# Sharing e-Learning Innovation across Disciplines: an Encounter between Engineering and Teacher Education

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**Abstract**: One of the major teaching challenges of higher education is helping students to bridge knowledge with real life practice. This is especially important in applied fields including medicine, social science, education and engineering. Traditionally, practicum and internship programs are the only means for students to step outside of classroom learning and to connect with the outside world, and a chance to apply what they learn to real life problems. Increasingly, information and communication technology (ICT) is being used to create yet another dimension for authentic learning beyond the boundaries of the classrooms, and in addition afford collaborative and flexible learning mode. This paper details a collaborative effort between the engineering and the education disciplines, in using ICT to support students' professional growth in teacher education. An eLearning platform was created as a result of the joint effort for the training of student teachers in developing their professional knowledge in teaching and learning and gaining understanding of the work of a teacher. Through the platform, student teachers gain understanding about the teaching profession from different people of the education sector; and they can reflect and share their teaching practicum experiences with each other using the online communication tools.

**Keywords**: e-Learning; teacher education; engineering education; TPCK, Web 2.0, interdisciplinary collaboration

## 1. Introduction

Within higher education, one of the major teaching challenges has always been helping students to bridge knowledge with real life practice. This is especially important in applied academic disciplines including medicine, social science, education and engineering where professional knowledge are constantly being renewed and recreated through real practice (Curry & Wergin, 1993; Boud & Feletti, 1997; Savin-Baden, 2000; Cheetham & Chivers, 2001). The engineering discipline for instance, often emphasizes learning through self-experience and the capturing of first-hand knowledge through problem solving. And in engineering teaching, using a problem solving approach has proven to be an effective instructional method, as well as in motivating and engaging student in the learning process (Felder & Silverman, 1988; Kolmos, 1996; Perrenet, Bouhuijs & Smits, 2000; Mills & Treagust, 2003). Traditionally, this problem based approach learning philosophy has been reflected by the substantial portion of internship that students within such applied fields have to undertake during their undergraduate years. In fact, practicum and internship programs used to be the only means for students to step outside of classroom learning and to connect with the outside world, and a chance to apply what they learn to real life problems. However, with the availability of Information and Communication Technology (ICT) and the rapid development of eLearning, ICT is increasingly being used to create yet another dimension for authentic learning beyond the boundaries of the classrooms and campus, and in addition afford collaborative and flexible learning mode. Compare to traditional methods of teaching that emphasize classroom lectures, the deployment of eLearning has increased the flexibility and effectiveness of teaching and learning by removing the restrictions of time and space in knowledge delivery and capturing. In a typical eLearning system, ICT components including computer graphics, animations, multimedia effect, databases, and other internet applications such as discussion forums and chat room facilities are incorporated . Such a stimulating learning environment engages students into a deeper learning process that can often elicit a high rate of information retention, and result in a shorter learning time (Ng & Komiya, 2000). In addition, such a multimedia education platform can be interactive, enabling students to control the content and flow of information capturing (Vaughan, 1998). The result is that students become active participants in learning and they take control of their learning processes.

In order to help their students to grasp the difficult concept of how industrial engineers work in the real world, and how they solve real life problems, a number of teaching staff at the Industrial and Manufacturing Systems Engineering Department (IMSE) of the University of Hong Kong started to explore the innovative use of ICT in their teaching since 2000 (Lee, Lau, Mak & Ma, 2004; Lau, Ma,


Reference this paper as:
Pan, N, Lau, H and Lai, W. (2010) "Sharing e-Learning Innovation across Disciplines: an Encounter between Engineering and Teacher Education" *Electronic Journal of e-Learning Volume 8 Issue 1 2009, (pp31 - 40), available online at www.ejel.org*

