中 文 摘 要

研究者和教育者指出，提高中国英语教师的教学信念和技能，以便使其能够应对 21 世纪英语教育的挑战，已经迫在眉睫。所以，机辅语言教学环境下的教师教育正在逐步受到关注(Chen, 2002; Egbert et al, 2002; 徐昉，顾佩娅，2003)。

本文调研了以需求分析为基础的机辅语言教学课程中的教师发展。通过探究教师信念和教学技能的发展以及促进和阻碍该发展的因素，我们可以更好的理解教师发展和此类机辅语言课程之间的关系，以便能更有效地设计和实践这样的课程。该研究的背景是苏州大学外国语学院为英语语言文学专业研究生开设的一门机辅语言教学课程。作为教师发展的两个方面，教师信念和教学技能是该研究的重点。这两个方面被进一步划分为关于学习者，学习和教师的信念，和关于教学法、教学活动、教学材料和工具的技能。这些构成了该研究的框架。

该研究运用了阐释性的定性研究方法。研究数据主要来源于作者的参与性观察，课后访谈，以及课程参与者的课后反思报告。主要调查结果概述如下：

1. 以需求分析为基础的机辅语言课程促进了教师发展，也就是说，它能很好地促进英语教师机辅教学的能力和个人的发展。

2. 研究表明，通过参与这门课程，参与者形成了对于学习者、学习和教师的新信念。他们意识到学习者是教师的伙伴和知识的探索者；学习是一项积极的知识构建过程，而不是被动接受知识的过程；教师扮演着多重角色，如需求分析者，课程开发者，辅助者和"个人"等。同时，参加者在教学法、教学活动、教学材料和工具等教学技能方面也取得了很大进步。

3. 研究揭示了教师的支持和同伴的帮助是促进参与者发展的因素，而时间限制，技术困难，上机和上网费用等是阻碍因素。

上述研究结果表明，以需求分析为基础的机辅语言教学课程在促进教师发展，尤其是在更新教师信念和提高教学技能方面颇有潜力。同时，研究表明机辅语言教学课程中的教师发展，需要更多的关注课前技术培训，关注把计算机整合到语言教学中的教学技能。并且，此类课程的设计应该充分考虑参与者的实际需求和具体情境。

关键词：教师发展，需求分析，机辅语言教学课程，教师信念，教学技能

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Abstract

Researchers and educators have noted the urgency to empower Chinese EFL teachers with technology to meet the challenge of the English education in the 21st century, and thus teacher development in computer-assisted language learning (CALL) context is receiving increasing attention (Pilus, 1995; Egbert et al, 2002; Chen, 2002; 徐昉，顾佩娅，2003). This paper investigates the effects of a needs-based CALL course on EFL teacher development in terms of the participants' beliefs and skills, as well as the underlying factors resulting in the development. The purpose is to gain a better understanding of the relationship of this kind of CALL course to EFL teacher development regarding teacher beliefs and teaching skills so as to offer some implications for improving the program design and implementation in the future.

This study is conducted in the context of a needs-based CALL course for MA graduate students in the School of Foreign Languages, Suzhou University. To study teacher development in this course, two aspects are chosen as research focus, i.e., teacher beliefs and teaching skills (Richards et al, 1996, p. 242). These two aspects are further divided respectively into beliefs about learning, learners and teachers; and skills related to teaching method, activity, materials and tools. All this forms the research framework of this study.

In the study, an interpretative qualitative research method is employed. The qualitative data is obtained mainly from the writer's participant observation, a post-course interview, and the participants' end-of-course reflections. The major findings can be summarized as follows:

1.   The needs-based CALL course offered support for teacher development, that is, it served well in preparing EFL teachers to integrate computers into their EFL teaching and for their personal development.

2.   The study indicates that by taking this course, the participants formed new beliefs about learners, learning and teachers. They realized that learners are partners of teachers and knowledge explorers; that learning is an active doing and constructing process instead of a passive knowledge-receiving process; that

teachers have multiple roles to play, such as needs analysts, course developers, facilitators and individual persons as well. Meanwhile, the participants got much improvement in their teaching skills related to teaching methods, activities, materials and tools.

3.   The results also reveal that the instructor support and peer help are the most facilitating factors, while time limit, technical difficulties and cost factor are the most obstructing ones.

In light of the above findings, this paper suggests that the needs-based CALL course has potential in teacher development, especially in teacher beliefs and teaching skills. Meanwhile, the study implies that to promote teacher development in such a CALL context, more attention should be paid to pre-course technical training, teacher beliefs as well as relevant teaching skills to integrate computers into language teaching. What's more, teacher development courses should be designed on the base of participating teachers' needs and their contexts.

Key words: teacher development, needs analysis, CALL,   teacher beliefs, teaching skills

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Chapter One   Introduction

1.1 Current situation of teacher development

With the fast-paced changes brought about by globalization and technological development, language teachers begin to see their influence on English language teaching. Many have realized the urgency to update their knowledge and skills related to the use of technology as practicing language professionals. Meanwhile, the promise of computer technologies, supported by both research and practice, underlies the emergence of technology-supported classes across teacher-education programs and a sharp increase in courses specifically aimed at language teachers (Johnson, 1999). There are both a felt and expressed need to get such just-in-time trainings that teach what language teachers really need to know. Indeed, the key to successful use of technology in language teaching lies not in hardware or software but in "humanware", our human capacity as teachers to plan, design, and implement effective educational activities (Warschauer & Meskill, 2000). Given this situation, language teachers must not only become aware of what tools are available, but also possess sufficient knowledge of relevant technology, as well as the skills to use them (Tella, 1996).

While the continuous flow of new technology often overwhelms many foreign language teachers in spite of their intention to improve themselves, not to say those who have never received formal instruction in computer applications, the result is they feel so far behind in technology that they avoid using it at all. A survey of Chinese college English teachers' computer skills and their teaching practice in the field of computer assisted language learning (CALL) can illustrate this well (马俊波, 2003). This survey investigates 99 English teachers from four comprehensive universities in Wuhan, Hebei province. The survey result indicates that above 80% of the English teachers think of their current computer skills as poor, and though 90% of them have realized the important role played by computer in English teaching, 60% feel afraid or difficult to conduct CALL courses in practice. Another conference survey of 33 English teachers from five institutions shows similar results with most

teachers holding favorable attitudes to CALL (75.2%), but with low computer literacy (92.3%) (Gu, 1999). The situation indicates that most English teachers show strong desire to improve their teaching skills with technology by taking teacher development programs, which are insufficiently provided for the limit of institutional investment and tight teaching schedules (戴炜栋，2001；何高大，2002).

Moreover, Freeman & Richards (1996) note that teacher development programs used to present student teachers with a given curriculum, based on a transmission model, which imposed certain teaching models, theories and methods on student teachers (p.73). This prescriptive approach to teacher development fails to take student teachers' needs into consideration, and consequently teacher educators lose the basis to design and to specify the content of teacher education in ways that can develop their previous knowledge more effectively. So it is necessary for educators to design teacher development courses with student teachers' needs taken into consideration. Besides, learning teaching is a complex cognitive activity, so the need to integrate the perspectives of student teachers into understanding their learning process seems inseparable, which offers a means to examine their interpretations of the empirical experience (Dubin & Wong, 1990).

1.2 Background of the study

A literature review of EFL teacher development or teacher education reveals that considerable studies concerning teacher beliefs and teaching skills are conducted abroad (e.g., Richards & Nunan, 1990; Freeman & Richards, 1996; Freeman, 1989; Richards, 1998; Wallace, 1991), and among them, many (e.g., Johnson, 1999; Levy, 1997; Opp-Beckman, 2002; Warschauer, 2002) are carried out in CALL context.

In China, though still in an initiative stage, studies on EFL teacher development are shaping out with various focuses: some explore feasible models of teacher education (张颖、王蔷，2000); some introduce approaches to training EFL teachers (吴宗杰，1995；甘正东，2000); and still some discuss teacher education curriculum development (吴宗杰，1997；朱万忠、韩萍，2002). As to those concerning technology-supported teacher learning, only a few theoretical discussions and

research models are introduced or proposed (徐昉，顾佩娅，2003；张建伟，杨薇，2002；阮全友、陈奇敏,2003；桑新民, 2003). What catches the writer's attention is the fact that none of the above studies done in China are empirical and databased studies with an attempt to investigate student teachers' learning process through technology-enhanced teacher development programs.

1.3   Research statement

To bridge the gap, this study, conducted in one graduate class of applied linguistics majors taking a one-semester selective CALL course in the spring of 2003 at Suzhou University, aims to explore the findings such a teacher development program might bring about in participants' beliefs and teaching skills, as well as the underlying factors resulting in the findings. It is the writer's intention to gain a better understanding of the relationship of this kind of CALL course to EFL teacher development regarding teacher beliefs and skills so that we can design and implement such courses more effectively in the future.

This thesis consists of five chapters. Chapter One serves as an introduction to the background, purpose and content of the thesis. Chapter Two is a literature review covering the definitions of key terms in the present study; a review of needs analysis theories, needs-based course design and related studies on teacher development both at home and abroad. Chapter Three is the methodology part, raising the research questions, describing the context and participants of the present study, and introducing the instruments, the process and methods of data collection and analysis. Chapter Four reports and discusses findings derived from the study. Chapter Five covers the conclusion of the present study, implications for EFL teacher development in CALL context, limitations of the present study and suggestions for further study.

Chapter Two　Literature Review

2.1 Teacher development

2.1.1 Definitions

To define the term "teacher development", it is desirable to compare it with other two terms first, "teacher education" and "teacher training", since the three are often used either interchangeably or with different connotations. A quick review of the literature shows the changing trend of the term use, which seems to have reflected a growing understanding of the central role of the student teacher in the process of learning. As is pointed out by 刘润清 (2000) in prefacing the *Cambridge Books for Language Teachers,* the understanding of teacher learning has evolved from a period of "teacher training", which focused on the transmission of techniques and skills from an expert to trainees; to "teacher education", which involved trainees in the passive reception and application of linguistic theories; and to the now prevailing "teacher development", which emphasizes student teacher's making their own sense of teaching on the base of theories and experiences.

Wallace (1991) distinguishes the three terms as "that training or education is something that can be presented or managed by others; whereas development is something that can be done by and for oneself (p. 3)." And just as what Lange (1990) holds "teachers would be developed, not trained (p. 250)." The use of the term "teacher development" in this paper is to suggest that teachers continue to grow both before and throughout a career, and they continue to evolve in the adaptation and application of their beliefs and teaching skills, not only when engaging in explicit training programs.

The concept of teacher development is defined differently in literature: Lange (1990) offers the following definition: "a term used to describe a process of teacher's continual intellectual, experiential and attitudinal growth (p. 250)", which encompasses both mental and practical aspects and stresses teachers' continued growth. Rod Ellis (1990), in an attempt to draw an outline of teacher development

activities, states that teacher development consists of experiential and awareness-raising practices (p. 28). It is Richards et al (1996) who define teacher development more specifically as "concerned with providing opportunities for student teachers to develop their knowledge, awareness, beliefs and skills (p. 242)". They summarize it into two aspects: teacher beliefs and teaching skills and further divide them respectively into beliefs about learning, learners and teachers; and skills related to teaching method, activity, materials and tools.

The two aspects of teacher development, teacher beliefs and teaching skills, are interrelated instead of being independent of each other A number of studies suggest that what teachers do is governed by what they think, and teachers' theories and beliefs serve as a filter through which a host of instructional judgments and decisions are made (Shavelson & Stern, 1981; Pajares, 1992; Woods, 1991). In another word, teacher beliefs are the primary source of teachers' classroom practice and teaching skills. A brief review of teacher beliefs and teaching skills is given below.

Teacher beliefs appear to be well established by the time a student gets to college, concerning the attitudes, values, expectations, and assumptions about teaching and learning that were built up over time and brought to classroom by teachers (Weinstein, 1989). Teacher beliefs consist of beliefs about learners, about learning and about teachers themselves (Richards et al, 1996). Teachers may hold any one or a combination of beliefs about those they teach, that is, learners may be construed as receptacles, clients, partners, or individual explorers, which in turn can have a profound influence on their classroom practice (Meighan & Meighan, 1990). As important as their views about learners are teacher beliefs about learning, such as whether or not they take learning as a quantitative increase in knowledge, or as a complex and lifelong process, or as an emotional and cognitive process, etc. Teacher beliefs about themselves, such as teacher's role ranging from knowledge transmitter to facilitator, and teacher's expression of values and attitudes, can also shape the way they teach (Williams & Burden, 1997).

Skills in teaching a language would appear to be the core competency of a language teacher, which is referred to as those dimensions of teaching regarded as

essential to the repertoire of any teacher, regardless of subjects (Richards, 1998). Teaching skills thus involve management, explanation, discussion and all the observable features of effective direct and heuristic instruction. To be more specific, teaching skills include skills to select learning activities, to present languages, to control practice, to give feedback, etc (Shulman, 1987). And just as Richards (1998) states, borne out by trends in Teaching English to Speakers of Other Languages (TESOL) teacher education throughout the 1990s, teacher education will be increasingly competency-based, and examination of the nature of basic skills in language teaching is a matter of some urgency (p. 5).

