Evaluating online solutions for experiential support of distance learning by teachers in China

X. Gu,* B. Zhang,† X. Lin‡ & X. Song*

*East China Normal University, Shanghai, China
†National Institute of Education, Nanyang Technological University, Singapore
‡Research and Development Centre for Knowledge Engineering, Beijing Normal University, Beijing, China

Abstract

This paper describes and assesses the development of an online solution for the experiential support of distance learning by teachers. Three hundred and forty-eight randomly selected K-12 teachers participated in this pilot study using the online learning environment designed in this research. Teachers’ products, surveys, and interviews were collected and analysed. Results showed that the teacher-learners could learn as well as in face-to-face learning in an earlier implementation of the course. The learning support system as designed fits teacher-learners’ needs. They benefited from learning communities formed online as well as face-to-face. More support for online discussion and example cases are needed to support experiential learning. Suggestions are made to improve the design of the learning support system and the pedagogy for experiential teacher learning.

Keywords

distance learning, experiential learning, learning support, teacher professional development, technology competence.

Introduction

To improve K-12 teachers’ competency in using educational technology in their teaching, at the end of 2004, the Chinese Ministry of Education (MOE) initiated the National Project for K-12 Teachers Educational Technology Competence Development (NPETCD). More than 12 million K-12 teachers need to be trained in the NPETCD project before 2010 (Chinese Ministry of Education 2005). Given the size of the learner population, both distance and face-to-face learning were selected to be used in the project.

This pilot study aims to explore online solutions for experiential distance learning by teachers using information and communication technology (ICT). It was implemented from March 2006 to April 2007. In the study, learning support strategies (especially online support) were the focus for facilitating experiential teacher learning. Through the data gathered in this study, valuable lessons have been learned about what learning supports teacher-learners need for distance learning and how it should be delivered.

Related work

Because of its rich experience in professional development programmes for teachers, the authors’ team was selected to develop one of two versions of a training course for NPETCD. The objective of this course, in accordance with Chinese educational technology standards, was to establish teachers’ competence in using technology in their teaching. The course, Learning Educational Technology for Teaching, was designed to support an experiential learning process (Zhu & Gu 2006).
During the course, teachers experienced a series of technology integration activities individually, in groups, or both for about 50 contact hours. The experiential learning progressed through a series of eight modules: preparation for professional development, comprehension of educational technologies, choice of medium, designing a technology-integrated lesson plan (lecture-based and research-based, in two modules), implementing a lesson plan under diverse technological conditions, evaluating technology-integrated teaching, and preparing a report on the learning experience. In each module, experiential learning activities such as reflective observation, acting, sharing and evaluation, and reflection were carried out considering the teacher-learners’ relevant knowledge and skills.

Learning products such as a narration added to a video clip, technology-integrated lesson plans, and implementation plans in various technological environments were created in the course. The portfolio containing these learning products was assessed both for an attitude of engagement and collaboration and for a level of competence in education technology.

A face-to-face pilot study was conducted to assess the effectiveness of the course as designed for NPETCD. The results showed that the course helped to build competence in teaching with integrated ICT through an experiential learning process (Zhu & Gu 2006). This second-round pilot study intended to implement the experiential learning process online. In this study, distance learning was carried out mainly online except for the opening and closing sessions. This new mode of professional development was encouraged by MOE (China Education Daily 2005).

Literature review

In this paper, ‘learning support’ refers to all resources that a learner can access to engage in the learning process, including materials, learning communities, teachers/facilitators, and media/technology, to achieve experiential learning objectives as ingredients of a major effort to facilitate experiential distance learning by teachers.

