

Combination of Service Learning and Pre-service teacher Training via Online tutoring

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Abstract: - During the teacher training process, service learning is an important element which can improve per-service teachers' teaching skills and increase their understanding about their students. This study integrated the concept of service learning into pre-service teacher training via online instruction. Fifty-four pre-service teachers participated in this program. X-learning system, an online tutoring system was provided by Chunghwa Telecom. Each pre-service teacher taught one rural area student by X-learn system. Through video record, interviews, and reflective journal, this study demonstrated how the pre-service teachers taught their students in online instruction, and what benefit the pre-service teachers gained from participating in this program.

Key-Words: - Online instruction, Service learning, Pre-service teacher training, E-tutor, One-on-one tutoring, X-learn system

1 Introduction

Teachers profoundly play significant roles in educational environment. Both the development of the professional knowledge and the connection between theory and practical situation are important in teacher training. Insight into current social conditions, understanding of different cultures and concern for underprivileged minorities are important. Integrating service learning into school academic curricula not only can enable pre-service teachers to apply their professional knowledge in practical situations, but also improve their understanding about what the society needs and have more concern about social justice

Because of Environmental factors, the educational resources are not distributed equally. Much more resources are available in urban regions than in rural regions. Therefore, sharing educational resources with rural areas becomes an important issue. The recent development of information technology and the Internet has increased the convenience for teachers to adopt these tools to teach students. Many different distance education methods have been formed. For example, discussion forums and e-mail are used for asynchronous online instruction, and video conferencing systems are applied for synchronous online instruction. Among these different modes of distance education, synchronous

online instruction is most similar to face-to-face instruction, and can provide rich information during the online instruction.

This study applies it to combine service-learning and teacher training via online instruction. the E-tutor program was held by Chunghwa Telecom and a university in northern Taiwan. This program aims to provide pre-service teachers an opportunity to teach students in rural areas via internet. In this study, we try to answer the two questions listed below:

1. How do pre-service teachers teach in the online tutoring program?
2. What benefits do pre-service teachers gain through participating in the program?

2 Literature Review

In this session, the researcher reviews the literature of service-learning and distance education.

2.1 Service Learning

2.1.1 What Is Service Learning?

Service-learning is not only an educational philosophy, but also a pedagogical method [1]. Service learning consists of two beliefs. First, service-learning should develop the learners' social

responsibility, the concept of serving others and understanding of social justice [2]. Second, service-learning should prepare learners for future life as citizens, and enables learners to understand the needs of society.

Service-learning is an instructional approach that integrates service activities into school academic curricula. By combining of service activities and school academic curriculums, learners can improve their professional knowledge and understanding of social justice [3].

2.1.2 The Theoretical Base of Service Learning

David Kolb (1984) proposed the idea of Experiential Learning Theory, which pointed out that the experiential learning circle consists four parts:

Concrete experience: Learners capture information through concrete experience.

Reflective observation: Learners perform reflection activities to focus on their observations, and deepen their understanding of information.

Abstract conceptualization: learners combine the new and the old experience, and generate a new concept in their minds.

Active experimentation: Learners actively apply new perspectives into a new situation, and during the process, the learners would gain new concrete experience.

The four parts would form a learning circle, and the learning will happen continually. It is not sufficient just to provide experience during the service learning. Reflection is a very significant part of service-learning, which allow individuals to monitor their behaviors and thinking process [4], and develop a better concept about the experience. Moreover, through reflective activities, learners connect the service-learning activities to the learning experience, and have better learning [5].

2.1.3 The Benefits from Service Learning

Service learning is a very beneficial part during the teacher training, which provide the chance to connect the theory and the real experience.

Service learning can improve pre-service teachers' teaching skills and knowledge [6-7], and increase their concern about their community or society [8]. Beside, service learning provides a chance for the per-service teachers to reflect their instruction [9], and that is critical for teacher development.

Recently, because of the development of internet and computer technology, it is cheaper and easier to instruct online. This means the distance barrier will be broken through internet. The service learning activities will not restrict in the area nearby, but can extend to the rural area. In this study, the pre-service

teachers taught the rural area students through online instruction.