Mak & Chan 2004; Lau, Mak & Ma, 2004). The originally designed and in-house developed Interactive Multimedia eLearning System (IMELS) was the result of such experimentation. The main objective of the eLearning system was to create a virtual learning environment where students can immerse themselves and try to solve the problems embedded within the case studies scenarios. The program's main features include animated virtual companies based on real industry case studies and an online knowledge base of engineering subjects. The program was used in several courses by the IMSE since 2002, and the impact of the program in improving teaching and learning was studied through focused-group evaluation. Results of the student evaluation indicated that the majority of students found the program had enhanced their understanding of the practical issues in industry, and that it provided an effective platform to assist them to produce solutions to these real-life problems (Lau et al., 2004; Lee et al., 2004; Lau & Mak, 2005a; 2005b). Students reported that they were stimulated by the use of the online and multimedia presentations, and the program motivated and aroused their interest in learning the discipline of industrial engineering as a profession (Lau & Mak, 2005a; 2005b).

In the year 2006, the IMSE Department and the Faculty of Education within the same institute created a joint project to re-purpose the IMELS eLearning system to serve teacher education students in relation to teaching practice. Similar to the situation of industrial engineering, the education filed also has a heavy professional practice component, and they too were seeking new and effective means to enhance their teaching practicum programs, and to strengthen their undergraduate learning in general. It was determined that the program scope would focus on the Education Faculty's *Teaching Practice* (TP) program because it serves very similar educational purposes as those of the IE internship program. However, the project team was conscious of the fact that the functionalities and features that once applied to the engineering teaching and learning purposes may not fit exactly with the TP program's objectives. The re-purposing of the original IMELS had to take into consideration the contextual differences between the two systems. One of the differences was that at the beginning stage, one of the crucial factors guiding the design principles was to solicit views and ideas from the end-users themselves (this element was missing from the original IMELS design). During the consultation session, both the teaching staff and the undergraduate students from the education faculty provided valuable suggestions about how the original IMELS eLearning system can be re-purposed and be further enriched by expanding its scope to cover more extensive contents and features. In particular, there was an emphasis on coming up with features to foster collaborative learning and the formation of active learning communities among student teachers and partners from the local schools**.** They pointed out the importance of having a virtual platform for sharing ideas, TP experiences, and knowledge about teaching and learning among student teachers as well as the faculty teaching staff, especially on interesting issues encountered during the TP. The undergraduate students who are being trained as future teachers in local schools felt a particular need to learn from each other, and from experienced teachers about the practical problem solving experiences which are hard to come by in normal lectures or tutorials.

The above mentioned new requirements posted a new challenge with which the previous programs had not encountered, yet highly relevant to the current educational reform initiative underway in our university. For instance, one of the main features of the university's new curriculum is to provide students centered and diverse learning experiences (Transforming Student Learning, 2006). This paper reports the successful attempt to such a eLearning platform that would enhance students' learning experiences.

## 2. Web 2.0 learning technology for education

The e-solution that the joint venture project needed to provide was to come up with effective ways in creating desirable ICT features that are applicable to the teacher education discipline. There are two major design objectives: (1) to build features to satisfy the social and communication need of the student teachers (2) to build a video content platform which structure must be clear and simple so that navigation and access to content is easy and smooth. These objectives were found to coincide with the emerging concept of *Web 2.0*. Within eLearning development, the technologies that are being employed in various platforms are also changing. One of the more recent web development has been conceptually framed as *Web 2.0.* The concept or definitions of *Web 2.0* are often varied, and usually point to not a singular technology, but represent certain design approach or web application strategies (Alexander, 2006). But many agree that a major characteristic of *Web 2.0* is the enhanced social connection function of various web applications (Alexander, 2006; Anderson, 2007; O'Reilly, 2007). It is a more dynamic way of both accessing web based contents and connecting web users against the traditionally static and one way information web pages. Many also argue that *Web 2.0*