Research indicates that appropriate and timely learning support is a key factor ensuring the quality of distance learning (McLoughlin 2002; Ludwig-Hardman & Dunlap 2003; Zhou 2005; Kramarski & Gutman 2006) and consequently has been considered as a solution to inherent problems in online learning, such as lack of human communication and high dropout rates (Moore & Kearsley 1996). Learning support can include various kinds of scaffoldings, resources, techniques, and tools to meet distance learning needs (Garrison & Baynton 1987; Winnips 2000; McLoughlin 2002; Pedaste & Sarapuu 2006), including orientation, coaching, explanations, task support, expert regulation, scaffoldings of various kinds (meta-cognitive, procedural, and strategic), inductive questions and comments, social support for interactions, and tools for enhanced learning (Roehler & Cantlon 1997).

Researchers and practitioners in this field have made great efforts to use online learning environments as a platform to embed various kinds of support. For example, they have provided online courses with tutorials, learning materials with scaffoldings for self-directed learning and problem solving, and online support tools for cooperative learning (McCracken 2005; Manlove et al. 2006; Oh & Jonassen 2007). Furthermore, assistant and peer support can be provided through online learning tools such as chat rooms and messaging tools (McLoughlin & Oliver 1998; Cleerhan et al. 2003; Pedaste & Sarapuu 2006; Price et al. 2007).

In China, research on support for online learning has begun only recently, focusing mainly on conceptual presentations of definitions, characteristics, and components (Zhou 2002; Zhou 2005; Zhang 2006; Feng 2007). Only a few researchers have begun to explore how to design and provide learning support in concrete contexts (Liu 2007b; Zhang & Su 2007). Few empirical studies in China can provide useful lessons in the present case. The authors hope to fill this gap by developing online teacher learning systems with support.

In the pilot study, a course was developed to involve teachers in experiential learning, in which learners progress through stages of a learning cycle consisting of concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb 1984). To date, experiential learning has been applied in numerous fields (Kayes 2002; Lai et al. 2007) and in professional teacher development (Delfino & Persico 2007). In China, experiential learning is accepted as a viable approach to build teachers’ competence in educational technology (Zhu & Li 2001; Tan et al. 2003; Zhu & Li 2003; Gu 2005).
Purpose of the study

The study aims to develop effective support for teachers’ online learning, enabling them to gain experience through the process of reflective observation, acting, sharing, and reflection and, ultimately, to attain competence in teaching using technology. The main research questions are the following:

- What kinds of support are needed for experiential distance learning for Chinese teachers?
- How should support for experiential learning in the distance learning platform be best provided?
- How does the learning support system as designed help teachers attain competence with educational technology?

It is expected that the results of this pilot study will have important implications for teachers’ professional development and will serve as a basis for wider future application of experiential distance learning in the NPETCD competency development project. The study will also add to the literature on designing effective learning support for online teachers’ professional development.

Design of the learning support system

The design of the online learning system was based on the authors’ experience with a previous, mainly face-to-face, experiential learning course. The implementation results showed that the course as developed was effective in helping teachers build competence in teaching with ICT, such as selection of media and design of ICT-integrated lesson plans (Zhu & Gu 2006); Liu 2007a). Some of the strategies found to be successful, such as building a class learning community and showing real cases of ICT use in class for experiential learning, will be kept. However, given the e-learning nature of a mainly online learning support system, additional specific strategies will be needed. The design used will be described in the following section.

Using an experiential learning approach, the learning activities in each module were subjected to an iterative process of reflective observation, acting, sharing and evaluation, and other activities that made up the ‘Comprehension→Action→Sharing and Evaluation→Revised Action’ experiential learning cycle (Gu 2006) (Fig 1). Furthermore, to address various objectives using different activities in each module, the activities were diversified to include not only learning activities directed by expert lecturers but also learner-centred constructive investigations, and not only personal learning activities such as designing ICT-integrated lesson plans but also group learning activities involving discussion and sharing.

Considering the ‘anytime and anywhere’ convenience of distance learning, the 50 h of learning activities in eight modules were redesigned to last for 8 weeks, one module for each week. After revising the schedule and learning activities, the online learning support system was redesigned to follow the experiential distance learning cycle.