2.2 Distance Education

2.2.1 The Development of Distance Education

Development of distance learning [10-11] is influenced by the improvement of technology. Based on the levels of interaction, the development of distance learning has three stages [12]:

Stage 1 (1880–1960s): This is a passive distance learning stage. The teaching messages are one-way conveyed, and have no real-time communication between teachers and students. An example is correspondence courses. The technology applications of distance learning in this stage are printed materials, hardcopy, recorded tape, video tape and radio programs.

Stage 2 (1960s–1990s): The interaction between learners and teachers is more active in this stage than in stage 1, since teachers and learners can engage in bilateral message exchange and interaction. Both synchronous and asynchronous teaching and learning are possible. The technology applications of distance learning in stage 2 are bilateral video training, bilateral audio distance training, unilateral satellite video, computer assistant instruction and BBSs (Bulletin Board Systems).

Stage 3 (1990s–21st century): This is a complex era for distance learning. This stage involves highly active interaction with no specific teaching methods. The use of educational technologies depends on the teaching objective and content.

Future of distance learning education: Distance learning will emphasize the lively learning environment in the future [11]. The key objective of researchers will be to develop a distance education system that can generate an environment similar to the real face-to-face context. Distance learning will involve interactive video, audio and visual reality systems, thus eliminating distance between students and the teacher. Furthermore, distance-learning will address not merely the physical distance, but also the emotional distance between students and teacher [13]. This gap in understanding between students and teacher needs to be shortened. This goal will be attained by discerning new improved educational strategies and education resources to integrate technological innovations into educational practice [11].

2.2.2 The Modes of Distance Education

Distance learning can be classified as synchronous and asynchronous, according to the mode of

interaction [14]:

Asynchronous distance learning: The instructors post softcopy or pre-recorded video-audio teaching materials on the webpage for students to download or read. Meanwhile, the teacher can host a BBS or a blog, to allow students to have asynchronous discussions. The time and spatial limitation can be broken in this model. The learner can have individual learning in “different times and places”. Both the teacher and students can teach and learn in their own time, and record their interaction activities at the same time. Additionally, those records become valuable references for other students in the same course or condition [12].

BBS (Bulletin Board System) is the most common utilized learning platform in asynchronous instruction. In the asynchronous model, the instructor’s leading tactics influence students’ intentions in discussion. Timely awards, and immediate responses to students’ questions are critical strategies affecting the results of adopting discussion bulletin boards for asynchronous distance learning. Other factors influencing asynchronous e-learning are the variegation of the choice of media, system reliability, interaction, flexible materials designation, and knowledge of information technology among students and teachers [12].

Synchronous distance learning: Instructors and students are the primary participants in the synchronous model. They can communicate and interact with each other in a high speed Internet networking system, computerized video-audio setups and packaged software. This environment enables the participants to have bilateral real-time teaching-learning exchanges in different locations. The teacher can distribute the materials with video-audio and multimedia to students, and receive real-time responses from student sides. This scenario is similar to face-to-face interaction [12].

The broadband Internet enables the adoption of new communication models, improving the interaction between participants, and thus improving learning achievement. Traditional instant messenger systems require both sides to communicate with each other by typing words, which is time consuming, and creates difficulties in self-expression. Therefore, the lack of an effective mechanism interaction will lead participants to give up on-line learning.

3 Research Methodology

3.1 Participants

Online instruction program lasted for two semesters. There are totally fifty-five pre-service teachers participated in this program.

Table 1, The gender of the pre-service teachers in the first semester.

Gender	Number
Male	12
Female	15
Total	27

In the first semester, twelve pre-service teachers were male, and fifteen pre-service teachers were female. There were twenty-seven pre-service teachers participating in E-tutor program in the first semester (table 1).

Table 2, The gender of the pre-service teachers in the second semester.

Gender	Number
Male	10
Female	18
Total	28

In the second semester, ten pre-service teachers are male, and eighteen pre-service teachers are female. There are twenty-eight pre-service teachers participating in E-tutor program in the second semester (table 2).