Three correspondent approaches to teacher development are identified: the behaviorist approach, the cognitive approach, and the constructivist approach. Since the first two approaches either neglected student teacher's cognitive process or separated theory from practice, the constructivist approach serves well the problem-solving teacher learning process (see Wallace, 1991). It is just as von Glasersfeld points out (1995), "Constructivism can not tell teachers new things to do, but it may suggest why certain attitudes and procedures are counter-productive, and it may point out opportunities for teachers to use their own spontaneous imagination (p. 177)." The need for teachers is to become self-aware of their beliefs and the ways in which they make sense of the world by reflective practice. Also teachers need to be aware that they themselves are being construed by their learners, and that their words and actions form part of every learner's own construction of knowledge.

One point to be made here is that though some scholars (Richards et al, 1998; Dubin & Wong, 1990) associate pre-service teacher development with training techniques and skills, and in-service teacher development with changing beliefs, the two are not mutually exclusive and teacher development often refers to both (Rod Ellis, 1990; Wallace, 1991). Therefore, distinction between pre-service and in-service teacher development is not emphasized here since current teacher development programs are often open to both groups and the teacher learning courses are usually found a mixture.

2.1.2 Related studies

Numerous studies on teacher development are conducted abroad about the effect of individual experience, social environment and professional training on teacher learning process (Richards & Nunan, 1990; Freeman & Richards, 1996; Wallace, 1991; Pilus, 1995). For instance, Smith's study (1996) examined the role that linguistic theory, individual teacher' beliefs and contextual factors play in the pedagogical decision-making process (p. 197). And Bailey's study (1990), by taking diary studies as potential tools for teacher preparation, reviewed briefly some of the insights gained by teachers-in-preparation who kept language teaching diaries, and offered some guidelines for the use of diary studies in teacher education programs (p. 215).

In China, there do exist some studies on teacher development in regular classes without computers: some explore feasible models of teacher education (张颖、王蔷, 2000); some introduce new approaches to training EFL teachers (吴宗杰, 1995; 甘正东, 2000); and still some discuss teacher education curriculum development (吴宗杰, 1997; 朱万忠、韩萍, 2002). As to those concerning technology-supported teacher learning, only a few theoretical discussions and research models are introduced or proposed (徐昉, 顾佩娅, 2003; 张建伟, 杨薇, 2002; 阮全友、陈奇敏,2003; 桑新民, 2003; 徐昉, 2003). All the studies really shed light on our understanding of relevant theories and issues. But there are few empirical studies on teacher learning process concerning student teachers' beliefs and teaching skills, not to say studies on implementation and effects of teacher development programs on these two aspects.

2.2 Needs analysis theories and instructional design

2.2.1 Needs analysis theories

Needs analysis (also needs assessment, see Richards et al, 1998, p. 304) is defined differently from different perspectives for different purposes. For instance, Richards et al (1998) take it as a process of determining the needs for which a learner or a group of learners require a language and arranging the needs according to

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priorities. Leshin et al (1992) regard it as a tool used by corporate trainers and instructional designers to aid in developing effective training programs and/or instructional materials. Whatever the definition is, a needs analysis aims to identify the problem to solve, the instruction to solve the problem, the purpose of the planned instruction and the reason to design such instruction (Cf. Kemp et al, 1994).

Since the primary goal of needs analysis is to determine whether or not a problem can be addressed successfully through new instructions by providing information about the learners, course goals, content, and about course evaluation (Richards, 1990; Johnson & Johnson, 1999), it becomes the starting point in instructional design. Leshin et al (1992) offers a four-procedure process for conducting a needs analysis: define the problem, identify the source of the problem, determine possible solutions, and communicate results. To put it specifically, one must first gain some contextual insights into the problem; then further analyze the performance gap to identify whether it stems from a lack of training, or if it has to do with the organizational environment; the third procedure is to decide if the problem can be solved by instruction alone or in another way; finally the results of the needs analysis should be communicated to the client by means of a written report with recommendations for solutions.

2.2.2 Instructional design

Instructional design (ID) is defined, though by different people (Smith & Ragan, 1993; Kemp et al, 1994), with a similar emphasis, as the systematic development of instructional specifications using learning and instructional theory to ensure the quality of instruction. The product of ID is often described as an "architect's blueprint" which is a prescription for what the instruction should look like (Levy, 1997). Being eclectic in nature, ID integrates the ideas of a number of areas such as behavioral psychology, cognitive psychology, adult learning, systems theory, and media technology (Bonner, 1988). The basic assumptions of ID are described by Gagne et al (1992) as: "aimed at aiding the learning of the individual; organized such that it has immediate and long-term phases; systematically described; conducted by

means of a system approach; designed on the basis of our knowledge of how students learn (p. 4)."

In most traditional ID frameworks, teachers do not design or develop their own materials; instead they are given materials, which is criticized for the lack of emphasis on the active and constructive role of the learner (Bonner, 1988). Jonassen (1991), therefore, distinguishes objectivist approach from constructivist approach to ID. The former approach has a predetermined outcome and intervenes in the learning process to map a pre-determined concept of reality into the learner's mind, while the later maintains that because learning outcomes are not always predictable, instruction should foster, not control, learning. Many ID models are proposed based on these two approaches, e.g., Gagne et al's "Nine Events of Instruction" based on objectivist learning theory (1992); Hannafin et al's "Open Learning Environments" based on constructivist learning theory (1999) and so on. They all have applications in different designing situations and just as Ertmer and Newby (1993) have noted that instructional strategy and content addressed depend on the level of the learners, in order that the designer is able to draw from a large number of strategies to meet a variety of learning situations.

Since learning is a process of actively constructing knowledge by integrating experiences into the learners' existing schemata, learning environments should support that process by providing multiple perspectives or interpretations of reality. Learning experiences should also enable knowledge construction in the learner through providing context-rich, experience-based activities. With this view of learning in mind, Jonassen (1999) suggests a model for designing constructivist learning environments (CLEs), which consists of four components: an enabling context, resources, tools and scaffolds. To be more specific, an enabling context refers to a problem or project as the focus of the environment, with various interpretative and intellectual support systems surrounding it. The goal for the learner is to solve the problem or complete the project with the support of related cases and information resources in understanding the problem or suggesting possible solutions. Cognitive and collaborative tools are offered to help the learners to manipulate and negotiate the

problem, and social or contextual support systems help to implement the CLE. Scaffold is given to learners by adjusting task difficulty or providing alternative assessments.

2.2.3 Needs-based instructional design

Though first applied in special-purpose program design, especially English for special purposes (ESP) in 1970s, needs analysis is fundamental to the planning of general language courses too (Richards, 1990; Davies, & Pearse, 2000). Just as Stern (1992) has indicated, "needs analysis remains an important first stage of curriculum development in many types of language teaching, serving as a key source of input for decisions to be made with respect to content, objectives, and treatment strategies (p. 43)." As the starting point of ID, need analysis should reflect the common needs of a learner group, not the diversified individual learner needs, so as to make the teaching benefit the majority and the course meet the goal.

The issue of needs-based instructional design has been dealt with extensively in the general literature of second and foreign language teaching. A widely accepted one is Tyler's (1949) classic model, which begins with considerations of learners' needs, and proceeds to the development of instructional objectives, then content and lesson plans are ultimately developed. Tyler's model has influenced generations of teacher educators, and it appears in modified form in many contemporary texts on course design. For example, Pang's book *Lesson Planning* (1992), intended as a guide for teachers of all subject areas, is based on 14-step framework for lesson plan. And Harmer (1991), a widely used text in pre-service Teaching English as Second Language (TESL) teacher training courses, provides a sample lesson plan that includes five major components.

However, it is pointed out that Tyler's model lacks evaluation procedures, which plays a key role in determining whether and where the goal of a program has been attained, and in suggesting space for improvement (Richards, 1984). So Richards (1990) attempts to redress this by presenting a curriculum model in which language teaching is seen as a set of processes and procedures, which are both systemic and

interrelated. The essential elements in the model are needs analysis, goal setting, content and methodology, and evaluation. Needs analysis allows for greater numbers of people to be involved in course design, and it also enables goals to be identified, and provides data for evaluation and accountability. Goals can be used as a basis for developing more specific descriptions of the intended outcomes of the program. Content includes selection and organization of course content, while methodology can be characterized as the activities, tasks, and learning experiences selected by the teacher to achieve learning, and how these are used within the teaching/learning process. Evaluation not only determines whether the goals of a program have been attained and where they have not been attained, but also suggests space for improvement.

Other scholars such as Nunan (1988), Yalden (1987) and Hedge (2000) have developed similar course design models with that devised by Richards. These models, though differ slightly with each other, are composed of the essential elements mentioned above. Though these models are commonly used for designing language-learning courses, it is also applicable for designing teacher development courses in that language teaching itself is the major content of teacher development course, and meanwhile teachers are trained to learn how to teach language in such courses.

2.3   Needs-based CALL course for teacher development

2.3.1 Role of technology in language learning and teacher development

Over the past thirty years language teachers have witnessed dramatic changes in the ways that languages are taught. The focus of instruction has been broadened from the teaching of discrete grammatical structures to the fostering of communicative ability. It is in this context that one of the most significant areas of innovation in language education, CALL, has come of age (Kern & Warschauer, 2000). To use new technologies in the language classroom can be interpreted in light of the changing goals of language education and the changing conditions in postindustrial society.

Namely, CALL activities can be designed to create ideal conditions for second language acquisition (SLA) from the perspective of input, output and interaction (Warschauer & Meskill, 2000). This is accomplished through creating opportunities for authentic and meaningful interaction both within and outside the classroom, and providing students the tools for their own social, cultural, and linguistic exploration. The computer is a powerful tool for this process as it allows students access to online environments of international communication. By using new technologies in the language classroom, teachers can better prepare students for the kinds of international cross-cultural interactions, which are increasingly required for success in academic, vocational, or personal life (Warschauer & Meskill, 2000).

Computer can serve a variety of uses for language learning: a tutor that offers language drills or skill practice; a stimulus for discussion and interaction; a tool for writing and research and so on. With the advent of the Internet, it can also be a medium of global communication and a source of limitless authentic materials (Warschauer, 1996). But as Garrett pointed out (1991), "the use of the computer does not constitute a method. Rather, it is a medium in which a variety of methods and pedagogical philosophies may be implemented" (p. 75). The effectiveness of CALL cannot reside in the medium itself but in how it is put to use. Therefore, identifying, exploring, and discussing key issues in the area of CALL are essential if teachers are to learn how to make informed choices about computer use. This requires language teachers rethink their traditional educational beliefs and reestablish their roles as a facilitator and helper in a CALL classroom (Gu & Xu, 1999; Naidu et al, 2002).

To meet the new challenges and directions of CALL for teacher development, there is a need to help teachers develop skills in autonomous learning and self-reflection so as to help them refine and improve their classroom practice. Computers can play a role in developing these skills (Johnson, 1999). To sum up, teachers require two basic kinds of training. Firstly, some technical training on the operation procedure of the computer itself and secondly, ways to integrate CALL in their teaching. Therefore, there's a felt need that in a country where CALL is still in its infancy, teachers receive adequate training to undertake most of the said

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responsibilities. Only then can CALL be implemented effectively with its potential fully realized (Pilus, 1995; Jones, 2001).

2.3.2 Related studies on needs-based CALL course for teacher development

Many researchers (Jones, 2001; Johnson, 1999; Levy, 1997; Pilus, 1995; Walker, 1994; Warschauer, 2000) abroad become aware of the critical role played by teachers in CALL process and the need for teacher development in CALL context. For example, Jones (2001) asserts, "For most students CALL will need more learner training and more of the teacher's presence than any of the other operations in the self-access center. CALL will not be effective without this essential interaction of teachers and students. We should give committed teachers adequate training." In the context of EFL teacher development, many CALL courses are offered to meet the needs. These courses are typically designed to give an overview of CALL, including its history, theoretical framework, courseware evaluation, computer-mediated communication and so on (Warschauer & Healey, 1998).

However, it is not easy to find needs-based CALL courses as teacher development programs. Here are two examples. One is Opp Beckman's description of an online project with English teachers in Africa, which includes a survey of participants' interests and needs at the beginning of the course, based on which preliminary materials, resources, and Web-based tools were selected (2002). And Warschauer reports a large, U.S.-funded, technology-enhanced teacher education program in Egypt, which was developed following a national needs analysis (2002).

Researches on teacher development in CALL context in China are still in an initial stage. Under the call of the Ministry of Education for informatization of teacher education (教育部，2002), studies concerned begin to spring out. Among them are theoretical discussions of the urgency and feasibility of informatization in the tertiary EFL teacher education from the perspectives of the research background, contents and methodology (e.g., 徐昉 & 顾佩娅，2003), and articles on ways of integrating students' computer skills, research-oriented learning method and students' career

needs into the construction of students' information-based competence (阮全友 & 陈 奇敏, 2003). Also some focus on the information technology and reform of teacher education models (桑新民, 2003).

All the studies reviewed above show their concern about the importance of integrating technology into teacher development programs, and their explorations are really enlightening. But studies on if and how a CALL course can offer support for EFL teacher development in specific ways such as teacher beliefs and skills remain rare, not to say investigating the effects of such CALL courses from participants' perspectives, hence the need of the present empirical study.

