Lack of time for planning and developing distance education program has been shown to be a reoccurring concern for faculty in developing Web-based courses (Betts, 1998; Clark, 1993; Olcott & Wright, 1995; Schifter, 2000). Rockwell, Schauer, Fritz, and Marx (1999) found lack of time and training as the biggest obstacles to adopting WBDE. Carl (1991) concluded that some educators resisted distance teaching because they were concerned that distance courses would significantly increase their workload and distance teaching may require more time for advanced planning and class enrollments may increase
significantly. Murphy (1998) noted that faculty teaching at a distance may need a reduction in teaching load to accommodate the additional responsibilities associated with teaching at a distance.

Inadequate compensation and recognition for distance educators have consistently been identified as inhibitors for potential adopters of WBDE (Edwards & Minich, 1998; Johnson & DeSpain, 2001). Research has shown that inadequate compensation and recognition, however, may not be as important as intrinsic motivators in getting faculty involved in online education than extrinsic motivations (Betts, 1998; Fredericksen, Pickett, Shea, Pelz, & Swan, 2000; Schifter, 2000, 2002; Wolcott, 2001).

Credibility of WBDE program was perceived as another barrier inhibiting WBDE. Born and Miller (1999) found faculty members’ greatest concerns about WBDE were the effectiveness of interactions and the overall quality of a Web-based degree. Although a lot of research focusing on the comparison of traditional on-campus education programs and distance education programs indicated no significant difference in learning outcomes (Lockee, Burton, & Cross, 1999; Navarro & Shoemaker, 2000; Murphy, 1997; Russell, 1999), distance courses are often stereotyped as being of lower quality and subsequently less value than traditional courses (Miller & Shih, 1999; Murphy, 1997; Olcott & Wright, 1995; Wolcott, 1996). Miller and Shih's (1999, p 57.) study about faculty assessment of the academic rigor of on- and off-campus courses concluded that teaching faculty in Colleges of Agriculture “perceived off-campus courses to be less rigorous than on-campus courses” and such perceptions “were independent of their participation in faculty development programs related to distance education and their experience with distance teaching.”

In China, access to and quality of technology was cited frequently as a barrier to diffusion WBDE (Ding, 2002; Edwards, Zou, Cragg, & Song, 2000; Potter, 2003). Potter (2003) noted additional areas that also challenged China’s WBDE development: (1) management of learning centers; (2) training of faculty; and (3) student graduation rates. Edwards, Zou, Cragg, and Song (2000) identified five other problems facing Chinese WBDE: (1) nonstandardized teaching platforms; (2) lack of standardized policies and procedures; (3) lack of financial resources; (4) limited technical support; (5) student assessment techniques; and (6) limited course offerings.

Purpose

The purpose of this study was to investigate China Agricultural University faculty perceptions about barriers to diffusion of WBDE. Specific objectives were:

- To describe faculty according to their perceptions about barriers to diffusion of WBDE; and
- To examine the relationship between faculty members’ personal characteristics and their perceptions about the ten barriers to diffusion of WBDE.

Methods

The research presented in this paper is part of a larger study being conducted to determine faculty perceptions about attributes and barriers impacting diffusion of Web-based distance education (WBDE) at the China Agricultural University (Li, 2004). The target
population for this study were faculty at the China Agricultural University ($N=1170$). Among the 1170 faculty, about 70 faculty were participating in WBDE programs and 1100 faculty were not currently involved in WBDE programs. Random and stratified sampling was used for the study (Gall, Gall, & Borg, 2003). The sample number was derived by using the table of “Determining Sample Size for Research Activities” (Krejcie & Morgan, 1970). Fifty faculty who were involved in WBDE programs and 250 faculty who were not involved in WBDE programs were randomly drawn from across the China Agricultural University. A usable response rate of 91% ($n=273$) was obtained for the study. To control for nonresponse error, late responses (last 50% received) were compared to early responses (first 50% received) on faculty perceptions about attributes of WBDE. No significant differences were found, therefore the results of this study can be generalized to the target population (Lindner, Murphy, & Briers, 2001).

To assess the magnitude of statistical differences, effect sizes were calculated, interpreted, and reported (Cohen, 1988). Interpretations for t-tests were based on the Cohen Conversion: negligible size, $d<0.20$; small effect size, $0.50>d\geq0.20$; medium effect size, $0.80>d\geq0.50$; and large effect size, $d\geq0.80$. Interpretations for ANOVA were based on the Cohen Conversion: negligible size, $f<0.10$; small effect size, $0.25>f\geq0.10$; medium effect size, $0.40>f\geq0.25$; and large effect size, $f\geq0.40$.