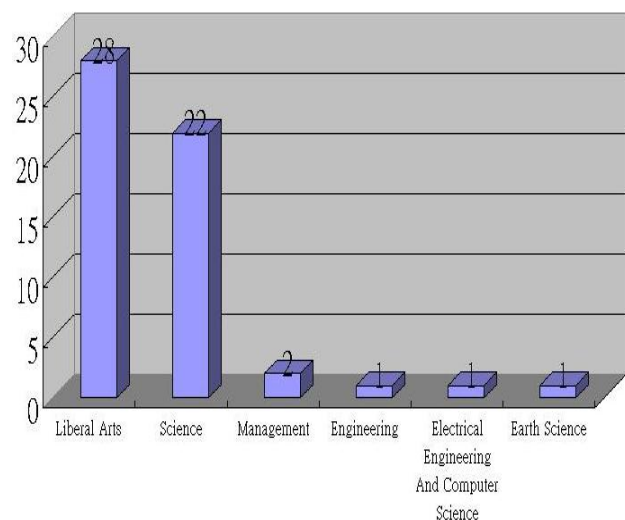


Figure 1, The major subject of the pre-service teachers.

The pre-service teachers came from six different colleges. Twenty-eight of them came from the College of Liberal Arts, which comprises three departments (Chinese Literature, English, and French

Language and Literature) and four graduate institutes (Philosophy, Art studies, History and Learning & Instruction). Twenty-two pre-service teachers came from the College of Science, which has five departments (Physics, Mathematics, Chemistry, Life Science and Optics & Photonics) and four graduate institutes (Statistics, Astronomy, Cognitive & Neuroscience and System Biology & Bioinformatics). Two pre-service teachers came from College of Management, which consists of four departments (Business Administration, Information Management, Finance and Economics) and three graduate institutes (Industrial Economics, Human Resource Management and Industrial Management). One pre-service teacher came from the College of Engineering, which is composed of three departments (Chemical and Materials Engineering, Civil Engineering and Mechanical Engineering) and six graduate institutes (Opto-mechatronics Engineering, Energy Engineering, Environmental Engineering, Construction Engineering & Management, Materials Science & Engineering and Biomedical Engineering). One pre-service teacher came from the College of Electrical Engineering and Computer Science, which has three departments (Electrical Engineering, Computer Science and Information Engineering and Communication Engineering) and two graduate institutes (Software Engineering and Network Learning Technology). One pre-service teacher came from the College of Earth Sciences, which comprises two departments (Earth Sciences and Atmospheric Sciences) and four graduate institutes (Geophysics, Atmospheric Physics Space Science, Applied Geology and Hydrological Sciences). More than half of the pre-service teachers in this study came from Liberal Arts colleges, and the next largest proportion came from Science colleges. In total, fifty pre-service teachers came from Liberal Arts or Science colleges (Fig. 1).

Table 3, The degree of the pre-service teachers

Degree	Number
Undergraduate	32
Graduate	21
Ph. D. candidate	2
Total	55

Most pre-service teachers participating in this study were undergraduate students, while two were Ph. D. students (Table 3).

3.2 Procedure of E-tutor Program

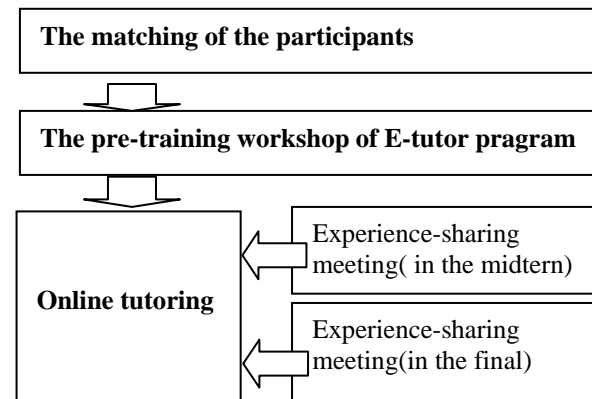


Figure 2, Process of E-tutor program during the first semester.