2.4 Teacher development research framework

Based on the above literature review, a research framework (see Figure 1 below) is constructed to help clarify the relationship between the conceptual context and research focus as well as those key factors and concepts. As a key part of the research design, this concept map reflects the writer's theoretical considerations and explains the major issues to be covered in this study.

As is mentioned above, the research context is a needs-based CALL course while the research focus is teacher development. The writer intends to gain a good understanding of the relationship between this kind of CALL course and EFL teacher development. The two-way arrows both on the top and at the bottom of the framework show the potential mutual enhancement between the CALL course and teacher development. It is the writer's hypothesis that by taking this needs-based CALL course, the participants could get improved both in teacher beliefs and teaching skills.
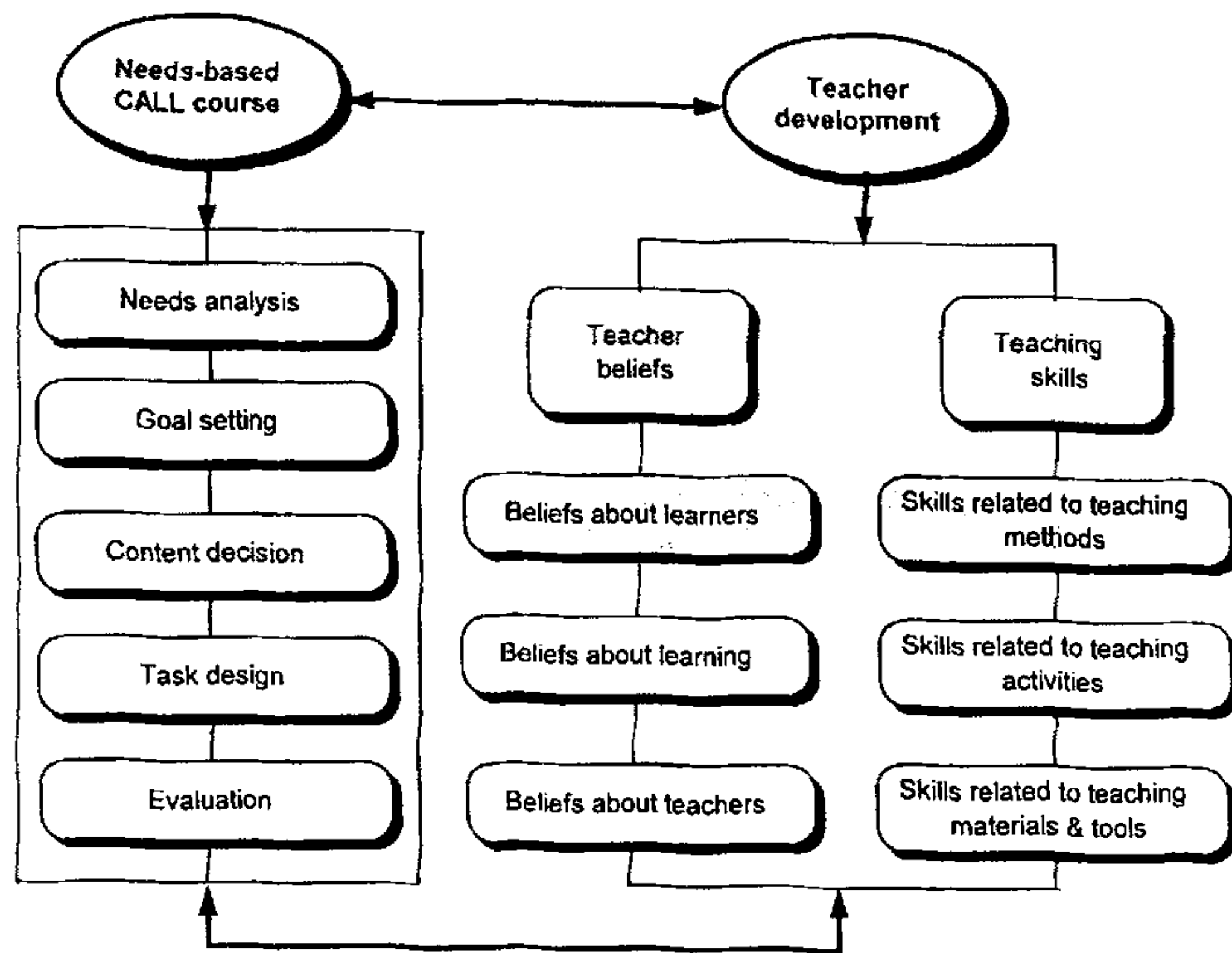
Figure 1: Teacher development research framework

The left part of the framework is a needs-based CALL course design that forms the context for this study. Since the participants of this course are graduate students who would be EFL teachers in one or two years, this CALL course is seen as a teacher-training course. Based on Richards' instructional design model (1990), the CALL course is designed by the instructor with these five essential elements taken into consideration: needs analysis, goal setting, content decision, task design and evaluation. The instructor begins the CALL course with a needs analysis, which offered information on participants' current computer level and their learning needs and interests. For other design elements, they are mostly ongoing teacher-student co-construction, thus may not follow exactly the order appearing here. Therefore, to list the elements this way is only for the clarity of description. The writer, acting both as a participant and observer of the course, tries to investigate if and how the participants' teacher beliefs and teaching skills undergo any change in this course context.

The right part of the research framework illustrates the focus of the study, that is, the components of teacher development regarding teacher beliefs and teaching skills. These two aspects are interrelated and indispensable for developing a teacher as a whole (Richards, 1998). As is mentioned above, teacher beliefs consist of beliefs about learners, learning, and teachers; and teaching skills are related to teaching methods, activities, materials and tools (Richards et al, 1996). It is in the needs-based CALL course context that the participants' beliefs and skills are studied. Meanwhile, the five course elements in the left part of the framework play important roles in help shape the participants' beliefs and develop their relevant skills. That is why there is a similar two-way arrow between these two parts to indicate their interdependent relationship.

Chapter Three   The Study

Researchers home and abroad have come to the consensus that EFL teacher development in this information age should focus on teachers' integration of technology into their teaching (Pennington, 1996; Hubbard, 1996; 何高大, 2002). However, such empirical studies in China are still in the embryonic stage. To bridge the gap, this small-scale study aims to explore the possible impact of a needs-based CALL course on participants' development regarding their beliefs and teaching skills. The following research questions are addressed in the present study:

1) To what extent, if any, does the needs-based CALL course offer support for EFL teacher development?

2) How did the participants' beliefs about learners, learning and teachers develop in the needs-based CALL course?

3) How did their skills related to teaching methods, activities, materials and tools develop in the needs-based CALL course?

4) What factors enhance or inhibit teacher development in the needs-based CALL course?

3.1 The context

3.1.1 Course description

The study is conducted in the context of a graduate-level selective course named "Computers-Assisted Language Learning", which was held during the spring semester of the year 2003, in a multimedia lab at Suzhou University in China. The course was conducted by a professor specialized in CALL from the English department. As is mentioned earlier, the instructor designed the specific course activities on the basis of the five elements: needs analysis, goal setting, content decision, task design and evaluation. A pre-course needs analysis survey was conducted by the instructor to collect not only the demographic information of the participants, but also their current interest and knowledge of CALL. Based on the result of this needs analysis, the goal

of the course was set to offer an overview of CALL theories and to provide hands-on skills to help the participants put theories into practice by learning to design a CALL course or activity for any real EFL classroom. For illustration, a flowchart of the course structure is given below:
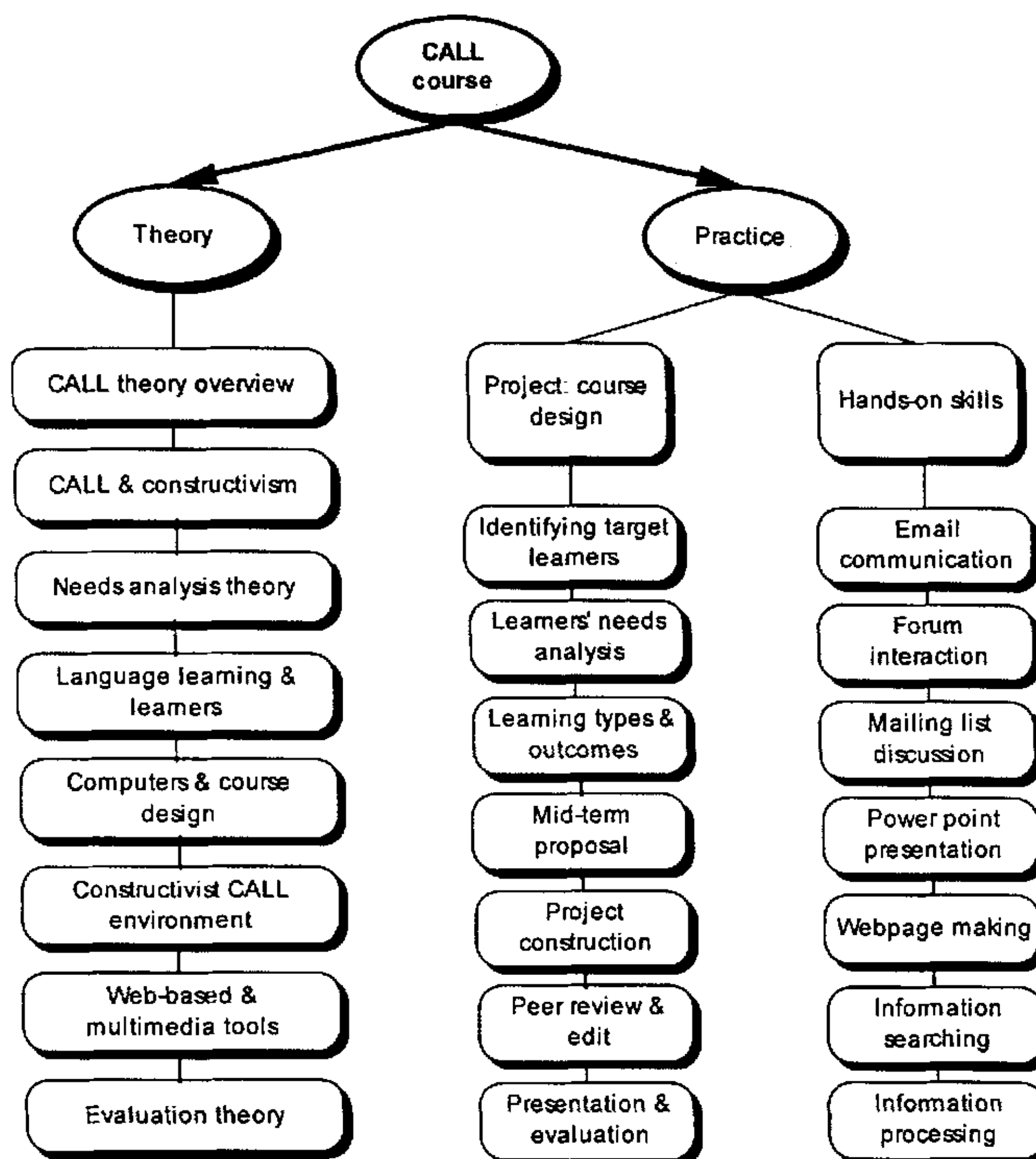

Figure 2:   Flowchart of 2003 CALL course structure

During the 2003 CALL course, the instructor organized seminar discussions in which the participants made power point presentations to illustrate their understandings of CALL theories under a series of topics in the Course Schedule[1]. Both face-to-face and online discussions were held to help the participants clarify

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[1]   See http://call.suda.edu.cn/courses/AL0124_CALL/schedule.htm

issues emerging from this process. Meanwhile, the participants were guided to learn some hands-on skills related to CALL, such as email writing, online information search and forum discussion. In addition, the participants were expected to finish a project by the end of the course, which was to design a CALL course or activity for real learners. They were helped to find their target learners, analyze learners' needs, propose project proposals, make peer reviews and construct the final projects. After the final project presentation, an end-of-course reflection was required of all the participants regarding their learning experiences, self-evaluation and suggestions for future improvement. All the participants' projects and reflections can be found at the Course Product page.[1]

3.1.2 Participants' background

Eight graduate students majoring in applied linguistics registered for this CALL course and they met on Monday mornings in the lab once a week, two hours each time. All the eight participants have got their BA degrees in universities, with their age ranging from 24 to 28. Though only three of them have formal teaching experiences in college, the other five admit they also have taught certain form of classes on or off campus (such as language training programs or night schools). They all take English teacher as their future career goal. All participants have access to computers at home, dorm, or office, and they often use basic computer functions such as Word and email, but not much as to power point and web page making before the course. Through interacting and cooperating through forum discussions or email exchanges in the course process, the eight participants have formed a warm learning community and thus made the study easier to carry out.

The computers in the multimedia lab are connected to the Internet through the campus network and the course page is accessible both on and off campus, making it easier for the participants to learn either at home or dorm. The instructor, updating the course content weekly according to practical situations, managed the course page in a

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[1] See http://call.suda.edu.cn/courses/AL0124_CALL/Sts_webpages/03spring_AL2

timely manner.