applications provides simple to use and easy to maneuver social and networking tools, and therefore are more appropriate for creating community-driven and collaborative user experiences (Guzdial, Ludovice, Realff, Morley & Carroll, 2002; Chen, Cannon, Gabrio, Leifer, Toye & Bailey, 2005; Hampel, Selke & Vitt, 2005; Alexanda, 2006; Byron, 2006; Duffy & Bruns, 2006; Levi & Stone 2006; Chao, 2007; Parker & Chao, 2007). Some of the popular emergent *Web 2.0* platforms on the World Wide Web such as *YouTube*, *Wikipedia* and *Blogging*, etc. are essentially center around the online experience of individuals gathering and participating freely in various virtual groups and online communities. These web users possess diverse identities, interests and cultural backgrounds, nevertheless collaborating and contributing information or knowledge to the much larger World Wide Web space (Alexanda, 2006; Levi & Stone 2006). For example, *YouTube* allows individuals to upload and share their "home videos" onto a large online database while others can freely search, watch and comment on the video clips and link the video clips to their own blogs; *Wikipedia* is an ever growing online encyclopedia entirely constructed by individual users contributing, modifying and co-building their knowledge to share with the rest of the world, and *Blogging* is basically individualized online journal that can be published on the Word Wide Web while others can comment and build on issues and topics which interest them.

Within the current education landscape, there has been growing interest and heated discussions about the need for higher education institutes to explore these new applications of web technologies. People from the education sector began to realize that with the available *Web 2.0* web software, more flexible and interactive eLearning systems can be constructed where students can share and construct their knowledge more easily with their peers. However, there has been a general lack of non-commercially developed, comprehensive and integrated eLearning programs that incorporate new *Web 2.0* features. This is probably due to a general lack of deep level understanding and theoretical framework in the educational uses of constantly evolving ICT technologies (Mishra & Koehler, 2006). In terms of the commercially available educational *Web 2.0* applications, there are *TeacherTube* which is essentially built upon the *YouTube* concept and structure yet educational content specific. There are also the educational blogs that are built upon the commercial blogging engines, used by teachers to teach particular subjects, much like the traditional teacher web pages, yet much easier to develop and maintain (Chao, 2007; Parker & Chao 2007). The strength of this project which built on previous experiences, therefore lies in its sound educational philosophy and a deep level understanding of the new teaching and learning needs of higher education which guides the design principals of the eLearning program. This kind of holistic approach to the implementation of ICT in teaching and learning takes into account of the inter-dependent nature and complex relation among academic content knowledge, pedagogical concerns, and the technology. The synergistic design process creates a unique type of knowledge all by itself increasingly known as *Technological Pedagogical Content Knowledge* (TPCK) which was first put forth by Mishra and Koehler (2006). According to TPCK, the knowledge that is both created and required when teachers try to adopt technology into their teaching and learning is both complex and context specific as a result of the interplay among content, pedagogy and technology (Koehler & Mishra, 2005; Mishra & Koehler, 2006). In other words, those who design eLearning environments need to take into consideration the unique pedagogical challenge that is inextricably linked to the subject knowledge of an academic discipline. In our case, teacher education which concerns largely a teacher's professional knowledge may pose a number of pedagogical concerns and need to be addressed if new eLearning platforms are to be constructed effectively.

## 3. Understanding the instructional need of teacher education

The use of ICT in teacher education has been widely studied and documented since ICT has become increasingly influential in the education field in recent years. (Kay, 2006; Murray, Nuttall & Mitchell, 2008). One of the major uses of ICT in teacher education was being an instructional tool (Carter, 1999; Kapitzke, 2000; Mayer, 2002; Murray, Nuttall & Mitchell, 2008; Ryan & Scott, 2008). One of the survey studies reviewed the context in which ICT was used in student teachers' learning, and suggests that a majority of the applications were in fact targeted at the teaching practicum component. It was pointed out that new approach to teaching such as the rising concept of teacher reflection couple with the availability of new web technologies has provided the ground for ICT development in teacher education:

> *Most of these focused on the use of online communications in the fieldwork component of programmes. This focus reflects a concern to explore the potential of technology to address ongoing problems in the practicum related to isolation and lack of connection*

