The perspectives of major stakeholders on video enriched problem-based learning for Chinese teacher education

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The study described in this paper investigated how the major stakeholders of a teacher education institution responded to a particular suite of educational products that involved video-based educational learning objects. It aims to look into stakeholder attitudes to potential technological development in fostering student-centred learning in general and problem-based learning (PBL) in particular, with the ultimate goal of enhancing and improving the quality of teacher training. The research objectives are specifically focused upon (a) the experience of the major stakeholders when using multimedia technology and PBL pedagogy; (b) perceived benefits and challenges when applying the courseware in actual teaching situations; and (c) the possibility of these video-rich PBL cases being adjusted to better suit stakeholder needs and encourage their wider use in the particular context of this Chinese teacher education institution. The results show that previous training can exert a significant influence on the adoption of PBL by teachers and students. The data analysis is expected to form a useful baseline for a longitudinal study to determine the extent to which such multimedia educational courseware can affect the processes of learning, and to identify the learning outcomes that may be achievable through video-rich learning objects.

Introduction

In July 2001, the Hong Kong Special Administrative Region Government published a curriculum reform report titled *Learning to Learn - The Way Forward in Curriculum Developmen*t (Curriculum Development Council, 2000), outlining the general direction for curriculum development in Hong Kong for the following ten years. One of the key directions promoted in the education reform documents is the provision of more room and flexibility for Hong Kong students so that they become masters of their own learning. Problem-based learning (PBL) was specified as one of the generic skills to be promoted by educators in various settings. This represents a considerable departure from traditional local educational practices of teacher-centred learning towards more student-centred learning. These developments have been accompanied by increasing interest in the use of information and communication technology (ICT) to enhance student learning.

Kovalik (1999) found that all facets of the school environment can be affected by PBL. Thus, any implementation plan needs to build on the institutional culture and be guided by a systemic view of the existing educational environment. Aspects of the curriculum are more likely to be modified through joint efforts by management, teacher trainers, student trainees and the community (Payne, 2009a).

PBL generally involves a purposefully ill-structured problem that initiates learning. The teacher serves as a facilitator instead of being an information repository (Hmelo-Silver, 2004), and the problems built into the PBL process are expected to help stimulate the learners to actively participate in common meaning building, rather than merely attempting to assimilate conventional lecture content. Much of the literature consulted, lists advantages of PBL over non-constructivist ways of learning in Western contexts (for example, Boud & Feletti, 1997; Cunningham & Cordeiro, 2006; Hmelo-Silver, 2004; Uden & Beaumont, 2007). Western staff and students involved in the process seem to find problem-based learning more enjoyable and stimulating than more traditional approaches (Uden & Beaumont, 2007).

The PBL literature seems to suggest that prior knowledge, authentic case studies and familiarity with student-centred learning, collaborative work, independent learning and deep learning are the key elements in enabling Western students to achieve in-depth and life-long learning habits. This fits well with the constructivist framework that underlies emerging contemporary curriculum development. Payne

(2009a) notes that using technology in a constructivist manner can potentially further expand the students' knowledge base and create more global learners. If this is truly the case, the development of educational projects that integrate ICT with appropriate learning designs may have the capacity to contribute to the desired PBL outcomes in an innovative way. Consequently, technology seems to be a useful partner to PBL and an investigation of their interaction would seem to be timely.

The integration of technology into the learning process can have profound consequences for how learning takes place socially. On one hand, one can see more individual learning in a student using the computer. On the other hand, the technology allows for much more diversified and socially rich learning contexts. Web 1.0 approaches, such as peer tutoring via computer; computer networks and email, have been joined by the social networking applications that characterise web 2.0 and movement towards the utilisation of virtual worlds seems to be gaining momentum. Increased recognition of the potential of computer-mediated communications and computer-supported collaboration work have enabled building of the more supportive, collaborative, and social learning environments called for by the constructivist perspective (Payne & Reinhart, 2008).

Moreover, ICT seems to be effective in developing higher-order thinking skills, including defining problems, judging information, solving the problems, and drawing appropriate conclusion and solutions (Almala, 2006; Brown & Adler, 2008; Payne, 2009b). From the teachers' point of view, multimedia can act as a catalyst for enhancing the teaching and learning process. The new technology makes it possible for educators to become part of student interactions and this may increase mutual enjoyment of the learning process, produce improved grades and decrease absenteeism (Beck & Kosnik, 2006). From the learners' point of view, multimedia can provide them with the opportunity to exercise control over their own learning. They are given the flexibility to set their own pace of instruction and work through the content at a rate commensurate with their ability and motivation (Collins & Halverson, 2009; Walker et al., 2011). Depending on the learning context, ICT may also make it possible to embed learning into authentic and meaningful contexts (Brown & Adler, 2008) in ways that are not feasible under more traditional learning modes. Video segments that prompt thought and trigger discussion can enrich learning situations that might otherwise depend on written scenarios.