3.2 Research Design

3.2.1 Interpretative qualitative research

To help investigate students' and teachers' evolving attitudes and sense of identity in changing circumstances, Warschauer (1998) suggests an interpretative qualitative research method in technology-enhanced language learning and teaching, which seeks to study the crucial but often hidden factors and to define the meanings of actions from the perspectives of the participants.

The interpretative qualitative data collection methods include participant observation, interviews, journals and stimulated recall procedures within particular institutions and communities (Freeman & Richards, 1996). The qualitative data gathered by these methods are designed to capture participants' knowledge and perceptions about language teaching and learning process. Qualitative data analysis consists of many analytic options such as content analysis, by which emerging patterns and themes are identified and interview data are coded and sorted into descriptive categories (Burns, 1996); and also categorizing strategies, which are featured with coding and thematic analysis to "fracture" the data and rearrange them into categories that facilitate the comparison of data within and between these categories and thus aid in the development of theoretical concepts (Maxwell, 1996).

Though the 2003 CALL course was not for language learning directly but for EFL teacher development, the final goal of the course is to promote language learning by training language teachers to teach the language more effectively with the support of technology. This makes the interpretative research method suitable for this study of teacher development. In the study, participant observation, interview and reflections of participants are employed as major data sources. With categories grounded in the data, the writer tries to limit as much as possible prior assumptions about what may be significant, in order to understand and interpret the participants' development in teacher beliefs and teaching skills, and also factors influencing this development.

3.2.2 Data collection

3.2.2.1 Participant observation

In contrast to earlier research traditions, which presented an outsider's perspective on teaching and sought to identify quantifiable classroom behaviors and their effects on learning outcomes, research on second language teaching has attempted to understand teaching from the "inside" rather than from the "outside" in recent years (Richards, 1998). And the need to listen to teachers' voices in understanding classroom practice has been emphasized (Cochran-Smith and Lytle, 1990). So comes out the research procedure: participant observation, in which the researcher takes part in the situation he or she is studying as a way of collecting data for further study. It is claimed that an observer who is also a participant can understand a situation more fully than an observer who is merely looking on from the outside (Richards et al, 1998). Also the participant observer is in the best position to note "details of practice", in other words, a fully detailed record of actions that can be used to provide the data for interpretation (McDonough & McDonough, 1997). Therefore, the writer of this thesis, acting as a course participant and an observer as well, could be able to make use of the opportunity to observe systematically the participants' learning process as a natural phenomenon.

As a participant, the writer underwent the course procedures from the beginning to the end, completing all the course tasks and her own project with the help of the instructor. Deep involvement in the learning process provides the writer with similar experience of other participants, both drawbacks and successes. The writer has overcome difficulties either in theory comprehension or computer skills, through interactions with peers and the instructor. Reflecting now, the writer could have a deep understanding of other participants' interpretations of their learning process, for this is true with herself.

As an observer, the writer kept daily observation notes on her own experience and other participants' behaviors in class and their feelings about their own learning

progress. The writer noticed their development in teacher beliefs and teaching skills through classroom discussions, email exchanges between peers and the instructor, forum discussions, professional email discussion lists (also mailing lists) and informal talks. Meanwhile, the writer collected all the written files from the course page with the permission of the participants and did an on-going analysis of the observation notes. Frequent discussions with peers, self-reflection and reorganization of the data were also held for the purpose of authenticity and clarity.

3.2.2.2 Interview

Besides the above-mentioned participant observation, another important data source is post-course interview, aiming to probe the perceptions of the participants about their learning process and the phenomenon concerned (Burns, 1996; Freeman, 1996). Out of the eight participants, four of them available as to their time and convenience were interviewed to get detailed information of their learning process. Among the four interviewees, two happened to have formal teaching experience and the other two have none, but claimed to have some previous teaching experience in their teaching practice. For the convenience of description, the four interviewees are marked respectively as Interviewee 1, Interviewee 2, Interviewee 3 and Interviewee 4.

Based on the four research questions, the open-ended interview after the course tried to draw out the interviewees' perceptions about their learning process from a retrospective viewpoint. The interview was conducted mainly by email right after the course, in July 2003, allowing the interviewees more time and freedom to pull out their interpretations and feelings about their learning experiences (Egbert et al, 2002). After a preliminary analysis of the interview data, the writer arranged a face-to-face meet with the interviewees to confirm certain findings or clarify certain unclear viewpoints. Due to health problem, a telephone talk was conducted with Interviewee 3 for she was not present at the meet. The writer took notes while talking with the interviewees, which complemented the interview data obtained by email. All the interviews and talks were conducted in English since the interviewees have mastered quite fine English language proficiency.

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The ten questions below constitute the interview. They are designed in a way from general to specific. Question 1 (Q1 here after) and Q2 are designed to answer the first research question, that is to what extent, if any, the needs-based CALL course offers support for EFL teacher development. Q3 to Q5 try to probe findings as to teacher beliefs about learning, learner and teachers. Q6 to Q8 aim to study participants' development regarding to teaching skills related to methods, activities, materials and tools. The last two questions examine factors enhancing and inhibiting teacher development. Figure 3 illustrates the relationship between the four research questions and ten interview questions:

Research questions (RQ)	Interview questions									
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
RQ1	X	X								
RQ2			X	X	X					
RQ3						X	X	X		
RQ4									X	X

Figure 3: Relationship between research questions and interview questions

1) What three or four words would you use to describe your experience in taking this course? What led you choose these words?

2) Looking back on your experience in this course, how do you feel about it in your development as an EFL teacher?

3) After taking this course, what is your view on learners' role in the learning-teaching process? Is it different with your previous view?

4) Have you changed anything as to what you mean by learning or what you believe learning involves?

5) To what extent, if at all, has your experience in the course led to changes of your views on effective teachers or qualified teachers?

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6)   Have you undergone any change as to your understanding of teaching methods and techniques? Or how will you carry out teaching after taking this course?

7)   What did you learn as to teaching activities you will carry out in your teaching?

8)   Have you changed anything as to teaching materials and tools you will adopt in your teaching?

9)   What are the factors or conditions enhancing your development as an EFL teacher in the whole process?

10)   What are the factors or conditions inhibiting your development as an EFL teacher in the whole process?

3.2.2.3 End-of-course reflections

In order to get an overall picture and to cross check the data, the participants' end-of-course reflections were also used as data source. As these reflections were done right after the course as the last assignment of coursework, they are taken as real time data and with interview results as reflected time data (Freeman & Richards, 1996). The end-of-course reflections allowed the participants a chance to sum up their learning process, from which evidence of teacher development can be found. In their reflections, some people described their project making process stage by stage, some illustrated their pains and gains from the learning process. All the reflections were collected from the CALL course page with the permission of the participants. Besides the four interviewees, the other four participants' end-of-course reflections are marked with Participant 1, Participant 2, Participant 3 and Participant 4 to illustrate the source.

3.2.3 Data analysis

The interview result and end-of-course reflections, firstly underwent line-by-line key points coding, and then themes and sub-themes (Bogdan & Biklen, 1982) were extracted and grouped under nine thematic areas: 1) findings in beliefs about learners;

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2) findings in beliefs about learning; 3) findings in beliefs about teachers; 4) development of skills regarding methods; 5) development of skills regarding activities; 6) development of skills regarding materials and tools; 7) factors enhancing teacher development; 8) factors inhibiting teacher development.

A case-by-case analysis of each of the four interviewees was done to find individual perspectives related to these thematic areas so as to enrich the findings. The four interviewees were invited again to check the accuracy of the main findings (See a sample of interview data coding process in Appendix I). To ensure the validity of data analysis, two other researchers were invited to analyze the same set of data to see whether they can obtain similar codes or not (文秋芳, 2001).

Other qualitative data such as participant observation notes were also grouped into relevant thematic areas. They are constantly drawn to cross check the accuracy of the coding process or enrich the identified findings about participants' development in beliefs and skills.

Chapter Four   Results and Discussions

This chapter provides the results on the research questions mentioned above and the discussions of the factors underlying the process of teacher development. The overall data analysis result indicates that the needs-based CALL course does offer support for EFL teacher development, especially in their teacher beliefs and teaching skills. It thus gives an affirmative answer to the first research question.

As mentioned above, teacher beliefs, built up over time, are the primary source of teachers' classroom practice, and resist change in a short time. However, teachers may interpret the practical condition and new input, and then reconstruct their beliefs and assumptions (Richards, 1998). In this CALL course, the participants seem to have formed some new beliefs about learners, learning and teachers, which are either in contrast with their previous ones or born the first time. As the other aspect of teacher development, teaching skills define the how of teaching: give clear instructions, manage classroom interactions, present materials and so on, which are further clarified as skills related to teaching methods, activities, materials and tools (Richards et al, 1996). Much data from this study illustrates the participants' improvement in teaching skills related to these three areas

The following discussion part consists of eight sections. The first three sections address the findings concerning participants' beliefs about learning, learner and teacher, which serve as answers to the second research question. Section four to six present the findings as to teaching skills related to teaching methods, activities, materials and tools, which answer the third research question. Section seven and eight answer the last research question by describing the factors enhancing and inhibiting the participants' development.

4.1   Findings regarding teacher beliefs about learning

Teacher beliefs about what is involved in learning will influence the way in which they teach, and will influence the language learning result eventually.

Literature review on conceptions of learning suggests that worthwhile learning is a complex process and produces personal change of some kind, and is always affected by the context in which it occurs (Williams & Burden, 1997). By taking the 2003 CALL course, the participants admitted that they reconsidered learning not just as memorization and a quantitative increase in knowledge, but as a dynamic process, in which students should be actively involved. Among several growing new beliefs, "learning by doing" and learning by self-directed knowledge construction seem to be most noticeable.

4.1.1 "Learning by doing"

"Learning by doing" is derived from experiential education philosophy advocated by the Dewey (1938). He believed that learning experience is seeded with surprises and possibilities for enhancement, if we but allow it to bathe over us in its own terms. This emphasis on learner's active participation in the learning process goes against the other school of thought that emphasizes rote learning and dogmatic instruction. An early philosopher Sophocles (c. 495--406 BC) also held that "one must learn by doing the thing; for though you think you know it, you have no certainty, until you try."

This "learning by doing" paradigm proved significant in the 2003 CALL course. At the beginning of the course, the instructor explained clearly that the main course assignment was to complete a project, i.e., to learn to design a CALL course for a real audience. This was a big challenge to all participants including the writer, for they were green hands in CALL area. But gradually the participants found this project doable with the help of the instructor and that of each other. Instead of sitting there and listening to the instructor like that in most other graduate courses, they were guided to identify their target learners, analyze their learners' needs, decide learning types and outcomes, plan and produce their projects. In a word, they were learning course design by doing things. Several participants described this "learning by doing" process in their end-of-course reflections. Take Interviewee 3's reflection for an example:

Learning by doing is essentially involved in CALL 2003. As we interact with our teacher and with each other, as we take part in whole class activities, pair activities, or individual activities, we practice using language in a variety of contexts and develop many different skills of CALL. (Interviewee 3, end-of-course reflection)

With this experience, Interviewee 3 further explained her new belief in contrast with her previous one during the interview. Her words are very encouraging, which shows that she would not depend on teachers too much any more, but take "the process of making" as "a true learning process":

Before the course, I, just like many other learners, hope the teacher tells me the theory and what I should do in a direct way. But this never occurred in CALL 2003. Take my experience for example; though the final web page is only the sample module of an online business English course, the process of making it is a true learning process for an English teacher, especially for a teacher interested in CALL.[1]

Interviewee 2 commented on the difference between the learning in this course and that in a traditional classroom. She expressed her new belief by listing what she thought should be involved in an active learning process:

Through taking this course, I come to realize that learning is an active process, which involves searching for information, exploring knowledge, connecting with the learner's own background knowledge, and collaborating with others. While in the traditional classroom, learning seems to mean only listening to the teacher and learn everything by heart.[2]

Interviewee 4 had relatively poor computer operation skills before taking this

course, so in the interview, she focused on this point when describing her achievement from this learning by doing experience:

This learning by doing process is rather painstaking yet really gives me a sense of achievement. I have got hands-on experience of making WebPages, and improved my abilities of making PowerPoint. Besides, in this CALL course, I have come to know the netiquette in email writing, and learn to post on an English forum, etc. [3]

4.1.2 Learning by self-directed knowledge construction

Although there are many literatures indicating that learning is not a passive process, it occurs only when learners begin to construct their knowledge on the basis of their previous experience (Williams & Burden, 1997). Learning, therefore, is a self-regulatory process of struggling with the conflict between existing personal models of the world and discrepant new insights, and the model of learning moves away from "transmission model of learning" to the "experiential model" (Nunan, 1988).