> *between campus coursework and fieldwork, and the use of Web 2.0 tools and the rise of reflective learning in teacher education (Murray, Nuttall & Mitchell, 2008, p.232 ).*

Like many other teacher education programs mentioned in the ICT research literature, the existing teacher education program of our study also comprises of a large *Teaching Practice* (TP) component of which there will be a total of nineteen weeks of student internship at local secondary schools throughout the 2nd, 3rd and 4th year of study. The TP involves direct field experiences where student teachers work often in pairs with school partners, mentors and the community of teacher practitioners. Teaching experience and knowledge sharing, reflection and mentoring are the pedagogical emphasis within the current TP program. Therefore, there has been an ever growing need and concern to provide the student teachers' with more flexibility in knowledge sharing and collaborative learning experiences. There is also the need to create some kind of network where mutual support and building new knowledge can in fact take place among the student teachers.

Another major challenge for the faculty is one of knowledge integration and application. Currently, the curriculum structure is such that three major areas of studies are being taught and delivered to student teachers in a disconnected manner, they are (1) educational studies, e.g. educational psychology; learning theories, etc; (2) subject knowledge, e.g. Language, Mathematics & Science, etc.; (3) Pedagogical skills, e.g. effective teaching methods and strategies. Students learn these subjects separately from individual courses, however, student's ability to integrate these different knowledge and to apply the knowledge to the real classroom teaching becomes vital to their TP and future career success. The current setting makes it difficult to provide the students with opportunity to generate their own knowledge integration prior to the TP because of time, space and resource constraints. It was apparent to the faculty that there is an urgent need to produce learning materials that are readily accessible and to provide the students with prior experiences of teaching. And last but not least the faculty needs to provide students with the means to access and share among themselves up-to-date information and new knowledge, especially from their TP practices. This is to ensure that their graduates are able to maintain a competitive advantage in the teaching profession field that is constantly changing. To summarize, the major instructional concerns of the TP program is to put it simply, the need to connect classroom learning with real life practice which keeps changing due to the rapidly evolving societies. The specific instructional concern of our study also coincides with the existing literatures which suggest that there are similar instructional needs of teacher education program shared among different tertiary institutions and across geographical locations.

## 4. The iTeach e-learning program

To come up with innovative solutions to meet these educational and pedagogical challenges, the IMSE Department worked closely with the teaching staff of the Education Faculty and focused on modifying and adapting the original IMELS architecture which was web-based and an open shell that can be flexibly extended to form an information portal for different disciplines. The new program continued to use the basic design concepts and structures of the original IMELS which has three major components, they are (1) authentic problems identified and constructed as case studies which serves as the major learning path for students; (2) subject knowledge content which serves as the bases of students understanding of the disciplinary knowledge, and (3) the contextual online, web based environment that integrate all the content material. In addition, the case study materials created for the platform were rich in content because unlike traditional paper based case studies, they were shot as video clips often in an authentic school environment, therefore bringing the rich flavor of contextual information to the viewer. Another major design in the new program, was to taken into consideration of students' need for communication and collaboration among themselves and with others, and added the extra feature of collaborative web tools, in this case, a Blogging function. The evolution from the original design to the present design is portrayed below graphically in Figure 1.

The resulting new eLearning program known as *iTeach* has three major components, namely, (1) digital video based content materials/data repository (similar to the concept of *YouTube*), (2) a virtual classroom environment with a number of case examples highlighting the different scenarios in classroom teaching, and (3) a new blogging feature that allows online collaborations, discussions and publications among student teachers (Figure 2).

