

# Challenges of e-Learning for University Instructors in Taiwan

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**Abstract:** Blended courses that include both face-to-face and e-learning have been offered in many universities in Taiwan but very little research has been undertaken on instructor perspectives of the challenges they faced in their e-learning teaching. This paper explores the challenges faced by university instructors in a national research-based university in Taiwan. An interpretive paradigm utilizing qualitative and quantitative methods was adopted. The paper outlines the findings from 27 e-learning instructors in in-depth interviews and 55 of 69 e-learning instructors who responded to this open-ended question in the questionnaire. Instructors noted they faced pedagogical, personal, and technological challenges. The findings suggested instructors needed to adopt different pedagogical approaches to work with new media in developing their e-learning courses so new curriculum design, new teaching methods, new ways of assessment, and new interaction approaches were needed. The instructors faced personal challenges in time management and role change if they needed to provide course materials online and respond in time. Instructors noted they also encountered four categories of technological challenges: easy access to necessary computer equipment, technical skills to access computer technology and the e-learning system, technical skills for communication, and the quality of e-learning computer facilities and technology. University administrators interested in solving the issue of the under-use of e-learning would be wise to recognize the challenges instructors face and to provide the necessary policy and practical support to help overcome these challenges if they wish to promote the use of e-learning as a part of the blended delivery of courses.

**Keywords:** e-learning, blended learning, university instructors, challenges

## Introduction

E-learning has altered, and will continue to affect teaching and learning contexts in tertiary education [1][2]. Blended courses that include face-to-face and e-learning have been offered in universities in Taiwan but very little research has been undertaken on university instructor perceptions of the challenges involved in e-learning as part of blended learning courses. The Taiwan government has built up a good ICT infrastructure and encouraged universities to develop e-learning systems but a majority of instructors still resist the use of e-learning regardless of its suggested benefits [3]. This leads to questions about instructor perspectives and expectations of e-learning and the reasons why very few instructors use e-learning. This paper outlines the findings from interviews with 27 e-learning instructors and an open-ended survey to 55 e-learning instructors at the National Research University (NRU, a pseudonym). These voluntary e-learning instructors were asked about their perceptions and experiences of e-learning and their perceptions of the challenges they faced in their e-learning teaching.

## Background literature and research design

Much literature has suggested e-learning has the potential benefits to increase institutional reputations and improve the quality of teaching and learning [4][5]. However, when instructors teach through e-learning they face multiple challenges such as the need for skills to work with new media, a lack of reliable technological infrastructure and support services, and the need for different pedagogical approaches [6][7]. Few articles discuss the views and experiences of instructors who teach on e-learning courses in Taiwan. Why some instructors use e-learning and others do not is of interest because instructors are key people who put the technology and learning objects into practice [8][9]. Previous studies suggest that some instructors prefer face-to-face instruction to e-teaching because it provides for greater interpersonal contact. Research has also identified instructor concerns about recognition and administrative support [6][10]; teaching online is not always highly valued or rewarded in tenure and promotion decisions [11][12]. Taken together, these studies suggest that the motivating and inhibiting factors for instructor e-learning use may be both personal and to do with the context of university policy along with technological and pedagogical factors [9][13]. In this paper we elaborate on university instructor perspectives of the pedagogical, personal challenges, and the technological aspects of the setting for their engagement in e-learning.

An interpretive paradigm utilizing quantitative and qualitative methods was adopted to gain rich data on instructor perspectives of the challenges they faced in their e-learning teaching [14]. The 150 instructors who used “Networking Teaching and Learning System” at NRU were asked to respond a questionnaire on aspects of their use of e-learning. Simultaneously, the questionnaire respondents were asked if they were prepared to be interviewed. The data for this paper is from 27 e-learning instructor interviews and from 55 of the 69 e-learning instructors who responded to the questionnaire. The instructor volunteers came from different departments within a number of different colleges at NRU. The questionnaire included an open question on perceptions of challenges. The same questions were asked of each instructor but because the interviews were semi-structured not all instructors discussed the questions in the same depth. The interviews were conducted and transcribed in Mandarin and then translated into English. In order to ensure the veracity of this translation, two colleagues who knew both Mandarin and English verified the transcripts of a sample of the interviews. The qualitative comparative method was used to analyze the transcripts [15][16]. Based on respondents’ descriptions and the literature, nine sub-categories were synthesized from questionnaires and interviews. The researcher read all the transcripts and manually highlighted the quotes that fitted into the categories. Some responses were counted in two or more categories. Three dominant categories that had been developed from the literature were grouped from those nine sub-categories.