In the CALL course, the writer noted that knowledge construction was an ongoing process for the participants. They started to understand new theories on the base of previous experience and probe relevant knowledge themselves. For example, by reflecting on her two years' experience in teaching adult students, Interviewee 3 came to see their characteristics and cognition style. So in setting learning types for her project, she laid emphasis on the types of applying skills and applying generic skills, which are featured with learners' independent application of the knowledge and theories into practice. And to know more about the scaffolding theory, she searched the university library and Internet after class, and finally constructed her own course page based on her self-directed learning and understanding. Just as what she wrote about this course and her belief of knowledge construction in her end-of-course reflection:

The course of CALL is actually a teacher-training course for CALL teachers. It requires learners use both their previous knowledge and newly learned knowledge to design an online English learning program.... When knowledge is actively learned by learners, it may be better grasped and developed. (Interviewee 3, end-of-course reflection)

In the end-of-course reflections, another participant reported her belief of knowledge construction in the process of applying theory into her project design. She wanted to use Gagne's Nine Events of Instruction to describe her course design steps in her project, but did not understand the theory fully at first. She met problems when trying to analyze her course design, and it was then did she realize that knowledge could only be constructed through doing something with it:

What do these terms really mean? How to make them specific in my task? The need of applying these theories forced me to restudy them and when I really did something by using them, I found that I had a better understanding and learned a lot. That is constructivism. I constructed my own knowledge. (Participant, end-of-course reflection)

4.2 Findings in teacher beliefs about learners

Teachers may hold any one or a combination of beliefs about those they teach. There are different ways in which teachers can construe learners, and such constructions reflect individual teacher's views of the world and also have a profound influence on their classroom practice. After taking the 2003 CALL course, the interviewees reported they began to regard learners as partners and explorers.

4.2.1 Learners as partners

To take the learners as partners of teachers, the assumption here is not one of equality but one of a relationship within which teachers recognize that they are also learners. Mutual trust and respect lead to growth and development for teachers and all

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their learners. In the language classroom, learners can be treated as partners by involving them in decisions about what activities to carry out, asking them what topics they are interested in or allowing them to select books to read (Williams and Burden, 1997).

During the CALL course process, the writer observed that the instructor invited views from the participants constantly. Sometimes, she even admitted that she needed to do more reading and thinking before she could answer their questions. She treated her students as partners and allowed them much free space to make their own decisions. For example, the participants could choose project topics from their own interests and produce the project in forms they like. The instructor's modeling as learning partners much influenced the change of participants' beliefs about learners. Interviewee 2 described her own experience in the interview:

My experience as a learner in this course is quite different from my previous ones. In the past, I took in what the teacher told me most of the time; while in this course, I have to explore and construct knowledge by myself and collaborate with the instructor and peers as well. After taking this course, I think an effective learner should be a good partner to others, because collaboration is important in constructing knowledge.[4]

From this experience, the participants, such as Interviewee 1, declared that they began to take their learners as partners especially in the needs analysis stage of their project. She did not decide her project topic randomly, but on the basis of her learners' voice, and in return she got their support too. Her end-of-course reflection is a case in point:

The reason I chose business letter writing as the topic of my project is that I carried out needs assessment among my students. I understood that most of my students were working in some joint ventures and they needed to handle some business writing in their daily work but they had much pain in it. As I told my

decision of the topic for this learning program to my students, I won great
support from them. Since they had great expectation on my project, I had no
reason to give up and spare my efforts in the project. (Interviewee 1,
end-of-course reflection)

Similarly, Interviewee 3 also set her project topic by talking with her learners,
taking her learners' needs and interest into account. She said this in her end-of-course
reflection:

In order to make a clear understanding of my adult students' background
information and their needs I did a pre-course online interview. Generally
speaking, they hope to improve their English communicative skills in workplace.
But because of limited class hours, their family and workload, they don't have
enough time to practice and use the language. As a result, I plan to design a
textbook-based online business English course --- Effective English. (Interviewee
3, end-of-course reflection)

4.2.2 Learners as explorers

Hoven (1999) stressed the point that technologies do not directly mediate
learning (p. 150). That is, people do not learn from computers, books or the other
devices that were developed to transmit information. Rather, learners are expected to
explore for themselves and come to their own decisions or conclusions.

Take the writer's participant experience as an example. I underwent all the
course stages, exploring both relevant theories and computer skills for completing my
project. This is a big challenge for me. I remembered to prepare for the seminar topic
presentation, I consulted and searched many materials on the topic of "web-based and
multimedia tools", trying to find some appropriate resources for use. As it is the first
time for me to make power point, I revised it many times both in content and form. I
experienced much pains and frustrations, but I discovered many "tricks" that work
during the process. Reflecting now, I felt that learners should be taken as explorers,

probing knowledge through their own experimentation.

The process of project construction was full of pains and gains for the participants. They met different problems in theory comprehension and application. But with their continuous efforts of exploration, they finally reached solutions and completed all the tasks. Being explorers themselves, the participants gradually realized that their learners should also be regarded as explorers too, since learning requires thinking of learners. Take the words of Interviewee 1 for an example: "I think the learners' roles are knowledge explorer in a social context; they are explorers with goals."[5]

In their end-of-course reflections, more evidence can be found as to how the participants explored knowledge with their own efforts and completed their tasks. Interviewee 2 put this in her reflection:

When learning Reigeluth's taxonomy of 4-types of learning, I didn't have a clear understanding of "apply generic skills" at first and had no idea about how to realize it in my course design. After re-reading relevant articles and exploring certain theories, I came to understand that it could be developed through designing reading tasks. (Interviewee 2, end-of-course reflection)

Through this exploring experience, interviewee 2 got similar belief that learners must explore and construct knowledge themselves. As what she said in the interview: "After taking this course I think an effective learner should be an individual explorer."[6]

4.3 Findings in teacher beliefs about teachers

Teaching is usually regarded as something that teachers do in order to bring about changes in learners (Richards, 1990). In this process, teacher roles form the basis for teachers' decisions on how the class activities and learning experiences can best be used to bring about learning. Language teachers are no longer seen exclusively as individuals who hold and transmit language, but as people who assist the learner to

develop a natural capacity to communicate in another language (Yalden, 1987). Data collected from the participants in the 2003 CALL course indicate that the participants have realized their new roles in teaching in CALL context as needs analyst, course developers, and facilitators. In addition, they see more clearly teachers as individuals with personalities and emotions.

4.3.1 Teachers as needs analysts

As mentioned above, needs analysis serves three main purposes: it provides a means of obtaining wider input into the content, design and implementation of a language program; it can be used in developing goals, objectives and content; and it can provide data for reviewing and evaluating an existing program (Richards, 1984). To carry out needs analysis, teachers need to take a new role, needs analyst. To fulfill this new role, teachers need to be familiar with not only needs analysis theories and procedures, but also needs analysis practice and techniques.

The 2003 CALL course was started with a survey of participants' needs and interests, which served as a basis for setting course content and goals. To prepare the participants for future teachers, the instructor explained in detail needs analysis theories and instructional design, and further helped the participants conduct needs analysis for their own projects. The project for the participants was to design a CALL course for a real audience, so after this needs analysis they set their project topics and began to design their projects.

Through this process of learning needs analysis theories and techniques, the participants have realized the importance of needs analysis and teachers' role in needs analysis. What's more, they have learned the techniques to base their teaching on their analysis of their own learners' needs.

Interviewee 1 described her new belief like this in the interview:

By taking this course, I perceived that being a teacher, one needs to clarify the students' needs at first. Without knowing the needs of the students, the knowledge that the teacher presents to students would not be easily and actively accepted

and assimilated[7].

Interviewee 3 offered a similar belief as follow: "We as teachers must design our course on the basis of students' needs, otherwise, the course is meaningless because what the teachers teach is not what the students want."[8]

4.3.2 Teachers as course developers

Looking back on the situation of English teaching in China, textbooks and teaching syllabus were predetermined to a large extent, leaving teachers little room to make decisions as to what and how to teach. But today, with the progress made in the educational reform, more and more teachers are encouraged to design and implement courses according to practical conditions. In this sense, teachers begin to try to develop courses for their own learners, not depend entirely on what are prescribed to them.

In the 2003 CALL course, the participants were mainly helped to design CALL courses for their own students, so they had a lot to say as to their beliefs about teachers as course developers. Though they did not have any experience in course design before the course, the participants produced their course step by step, with the guide of the instructor.

Interviewee 1 reflected on her growth in designing a course as this:

As a pre-service teacher, I do not have much teaching experiences in course design, not mentioning online course designing. I worried much about the required project in this course at the beginning. But as I was learning step by step, I found myself accumulated much knowledge in course design which would help me a lot in my future teaching. (Interviewee 1, end-of-course reflection)

When mentioning the most helpful part for future teaching, the participants, such as Interviewee 3, all reflected on the experience of course design. She described the process of learning course design as this:

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The most helpful part is the standardized step-by-step course design: with a real problem to solve at hand, set the target learner/audience; do the needs-assessment; propose a need-based course plan; define the objectives; apply a suitable design framework; real tasks design, then production, application and final evaluation. (Interviewee 3, end-of-course reflection)

Within this learner-centered system, the participants learned to practice as agents of course design and such design itself becomes largely a matter of appropriate teacher development (Nunan, 1990). However, they will be in a position to do this only if they have appropriate skills and techniques that will be discussed in the next section.

4.3.3 Teachers as facilitators

As pointed out by Gu & Xu (1999), the new social dynamic in the technology-supported classroom requires that teachers rethink their traditional educational beliefs and step down from the podium to students' computer stations; they need to foster a more balanced relationship with students, and reestablish their roles as a facilitator, guide and helper (p. 181).

In the CALL course, the instructor was not an authority but a facilitator, offering timely guide and feedback, providing materials and information, suggesting ways to solve problems. So much so that the participants took the instructor's help as the one of the most enhancing factors for their development. Having observed what the instructor had done to help them, the participants including the writer realized this is a new role for them to adopt in their future teaching. As interviewee 2 remarked in the interview:

In this course, the instructor herself set a good example as a qualified teacher. I begin to realize that in the teaching process, the teacher is a facilitator, a helper, and a guide rather than a dictator.[9]

And Interviewee 1 echoed the same new belief about teacher's role as this: "By taking this course, I perceived that being a teacher, one needs to act as facilitator, encourager, and guide in the students' process of learning."[10]

4.3.4 Teachers as individual persons

A teacher's view of teaching mirrors her view of herself and her teaching behavior reflects her essence as a "person" (Williams and Burden, 1997). For a humanistic teacher, teaching is essentially a personal expression of the self. Learners feel the personal emotional structure of the teacher long before they feel the impact of the intellectual content offered by that teacher. To take teachers as individual persons, the intention here is to regard them as individuals with personalities and emotions. But this kind of personalities and emotions are different with that in common sense because teachers will bring them to the teaching-learning relationship, and thus provide learners with a supportive learning environment. In this environment, learners are helped to develop as a whole person.

Among the data collected, the writer found much about participants' reflections on modeling the instructor's individual beliefs and behaviors. Besides mentioning the instructor's guide and help, the participants also described their feelings about the instructor's enthusiasm and attitudes in teaching. And they decided to learn from her in this aspect, that is, to treat their own learners with enthusiasm, patience and kindness. Interviewee 2 stated this in her reflection:

The instructor is very effective in the following parts: project-oriented teaching...encouraging and giving appropriate guidance for students to think for themselves; the enthusiasm for teaching. She sets a good example for us as future teachers. (Interviewee 2, end-of-course reflection)

A good teacher should first of all be a kind person, as Interviewee 3 remarked in the interview: "Then for the qualities of a good teacher, to be helpful, kind and

learned are very important."[11]

Similarly, Interviewee 4 realized that presenting values of life is part of teaching: "Teaching should involve conveying knowledge as well as presenting values of life, and teachers should update what they are teaching with the passage of time."[12]

This new view of teachers as individual persons greatly reminded the participants of good qualities required of a good teacher, and of the importance of participating in a lifelong process of learning and change.

4.4 Development in skills related to teaching methods

Teaching skills define what the teacher has to be able to do, such as giving clear instructions, correcting errors in various ways, managing classroom interaction and discipline, presenting material, using proper tools and so on, which are further clarified as skills related to teaching methods, activities, materials and tools (Freeman, 1989).

Data collected show that the participants in 2003 CALL course got improved in teaching methods mainly in two aspects: classroom management and face-to-face and online interactions.

4.4.1 Classroom management

Classroom management refers to the ways in which student behavior, movement, and interaction during a lesson are organized and controlled by the teacher to enable teaching to take place most effectively (Richards, 1990). In a well-managed class, discipline problems are few, and learners are actively engaged in learning tasks and activities; this contributes to high motivation and expectation for success.

In their end-of-course reflections, the participants commented that they learned much about classroom management by taking this "well organized and logically structured course"(Interviewee 3). The course schedule, weekly course guide page and just-in-time announcement proved helpful. Every class time they had tasks at hand and they approached step by step with the instructor' help. Both face-to-face seminar discussions and online forum activities provided much space and

opportunities for individual thinking and interaction. Several participants expressed the interest in doing the same in their own classrooms. Interviewee 1 described how she would manage her class as follow in the interview:

Yes, I think I've learned a lot from this course on teaching methods and techniques. For example, I will be able to carry out needs analysis before teaching, offering necessary scaffolds for students to fulfill the tasks or projects[13].

Feeling her urgent need of teaching methods, Interviewee 4 summarized her improvement in teaching methods as this:

Yes, as a new EFL teacher, I am badly in need of certain teaching methods and techniques to help Ss get what I want to teach. After taking this course, I have some ideas about: a) Improving the planning work, set a schedule for the course, set clear objective before every unit. b) Carrying out more classroom activities to make it interactive c) summarizing every unit and assessing Ss 'performance[14].