 

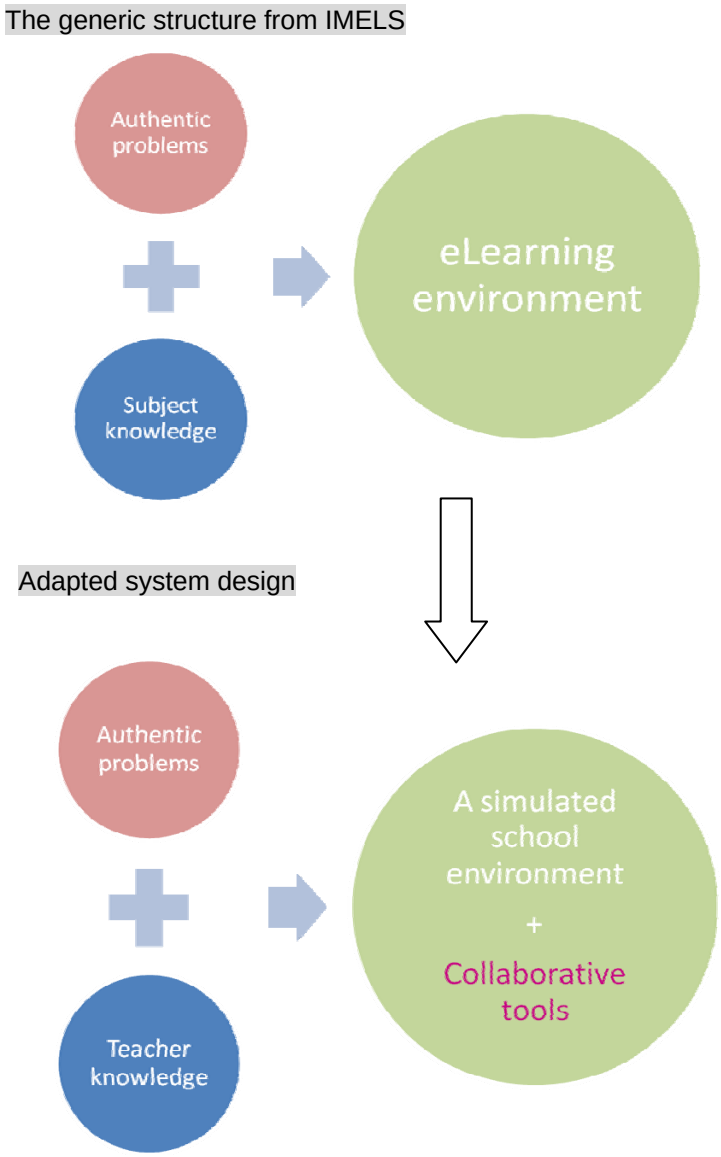


**Figure 1**: Design evolution

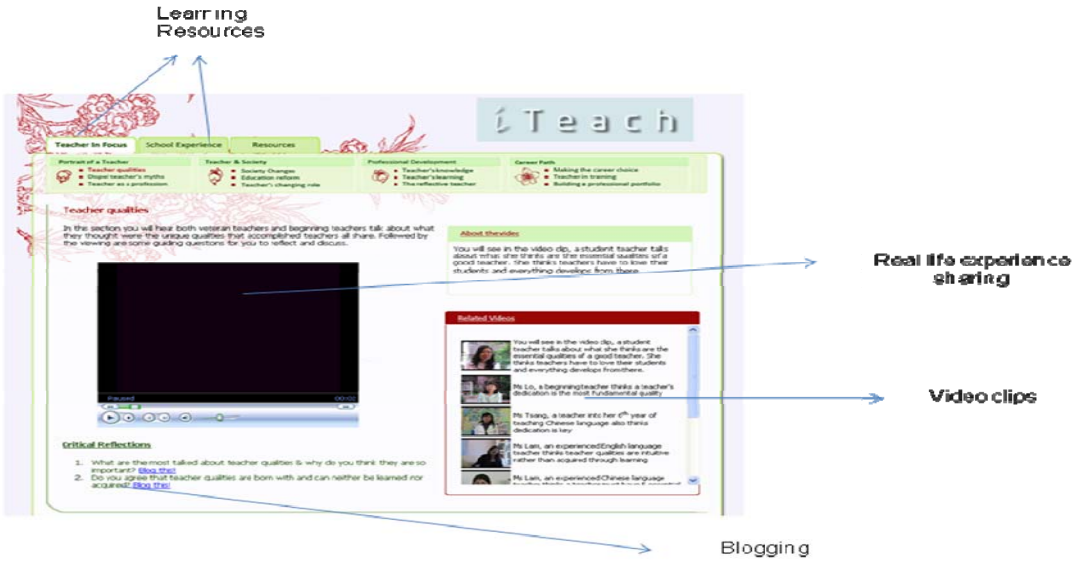


**Figure 2**: Final product - iTeach

When a student teacher enters the website, what he or she will see is the main page of the eLearning platform *iTeach*. All the navigation buttons and links to the various contents can be accessed on the main page on top of the screen. The main focal point of the web page is an embedded media player (can be seen in figure 2 as the black square) which plays all the video contents of the website. To the right of the screen are a list of available video clips of the website categorized according to topics. Underneath the media player are a set of open ended questions to prompt student teachers' reflective thinking in relation to what they see in the video clips. A link to the website's blog is put at the end of each question so that student teachers can discuss the guided questions with peers on the blog if they desire. The platform was designed to display mainly video contents. Text contents are kept at a minimal to reflect this moving picture orientated design. The viewing experience is similar to what people normally experience on *YouTube*, a video content sharing website, and the difference is that users cannot upload their own videos. This was due to the fact that all the contents of the website has gone through a careful selection and categorization process to ensure their legibility, clarity and ease of concept grasping. Moreover, the main learning attraction is the viewing of real classroom actions and the guided questions for students' reflections. In other words, the platform is different from other video based platforms, such as video blogs and *YouTube* because it is essentially learning oriented as opposed to the more leisure viewing type of commercial websites.

## 5. Program evaluation and findings

A questionnaire evaluation was conducted on the beta version of the eLearning program with two cohorts of first year students from the faculty who undertook the Bachelor of Education (BEd) program. These students represented approximately 31 % of the total number of first year BEd students in the faculty. Prior to the actual survey, we tested the questionnaire design with six students randomly picked from outside the surveyed cohort. Their feedbacks were generally positive on both the quality and attractiveness of the program. And the written comments regarding the learning benefits of the *iTeach* were encouraging. Below are two comment excerpts:

> *SA: In order to have a general understanding, I spend approximately one hour for each topic, and I think it is of great worth as the videos do make me realize that to be a teacher in the future, there are still many things that I have to make more efforts to learn at the moment, not only the subject knowledge, but how to equip myself as a good teacher, say, in psychological aspects. The videos do make me think about questions like what I really want to achieve seriously.*
>
> *SB: To me it is (referring to content material) more philosophical than educational. The topics not only provide information but lead to in depth reflections.*

During the actual survey, we asked the students to rate the web program in two broad areas: (1) Program design and presentation (2) Web content and its educational value. We also asked the students to provide written assessment on the usefulness and learning benefits of the subject contents. A total of 38 students were given a paper questionnaire to be completed at their convenience and after they have gone through a self directed learning process with *iTeach*. Two class representatives were appointed to collect the completed questionnaires as students may complete them in different times although the deadline was set at one month. There were a total of 33 successfully completed questionnaires.

In terms of the items on program design and presentation, the students were satisfied with the structure of the program and how its contents are presented (the average rating is 2.01 on a scale from 1 being very much satisfied to 4 very much not satisfied). The ratings on two of the items are slightly higher than others. They are: (i) The contents are presented in a way that are easy to understand (mean 1.85), and (ii) The program is structured in a way that allow me enough freedom to choose when and where to engage with the content (mean 1.82). However, one of the item receives a slightly lower rating which is (iii) The program encourages me to learn collaboratively (mean 2.18). The higher rating on item (i) and (ii) shows that some of the design criteria that the project team had set in the beginning such as creating clear structure and easy to understand contents has been met. The lower rating on item (iii) was within the expectation of the project team because elements that encourage more user input and interaction among user themselves may give way to a more structured learning platform, although this is not always the case.