## The Findings

Table 1 below summarized the responses from the questionnaires and interviews. Three dominant categories pedagogy, personal, and technology are described below. The first dominant category is pedagogy which included new curriculum design, new teaching methods, new assessment of student learning outcomes, and new ways of interaction. The second is personal challenges which indicated all personal related issues such as personal time management and role change. The third category is technology category which

included familiarity with new technology and any technical problems faced such as network bandwidth, computer storage and computer facilities and technology operation.

Table 1  
*Frequencies of perceived challenges faced by instructors*

| Category   | Challenges for the instructors | Questionnaire |         | Interview |         |
|------------|--------------------------------|---------------|---------|-----------|---------|
|            |                                | N1 (=55)      | % of N1 | N2 (=27)  | % of N2 |
| Pedagogy   | New curriculum design          | 35            | 64%     | 22        | 81%     |
|            | New teaching methods           | 28            | 51%     | 20        | 74%     |
|            | New assessments                | 19            | 35%     | 14        | 52%     |
|            | New interactions               | 13            | 24%     | 13        | 48%     |
| Personal   | Time management                | 7             | 13%     | 23        | 85%     |
|            | Role change                    | 7             | 13%     | 7         | 26%     |
| Technology | Required technology            | 7             | 13%     | 6         | 22%     |
|            | Technical skills               | 6             | 11%     | 13        | 48%     |
| Other      | Other comments                 | 5             | 9%      | 8         | 30%     |

## 1. Pedagogical challenges

This category included new curriculum design, new teaching methods, new ways of assessment, and new interaction approaches. When respondent instructors were asked to identify the challenges they faced in their e-learning teaching, a majority of instructors from questionnaire and interviews reported pedagogical challenges they faced most as being new curriculum design (64% and 81%), and new teaching methods (51% and 74%). The respondents noted they needed to provide various types of e-content online so they had to learn new curriculum design and new teaching methods for their e-learning courses. They noted different course attributes would also challenge their use of e-learning because they felt not all the courses were suitable to teach in e-learning. A science e-learning instructor said, "Some science laboratory courses are hard to design in e-learning and it is better to let students learn by 'doing'" (SeiCi.4.2.4). Another science e-learning instructor said, "It takes me much time and effort to type all formulae or symbols online especially for science courses. Some instructors feel it is hard for them" (SeiEi.5.2.1). Non-science e-learning instructor P reiterated that the course attributes influence their use of e-learning, "The computer programming courses are not appropriate to be developed in e-learning because IT changes very fast. Often I just complete developing a course this semester, but I cannot re-use it for next semester or next year because a new version of computer programming language is announced" (NSeiPi.3.5.2). Moreover, the instructors also indicated they faced many challenges while they were required to video-record their lessons and they needed to prepare well in advance to design their course curriculum.

Some instructors (35% and 52%) noted new ways of assessment was a pedagogical challenge they faced in e-learning teaching. Instructors noted the ways of assessment of student learning outcomes were different from those in F2F instruction and they had difficulties in typing all formulae or symbols in online assignments or tests. Non-science e-learning instructor S noted this difficulty, "I have many formulae derivations needed in my 'Economics' courses and it is hard for me to design and type them online. I am afraid my students also have this problem, especially in online tests or assignments" (NSeiSi.5.1.4). They noted they also worried about the unfairness of assessments in their online assignments or tests because many online cheatings have easily been made by some students who used 'cut and paste' method to copy peer's answers online.