In the first semester, the E-tutor program consisted of four stages: 1. matching of participants, 2. pre-training workshop for the E-tutor program, 3. online tutoring and 4. Experience-sharing meeting (Fig. 2). Before the pre-service teachers started online instruction, the researchers and the staff in charge of E-tutor program at Chunghwa Telecom determined the time when the pre-service teachers and students can participate in online instruction. The researchers and the staff matched the pre-service teachers with students in this study.

One week before the start of the online instruction, Chunghwa Telecom held a two-hour pre-training workshop for the pre-service teachers. The purpose of the workshop was to familiarize the pre-service teachers with the X-learn system, the process and the objective of E-tutor program. During the two-hour workshop, the pre-service teachers had the opportunity to use the X-learn system. Technicians were available to help solve the problems faced by the pre-service teachers. Briefly, the pre-service teachers instructed online through the X-learning system two hours a week in their dormitory; however the computer lab in school was available to the pre-service teachers who lack computer equipments.

Experience-sharing meetings were held in the midterm and final weeks of the semester for the pre-service teachers to exchange their online tutoring experience.

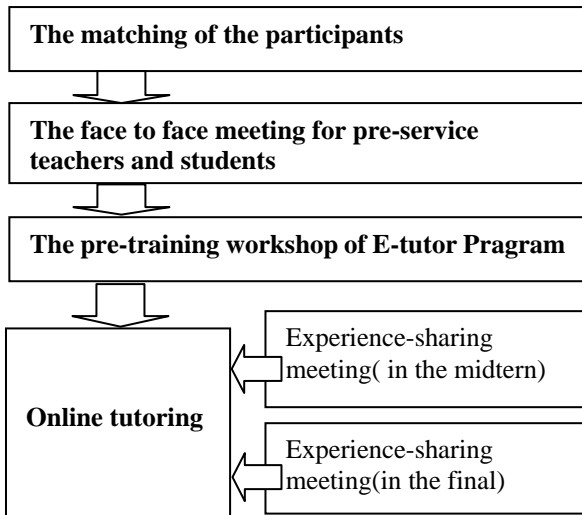


Figure 3, Process of E-tutor program during the second semester.

According to the feedback from the participants in the first semester, a face-to-face meeting was held for the pre-service teachers and the students before their online instruction, in the second semester, to enable them to get to know each other (Fig. 3).

Table 4. Differences between the two semesters

Differences	The first semester	The second semester
Online tutoring Subjects	English and Math	Chinese, English, and Math
Face-to-face meeting	No	Yes

E-tutor programs in the first and second semesters differed from each other in two ways. One is the subjects taught. Only two subjects (English, and Math) were included in the first semester program, while Chinese was added as the third subject in the second semester. Another difference is in the face-to-face meeting pre-service teachers and the students — this only occurred in the second semester (Table 4).

3.3 Data Collection and Analysis

The records of two experience-sharing meetings, and the interviews were used to gather data about how pre-service teachers gave online tutoring during each semester, and what they learn from online tutoring. Five topics were discussed in the experience-sharing forums: 1. the problems faced during online tutoring (Fig. 4); 2. how teachers managed online tutoring (Fig. 5); 3. the teaching strategy adopted in online tutoring (Fig. 6); 4. the expectations from their students, and 5. the expectation from themselves. The

video records of the experience-sharing activities, and the audio record of the interview were utilized to collect feedback on online tutoring from the pre-service teachers.



Figure 4, The pre-service teachers shared the problem they face on X-learn system.

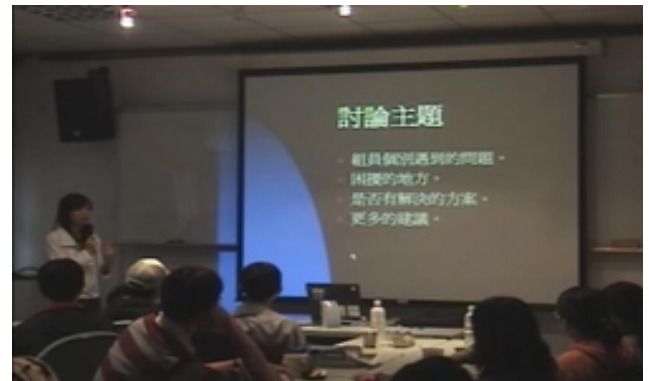


Figure 5, The pre-service teachers shared how they manage their online tutoring.