The research instrument was designed to measure participants' perceptions about barriers to diffusion of WBDE. Based on Muilenburg and Berge’s (2001) study about barriers to distance education, ten barriers were summarized as the major barriers to current diffusion of WBDE: concerns about time, concerns about incentives, WBDE program credibility, financial concerns, planning issues, fear of technology, conflict with traditional education, technical expertise, administrative support, and infrastructure. Participants were asked to indicate their perceptions about each of the ten barriers by responding to four statements on a five point Likert-type scale. Content and face validity of the instrument was established by a panel of experts consisting of faculty (at both American and Chinese institutions of higher education) who have expertise in adoption/diffusion research. Reliability for the scales were estimated by calculated a Cronbach’s alpha coefficient on pilot study data. Reliability for the scales ranged from .70 to .94.

### Results

Participants ($N=273$) from twelve different colleges were randomly selected to participate in the study. Among them, 179 (65.6%) were male and 94 (34.4%) were female. Their average age was 38 (range=23-66). More than half of the participants (57.4%) had a doctoral degree, 26% had a master’s degree, and 16.6% had a bachelor’s degree. About half of respondents (50.5%) were associate professors, 26.4% were professors, and 23.1% were teaching faculty with other titles. The average years of teaching is 11 (range=1-40). More than one quarter of the respondents (28.7%) indicated they had distance education experience at least in one of the three distance education programs: WBDE program, TV and broadcasting education program, or correspondence education program.

Participants’ perceptions about each of the ten possible barriers to diffusion of WBDE were measured by four statements. As Table 1 shows, overall, the means and standard deviations for the ten perceived barriers to diffusion of WBDE were: concerns about time,
Table 1

Faculty Perceptions about Barriers to Diffusion of WBDE (N=273)

<table>
<thead>
<tr>
<th>Perceived Barriers to Diffusion of WBDE</th>
<th>M</th>
<th>SD</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBDE Program Credibility</td>
<td>3.14</td>
<td>1.02</td>
<td>Moderate</td>
</tr>
<tr>
<td>Administrative Support</td>
<td>2.94</td>
<td>0.84</td>
<td>Moderate</td>
</tr>
<tr>
<td>Planning Issues</td>
<td>2.90</td>
<td>0.95</td>
<td>Moderate</td>
</tr>
<tr>
<td>Technical Expertise</td>
<td>2.88</td>
<td>0.99</td>
<td>Moderate</td>
</tr>
<tr>
<td>Financial Concerns</td>
<td>2.87</td>
<td>0.88</td>
<td>Moderate</td>
</tr>
<tr>
<td>Concerns about Time</td>
<td>2.84</td>
<td>1.04</td>
<td>Moderate</td>
</tr>
<tr>
<td>Concerns about Incentives</td>
<td>2.75</td>
<td>0.94</td>
<td>Moderate</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>2.70</td>
<td>0.96</td>
<td>Moderate</td>
</tr>
<tr>
<td>Conflict with Traditional Education</td>
<td>2.58</td>
<td>0.91</td>
<td>Moderate</td>
</tr>
<tr>
<td>Fear of Technology</td>
<td>2.57</td>
<td>0.93</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Note: 1=No Barrier, 2=Weak Barrier, 3=Moderate Barrier, 4=Strong Barrier, 5=Very Strong Barrier

As Table 2 shows, CAU faculty perceptions about concerns about time as a barrier to diffusion of WBDE differed significantly by professional area, $F(11, 258)=1.89, p<0.05$. A medium effect size ($f=0.28$) was found. Faculty from the College of Humanities and Social Science, College of Resource and Environment, College of Economics and Management, College of Animal Science and Technology, College of Water Conservancy and Civil Engineering, College of Engineering, College of Agronomy and Biotechnology, College of Electronic and Electric Engineering, and College of Food Science and Nutrition tended to perceive concerns about time as a moderate barrier. Faculty from the College of Basic Science and Technology and College of Veterinary Medicine tended to perceive concerns about time as a weak barrier.