Interviewee 2 gave similar description on her improvement in skills to manage a class:

After taking this course, I have learned much about how to teach more effectively. Design authentic tasks to motivate students; Provide students with rich and up-to-date materials; Encourage students to take challenging tasks; As learners vary from person to person, each learner has their unique way of learning and construct knowledge. The teacher should take students particularity into consideration. Arrange the class time properly[15].

However, due to the time limit, the participants didn't get the change to actually practice such classroom management skills in a real classroom. Their "improvement" in this area was only identified and illustrated in their course plans and reflections.

4.4.2 Face-to-face and online interaction

Language learners need practice in producing comprehensible output using all the language resources they have already acquired. Getting feedback from the teacher and from other students in the class enables learners to test hypotheses and refine their developing knowledge of the language system. This is the process of interaction in classroom, which, by providing input for other students, pushes learners to produce more accurate and appropriate language (Hedge, 2000). Given its importance, language teachers need to know how to foster interactions in class.

Many interactive activities were conducted in the 2003 CALL course including face-to-face and online interactions. The former often took place in class either in the form of topic discussions or questions/answers between the instructor and participants. The later was most characterized in a CALL course, containing forum discussions and email exchanges. All the interactions play key roles in clarifying questions and constructing projects. So the participants reported that they have realized the importance of interactions and started applying their learning to their own course design. Take Interviewee 4 for an example: "I become more sensitive to the importance of authenticity and interaction in designing classroom activities and get better use of the face-to-face time in class."[16]

Interviewee 1, who was teaching business English for a class of adults from joint ventures then, illustrated her improvement in skills to foster interaction in her own class:

I learn to conduct social and instructional interaction in the classroom. By social interaction, I mean the eye contact, facial expressions, gestures used to organize the class. And instructional interaction includes those warm up exercises, lectures, questions and answers, all those related to teaching material and content[17].

4.5 Development in skills related to teaching activities

Many scholars have investigated teaching activities on the usefulness of them (Nunan, 1988,). The kinds of activities that should be stressed are the ones known as communicative, interactive, and task oriented, and the focus of the activities should be on meanings to be communicated, not on forms and structures to be learned (Yalden, 1987).

After taking the CALL course, the participants mainly learn to carry out these activities in their class, which they claimed as most useful: task design and group work.

4.5.1 Learning task design

In language teaching, a task is any activity that learners engage in to further the process of learning a language (Williams & Burden, 1997). Tasks can be seen as a manifestation or embodiment of teaching/learning theories adopted by teachers. Teachers will select tasks that reflect their teacher beliefs such as co-operation or competition, learning styles, levels of challenge and so on. In designing tasks, teachers have to make decisions not only about the appropriate kinds of tasks to assign to learners, but also about the order of tasks, pacing, products (whether the product or result of a task is expected to be the same for all students), and learning strategies (Richards, 1990). Task design, therefore, is a complex and demanding process, which is deeply felt by the participants.

In the process of project making, the writer noted that though the participants have realized the importance of task design, they found it hard to design real tasks in their projects. For example, Interviewee 2 reflected task design was the weak point of her project:

After final presentation, both Prof. Gu and Prof. Su pointed out that my project lacked effective reading tasks design. Until then I came to realize that in designing a web-based course, the appearance was not that important, what counted was effective tasks design based on the real understanding of the nature

of learning, learners' needs and the purpose of the course. (Interviewee 2, end-of-course reflection)

In the interview, Interviewee 2 described her improved understanding of task design and planned activities:

First, the tasks should be challenging, meaningful and relevant to students' study. Secondly, as a teacher, I should give students adequate scaffold to help student finish them. For example, I will ask students to do some response writing activities in reading class, so that they can get deeper comprehension of the text and form the habit of critical reading[18].

Interviewee 1 gave similar illustration about her learning about task design with an emphasis on teachers' scaffold in this process:

I learned that tasks are essential in a classroom, and the tasks should be designed with scaffolding. The teacher's sustained support to students while they are performing tasks is rather essential. I will design activities according to the audience that is on the basis of students' situation, for some interesting topics, I will organize some games to bring students pleasure and related knowledge[19].

4.5.2 Group work

In language teaching, group work refers to a learning activity, which involves a small group of learners working together (Richards et al, 1998). There is accumulating evidence that working in groups can have considerable benefit for all learners. Firstly, members of groups can offer complementary and supplementary information and opinions, making the pooled knowledge greater than the sum of its parts. Secondly, for many students, the simple presence of others even without interaction spurs them on to think harder and more creatively than they do by themselves. Thirdly, mistakes made by the group are more likely to be detected by a

group member than individual mistakes are to be detected by an individual (Williams & Burden, 1997).

During the 2003 CALL course, the participants were offered many chances to do group work (mostly pair work, due to the small number of course participants), such as peer review and topic presentations, in which they cooperated to revise their writings or improve their power point presentations. For instance, the writer and Interviewee 2, as a small group, worked together preparing for a seminar power point presentation. After dividing the task into two parts, Interviewee 2 was in charge of searching relevant materials while the writer was responsible for arranging the content and producing the result with power point. In this process, they often called or met each other in spare time, discussing problems or exchanging ideas. Our intensive cooperation resulted in a successful presentation that was commented highly by peers and the instructor. After the presentation, we summarized the pains and gains together and also encouraged each other to work on.

Through group work, the participants formed a warm learning community and supported each other in making progress together. This positive feeling about group work led the participants to thinking about tying it out in their own teaching. Interviewee 4 expressed this feeling in the interview: "Group work is a good activity that I will try on Ss. What's important is to set a clear goal for the group work, balance its difficulty, comment on Ss' performance positively."[20]

Interviewee 2 stated she would encourage group work too: "I would encourage group work and cooperation among students."[21] And Interviewee 1 mentioned her plan to conduct group work for college students as this: "For college students, group work and role-play are good ways to practice their cooperation spirits."[22]

4.6   Development in skills related to teaching materials and tools

4.6.1 Material search and research

Good instructional materials constitute an important factor in effective teaching. Nunan (1988) suggests that teaching materials should have a degree of authenticity,

foster independent learning, and be suggestive rather than definitive (p. 98).

By reflecting on all kinds of learning materials available in 2003 CALL course, the participants began to realize that in addition to textbooks, a variety of authentic materials should be provided to their learners so that they could have more choices about what they want to learn according to their own interest and needs in different levels of difficulty.

In the interview, Interviewee 2 stated that she would use Internet as a source of teaching: "Previously, I mainly use textbooks, sometimes tapes in my class. Now I come to know that computer and Internet is a powerful tool and a great source of teaching."[23]

Interviewee 1 pointed out the advantage of using materials from Internet as this:

In the previous time, I usually use textbooks, printed handouts for teaching. But now I know that the Internet and computer can also be applied for teaching because they have the advantages of immediate feedback and abundant resources. But teachers also need to guide students in using them[24].

After taking the course, most participants learned how to search useful materials from Internet by using some search engines such as "Google". They started using key-word search and combined key-word search for relevant information about English teaching. In the process of project making, they learned to search materials from Internet to complement textbooks and enlarge their eyesight. When surfing the Internet, they found not all materials online are good resources, so they began to evaluate, select and synthesize them. This process improved their critical and creative thinking skills.

4.6.2 Email communication and forum/mailing list discussion

Email allows teachers and students to communicate rapidly and inexpensively with each other throughout the world, developing an invaluable network of learning. In the CALL course, a lot of questions, answers, ideas and challenges were shared via

email, and many Word files and resources were exchanged as email attachments. The participants not only learned proper email writing etiquettes and formats for their own exchange with the instructor and peers, but also learned to exchange with their own students via email. Just as Interviewee 1 put it in the interview: "As to teaching tools, I think email is effective to communicate with my students, I can send them some materials related to lessons and they can ask questions after class."[25]

Besides email, the SudaCALL forum on the course page also fostered threaded discussion between the instructor and participants, and among participants themselves, hence another space for their ideas and skill development. For example, Interviewee 3 posted her project plan and got responses from the instructor and her peer. Here is the threaded discussion on the forum:

Posted: April/20/2003 at 2:44pm - IP Logged

My project is to help my adult students improve their English communicative skills in the business world. I think the Scaffolding Instruction in Constructivism or Vygotsky's Zone of Proximal Development (ZPD) theory can offer me the framework to help students achieve their objectives step by step. From this point of view, I will divide my project into 5 steps [...].

Luqian

Posted: April/20/2003 at 3:50pm - IP Logged

Very good design, but there's no connection with types of learning. What I mean is to tell me what kind of learning is concerned with your every step respectively. Thus I can see their relation more clearly about how to apply our knowledge.

Xuemei.

Posted: April/20/2003 at 8:13pm - IP Logged

Xuemei made a good point here. These instructional steps will be more effective if you know their specific purposes concerning different types of learning for your learner group.

BTW, you missed the 5th step. I guess it's "Evaluation and Reflection", right?

Peiya

Through this forum discussion, Interviewee 3 got to know that her course design step should be connected with the types of learning, and was reminded of the evaluation step in her project. This experience of interviewee 3 and also that of other participants not only helped to solve problems in their course design but also served as good practice of idea construction and communication skills.

What's more, the participants felt the power of email discussion lists (mailing lists) the first time in the course. With the instructor's guidance, all the participants subscribed to some popular English teaching email discussion lists, such as TESL-L and TESLCA-L. These lists allow hundreds even thousands of English professionals around the world to exchange information and views on certain topics of common interest. Almost every week, the instructor would invite some participants to talk about their leaning from reading g from reading the postings forwarded from these mailing lists. After lurking for some time, the participants were encouraged to participate in the discussion by posting their views and request of information on this international mailing list. The writer's experience can illustrate this well.

I posted on TESLCA-L to ask for resources and suggestions on the topic of teacher development. And how excited I was when receiving replies from professionals such as Nik Peachey (British Council Teaching Websites Manager) and John Higgins (one of father experts in technology for education). They offered not only resources and articles on teacher development, but also suggestions on how to carry out research in this field. For the limit of space here, only John Higgins' reply is listed and some irrelevant technical headings are omitted:

----- *Original Message* -----

From: "Automatic digest processor" <*LISTSERV@CUNYVM.CUNY.EDU*>

To: "Recipients of TESLCA-L digests" <*TESLCA-L@CUNYVM.CUNY.EDU*>

Date: Mon, 23 Jun 2003 10:25:09 +0100

From: marlodge <*marlodge@SUPANET.COM*>

Subject: Teacher development

One suggestion I would make to Fan Yanni and Tia Bodeepongse is not to look

just for journal articles but rather for the syllabuses and statements of aims of existing courses, which should be findable on the internet. I know mine at Stirling was published on the website, though I have been retired for nearly three years and have not looked recently to see if it is still there.

John Higgins

==== Original Message From fanyanni <yannifan@SUDA.EDU.CN> ====

[....]

Interviewee 4 reflected on her growth in teaching skills related to using these tools:

Besides, in this CALL course, I have come to know the netiquette in email writing, and learn to post on an English forum, etc. What's more, in this course, we get a chance to know TESL-L and TESLCA-L, two international lists for academic discussion. By means of lurking and participating, we learn to pay more attention to the netiquette, get informed of the latest news in CALL development and the common concerns in CALL. (Interviewee 4, end-of-course reflection)

Most participants expressed that they would adopt these communication tools in their future teaching. In the interview, Interviewee 2 expressed her plan to use email and forum as communication tools in her class: "If condition permits, I will adopt computer in my class, and will use email, electronic discussion forum as communicative tool to encourage cooperation."[26]

4.6.3 Multimedia presentation skills

Computer brings us convenient teaching tools to replace the blackboard-chalk lecturing model, such as power point presentations, web pages and other demonstrative software. Take power point as an example, it is a tool used for presenting information in a dynamic slide show format. It can incorporate texts, charts, sound effects and video into presentations with ease, which helps to make a powerful impression on the audience.

By taking the CALL course, the participants learned to make power point and web page to demonstrate information, though the learning process is full of pains and frustrations. In her reflection, Interviewee 2 described her experience of learning:

The first, and the most direct gain is that my e-literacy has been improved. At the beginning of this term, when I learned that we would build up our own web page by the end of this course, I couldn't imagine how could I achieve that. At that time, making web page was like a miracle to me. In the middle of June, when my course pages came into shape at last, though it was not a beautiful one, how proud I was then! (Interviewee 2, end-of-course reflection)

Interviewee 4 also described her improvement in this aspect:

This learning by doing process is rather painstaking yet really gives me a sense of achievement. I have got hands-on experience of making WebPages, and improved my abilities of making PowerPoint. (Interviewee 4, end-of-course reflection)

As to the application of presentation skills, the participants said that if condition permitted, they would use power point and web page in their teaching. But they said presently it is limited by financial factors in some schools and institutes. Interviewee 1 expressed her hope to teach in computer lab in the interview: "If condition permits, I will use a lab to teach and use power point to present some ideas clearly."[27]

4.7 Factors enhancing teacher development

When interviewed about the factors enhancing their development as EFL teachers in this CALL course, the participants mainly focused on two factors: instructor support and peer help. The following two sections discuss the two factors one by one.