Not many instructors (24% and 48%) noted the new interaction approach was a pedagogical challenge they faced in e-learning teaching. Science e-learning instructor F said,

“Instructors need to adopt different pedagogical approaches developed to work with new media in the e-learning courses. It was hard for me because I do not know how to design and support students in synchronous and or asynchronous interactions” (SeiFi.6.3.9). This implied the instructors also faced the anxiety of computer technology use in e-learning. Instructors needed to learn how to design, support, guide and interact with the students and usually they needed to spend much time and effort to respond in time. The instructors said they faced the problem of timely responses in their interaction. A non-science e-learning instructor said, “I often spend one or two hours per day to reply student email and respond in Q and A and online discussion. If I do not have time to respond to them immediately, I let my student assistant help me to respond online” (NSeiGi.5.3.7). The respondent instructors noted that they and their students faced different demands in communication methods and quality. Some missed being able to monitor facial expressions and voice tone. Others had difficulty including figures, formulae and symbols in their contributions to online discussions. Some comments were:

*In e-learning interaction or discussion, we can only communicate by using words but no facial expressions or body or tone language. I feel it is hard to present the abstract concept especially in my science courses. I often use my fingers to show the rotations of some ‘Chemistry’ elements. (SeiCi.4.6.1)*

*When I ask questions or discuss with students online, it is difficult to express my questions or ideas clearly, especially for mathematical formulae derivations or science symbols or figures. (SeiEi.5.2.6)*

Thus, the instructors needed to be supported by the university to overcome their pedagogical challenges in their e-learning teaching. Science e-learning instructor B remarked, “The University needs to provide more support services to help instructors in their development of e-learning courses such as providing seminars for new instructional design or new teaching approaches and so on” (SeiBi.6.2.1).

## 2. Personal challenges

Personal challenges are about the problems instructors faced in using the e-learning system and/or developing e-learning course materials. These included their time management and role change. Over four fifths (85%) of interviewees reported they faced the challenge of time management. They said when the instructor had an e-learning course, how to manage his/her time schedule becomes a big problem if he/she needs to respond to the students’ questions online and immediately. They noted that usually in a face-to-face class they can answer the questions in class or after class or by help from the teaching assistant. A science e-learning instructor highlighted this:

*We often need to spend double or triple time in developing an e-course than F2F instruction and we need to guide or support students in their e-learning activities such as providing guidance in online discussion or helping them solve the technology problems. This is a big challenge for the instructors in their time management because they also need to do their research. (SeiAi.5.3.2)*

The instructors indicated they had a time management problem in providing course materials online. A science e-learning instructor commented on this:

*E-learning courses have their time efficiency problems. Usually I need to put my video on the system soon after class because the students wait to review it. In addition, the course materials must be prepared well and put on the system before class. To complete all this work in a certain time period I must spend much time. Sometimes I have troubles in my time management. (SeiBi.3.2.6)*

The general perception was that e-learning courses required a greater investment of time and effort in both setting up and monitoring ongoing involvement. A typical comment, from science e-learning instructor B is:

*The reality is that the instructors do not think they need to spend more time and effort to develop their courses in e-learning although they know they will be overloaded in the beginning but will reduce their teaching load later on. They do not have much time and capability to do that. (SeiBi.2.11.1)*

This greater investment of time and effort required was also said to be largely unnoticed by the university administration, as this instructor noted:

*Usually we spend much time and effort in correcting content characters, online discussion, e-mail, answering questions, etc. However, the results of the university dealing with this matter let us feel unhappy and uncomfortable. (SeiBi.2.13.1)*

A small portion of instructors (13% and 26%) noted instructor role change was a challenge. The instructors declared they needed to spend more time and effort on their e-learning teaching because it was significantly different from face-to-face classroom teaching. They pointed out that in e-learning, the role or main responsibility of instructors had changed from an instructional designer to discussion guide and problem-solver. A science e-learning instructor remarked, "The role of the instructor is changed to be a discussion guide and problem-solver rather than only be an instructional designer and the practitioner for his/her teaching strategy" (SeiBi.2.14.2). Another science e-learning instructor A reiterated this point. In addition, he emphasized the added technology requirements associated with e-learning. He pointed out, "Instructors are not just responsible to prepare their course materials to teach in e-learning but also need to be concerned with the e-learning environment and to solve all related technical problems" (SeiAi.13.1.6).