![Experiential learning cycle](image)
Learning support is needed whenever an experiential learning process takes place online. For example, the fourth module (designing a technology-integrated lecture-based lesson plan) included four activities: a case study of a technology-integrated and lecture-based lesson plan, a design of a new technology-integrated lesson plan, peer sharing and evaluation of the plan, and improvement of the plan. The learning support system designed here was aligned with the experiential learning cycle to direct and orientate these experiential activities to guide teachers’ progress, to provide coaching to assist comprehension of teaching with technology using the cases studied, to provide support for design efforts, and to help regulate the sharing and evaluation process.

The eight modules mentioned earlier require various learning activities, all of which need different kinds of learning support. In accordance with the characteristics of experiential learning, some of McLoughlin’s learning support elements have been adopted in the support system developed in this study, including the establishment of orientation and expectations, online coaching, task support, and procedural, conceptual, and metacognitive scaffolding (McLoughlin 2002).

Therefore, the online learning support system was designed in two dimensions. One involved designing the system to fit the experiential distance learning cycle and its three learning phases: comprehension, action, and sharing and evaluation (Table 1; learning support dimension) to help learners traverse the (Comprehension → Action → Sharing and Evaluation → Revised Action) cycle. The other dimension involved explanations of the system design and presentation that were adopted (see Table 1).

The learning support intended for the three phases of experiential learning as described in Table 1 is further elaborated as follows.

**Comprehension phase**

In experiential learning, comprehension is fundamental for action. Accordingly, in addition to providing pre-formulated explanations and introductory questions in course materials, an online learning agent was designed as a data acquisition technique. Such an agent can help learners acquire conceptual understanding and some technical skills (Liu & Lee 2005), similar to the interpretative support proposed by Zhang et al. (2004) to promote comprehension. Technical frequently asked questions (FAQs) were also provided to resolve technical issues, and online lectures and guidance by tutors to help learners improve their comprehension (Table 1; experiential learning – comprehension).

**Action phase**

In the action stage, the key is to obtain practical experience of how things happen in real work situations. Here, the activities involved are either developing and modifying technology-integrated lesson plans based on teacher-learners’ real practice or creating and modifying teaching materials and media products. To help learners succeed in this stage, the most important component were cases providing information on how to accomplish certain activities (Gu 2006). Other important elements were professional guidance from tutors and idea exchange with partners. Although actions relied primarily on learners’ personal initiative, community-based activities, especially in-depth discussions, were also of crucial importance (Gu 2006; Wei & Chen 2006). Therefore, the ‘action orientation’, ‘practical demonstrations’, and ‘sharing in a learning community’ activities were designed to support teachers’ actions (Table 1; experiential learning – action).

**Sharing and evaluation phase**

Sharing and evaluation are important for experiential learning. Thanks to technology, knowledge sharing and peer evaluation are now more convenient, recordable, and trackable. The authors tried to establish a learning community through the distance learning platform, where learners could safely share and evaluate their ideas, products, and reflections. These activities are beneficial both for conceptual comprehension and for action. The discussion forum was the main venue for communication in the learning community. Table 1 shows its structure and how its features were implemented.