4.7.1 Instructor support

As is pointed out by Freeman (1990), teaching is first and foremost a "helping profession", which depends on the relationship between the teacher and the leaner. This is true with the view that the student teacher can be helped to teach more effectively through the input and perceptions of the instructor, i.e., what Freeman (1990, p.104) calls "teacher educator", who oversees and in some way facilitates the student teacher's learning process. Otherwise, student teachers would simply be left to figure it out on their own. In the 2003 CALL course, the instructor is regarded as a "facilitator and helper both in and out of class, who can effectively stimulate learning in class (Interviewee 1)." Her guide and help can be summarized in three areas: providing relevant materials and information, offering timely feedback and guide to questions and giving encouragement and love to the participants.

For the first area, Interviewee 3 reflected as this:

I need a suitable design framework. A timely e-mail from Prof. Gu offers me help. It is a Q & A list on constructivism between an MA student and a professor from U.S. Their discussion on scaffolding theory and Vygotsky's Zone of Proximal Development (ZPD) theory suddenly arouses my interest. (Interviewee 3, end-of-course reflection)

So Interviewee 3 formed her course design framework with reference to the example from the instructor. And another participant clarified her course objective with the help of the instructor:

How to make these objectives specific in my project was related to design issues. However, I got confused when I read the Ppt file about Gagne's Nine Events, and I was quite worried. Again, I am grateful to the instructor for her help. She provided me with one of Columbia students' analysis of her project based on her understanding of 'Objectives, Task Analysis and the Nine Events of Instruction'. I studied her analysis and gradually got a better understanding of how to make

those abstract ideas into concrete tasks. (Participant 1, end-of-course reflection)

The second aspect of instructor' help is her timely guide and feedback to participants' learning process, which are described as "standardized way of designing the course" (Interviewee 3), "project-oriented teaching, timely and to-the-point feedback, and effectively guidance for students to apply theories into practice" (Interviewee 2), take Interviewee 2's words as an example:

When learning Reigeluth's taxonomy of 4-types of learning, I didn't have a clear understanding of 'apply generic skills' at first and had no idea about how to realize it in my course design. After reading Prof. Gu's reply on the forum and her clear explanation in the classroom, I came to understand that it could be developed through reading tasks design. After all, the key point was 'task' in a course design. (Interviewee 2, end-of-course reflection)

Furthermore, the instructor's helpful attitude and encouragement offered a hand to help the participants complete their project, as illustrated by Interviewee 4:

At every trying moment, I had thought of dropping out but remained working because there has been Prof. Gu encouraging me and giving advice, and from peer review I was helped to find out the place for improvement. I think I will continue to learn and perfect my online writing project and make it work for my learners. (Interviewee 4, end-of-course reflection)

Another participant in her end-of-course reflection described the impact of the instructor' attitudes as this:

I think the most effective part of the instructor is her conscientious attitudes to the teaching and to the academy, also her broad knowledge in instruction. I am deeply impressed by her task-based teaching method, in which we are slightly pushed to finish the task step by step with clear goals. Her open mind set us a

good example in teaching and treating people. (Participant 2, end-of-course reflection)

4.7.2 Peer help

The positive benefits of cooperative and collaborative learning in the classroom have been extensively researched and reported in the educational literature (Bailey, 1996; Knezevic and Scholl, 1996). By working and learning together with peers through interaction inside and outside the classroom, participants can acquire new conceptions from exposing and developing knowledge of teaching. Though the 8 participants had their own project topics, i.e., they tried to design a CALL course for different audience and purpose, they all mentioned peer help as an enhancing factor, which stems from peer review of writings, peer discussion of problems and peer assistance in computer technology. All these collaborations and interactions were carried out through course forum, emails, and of course, face-to-face activities in the lab.

In every section of 2003 CALL course, participants were expected to post weekly responses to the required readings and seminar topics, such as CALL and constructivism, learning types and outcomes. Their understandings of these topics would affect their project design principles and practice. By peer review, some advice and comment were given to the participants' implicit mistakes in their writings for their revision and improvement. These mistakes were hard to detect by themselves, as reflected by Interviewee 1:

Peer review or peer editing is an effective way of improving within partners. One can detect defaults with the help of others' comments; one can get self-elevated by evaluating others work through deep consideration and comparison. At the peer review stage of projects, I cooperated with Miss Wu. She studied my project and pointed out that the evaluation part in my project was incomplete. With her suggestions, I made some improvement. (Interviewee 1, end-of-course reflection)

Since it is their first time to take a computer-based training course, the participants of 2003 CALL course met various problems in their application of theories in practice and their project designing process. By discussion with peers, they clarified those ambiguous or unclear problems. For instance, in her end-of-course reflection Interviewee 3 reflected as this:

Still I gain a lot from our peer discussion. One of my classmates offers me kindly advice. She suggests that since it is an English course learners attend regularly, I should add a final assessment for students' achievement during the whole course period, not just for a single unit. Therefore, the course will be more consistent. I also exchange ideas with my sisters Yang and Fan. Though we modify and revise our webs again and again, we are really involved in this job. Learning becomes a thing of our own. (Interviewee 3, end-of-course reflection)

Computer operation skills may be the biggest physical hindrance for all participants to complete their projects; this also was conquered by peer assistance besides their own efforts. Though most of the participants were able to use basic computer functions such as Word, email, and web surfing previously, they needed to know how to make power point and web page to finish their seminar presentations and on-line course projects. Class time was limited, so they assisted with each other to improve these skills out of class. Interviewee 2 admitted this improvement in her end-of-course reflection:

Because of my poor computer skills, making web pages was really a painstaking process to me. Every thing was new to me, I had to learn them one by one. In this stage, peers gave me much help. For example, Mei showed me the basic skills in using FrontPage, Fan told me how to search for and save materials from Internet. I also learned how to make buttons from Wang. Without their help, my web pages couldn't have had today's look. (Interviewee 2, end-of-course reflection)

4.8 Factors inhibiting teacher development

4.8.1 Time limit problem

Though all the interviewees have completed their course project on time and got approved, they all expressed time limit problem as the primary factor inhibiting their development. There are three reasons accounting for this. First of all, the tight schedule did not allow them to spend much time on the course learning. For example, Interviewee 1, 2 and 4 had five other subjects to deal with in spring, 2003, which gave them pressure when they were required to revise and modify their projects many times. And for them, to prepare for the Japanese exam was a demanding task then, if they failed that exam, they would not get graduated. Here is what Interviewee 2 stated regarding this point:

Being in a quandary of how to balance between Japanese and weekly CALL task left me no peace. I was obliged to project my power at Japanese preparation while paying less attention on CALL homework. At the same time, I felt a little guilty. I tried my best to keep up with the procession of our CALL course though the result was probably not as good as expected. (Interviewee 3, end-of-course reflection)

Secondly, the participants' low level computer operation skills also cost them much time to finish their projects, especially in Power Point making and web page making. Take the latter as an example, as green hands to make a web page, all the participants confronted many problems such as failure of web page links and website building, unclear structure of web page content and so on. In her end-of-course reflections, Interviewee 4 reflected her experience as this:

The third and fourth times of improving the web page were both accompanied with redoing numerous ineffective links without knowing the flying time at deep night. (Interviewee 4, end-of-course reflection)

Interviewee 1 also mentioned she spend much time learning to make web page:

I downloaded a web page teaching program from the Internet and began to learn it by myself. I could say that I wouldn't know how to make web pages if I hadn't taken this course though it's not a computer course. Of course, it cost me a lot of time. (Interviewee 1, end-of-course reflection)

4.8.2 Technical difficulties

In their reflections all the participants claimed improvement in computer use skills at last, but during the course process, they met different kinds of difficulties due to their low computer competence. For instance, Interviewee 2 and 3 initially intended to build a discussion forum in their course projects for active interaction online, but at last Interviewee 3 gave up for lack of technical support then, planning to invite computer majors to help them when putting the project into effect, while Interviewee 2 made it with the help of a friend. Interviewee 3 said this in her end-of-course reflection:

How can I promote students' keen online discussion without a forum, which so far is a luxury for me? I wish to find a way out when I really apply this web to my course. (Interviewee 3, end-of-course reflection)

Interviewee 2 made it finally only with her friend's days of help:

Initially I intended to build a discussion forum in the course design. As it was totally beyond me, I asked a friend for help. He spent days on making it according to my requirements, and the last product was workable. (Interviewee 2, end-of-course reflection)

Other technical problems such as virus attack also obstructed the learning

progress. Though the computers in the lab classroom are newly equipped and functioned well as a whole, there did exist some unexpected problems, e.g., sometimes Internet connects broke, or the instruction software did not work well.

Besides, for some reasons, the participants could not have access to lab computers after class, forcing them to finish assignments on their own computers, which brought out a series of technical problems. The hardware and other components of Interviewee 1's computer were broken down once, and she had to replace it with a new computer. Interviewee 2 had to ask friends' help to eliminate her computer's problems. As an in-service teacher, Interviewee 4 had to finish assignments in her office since she did not have computer at home.

4.8.3 Cost factor

As is shown above, technical problems could cost a lot for the participants, another cost from web-surfing fees contributed to the inhibition of their development too. To finish course tasks, the participants need to have a computer and relevant software first, but that is not all. They had to connect their computers with the Internet so that they could send emails and land on course page whenever necessary after class. The writer noted that the participants often bought discounted calling cards to get their computers connected to Internet by a dialing-up service

Being graduates, the participants' economic condition was not very fine, so they might take this into consideration when they surfed the Internet for some information or posted on the forum discussion list. Furthermore, to maintain the computer and update its operation system also becomes an economic burden for some participants. As admitted by Interviewee 2 in the interview: "The last one is financial factor, because using Internet costs quite a lot of money."[28]

Chapter Five   Conclusion

The findings from the study show that needs-based CALL course really offered support for teacher development, that is, it served well in preparing EFL teachers to integrate computers into their own teaching in this information age. The study indicates that by taking this course, the participants formed teacher beliefs either contrasting with previous ones or born new, which are beliefs about learners, learning and teachers. The participants realized that learners are partners of teachers and knowledge explorers; that learning is an active doing and constructing process instead of a passive process; that teachers have multiple roles to play including needs analysts, course developers, facilitators and "persons". Meanwhile, the participants got much improvement in teaching skills related to teaching methods, activities, materials and tools. What's more, the study also reveals the instructor support and peer help are two most facilitating factors for teacher development, while time limit problem, technical difficulties and cost factor are the most obstructing ones. Based on the findings from the study, three implications can be drawn for promoting EFL teacher development supported with technology in China.

Firstly, pre-course technical training is needed to achieve the most out of such CALL courses. As schools and universities continue to purchase more and better technology equipment, the benefit to students will increasingly depend on how well teachers are prepared to use these new tools. Since many teachers have little or no knowledge of the computer, it is reasonable to suggest that the teachers receive a basic technical training preferably before any CALL program is implemented. This suggestion is also put forward by the participants of the 2003 CALL course, who spent a lot of time on solving technical problems and mastering computer skills during their project making process, and said technical training was in great need before the course. Of course, it is nearly impossible to cover every piece of technology in a short time, but a brief introduction to some most useful computer skills, such as Word processing, power point making and simple web page design can

save much time and trouble in the coursework.

Secondly, beliefs and skills to integrate computer into EFL teaching should be the major focus of teacher development. Computers can neither perform magical tasks nor substitute for teachers, and they have to be treated like other teaching aids, thus appropriate training in this aspect is crucial (Pilus, 1995). With the empowering potential of CALL in mind, the EFL teachers need to rethink their beliefs and teaching skills in this new environment. For example, the participants of the 2003 CALL course reported that they had formed new beliefs about teacher roles. That is, teachers should not only act as knowledge transmitters, but also as needs analysts, course developers, facilitators and persons. The participants also claimed improvement in skills to integrate computer into their teaching such as task design. As learning is a life long process, so is teacher learning. Therefore, development of teacher beliefs and teaching skills is an ongoing process either during teacher development courses or during real teaching practice.

Thirdly, teachers learn better in situated contexts. Teacher educators need to design CALL courses that teach what language teachers really need to know. That is to say, for CALL courses to have an impact, they should focus on the needs of individual teachers and their contexts (Egbert et al, 2002). To meet teachers' specific needs, teacher educators should base teacher development courses on needs analysis result, and set course goals and content accordingly. As the final prospect of such CALL courses is to improve language-learning effect in EFL classroom, student teachers, besides reconsidering their own beliefs and teaching skills in technology-enhanced environment, should also pay more attention to their learners' needs. They should remind themselves that their learners also learn better in a situated context. In the study, participants were helped to design an online course (i.e., project) for their specific learners and context. They did detailed analysis of their learners' needs and interests, and constructed their projects accordingly. This made their coursework authentic and meaningful. In other contexts, teacher development courses may have different focuses regarding different needs, such as computer-assisted classroom teaching practice etc.