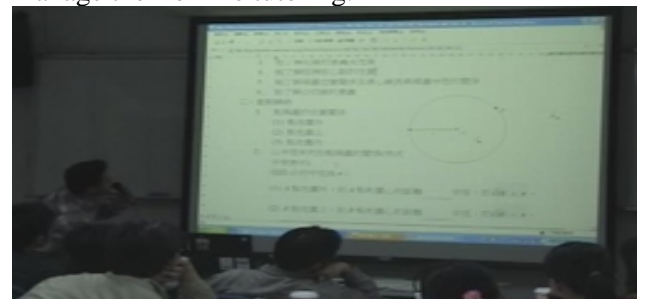


Figure 6, The pre-service teachers shared their teaching strategy during the experience sharing meeting.

4 Data Analysis

4.1 How Pre-service Teachers Taught in E-tutor Program

This section discusses two questions:

1. How did pre-service teachers prepare their teaching materials?

2. What activities were involved in online tutoring?

4.1.1 How Pre-service Teachers Prepared Their Teaching Material

The results of interview and experience-sharing meetings indicate that the pre-service teachers spent 1–4 hours preparing their teaching material. The pre-service teachers obtained more teaching resources from the Internet, textbooks and other reference books. The format of the teaching material was ppt, pdf and jpg. They generally produced their teaching materials from the dormitory and the computer lab.

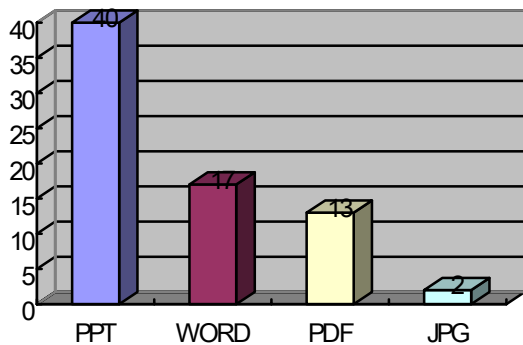


Figure 7, Formats of teaching material.

Teaching materials used in the X-learn must be in any of four formats. The PPT format was applied most frequently in this study (Fig. 7). Forty pre-service teachers would use power point file in their online instruction, seventeen would use word file, thirteen would used pdf file, and two would use jpg file. The per-service stated that they were familiar with power point file, and they thought power point file can clearly convey what they want to teach in online instruction.

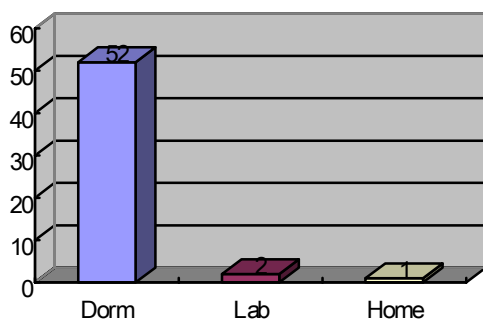


Figure 8, Locations for online tutoring.

Analysis results revealed that 52 pre-service teachers did the online tutoring in their dorms; two

did online tutoring in the computer lab, and one did online tutoring at home (Fig. 8). This showed that most pre-service teachers have their own computer equipment.

4.1.2 What Activities Were Involved in Online Tutoring?

Table 5, Activities in online tutoring of English.

Subject	Activity	Function
English	1.Grammar Instruction	Audio (1,2,3,4,5,8,9)
	2.Article Explaining	Chatting Room (1,2,3,4,5,6,8)
	3.Dialog Practice	Desktop Sharing (4,7)
	4.Singing Songs	Document Management (8,10)
	5.Asking Questions	Emoticon (11)
	6.Giving Exam	Material Category (10)
	7.Material Presentation	Member Management (1,2)
	8.Question Answering	Presentation Area (1,4,5,6,7,8,9)
	9.Pronunciation Instruction	Recording (12)
	10.Material Uploading	Video (1,2,3,4,5,9)
	11.Social Interaction	Whiteboard (1,2,5,6,7,8)
	12.Instruction Review	

In English online instruction, twelve activities are included. The top five functions were: Audio, video, whiteboard, presentation area and chat room Audio, chat rooms and presentation areas were used in seven kinds of activities. Video interaction and whiteboards were employed in six activities. Desktop sharing, document management, member manage were utilized in two activities. Emoticon and recording were utilized in one activity (table 5).