In addition to these types of learning support, other kinds of support were also designed to help learners manage their learning more effectively: learning process guidelines, self-tests, and schedule reminders using a mobile phone.
<table>
<thead>
<tr>
<th>Learning support (LS) dimension</th>
<th>LS form</th>
<th>Description</th>
<th>Offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiential learning – comprehension</td>
<td>Learning agents for conceptual learning</td>
<td>Function as acquisition techniques to help learners understand concepts</td>
<td>Learning agent designed into the distance course</td>
</tr>
<tr>
<td>Online lectures and Q&amp;A sessions</td>
<td>Help teacher-learners to better understand and solve problems in the learning process with two or three online lectures and Q&amp;A sessions</td>
<td>Tutors supported by real-time conference system (Centra) integrated into the platform</td>
<td></td>
</tr>
<tr>
<td>Online coach</td>
<td>Provide orientation and timely feedback for teacher-learners online</td>
<td>Tutor and assistants, with pre-formulated guidance and discussion questions, using the learning platform</td>
<td></td>
</tr>
<tr>
<td>FAQ for learning platform operation</td>
<td>Help teacher-learners address technical problems, which may arise in platform operation</td>
<td>Pre-formulated technology FAQ integrated into the learning platform</td>
<td></td>
</tr>
<tr>
<td>Action orientation</td>
<td>Provide orientation with learning activities referring to their daily practice, to help teacher-learners better experience how to teach with integrated ICT</td>
<td>Pre-formulated diversified activities in the online course</td>
<td></td>
</tr>
<tr>
<td>Practical demonstration cases</td>
<td>Provide cases to demonstrate how to teach with integrated ICT to help teacher-learners carry out actions including lesson plan design</td>
<td>Cases in the online learning platform, with a possibility of adding cases during the learning process</td>
<td></td>
</tr>
<tr>
<td>Sharing in the learning community</td>
<td>Making group learning activities available and helping teacher-learners alleviate the loneliness of distance learning</td>
<td>Discussion forum in the platform, with pre-formulated orientation questions for discussion and the possibility of updating questions within the forum</td>
<td></td>
</tr>
<tr>
<td>Peer evaluation</td>
<td>Making the teacher-learners share action products, peer evaluations, and reflections, leading to improvement of actions with the benefit of peer review</td>
<td>Product-sharing area in the platform, open to peer comments and further discussion of the products</td>
<td></td>
</tr>
<tr>
<td>Management of own learning</td>
<td>Self-test at the beginning of every module</td>
<td>Help teacher-learners discover the limitations of their competency and provide learning suggestions</td>
<td>Integrated pre-tests in the platform</td>
</tr>
<tr>
<td>Provide learning guidelines</td>
<td>Help teacher-learners achieve learning objectives and requirements; help them prepare for self-motivated distance learning</td>
<td>Integrated learning guidelines in the distance course</td>
<td></td>
</tr>
<tr>
<td>Remind of schedule using mobile phones</td>
<td>Provide a reminder service for teacher trainees to help them keep up with the schedule</td>
<td>Reminder service integrated into learning platform</td>
<td></td>
</tr>
</tbody>
</table>

ICT, information and communication technology; FAQ, frequently asked questions; Q&A, question and answer.
Research methodology

Design-based research

This study investigated how to provide effective learning support for an online experiential learning programme. Learning support as a kind of intervention was developed, tested, and improved based on implementation results. The design-based research methodology was thus used to find out what types of learning support should be included, how learning support interacts with the targeted environment, and what kinds of improvements should be made during implementation (Reeves 2006).

Research process

This study followed a three-phase process typical of design-based research (Fig 2). In the first phase, a support system for the whole experiential distance learning process was designed. Specific support strategies were embedded and delivered in different ways, including learning activities, resources, online learning platform, online course agent, and guidance by tutors, the whole forming an integrated learning support system (Table 1). The second phase consisted of a pilot study of the learning support system as part of a pilot experiential distance learning project in Jiangsu, Henan, and Fujian provinces. With feedback from an online survey, some improvements were made to the support system in this second phase. Finally, in the third phase, data analysis and review were conducted and conclusions were drawn to determine learning support system effectiveness. Both survey and interview data were collected, and the teacher-learners’ learning products were assessed.

Data gathering and analysis

Three hundred and forty-eight K-12 teachers from Jiangsu, Henan, and Fujian provinces were involved in the pilot distance learning project: 100 from Jiangsu, 130 from Henan, and 118 from Fujian. Among these teachers, 214 were middle school teachers, 124 were primary school teachers, and 11 held other teaching positions.

Multiple data sets were collected to obtain more information on how to design and deliver learning support for experiential distance learning. Surveys and interviews were conducted, and teacher-learners’ learning products were evaluated.