In terms of content and educational benefits, the students were also satisfied with the content and the learning experience (the average rating is 1.99). The ratings on three of the items are slightly higher than others. They are: (i) The topics covered offer a good overview of the various topics involved of

 

the main subject (mean 1.91), (ii) I was able to find new and fresh ideas about the subject after going through the contents (mean 1.91), and (iii) I would recommend this learning program to my fellow students (mean 1.91). One item that receives slightly lower rating is (iv) The topics covered are relevant to my experience and knowledge in the subject (mean 2.09). The higher rating on item (i), (ii) and (iii) showed that students were generally satisfied with the content material and the learning experience. The lower rating on item (iv) perhaps can be explained by the fact that those who participated in the survey were all first year students. They have not had any TP experiences yet, so they might find the content that emphasized TP experience to be slightly unfamiliar. This point was actually mentioned by a few students in the written comments.

Information gathered from the written responses of student teachers from our survey show some interesting learning issues and challenges that first year student teachers may face. The responses reflected the first year students' lack of confidence in real teaching. They were aware of the fact that the lack of practical experience may have a toll on their future teaching. Many said they would like to gain more knowledge on practical teaching skills when asked what topics in the video contents they would like to discuss with their peers the most. And among those teaching skills, classroom management in terms of controlling students' behaviors in the classroom was one of the most frequently mentioned.

> *S2: As I am a year 1 student, there is still not enough subject relating to education, for example, the skills of teaching. I think this eLearning program can provide us more knowledge in the field and let us prepare to become professional teachers.*
>
> *S7: I wish to discuss with others about how to make the classroom more orderly, classroom management. It is because a good learning environment is very important if one wants to teach the students knowledge. Besides for a novice teacher, someone who has little teaching experience, the orderliness of the classroom is more difficult to control.*
>
> *S17: (topics I would like to discuss with peers) How to handle students' behavior problems. How to enhance students' interest in learning. Pedagogy.*
>
> *S3: School experience, classroom management because this is the most useful for student teachers. And we can use the examples and methods mentioned in the video clips to solve the problems we encountered during the practicum. The video contents also invoke our thinking.*

Many responses also showed that student teachers started to reflect about their own conceptions and understanding of teaching and teaching as a profession after viewing the video clips of in-service teacher's experience sharing.

> *S32: "Teachers must be inborn", I doubt the statement.*
>
> *S33: If teacher is a profession, how come a lot of people switch from other unrelated field to teaching profession without acquiring any professional qualification?*
>
> *S14: The idea that classroom teaching is not just about 'teaching'. In real teaching, teachers need to attend to many other aspects, such as (a Confucius quote) : "To teach about the path, to hand down the knowledge, and to clear confusion".*
>
> *S1: Yes. Teaching is a really demanding career. But those good teachers are proud of their students, but not proud of themselves.*

Many agreed that the contents stimulated them to think more deeply about the teaching subject. Students became aware that sharing and hearing different ideas inspire them and provoke them to think deeper about themselves as future teachers.

> *S17: Yes, it has (stimulated my thinking). Teaching can be more than one-way transmission, more elements can be incorporated such as singing, so that students' motivation in learning can be enhanced. Teaching should not be just about transmitting knowledge, it can also be enjoyable.*
>
> *S4: Yes. Different people sharing their ideas makes me think more of the future and my role as a student-teacher.*
>
> *S12: There are lots of teachers' sharing on the Web. Their enthusiasm in teaching inspires me a great deal. It also makes me rethink why I decided to become a teacher and what sort of teacher I would like to be.*

When responding to the question about the educational value of the eLearning platform, the feedbacks were generally positive with some very good praises. The following quote shows possible reasons why students may appreciate the eLearning program.