CAU faculty perceptions about the remaining nine barriers did not differ by professional area. CAU faculty perceptions about concerns about incentives as a barrier did not differ by professional area, $F(11, 258)=1.14, p>0.05$. A small effect size ($f=0.22$) was found. Faculty perceptions about WBDE program credibility as a barrier did not differ by professional area, $F(11, 258)=1.01, p>0.05$. A small effect size ($f=0.21$) was found. Faculty perceptions about financial concerns as a barrier did not differ by professional area, $F(11, 252)=0.97, p>0.05$. A small effect size ($f=0.21$) was found. Faculty perceptions about planning issues as a barrier did not differ by professional area, $F(11, 258)=1.57, p>0.05$. A medium effect size ($f=0.26$) was found. Faculty perceptions about fear of technology as a barrier did not differ by professional area, $F(11, 260)=0.70, p>0.05$. A small effect size ($f=0.17$) was found. Faculty perceptions about conflict with traditional education as a barrier did not differ by
professional area, $F(11, 260)=1.69, p>0.05$. A medium effect size ($f=0.27$) was found. Faculty perceptions about technical expertise as a barrier did not differ by professional area, $F(11, 259)=1.34, p>0.05$. A small effect size ($f=0.24$) was found. Faculty perceptions about administrative support as a barrier did not differ by professional area, $F(11, 258)=1.21, p>0.05$. A small effect size ($f=0.23$) was found. Faculty perceptions about infrastructure as a barrier did not differ by professional area, $F(11,160)=1.26, p>0.05$. A small effect size ($f=0.23$) was found.

Table 2

<table>
<thead>
<tr>
<th>Participating CAU Faculty Perceptions about Concerns about Time as a Barrier to Diffusion of WBDE by Professional Area (N=273)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concerns about Time</td>
</tr>
<tr>
<td>Professional Area</td>
</tr>
<tr>
<td>Humanities and Social Science</td>
</tr>
<tr>
<td>Resource and Environment</td>
</tr>
<tr>
<td>Economics and Management</td>
</tr>
<tr>
<td>Animal Science and Technology</td>
</tr>
<tr>
<td>Water Conservancy and Civil Engineering</td>
</tr>
<tr>
<td>Engineering</td>
</tr>
<tr>
<td>Agronomy and Biotechnology</td>
</tr>
<tr>
<td>Biological Science</td>
</tr>
<tr>
<td>Electronic and Electric Engineering</td>
</tr>
<tr>
<td>Food Science and Nutrition Engineering</td>
</tr>
<tr>
<td>Basic Science and Technology</td>
</tr>
<tr>
<td>Veterinary Medicine</td>
</tr>
</tbody>
</table>

Note: 1=No Barrier, 2=Weak Barrier, 3=Moderate Barrier, 4=Strong Barrier, 5=Very Strong Barrier

As Table 4 shows, faculty perceptions about concerns about time as a barrier differed significantly by gender, $t(269)=2.68, p<0.05$. A small effect size ($d=0.34$) was found. Male faculty tended to perceive concerns about time as a moderate barrier more than female faculty. Faculty perceptions about concerns about incentives as a barrier to diffusion of WBDE did not differ by gender, $t(269)=1.20, p>0.05$. A negligible effect size ($d=0.15$) was found. Faculty perceptions about WBDE program credibility as a barrier did not differ by gender, $t(263)=0.52, p>0.05$. A negligible effect size ($d=0.07$) was found. Faculty perceptions about financial concerns as a barrier did not differ by gender, $t(263)=0.49, p>0.05$. A negligible effect size ($d=0.07$) was found. Faculty perceptions about planning issues as a barrier did not differ by gender, $t(269)=0.08, p>0.05$. A negligible effect size ($d=0.09$) was found. Faculty perceptions about fear of technology as a barrier did not differ by gender, $t(271)=0.55, p>0.05$. A negligible effect size ($d=0.06$) was found. Faculty perceptions about conflict with traditional education as a barrier did not differ by gender, $t(271)=0.21, p>0.05$. A negligible effect size ($d=0.02$) was found. Faculty perceptions about technical expertise as a barrier did not differ by gender, $t(270)=0.92, p>0.05$. A negligible effect size ($d=0.11$) was found. Faculty perceptions about administrative support as a barrier did not differ by gender, $t(269)=0.24, p>0.05$. A negligible effect size ($d=0.02$) was found. Faculty perceptions about infrastructure as a barrier did not differ by gender, $t(271)=0.81, p>0.05$. A negligible effect size ($d=0.10$) was found.
Faculty perceptions about concerns about time as a barrier did not differ by level of education, $F(2, 260)=0.66$, $p>0.05$. A negligible effect size ($f=0.07$) was found. Faculty perceptions about concerns about incentives as a barrier did not differ by level of education, $F(2, 260)=0.35$, $p>0.05$. A negligible effect size ($f=0.05$) was found. Faculty perceptions about WBDE program credibility as a barrier did not differ by level of education, $F(2, 260)=2.13$, $p>0.05$. A small effect size ($f=0.13$) was found. Faculty perceptions about financial concerns as a barrier did not differ by level of education, $F(2, 255)=1.49$, $p>0.05$. A small effect size ($f=0.13$) was found. Faculty perceptions about planning issues as a barrier did not differ by level of education, $F(2, 262)=0.40$, $p>0.05$. A negligible effect size ($f=0.05$) was found. Faculty perceptions about fear of technology as a barrier did not differ by level of education, $F(2, 261)=0.79$, $p>0.05$. A negligible effect size ($f=0.08$) was found. Faculty perceptions about conflict with traditional education as a barrier did not differ by level of education, $F(2, 261)=0.36$, $p>0.05$. A negligible effect size ($f=0.05$) was found. Faculty perceptions about administrative support as a barrier did not differ by level of education, $F(2, 260)=0.83$, $p>0.05$. A negligible effect size ($f=0.08$) was found. Faculty perceptions about infrastructure as a barrier did not differ by level of education, $F(2, 262)=0.30$, $p>0.05$. A negligible effect size ($f=0.05$) was found.