Table 6, Activities in online tutoring of Mathematics.

Subject	Activity	Function
Math	1. Giving Exam	Audio (1,2,3,4)
		Chatting Room (1,2,3,4)
	2. Explain the Content	Desktop Sharing (1,)
		Document Management (5)
	3. Solving Problem	Emoticon (4)
		Material Category (5)
	4. Social Interaction	Member Management (6)
		Presentation Area (1,2,3,4)
	5. Material Uploading	Recording (6)
		Video (1,2,3,4)
	6. Instruction Review	Whiteboard (1,2,3,4)

Six instructional activities were involved in math online instruction. The top five functions used in math online tutoring were: Voice, video, whiteboard, presentation area and chat room. In math online instruction, audio, presentation area, video interaction, and whiteboard were used in four activities. Desktop sharing, document management, emoticon, material category, member management, and recording were applied in one activity (Table 6).

4.1.3 How did Pre-service Teachers Evaluate Students?

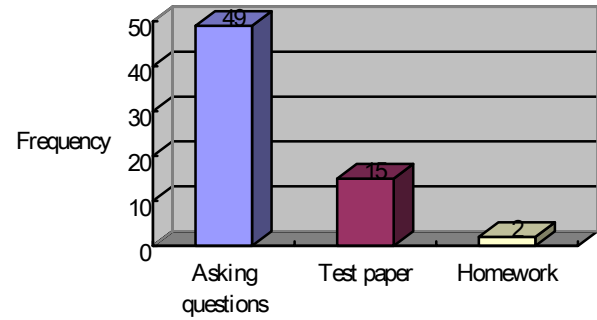


Figure 8, Evaluating strategies applied in online tutoring

From the interviews, we found that three kinds of evaluating strategies were used in online instruction in this study. Asking question, giving test papers and assigning homework were utilized by the pre-service teachers to evaluate their students. Asking questions is the strategy adopted most frequently during online instruction (Fig. 8). Forty-nine pre-service teachers evaluated their students by asking questions; fifteen pre-service teachers evaluated their students by giving a test; only one pre-service teacher evaluated their students by assigning homework. It shows that in online instruction, more pre-service teachers like to evaluate their students by asking question. *Teacher2: After I finish my explanation, I will give some questions related to the content for the students. This helps me to determine whether my student really understands what I have just taught.*

Teacher 4: I set some examination papers before the class. After my instruction, I give the examination to my students to complete. After my student finishes the paper, we check the answers together, and identify any problems.

4.2 What Pre-service Teachers Learn from Participating in the E-tutor Program

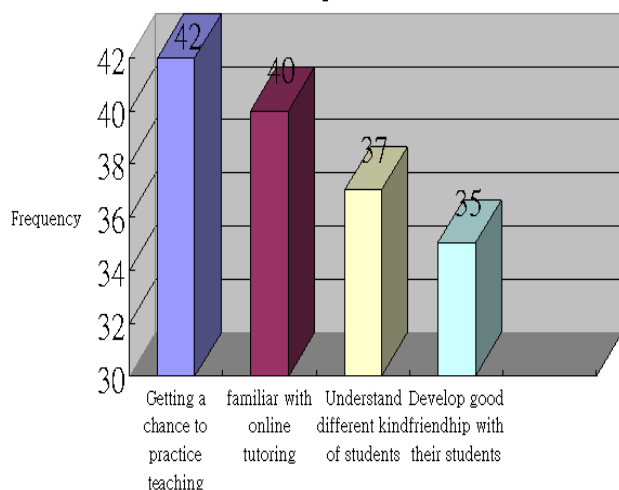


Figure 9, Benefits obtained by the pre-service teachers when participating in the E-tutor program

From analyzing the audio record of interview and the video record of experience-sharing meeting, we identifies four benefits the pre-service teachers gained from participating in E-tutor program (Fig. 9).