Instructor psychological barriers were considered an important challenge, influencing their use of e-learning resources, particularly while they were in a video of lessons. A non-science e-learning instructor said, "I am afraid my face will become uglier due to bad quality of video facility ... It will decrease my students' good impression of me" (NSeiCi.3.1.5). Another science e-learning instructor reiterated this challenge, "I do not like to be video-recorded because I feel embarrassed on it. Once I feel uncomfortable and unnatural, I do not know how to teach my class" (SeiDi.3.4.2). They said these barriers included fears of facing the video camera, discomfort with e-learning tools or methods and fears of bad impressions in video from students were their psychological barriers to be overcome.

### **3. Technological challenges**

Technological challenges are broadly defined as challenges surrounding issues of familiarity with new technology and technical problems encountered by instructors, for example, network bandwidth, computer facilities and storage and technology operation. A personal lack of easy access to these technologies as well as a lack of skills necessary to use available computer and communication technology has hindered instructor use of e-learning. Even when instructors did have access to computers themselves, there could be issues to do with the quality of this access, for example other technologies (e.g., high quality of audio-video facilities or network) related to e-learning practice were sometimes also required. Four categories of technological challenges will be discussed: easy access to necessary computer equipment, technical skills to access computer technology and the e-learning system, technical skills for communication, and the quality of e-learning computer facilities and technology.

#### *3.1 Easy access to necessary computer equipment*

Only a small portion of instructors (13% and 22%) instructors identified a lack of easy access to necessary computer equipment. They repeatedly emphasized that the time and capability needed to prepare course materials which often meant that the inconvenience involved in using the university e-learning facilities would become a challenge for them. In support of this, a science e-learning instructor described the inconvenience involved in using the university e-learning facilities because he spent a lot of time collecting and/or waiting for equipment to transfer videos onto the e-learning system. He explained:

*The students and instructors won't use the university facilities very often because it is not convenient for them to use. Currently, the university has put all the e-learning equipment together in the Computer Center so everyone needs to go over there to use it. However, they think it wastes their time to go back and forth, and sometimes they can not use it immediately when they go over there. They maybe spend much time in waiting ... Time consuming and inconveniences are the two important issues for the instructors and the students to use the related equipment. (SeiBi.4.3.8)*

### 3.2 Technical skills to access computer technology and the e-learning system

Few (11%) questionnaire respondents, but nearly a half (48%) of the interviewed instructors indicated they lacked the necessary technical skills to engage properly in e-learning. They noted that the complex nature of the e-content demanded high technical literacy of participants engaged in them. They found this technological requirement challenging due to a lack of familiarity with the university e-learning system and recently up-dated ICT facilities, as well as with multimedia operations themselves. Instructors felt they needed not only to be familiar with new technologies but also able to deal with technical problems encountered, for example, network bandwidths, computer facilities and storage and technology operations. Similarly, some instructors reported their colleagues had difficulties using e-learning systems due to a lack of technical skills. Typically, they reported overcoming these problems by asking their colleagues, technical support staff or student assistant support for help.

Some respondents noted older instructors would resist e-learning because of being unfamiliar with computer technology. Non-science e-learning instructor T said:

*Older instructors may be afraid of using computers because they had never used computers before, so they will reject to use e-learning. Therefore, they need to learn new technology knowledge and skills. On the contrast, younger instructors have used computer before while they are educated so perhaps they do not resist in using e-learning. (NSeiTi.2.3.2)*

### 3.3 Technical skills for communication

The instructors noted they struggled to communicate their ideas with students in online discussion when this involved the use of figures or pictures. They indicated they were only able to post text and not figures or pictures in the online discussion forum of the university's e-learning system, so sometimes they could not express their ideas clearly. Instructors indicated they had difficulty with their online typing ability, particularly identifying Chinese characters, formulae and symbols as slow to type. Thus, they proposed the university should improve their computer facilities or the e-learning system interface by providing, for example, digitizing tablets, drawing tablets or network online talk programs like Skype. Respondents indicated they also worried about the difficulty of typing formulae or symbols in online tests or assignments or online discussion due to their own lack of personal technical skills and ability. A science e-learning instructor noted:

*The instructors in the College of Science and College of Engineering may easily accept the ideas of e-learning but they may feel it is inconvenient or difficult to input lots of symbols or formulae in online tests or assignments or online discussion. (SeiFi.3.6.5)*