Surveys

To understand what types of support teachers need for experiential distance learning, an ongoing survey was posted in the online learning platform 2 weeks after the start of the programme. Here, ‘ongoing’ means that the survey was not compulsory for the teacher-learners but could be taken if they had learning support needs; their responses would be considered during the learning process, on the assumption that different kinds of support needs would emerge over time. Therefore, feedback was also ongoing during the entire learning process. Although in-depth data analysis was performed during the third phase, feedback gathered during the learning process was used to improve the system during the second phase. At the end of the distance learning study, feedback from 58 volunteer learners was collected.

Besides the ongoing survey, a questionnaire on teachers’ satisfaction with the pilot experiential distance learning project was carried out at the end of the 2-month programme. The intent was to examine in more depth the effectiveness of the learning support system as implemented. The questionnaire consisted of five parts with 28 multiple-choice questions and 1 free-response question: ‘What do you think changed you most in this learning process?’ In addition to questions about the teacher-learners’ overall satisfaction with the learning programme (Part 1), online learning platform (Part 2), learning content (Part 3), and other factors (Part 5), the

![Fig 2 Design-based research process.](image-url)
questions in Part 4 specifically addressed the learning support system. The main questions asked in this part were the following:

- Are the learning process and requirements clear enough for you to set your learning pace?
- Is the learning content beneficial for you in building competence in educational technology? Are the learning activities arranged reasonably?
- Are the self-tests helpful for you to understand better your learning situation and competency status?
- Are the cases adequate? Are they helpful for you in designing ICT-integrated lesson plans?
- Did online sharing and discussions help you learn from your learning community?
- Did online lectures and question and answer sessions help you better understand complex problems?
- Did you receive timely feedback during the learning process?

Two hundred and thirty-three valid responses from the 348 participants were gathered at the end of the experiential learning process. In this paper, the results of the learning support part are highlighted.

Interviews

To obtain more detailed feedback, the authors also conducted semi-structured interviews with selected teachers on what kinds of learning support they need most and how they viewed the support provided. The interviews were conducted partially online and partially in person. Two specific questions were asked: (1) What learning support arrangements helped you in the online learning process? (2) What support arrangements do you think should be enhanced? Eight teachers were randomly selected on the closing day of the programme in Zhengzhou (Henan Province). They were interviewed individually face-to-face for about 20 min each. The interviews were audio-recorded and transcribed after for further analysis. Another 14 teachers were randomly selected from the list of Jiangsu and Fujian teachers and interviewed using e-mail. Data from these sources were added to the data from other sources to address the research questions.

Learning process and products

Another useful data source was the teacher-learners’ products created during the 8-week programme. These served as the main evidence of the quality of educational technology competency developed by the teachers. The products include a portfolio of teacher-learners’ lesson plans as developed or revised. Their online posts were also collected for marking purposes. Teacher-learners’ products and assignments were graded according to the evaluation scheme shown in Table 2. These online posts also showed the change in teachers’ attitude during the 8-week programme.

Findings

Learners’ needs

Learners’ needs for support could be expressed freely in the online ongoing survey from the beginning of the distance learning project. Because the survey was not compulsory, only those who had real needs posted, so the survey data indicated what kinds of support teachers expected for experiential distance learning. From this source and from the analysis of the interviews, it was found that the learning support expected by teacher-learners included: more support from tutors, especially professional guidance; more support from their communities, especially in-depth discussion and sharing; more cases; and more time to complete the work. As a result, improvements were made during the modification phase of this project. A summary of teacher surveys and interviews is provided next.