Faculty perceptions about concerns about time as a barrier did not differ by academic rank, $F(2, 268)=0.20$, $p>0.05$. A negligible effect size ($f=0.04$) was found. Faculty perceptions about concerns about incentives as a barrier did not differ by academic rank, $F(2, 268)=0.35$, $p>0.05$. A negligible effect size ($f=0.05$) was found. Faculty perceptions about WBDE program credibility as a barrier did not differ by academic rank, $F(2, 268)=1.22$, $p>0.05$. A small effect size ($f=0.10$) was found. Faculty perceptions about financial concerns as a barrier did not differ by academic rank, $F(2, 262)=1.68$, $p>0.05$. A small effect size ($f=0.11$) was found. Faculty perceptions about planning issues as a barrier did not differ by academic rank, $F(2, 268)=0.46$, $p>0.05$. A negligible effect size ($f=0.06$) was found. Faculty perceptions about conflict with traditional education as a barrier did not differ by academic rank, $F(2, 270)=2.33$, $p>0.05$. A small effect size ($f=0.13$) was found. Faculty perceptions about planning issues as a barrier did not differ by academic rank, $F(2, 268)=1.17$, $p>0.05$. A small effect size ($f=0.09$) was found. Faculty perceptions about conflict with traditional education as a barrier did not differ by academic rank, $F(2, 270)=0.78$, $p>0.05$. A negligible effect size ($f=0.08$) was found. Faculty perceptions about technical expertise as a barrier did not differ by academic rank, $F(2, 269)=0.63$, $p>0.05$. A negligible effect size ($f=0.07$) was found. Faculty perceptions about administrative support as a barrier did not differ by academic rank, $F(2, 268)=0.46$, $p>0.05$. A small effect size ($f=0.09$) was found. Faculty perceptions about infrastructure as a barrier did not differ by academic rank, $F(2, 270)=0.04$, $p>0.05$. A negligible effect size ($f=0.02$) was found. Faculty perceptions about concerns about time as a barrier to diffusion of WBDE did
not differ by teaching experience, $F(4, 250)=0.96$, $p>0.05$. A small effect size ($f=0.12$) was found. Faculty perceptions about concerns about incentives as a barrier did not differ by teaching experience, $F(4, 251)=0.24$, $p>0.05$. A negligible effect size ($f=0.06$) was found. Faculty perceptions about WBDE program credibility as a barrier did not differ by teaching experience, $F(4, 250)=0.16$, $p>0.05$. A negligible effect size ($f=0.05$) was found. Faculty perceptions about financial concerns as a barrier did not differ by teaching experience, $F(4, 244)=0.70$, $p>0.05$. A small effect size ($f=0.11$) was found. Faculty perceptions about planning issues as a barrier did not differ by teaching experience, $F(4, 250)=0.24$, $p>0.05$. A negligible effect size ($f=0.06$) was found. Faculty perceptions about fear of technology as a barrier did not differ by teaching experience, $F(4, 252)=0.75$, $p>0.05$. A small effect size ($f=0.11$) was found. Faculty perceptions about conflict with traditional education as a barrier did not differ by teaching experience, $F(4, 252)=0.09$, $p>0.05$. A negligible effect size ($f=0.04$) was found. Faculty perceptions about technical expertise as a barrier did not differ by teaching experience, $F(4, 251)=0.74$, $p>0.05$. A small effect size ($f=0.11$) was found. Faculty perceptions about administrative support as a barrier did not differ by teaching experience, $F(4, 251)=0.66$, $p>0.05$. A small effect size ($f=0.10$) was found. Faculty perceptions about infrastructure as a barrier did not differ by teaching experience, $F(4, 252)=0.39$, $p>0.05$. A negligible effect size ($f=0.08$) was found.