### 3.4 The quality of e-learning computer facilities and technology

Over a half (52%) of the interview instructors indicated the quality of the audio/video facilities affected their use of video of lessons. They reported that currently the quality of audio/video facilities for e-learning was poor so sometimes they were unable to see the images or contents clearly or hear the audio. They noted usually the complex nature of the e-content required their computers have necessary hardware and software such as a graphics card and high processing speed and often specific software. Moreover, some instructors indicated they lacked the high quality network and facilities required to download student

assignments online. These instructors noted they needed more adequate and higher quality e-learning related computer technology, peripherals and other multimedia accessories. A stable, reliable, easy-use, fully functionalized and high performance e-learning system was considered necessary. Science e-learning instructor E indicated, “Classroom network and e-learning system is unstable. Sometimes I cannot download my course materials to let students do the practice in class” (SeiEi.4.11.1). A high quality network for e-learning practice involving a high enough network bandwidth, fast speed for image presentation, good network management, and enough computer storage space was also considered important.

#### 4. Other comments

Five instructors answering the questionnaire did not directly respond to the question about the perceived challenges for themselves but gave other comments such as “E-learning system should be considered as a supplement to the traditional F2F ‘lecture on class’ courses. E-learning could not replace all the functions and effects of the F2F class” (QI.30.27); and “I think F2F is the best way of teaching ... It depends on university policy and definition of e-learning” (QI.30.65). Similarly, some interviewees also gave their additional comments. Some typical comments were:

*I don't have any challenges in e-learning development. I developed it by myself and had no student assistant support. I like to learn new knowledge and skills and I found many interests and advantages in it. (SeiFi.12.4.1)*

*Instructor preference for face-to-face instruction also challenged their use of e-learning because working from a textbook was faster than creating videos or other materials online. (NSeiGi.14.5.9)*

### Discussion and Implications

This paper has described instructor perceptions of the challenges of e-learning. A majority of instructors involved in the study pointed out that e-learning not only relies on multiple ICT technologies but also that technology innovation is ongoing and so instructors are continuously faced with pedagogical, personal, and technological challenges. The assertion from a majority of instructors was e-learning was significantly different from face-to-face instruction and so they need to adopt different pedagogical approaches. However, respondent instructors indicated that actually most instructors have had little or no formal training in the effective use of technological resources in e-learning. The general perception was that they would benefit from training in this, either from the university and or external professionals. The contention that training is important to create a shift in teaching practice is supported by [17]. The findings indicate that ‘computer anxiety’ [18] is an obstacle in the early stages of e-learning adoption as described by some instructors who said they had fears in technology use such as they did not know how to operate multimedia facilities and transfer their video-recorded lesson onto e-learning system. However, even when anxiety is reduced, there is still a need to integrate technology into teaching itself. Instructor commentary indicated they were still questioning whether technology devalues their profession, and enables students to learn as well as face-to-face instruction. Adams [19] and Berge and Lin [13] also found instructors identified these psychological barriers. On a more practical note, a majority of instructors noted the time needed to prepare e-learning lessons and interact with students was a challenge to their use of e-learning. The time and effort needed for instructional design with new media to produce e-content and in online interaction was reported to have decreased instructors’ motivation to use e-learning as has been reported by Adams [19] and Beggs [20]. Overall, the findings of the study indicate that in the face of ongoing technology demands instructors not only feel they lack time but some also experience challenges from their personal expertise and beliefs to the incorporation of

technology into course design. An easy use and high quality interface and functionality was said to be required for graphs, figures, and even voice online and also to address the challenge of typing Chinese characters and science formulae and symbols online. In sum, the findings indicate instructors perceive challenges from e-learning that might hinder instructor personal motivation to adopt e-learning teaching. These include lack of time, support, pedagogical and technical skills, and easy and high quality access to infrastructure and e-learning platforms. University administrators interested in solving the issue of the under-use of e-learning would be wise to recognize the challenges instructors face and to provide the necessary policy and practical support to help overcome these challenges if they wish to promote the use of e-learning as a part of the blended delivery of courses.

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