For learning activities in the comprehension and action phases, teacher-learners expected more learning support from tutors, especially professional guidance such as better discussion topics related to real practice. This was the most prevalent request expressed by the teachers in the ongoing survey (40 of 58); at least half of the interviewees also expressed this concern (13 of 22). As one teacher said, ‘... without an onsite coach I felt helpless. Maybe most of us are not used to learning through this approach’. Teachers seemed to be unaccustomed to learning by themselves as required by distance learning, and they consequently expected to have more face-to-face sessions (17 of 58). In addition, 16% of the teachers responding to the survey (9 of 58) expected more timely feedback. For example, Jiang Lei stated that, ‘... if there is a tutor who can provide support such as technical and other support at any time, it will help us to understand educational technology better’. This opinion was also expressed in the interviews. One of the interviewees ranked timely feedback as the most urgent support.
learning support need (Yan Weilong, a junior high school teacher in Henan). During the learning process, teachers realized that their previous expectation of having tutors always online was infeasible. Interesting changes then emerged in the responses to the ongoing survey in that requests for onsite tutors decreased, to be replaced by requests for professional guidance from tutors; 24% of the responses (14 of 58) asked for professional guidance to deepen their learning in a distance context. As one teacher (Cai Yazi, female, teaching for more than 10 years in a junior high school in Henan) said, ‘. . . I constantly feel motivated and stressed to learn through this distance learning. With such active partners and energetic tutors, I have learned a lot every day. However, I hope tutors could lead our learning discussion more often in a way to help us think deeply’. They thought that discussion topics related to problems in practical teaching would make them more deeply involved. These are concerns that must be addressed to improve learning support systems in future programmes.

For learning activities in the action and sharing and evaluation phases, 53% of the survey respondents (31 of 58) expected more support from their community, especially for in-depth discussion. Twenty-nine per cent (17 of 58) agreed that the learning community had played a crucial role in effective communication. As one teacher said, ‘Although I cannot meet other learners and tutors face-to-face, I still feel warmhearted in the discussion forum’. The community also motivated and pressured teachers greatly (9 of 58 and 9 of 22, respectively); one teacher (Qiao Jing, female, teaching for about 15 years in a junior high school in Jiangsu) said in her interview, ‘It made me nervous when I saw that other learners had finished and uploaded their design work while I had not. That didn’t happen before’. They appreciated the learning community so much that one teacher hoped that it would last forever. More informatively, 16% of the survey respondents (9 of 58) and 12 interviewees hoped that the learning community would facilitate meaningful and in-depth discussion to ‘share best practices with other learners and supervisors’. They appreciated the collaborative learning environment where learners could maximize their collective wisdom to solve complex problems. From teacher-learners’ feedback, it is apparent that more support is needed for community-based activities, especially in-depth discussion and collaborative learning. Such support is also needed to

<table>
<thead>
<tr>
<th>Item</th>
<th>Score</th>
<th>Objects</th>
<th>Graded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning products</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Report of comprehension of educational technology</td>
<td>10</td>
<td>Understanding of education technology</td>
<td>By tutor according to a specific scheme</td>
</tr>
<tr>
<td>Technology-integrated lesson plan (lecture-based)</td>
<td>10</td>
<td>Ability to design an ICT-integrated lesson plan</td>
<td></td>
</tr>
<tr>
<td>Technology-integrated lesson plan (research-based)</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choice of medium and making of clips</td>
<td>5</td>
<td>Ability to teach using technology</td>
<td></td>
</tr>
<tr>
<td>Implementation plan in a technological environment</td>
<td>10</td>
<td>Ability to evaluate using technology</td>
<td></td>
</tr>
<tr>
<td>Analysis of students’ learning results</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discussion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation at least twice a week and writing in depth</td>
<td>15</td>
<td>Ability to communicate using technology</td>
<td>Autosave credits for posts and convert to score</td>
</tr>
<tr>
<td>Sharing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharing own products and comments on peers’ products</td>
<td>15</td>
<td>Ability to make collective effort using technology</td>
<td>Autosave credits for comments and convert to score</td>
</tr>
<tr>
<td>Attitude and engagement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attend online learning activities at least once a week</td>
<td>10</td>
<td>Learning attitude</td>
<td>Autosaved by the learning platform</td>
</tr>
<tr>
<td>Attend opening and closing sessions</td>
<td>10</td>
<td>Learning attitude</td>
<td>By a tutor</td>
</tr>
</tbody>
</table>

ICT, information and communication technology.
improve the learning support system in the subsequent distance learning process.