Finally, the overall result of this study indicates that this needs-based CALL course brings about new teacher beliefs about learners, learning and teachers; and it provides provide participants with teaching skills related to teaching method, activities, materials and tools. However, the study has its limitations. Firstly, because of the small sample size and the diversity of participants' background and teaching contexts, these findings cannot represent a general language teacher population, which is not the purpose of this study. Secondly, the participants in the study were graduate students who chose to take the CALL course because they already had an interest in technology-enhanced language teaching. This may not be the case with most teachers in the field. Thirdly, the course only lasts for one semester. Its short duration can hardly bring about complete changes of the participants' beliefs, and also leaves them insufficient time to apply the CALL theories into practice and pilot test their course design projects in a real classroom. Given the above-mentioned limitations, the study is expected to serve as a trial in exploring EFL teachers' development in a needs-based CALL course, and giving other teachers and educators suggestions as to relevant issues under the topic.

As China is fast moving toward the information age and schools are increasingly technology-equipped, it is in urgent need to develop Chinese EFL teachers to meet the challenge of English education in the 21st century. Given this situation, it is the writer's hope that issues raised in the study, especially the process of teacher development supported with technology, will likely be applicable to other teachers facing the same challenge. Meanwhile, the writer believes that further studies on the effects of technology-enhanced teacher development courses will certainly offer more insights into this area.

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Appendix I   A Sample of Interview Data Coding Process

Step One: Deriving themes and sub-themes starting with line-by-line coding: an illustration

Sample of a written interview with Interviewee 2	Line-by-line codes and categorization
Q: Looking back on your experience in this course, how do you feel about it in your development as an EFL teacher?	
Interviewee 2: I think I have developed both in theoretical knowledge and practical skills. On one hand, I have learned CALL theories and the general second language acquisition theories through this course, which are very helpful in my future teaching. On the other hand, I have also learned some basic techniques and skills of CALL, which will make my future teaching more effective. In fact, I am carrying out an electronic forum-based writing project this semester, which is quite successful. And I've got most of the idea from this course.	-Developed in theoretical knowledge and practical skills -Helpful in future teaching -Learned basic CALL skills -Course learning applied successfully in a forum-based writing project
Q: After taking this course, what is your view on learners' role in the learning-teaching process, is it different with your previous view?	
Interviewee 2: My experience as a learner in this course is quite different from my previous ones. In the past, I took in what the teacher told me most of the time; while in this course, I have to explore and construct knowledge by myself and collaborate with the instructor and peers as well. After	-Different -Used to learn passively, now construct knowledge

taking this course, I think an effective learner should be an individual explorer and a good partner to others, because collaboration is important in constructing knowledge.	-Learn to collaborate with others -New view of learner as explorer and partner
Q: Have you changed anything as to what you mean by learning or what you believe learning involves?	
Interviewee 2: Through taking this course, I come to realize that learning is an active process, which involves searching for information, exploring knowledge, connecting with the learner's own background knowledge, and collaborating with others. While in the traditional classroom, learning seems to mean only listening to the teacher and learn everything by heart. What's more, learners vary from person to person; each learner has their unique way of learning and construct knowledge. In this course, we can choose our project according to our own interest, and make the project in our own ways. Therefore, we can learn more autonomously.	-An active process, not a passive process -Individual differences -Autonomous learning
Q: To what extent, if at all, has your experience in the course led to changes of your views on effective teachers?	
Interviewee 2: In this course, the instructor herself set a good example as a qualified teacher. I begin to realize that in the teaching process, the teacher is a facilitator, a helper, and a guide rather than a dictator.	-A good example -A facilitator -A helper -A guide
Q: Have you undergone any change as to your teaching methods and technique? Or how will you carry out teaching after taking this course?	
Interviewee 2: After taking this course, I have learned much about how to teach more effectively like. Design authentic tasks s to motivate students; Provide students with rich and	-Learn to design authentic tasks to motivate students

up-to-date materials; Encourage students to take challenging tasks; As learners vary from person to person, each learner has their unique way of learning and construct knowledge. The teacher should take students particularity into consideration. Arrange the class time properly.	-Provide rich and up to date materials -Consider students' individuality -Arrange class time
Q: What did you learn as to teaching activities you will carry out in your teaching?	
Interviewee 2: First, the tasks should be challenging, meaningful and relevant to students' study. Secondly, as a teacher, I should give students adequate scaffold to help student finish them. Thirdly, I would encourage group work and cooperation among students	-Use challenging, meaningful and relevant tasks -Teacher's scaffolding -Group work & cooperation
Q: Have you changed anything as to teaching materials and tools you will adopt in your teaching?	
Interviewee 2: Previously, I mainly use textbooks, sometimes tapes in my class. Now I come to know that computer and Internet is a powerful tool and a great source of teaching. If condition permits, I will adopt computer in my class, and will use email, electronic discussion forum as communicative tool to encourage cooperation.	-Used to use textbooks and tapes -Will use computer and internet in class -Will use email, forum as communicative tools
Q: What are the factors or conditions enhancing your development as an EFL teacher in the whole process?	
Interviewee 2: The instructor's guide, peer assistance, information and sources got from the web, materials provide by the instructor.	-Instructor's guide -Peer assistance -Web resources
Q: What are the factors or conditions inhibiting your development as an EFL teacher in the whole process?	

Interviewee 2: First, time is the biggest element that inhibits my taking this course. For I have some other heavy learning load, so I can't spare much time on this course, which is quite a pity.	-Time limit problem
Secondly, my low e-literacy is another big limitation. Due to this, I can't search for information or use some software skillfully. Furthermore, the website I make is a very simple and layman-like one.	-Low e-literacy -Website making skills
The last one is financial factor, because using Internet costs quite a lot of money.	-Internet surfing cost

Step Two: Themes and sub-themes derived from line-by-line coding and categorizing

Themes	Sub-themes

Beliefs about learners	▪ Explorers
	
	  -Actively construct knowledge
	
	▪ Partners
	
	  -Learn to collaborate with others

Beliefs about learning	▪ An active process, not a passive process ▪ Individual differences ▪ Autonomous learning
Beliefs about teachers	▪ A facilitator ▪ A helper ▪ A guide

Skills related to teaching methods	▪ Classroom management
	
	  - Motivate students with tasks
	
	  -Arrange class time
	
	▪ Provide rich and up to date materials
	
	▪ Consider students' individuality

Skills related to teaching activities	▪ Task design
	
	  -Should be challenging, meaningful and relevant
	
	  -Need teacher's scaffolding
	
	▪ Group work and cooperation

Skills of teaching materials & tools	▪ Will use computer and internet in class ▪ Will use email, forum as communication tools
Enhancing factors	▪ Instructor's guide ▪ Peer assistance ▪ Web resources
Inhibiting factors	▪ Time limit problem

	■ Technical difficulties
	
	  -Low e-literacy
	
	  -Website making skills
	
	■ Internet surfing cost

Step Three: Thematic patterns and representative quotes

Theme	Sub-themes
Beliefs about learning	▪ An active process, not a passive process ▪ Individual differences ▪ Autonomous learning
Representative Quotations	"Through taking this course, I come to realize that learning is an active process, which involves searching for information, exploring knowledge, connecting with the learner's own background knowledge, and collaborating with others. While in the traditional classroom, learning seems to mean only listening to the teacher and learn everything by heart. What's more, learners vary from person to person; each learner has their unique way of learning and construct knowledge. In this course, we can choose our project according to our own interest, and make the project in our own ways. Therefore, we can learn more autonomously."

Inhibiting factors	▪ Time limit problem
	
	▪ Technical difficulties
	
	   -Low e-literacy
	
	   -Website making skills
	
	▪ Internet surfing cost

Representative Quotations	"First, time is the biggest element that inhibits my taking this course. For I have some other heavy learning load, so I can't spare much time on this course, which is quite a pity. Secondly, my low e-literacy is another big limitation. Due to this, I can't search for information or use some software skillfully. Furthermore, the website I make is a very simple and layman-like one. The last one is financial factor, because using Internet costs quite a lot of money."

Appendix II A Numbered List of Quotations from the Interview

[1] Before the course, I, just like many other learners, hope the teacher tell me the theory and what I should do in a direct way. But this never occurred in CALL 2003. Take my experience for example; though the final web page is only the sample module of an online business English course, the process of making it is a true learning process for an English teacher, especially for a teacher interested in CALL. (Interviewee 3)

[2] Through taking this course, I come to realize that learning is an active process, which involves searching for information, exploring knowledge, connecting with the learner's own background knowledge, and collaborating with others. While in the traditional classroom, learning seems to mean only listening to the teacher and learn everything by heart. (Interviewee 2)

[3] This learning by doing process is rather painstaking yet really gives me a sense of achievement. I have got hands-on experience of making WebPages, and improved my abilities of making PowerPoint. Besides, in this CALL course, I have come to know the netiquette in email writing, and learn to post on an English forum, etc. (Interviewee 4)

[4] My experience as a learner in this course is quite different from my previous ones. In the past, I took in what the teacher told me most of the time; while in this course, I have to explore and construct knowledge by myself and collaborate with the instructor and peers as well. After taking this course, I think an effective learner should be a good partner to others, because collaboration is important in constructing knowledge (Interviewee 2)

[5] I think the learners' roles are knowledge explorer in a social context; they are explorers with goals. (Interviewee 1)

[6] After taking this course, I think an effective learner should be an individual explorer. (Interviewee 2)

[7] By taking this course, I perceived that being a teacher, one needs to clarify the students' needs at first. Without knowing the needs of the students, the knowledge that the teacher presents to students would not be easily and actively accepted and assimilated. (Interviewee 1)

[8] We as teachers must design our course on the basis of students' needs, otherwise, the course is meaningless because what the teachers teach is not what the students want. (Interviewee 3)

[9] In this course, the instructor herself set a good example as a qualified teacher. I begin to realize that in the teaching process, the teacher is a facilitator, a helper, and a guide rather than a dictator. (Interviewee 2)

[10] By taking this course, I perceived that being a teacher, one needs to act as facilitator, encourager, and guide in the students' process of learning. (Interviewee 1)

[11] Then for the qualities of a good teacher, to be helpful, kind and learned are very important. (Interviewee 3)

[12] Teaching should involve conveying knowledge as well as presenting values of life, and teachers should update what he is teaching with the passage of time. (Interviewee 4)

[13] Yes, I think I've learned a lot from this course on teaching methods and techniques. For example, I will be able to carry out needs analysis before teaching, offering necessary scaffolds for students to fulfill the tasks or projects. (Interviewee 1)

[14] Yes, as a new EFL teacher, I am badly in need of certain teaching methods and techniques to help Ss get what I want to teach. After taking this course, I have some ideas about: a) Improving the planning work, set a schedule for the course, set clear objective before every unit. b) Carrying out more classroom activities to make it interactive c) summarizing every unit and assessing Ss' performance. (Interviewee 4)

[15] After taking this course, I have learned much about how to teach more effectively. Design authentic tasks s to motivate students; Provide students with rich and up-to-date materials; Encourage students to take challenging tasks; as learners vary from person to person, each learner has their unique way of learning and construct knowledge. The teacher should take students particularity into consideration. Arrange the class time properly. (Interviewee 2)

[16] I become more sensitive to the importance of authenticity and interaction in designing classroom activities and get better use of the f2f time in class. (Interviewee 4)

[17] I learn to conduct social and instructional interaction in the classroom. By social interaction, I mean the eye contact, facial expressions, gestures used to organize the class. And instructional interaction includes those warm up exercises, lectures, questions and answers, all those related to teaching material and content. (Interviewee 1)

[18] First, the tasks should be challenging, meaningful and relevant to students' study. Secondly, as a teacher, I should give students adequate scaffold to help student finish them. Thirdly, I would encourage group work and cooperation among students. For example, I will ask students to do some response writing activities in reading class, so that they can get deeper comprehension of the text and form the habit of critical reading. (Interviewee 2)

[19] I learned that tasks are essential in a classroom, and the tasks should be designed with scaffolding. The teacher's sustained support to students while they are performing tasks is rather essential. I will design activities according to the audience that is on the basis of students' situation, for college students, group work and role-play are good ways to practice their cooperation spirits. For some interesting topics, I will organize some games to bring students pleasure and related knowledge. (Interviewee 1)

[20] Group work is a good activity that I will try on Ss. What's important is to set a clear goal for the group work, balance its difficulty, comment on Ss' performance positively. (Interviewee 4)

[21] I would encourage group work and cooperation among students. (Interviewee 2)

[22] For college students, group work and role-play are good ways to practice their cooperation spirits. (Interviewee 1)

[23] Previously, I mainly use textbooks, sometimes tapes in my class. Now I come to know that computer and Internet is a powerful tool and a great source of teaching. (Interviewee 2)

[24] In the previous time, I usually use textbooks, printed handouts for teaching. But now I know that the Internet and computer can also be applied for teaching because they have the advantages of immediate feedback and abundant resources. But teachers also need to guide students in using them. (Interviewee 1)

[25] As to teaching tools, I think email is effective to communicate with my students, I can send them some materials related to lessons and they can ask questions after class. (Interviewee 1)

[26] If condition permits, I will adopt computer in my class, and will use email, electronic discussion forum as communicative tool to encourage cooperation. (Interviewee 2)

[27] If condition permits, I will use a lab to teach and use Ppt to present some ideas clearly. (Interviewee 1)

[28] The last one is financial factor, because using Internet costs quite a lot of money. (Interviewee 2)