Forty-two pre-service teachers stated that participating in this program gave them an opportunity to practice their teaching skills. They learned how to make their teaching material more appropriate for their students, and learned how to modify their teaching content according to their students' learning. Furthermore, in the online instruction, the pre-service teachers realized the deficiency in their instruction.

Teacher 6: I never had any teaching experience before participating in this program, and this experience helped me discover the skills I need to improve, and what knowledge I lack.

Teacher 48: Participating in the E-tutor program gave me an opportunity to practice my teaching. From this online tutoring experience, I learned that a teacher always(has to adjust the speed of teaching to fit the learning needs of the students.

Forty pre-service teachers stated that teaching online is a unique experience for them. They learned what they should pay attention to during the online instruction, and what instructional resources they could adopt.

Teacher 5: I never teach students through the Internet. However, it is a very interesting and convenient. It saves lots of time, and makes me more familiar with online tutoring. I think it is a trend, and I'll have to learn it.

Teacher 45: Online tutoring is a unique experience. Many technologies and resource can be utilized to teach students. From the experience, I learned how to use technology effectively, and how to solve the problem during online tutoring.

Contacting with different students helped the pre-service teachers understand the rural area students' lives, thoughts and needs. The rural area students' backgrounds were very different from the pre-service teachers'. To improve the effectiveness of their teaching, the teachers had to understand their students' background and thoughts. It is important to design their instruction based on their students' needs. Thirty-seven pre-service teachers stated they learned what the students need, and tried to help them. Thirty-five pre-service teachers developed close relationships with their students. Many pre-service teachers said that during the online tutoring, they not only taught the subject-related content, but also shared their lives with their students.

Teacher 7: Participating in this program has helped improve my understanding of students living in rural areas. I realize the difference between the life in urban and rural areas. Moreover, I have begun to think about my students' needs, and now try to help hem.

Teacher14: During online tutoring, we also share what happen in our life with each other. At last, I feel that our relationship is not just like teacher and student, but more like friends.

5 Conclusion

Advances in development of information technology and popularity of the Internet have led researchers to focus on online instruction. Applying online instruction in teaching has several merits. Online tutoring can not only break the limitation of space for teachers to teach student in different places [10, 15], but also increase realism [11], implying that online tutoring can provide two-way communication with audio and video information, similar to face to face tutoring. Due to these advantages of online tutoring, researchers are likely to become increasingly interested in it in the future.

In this study, we figure out some interesting findings. First, many pre-service teachers like to use power point format file to teach their students online. Besides, we also found that in this study the per-service teachers like to evaluate their students by asking questions. From the interview, the pre-service

teachers stated that asking question is the easier and convenient strategy to evaluate their student. Second, the interaction-related functions (ex. audio, video, chatting room) were frequently used in no matter in English or Math online instruction. This tells us that in online instruction, interaction is very important, if these functions didn't functions well, the online instruction would be affected [16].

From participating in E-tutor program, the pre-service teachers gained a chance to connect the theory they learned in the classroom and real teaching experience. Besides, they also learned how to make their teaching material more appropriate for their students, and how to modify their teaching content according to their students' learning. Furthermore, in the online instruction, the pre-service teachers realized the deficiency in their instruction.

During the online instruction, the pre-service teachers developed close relationship with their students, and learned more about their students' need. This showed that the online instruction provided the pre-service teachers a chance to contact with students in different place, and increased their concern about these students. The finding echoed Malone, Jones, and Stallings' finding that the service learning can increase pre-service teachers' social responsibility and social concern [7].

In this study, we figured how pre-service teachers instructed online, and what benefits they gained from participating in the program. In the future, the teaching materials and the teaching modal should be develop for online instruction, and that will be helpful for online instruction program.

Acknowledgments:

The authors would like to thank the National Science Council of the Republic of China for financially supporting this research under Contract No. NSC 96-2520-S-008-003.

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