For the action phase of experiential learning, a need for more cases was expressed. In the survey, 26% (15 of 58) of the teacher-learners requested best-practice cases and examples in the online course. This request was also prominent in the interviews, with 14 of the 22 interviewees mentioning this need. For example, Shi Zhenjun, who has 15 years teaching experience in a junior high school in Zhengzhou, said that the most urgent learning-support need for him was a database of practical cases. Suggestions for how to provide the cases were also offered both in the survey and in the interviews. For example, Zhang Li, a primary-school teacher from Jiangsu, requested cases developed by teachers from a previous programme. Zhang Chunxiang, a junior high school teacher from Henan, suggested that the case database should be large enough to cover all subjects and grades.

For the sharing and evaluation phase of experiential learning, needs were expressed concerning the online learning platform, especially for knowledge management. Five of the 58 survey respondents and three of the interviewees expressed concerns about the online learning platform. They suggested that the system should provide more convenient functions for sharing and evaluation as well as a knowledge management function to enhance the quality of sharing in experiential learning. They expected that in a learning community, information should be filtered and managed on a term basis because otherwise, it was difficult for them to find what they wanted.

Lessons learned

According to the survey data, teachers needed more timely guidance from tutors (14%), more support for in-depth online discussion and effective collaborative learning (16%), more practical cases (26%), and more time to engage in experiential learning (12%). The authors agree that all these forms of support are needed, and their design has taken most of these requests into consideration. For example, the ‘online coach’ designed for the comprehension phase was supposed to ‘provide timely feedback for teacher-learners by tutors and assistants’; ‘practical demonstrations’ in the action phase provided practical cases (Table 1). On the other hand, it is clear that there is still room for improvement: more timely professional guidance by tutors can enhance comprehension and action; an adequate case database can facilitate learning by example and be beneficial for design and implementation; meaningful and in-depth sharing, and reflection and collaborative learning in the community can help generate comprehension and the ability to take action in real life.

In response to the survey results, adjustments could be made to the learning support system only when the distance learning programme was already underway.

- To provide more learning support from tutors, especially for professional guidance, the design of the ‘online coach’ and ‘action orientation’ components of the support system was improved. The ‘online coach’ was extended to cover not only the comprehension phase but also the action phase; meanwhile, tutors and assistants were instructed to provide more online feedback both synchronously and asynchronously. Most significantly, the orientation and discussion questions in the subsequent modules were updated and redesigned, with some questions based on real problems identified in discussions to make them more relevant to practical teaching problems.
- To enable more support from the learning community, especially for in-depth discussions, a number of improvements were made during the 8-week session. Improvements to the ‘online coach’ module provided more in-depth discussion topics and professional guidance. The discussion topics were updated, and tutors were asked to spend more time providing guidance for in-depth discussion and collaborative learning. In addition, knowledge management facilities such as information filtering and searching are needed in the online learning system to support more convenient sharing and evaluation. This improvement was left to be made after this pilot study because it involved changes to the learning platform itself.
- More learning support was needed for use of cases. Although cases had been specifically designed and integrated into the online course as one of its most important components, evaluation data showed that they were still insufficient to support action, especially the subject-related cases. Accordingly, more case resources were added in the later phases, especially in modules 4, 5, and 6 where more activities were case-based.
Learning products and learners’ satisfaction

Teacher-learners’ learning products were graded according to the evaluation scheme presented in Table 2. Out of 348 participants, 89% (309) received a qualifying grade and 11% (39) were disqualified. The figure of 11% disqualified is a reminder that much work remains to be accomplished to include learning support strategies effectively in distance learning, but the high proportion that qualified successfully proved that experiential distance learning with learning support was effective.

Along with the grade results, the satisfaction survey indicated whether teachers were satisfied with experiential distance learning and how they viewed the learning support system. The questions in Part 4 concerned the learning support system; the results showed that most teachers were very satisfied with the learning support system as designed; 92% were very satisfied or satisfied with the timely feedback received for their problems. Similarly, most teachers reported that they were satisfied or very satisfied with support resources, including best-practice cases, product examples, and specific-subject applications. For other learning support strategies, satisfaction rates were as shown in Table 3.