Faculty perceptions about concerns about time as a barrier did not differ by distance education experience, $t(268)=0.88$, $p>0.05$. A negligible effect size ($d=0.11$) was found. Faculty perceptions about concerns about incentives as a barrier did not differ by distance education experience, $t(268)=0.16$, $p>0.05$. A negligible effect size ($d=0.02$) was found. Faculty perceptions about WBDE program credibility as a barrier did not differ by distance education experience, $t(268)=0.13$, $p>0.05$. A negligible effect size ($d=0.01$) was found. Faculty perceptions about financial concerns as a barrier did not differ by distance education experience, $t(263)=1.20$, $p>0.05$. A negligible effect size ($d=0.16$) was found. Faculty perceptions about planning issues as a barrier did not differ by distance education experience, $t(268)=0.72$, $p>0.05$. A negligible effect size ($d=0.09$) was found. Faculty perceptions about fear of technology as a barrier did not differ by distance education experience, $t(270)=1.20$, $p>0.05$. A negligible effect size ($d=0.16$) was found. Faculty perceptions about conflict with traditional education as a barrier did not differ by distance education experience, $t(270)=1.90$, $p>0.05$. A small effect size ($d=0.24$) was found. Faculty perceptions about technical expertise as a barrier did not differ by distance education experience, $t(269)=0.53$, $p>0.05$. A negligible effect size ($d=0.07$) was found. Faculty perceptions about administrative support as a barrier did not differ by distance education experience, $t(268)=0.34$, $p>0.05$. A negligible effect size ($d=0.05$) was found. Faculty perceptions about infrastructure as a barrier did not differ by distance education experience, $t(270)=0.39$, $p>0.05$. A negligible effect size ($d=0.05$) was found.

**Conclusions and Educational Importance**

All of the listed ten barriers to diffusion of WBDE were perceived as moderate barriers by China Agricultural University faculty. WBDE program credibility was perceived by CAU faculty as the biggest concern. Concerns about incentives, infrastructure, conflict with traditional education, and fear of technology were seen as the least concern of the ten barriers. To ensure CAU’s WBDE program is successful, in helping China to increase
student access to higher education, information about barriers to its adoption and diffusion may help administrators and faculty to understand better how to modify and implement WBDE programs.

Further studies are needed to investigate (1) why age, academic rank, and distance education experience would significantly influence faculty perceptions about inhibiting factors for participating in distance education in Schifter’s (2000) study while they did not have significant influence on faculty perceptions about the ten barriers to diffusion of WBDE at the China Agricultural University; (2) why faculty from different professional areas perceive time in WBDE differently; and (3) why male faculty would see time concerns as a more moderate barrier to WBDE.

Most CAU faculty felt copyright/fair use issues in using materials in WBDE was a moderate, strong or very strong barrier. This result supports Edwards and Minich’s (1998), and Johnson & DeSpain’s (2001) findings, which also concluded that faculty concerned about intellectual property of online courses. This study also found lack of support or encouragement from administrators and difficulties in recruiting faculty and students might be a moderate barrier.

The finding implicates that lack of identified needs, shared vision, and strategic planning for WBDE were looked as challenges to diffusion of WBDE at the China Agricultural University. Rogers (2003) identified that felt needs and innovativeness were crucial prior conditions for one’s innovation adoption behavior. China Agricultural University needs a shared vision about university development and efforts are also needed to investigate whether or not WBDE could be a strategy for the university’s future development. Leadership and policy-makers’ vision would be important for planning strategy, however, faculty members also need to be encouraged to plan WBDE in his/her own vision.

The majority of CAU faculty found that lack of knowledge, lack of training programs, and lack of ‘right’ person to implement were problems for them. The findings are similar to the results of several previous studies (Dooley & Murphy, 2001; Kotrlik, Redmann, Harrison, & Harndley, 2000; Murphy, 1998). This finding supported Potter’s (2003) and Ding’s (2002) viewpoint about lack of technical support and lack specific trainings related to WBDE as barriers to WBDE in China.

The findings implicate that economic analysis are needed to study what are the benefits for investment of WBDE by University or by the Ministry of Education or the Ministry of Agriculture. Policy-makers in university as well as in the Ministry of Education and the Ministry of Agriculture need to be informed about the outcomes of such economic analysis to help them make development strategy and allocate financial resources.

More time is needed for CAU faculty to develop online course and to communicate with distance students. Murphy (1998) recommended that adjustment of workload for faculty involved in WBDE and recognition of faculty members’ additional time and efforts in WBDE would decrease faculty members’ concerns about time. Findings of the study implicate that workload adjustment and recognition of extra time and effort are also needed for potential adopters of WBDE at the China Agricultural University.
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