> *S23: Although I have only studied the BEd program for one year, and what I have learned are limited, but my impression was that we have been taught with some general theories. But I think for teaching, what's more important is the practical aspect which is different depending on each situation. Therefore, I'm really looking forward to the teaching practice in year 2, 3 and 4. And I think what I'll learn from TP will definitely be richer than the classroom learning. And eLearning program provides a good platform for those of us at the beginning level, or even for those who wants to become a teacher to know more about it. The videos also help to make certain concepts more concrete. And the sharing from senior students is also a very valuable reference.*

It seems that students do acknowledge the usefulness of such ICT learning, however they also expressed concern over the actual usage. One response came from a student in Chinese language teaching reflecting that language was perceived to be a factor affecting ICT usage although most of the video clips were shot in local dialect.

> *S1: As I am just going through the first year, it's hard to give comments. But eLearning is not very popular among Chinese major students.*
>
> *S33: I think so. Since I am just in my first year I don't think I have much suggestion to make. This kind of program may help but I doubt the participation.*

In the conclusion below, we will offer some insights for the student responses mentioned above. Suggestions for how to improve the eLearning platform and the use of ICT in teacher education in general will also be made. And finally, possibilities of the kinds of further research in the field of ICT in teacher education is discussed.

## 6. Conclusion

The students' feedbacks showed that the first year students display a lack of confidence in their ability to teach because they felt that they have not had any teaching practice experience yet. It is interesting to note that many of them mentioned the aspect of teaching that concerned them the most was how to manage a classroom in terms of maintaining order. Students were aware that such kind of practical knowledge is hard to obtain from university classes because every teaching situation is unique and different. They also pointed out that having actual experience in teaching is important for teacher education. The self perceived inexperience may also explain why many of them liked the in-service teachers' sharing and found the stories inspiring and stimulating. They especially appreciated sharing on actual teaching skills such as how to build good relationship with students and design good lesson plans. As one student remarked, experience sharing is not only thought provoking but it is also how the teaching legacy gets passed on from one generation of teachers to another: "It's also a way to learn from others' experiences and see if I we can apply the same to my own teaching. It also helps to build my own teaching repertoire". Other studies have suggested that the use of digital media contents in teacher education can often lead to learning that is more student-centered, authentic, and meaningful (Schaverien, 2003; Kearney & Schuck, 2006; Ma, O'Toole & Keppell, 2008). But as Murray rightly points out, little is known about the learning outcomes of the use of ICT. Our studies seems to suggest that eLearning platforms which are rich in contents about actual teaching experiences may have played a role in the process of knowledge transfer from one generations of teachers to another. The eLearning platform in fact provided the space and means for such kind of knowledge transfer. The following quote from one of our participants highlights the questions worth pursuing in terms of how the learning process may occur: "I am most interested in the process of student teachers becoming a teacher. How the shift occurring between these two identities…**".**

Although the study does show some evidence that ICT is being used to good effect in supporting student teachers in their learning to become a future teacher, the data also reveals that student may not actively use or participate on the eLearning platform. This problem which is not uncommon to online learning (Pearson, 1999), may undermine the ultimate success of such online learning resources. However, the problem does not seem to be the contents or the platform itself because students were readily attracted by the rich contents that the video based case study provided. In other words, the contents were engaging enough so that students would take pleasure in going through the learning material. Some studies suggest that a facilitator or teacher's involvement in the

online learning environment is important factor for students' active participation and retention (Salmon, 2000; Woods, 2002; Mazzolini & Maddison, 2003). We argue, therefore that web technologies and good contents alone will not encourage more interactions among the student teachers, and the participation and facilitation by experienced teachers are perhaps needed. It was suggested that by integrating the eLearning program more tightly with the existing curriculum, and the active involvement of teaching staff who make use of it in their teaching might help to encourage student participation. In fact this would be a good hypothesis to be tested out in further research in this area. To summarize, although it appears that ICT and new web technologies play an important role in enriching student teachers' learning experiences, the success of its application still depends on factors that are beyond the technologies or pedagogies. Nevertheless, the project has been a remarkably encouraging experience for inter-disciplinary/cross faculty collaboration in the effort to advance teaching and learning practices.

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