In addition, teacher-learners’ free responses to the question, ‘What do you think changed you most in this learning process?’ also indicated their degree of satisfaction with experiential distance learning and the learning support system. According to the teachers’ responses, they gained a lot from this learning process; as one participant said, ‘For me, the biggest change after the programme was the update of educational ideas. This learning changed my instructional ideas and focus. Reflecting on my own teaching practice in the last few years, I think I should have changed my knowledge structures by making full use of educational technology for future teaching’.

Discussion and conclusions

This pilot study focused on what kind of support for experiential distance learning should be designed and how it should be provided.

As the results show, most teachers were satisfied with the various kinds of support provided within the distance learning system to help them traverse the three phases of experiential learning. For example, 58% and 39%, respectively, were very satisfied or satisfied with the cases provided, and 61.4% and 33.4%, respectively, were very satisfied or satisfied with the online discussions. On the other hand, the results show that there is room for improving professional guidance, in-depth discussion, practical cases, and knowledge management functions in the learning platform. The results affirm that learning support should include different kinds of resources and tools to facilitate learning (Garrison & Baynton 1987), including a tutorial orientation coach, multi-level scaffolding for learner action, peer support for exchanging and sharing ideas, and learning tools (Roehler & Canton 1997; McCoughlin 2002; Nevgi et al. 2006). The results also affirm that learning support can be provided through online courses and materials (McCracken 2005; Manlove et al. 2006; Oh & Jonassen 2007). Minor fine-tuning of the system, such as revising the orientation questions, was possible and probably unavoidable.

The learning support system designed here mainly followed the experiential learning process cycle and partially referenced some of its classifications. The connection with the experiential learning process served to direct and orientate experiential activities online. As the results show, most of the support tools for the comprehension, action, and sharing and evaluation phases worked well, providing coaching in comprehension of the cases studied and scaffolding for imitation and design activities. The other dimension of the learning
support system was to explain why it was designed in a particular way and how it was offered. The results affirm that the classification of learning support was reasonable (McLoughlin 2002). Nevertheless, a more practical and comprehensive learning support system should be investigated to determine not only what kind of system is needed but also how it should be provided for specific distance learning applications. This research has begun to fill the existing knowledge gap regarding experiential teacher learning programmes.

Although the online learning platform is important for offering learning support, it needs to become more effective for sharing and evaluation. For example, the knowledge management function in the learning platform should be improved to support more convenient and effective information sharing. New technology such as artificial intelligence (AI) should also be applied in the platform (Sison 2001; R-Moreno et al. 2005). AI technology could release tutors from routine support duties. For example, an AI mechanism to gather FAQs or information could be used to provide timely feedback, freeing tutors to focus on in-depth professional guidance. This raises the issue of interaction with individuals, which is labor-intensive as distance education providers have found, and could be applied in experiential distance learning in follow-up work.

Finally, as a ‘by-product’, this research has indicated how to design a learning system for teachers to shape teacher expectations and teaching behaviours. Chinese educational reform emphasizes student-centred learning, which is very challenging because even the teachers have not been used to independent exploration. Therefore, they counted on the tutors to lead them until they realized that this was not feasible. As the results show, teacher-learners could become ‘independent learners’ if they were provided the opportunity for independent inquiry. Therefore, a learning system for teachers should be designed first to change teachers’ learning habits.

Acknowledgement

This material is based on work supported by the Project of Teacher Ministry 2006 (26) of MOE and is also supported by ‘Project 985 for Teacher Education Innovation’ of the East China Normal University (ECNU). Any opinions, findings, and conclusions or recommendations expressed here are those of the author(s) and do not necessarily reflect the views of the National Project and ECNU. The authors would also like to thank Jeanette Bopry for editing this paper. The authors are very grateful to the anonymous reviewer for his/her insightful and knowledgeable comments and constructive suggestions.

References


Liu Z.X. (2007b) Research and application of a ‘virtual all-round tutor’ as a learning support service mode (in Chinese). Distance Education in China 4, 44–46.