Video-based learning offers a far greater degree of authenticity by allowing teachers and student teachers to observe teachers in action and listen to student interactions. Media-rich educational courseware in the form of video-cases includes the visual elements of posture, proxemics, eye contact, facial expression and uses of gesture, and so it may offer a more effective means of engaging the student authentically within PBL than do text-based scenarios. The combination of visual cues with an effective and systematic classroom exploitation of well-selected video sequences can help increase students' interest and serve as a stimulus for free discussion in group work (Collins & Halverson, 2009). A recent comparison study of medical postgraduates, Balslev, de Grave, Muijtjens, and Scherpbier (2005), indicated that a video presentation is particularly helpful for PBL formats, producing improvement in data exploration, theory building and theory evaluation. Historically, students in university teacher-training programmes had thought that their preparation for classroom management seemed appropriate until the first day of real teaching when they suddenly realized that their hands-on application of theory was far from adequate (Matus, 2001). Video-rich educational courseware may help to alleviate this problem.

Technology integration is being promoted as a means to actualize substantial educational reform. The adaptability and versatility of technology not only suggests its use as a partner to traditional or revitalized educational practices but also facilitates an expanded array of instructional and evaluative methodologies and strategies. Technology and PBL are related in the sense that technology can facilitate elements of PBL without necessarily being the focus of the instructional process, serving as a tool to gather and organize information, prepare tangible learning outcomes, store analytical results, and provide insight into meta-cognitive strategies like self-reflection and self-evaluation. The ability of technology to provide a means to create and modify learning products prior to final production reinforces basic PBL tenets of interactive teaching and learning.

The integration of technology and PBL may be highly conducive to teacher training. This paper suggests that PBL, ICT and teacher education, acting together, may be instrumental in achieving effective educational reform results that can provide the pre-service teachers with a meaningful and cohesive

educational experience. However, it seems likely that the cultural differences between a Confucian context and the North American progressivist context within which PBL developed will problematize uptake of this apparently successful approach to education. Such cultural problematics encourage the use of the term *stakeholder* for the participants in this educational innovation. Each group has different interests to preserve and defend and this is better communicated by the business notion of stakeholder than the more usual educational term *participant*.

This paper describes an investigation of the impact of video-based stimulus material on stakeholder attitudes to PBL. Such material is sometimes referred to as a "trigger" because its specific detail is less important than its motivational and constructive impact. This investigation sought to discover whether the use of such triggers would encourage more effective episodes of student learning through their engagement in realistic simulations of actual school experiences.

Video-rich educational courseware

The working hypothesis for this investigation is that integrating technology into PBL pedagogy may enrich teaching and learning by providing visual scenarios to assist educators in their training of pre-service teachers.

The focus institution provides courses designed to prepare teachers for Early Childhood Education, Physical Education, Inclusive Education, Business Studies and Information and Communication Technology. Consequently, five sets of video-rich cases were specifically developed for this investigation. The scripts for the vignettes were written by members of the institution's Centre for Learning, Teaching and Technology and then formed the basis of performances by Institute staff and students, which were digitally recorded by that centre. These digital recordings were subsequently used in the classes of participating Institute teachers.

The teacher educators responsible for the particular content area wrote the scripts to expose a number of problems that emerged from teaching practice. The video vignettes were set as discussions between "teachers" (or between an Early Childhood teacher and a parent in one vignette) that expressed the problems with which the educators wished their classes to engage. They were not set in classroom contexts. Each vignette was 15 to 30 minutes long and each illustrated a dilemma that commonly arises in teaching that particular subject. The vignettes were "authentic" in the sense that they reflected real teaching dilemmas (Keppell, 2005), but they were more focussed than what the use of hidden cameras may have revealed.

Table 1 gives a brief description of the five cases and their respective foci.

Table 1
Video triggers

Title of the case	Focus	Number of Teachers
1) "What's Wrong With My Baby Boy?"	Early childhood education	1
2) "Quantum Leap"	Exercise physiology - physical education	1
3) "Why Can't I Save This File?"	Digital video production	1
4) "Just One More Minor Change…"	Project management in educational technology	1
5) "Do You Want to Play As Well…?"	Inclusive physical education	1

The vignettes were accompanied by stapled notes for PBL facilitators. There were approximately five pages of notes per vignette. They included suggestions as to how each scenario could be used as a PBL trigger, as well as questions designed to illuminate the problem posed and guide subsequent student discussion. Table 1 provides details of these vignettes and the number of teacher educators who used each. The vignettes were projected for group viewing and then the participating students formed into PBL groups, as directed by participating staff, who were guided by the supportive material that accompanied each vignette. This is the sense in which the vignette triggered the PBL (Keppell, 2004).

The video trigger was less important than the group process by which students built defensible responses to the dilemmas they identified after viewing the scenario. Like other effective PBL stimuli, these scenarios were open-ended and relatively poorly structured. They were intended to provoke joint construction, rather than to evoke a particular "required" response. The following still images are taken for the video triggers for the first and last cases.

Figure 1. Case one on Early Childhood Education: "What's Wrong with My Baby Boy?"
(Picture taken from Keppell, 2005, p. 232).

Context: The nursery teacher (on the right) is talking to a baby boy's mother about her little boy's recent problems. The baby boy's parents, who are new migrants to Hong Kong, are so busy earning a living that they sent their one-year-old boy to a nearby nursery.

Figure 2. Case five on Inclusive Physical Education: "Do You Want to Play as Well?"
(Picture taken from Keppell, 2005, p. 236).

Context: A disabled student who has to use a wheelchair is being excluded from sports due to his disability. He likes volleyball and has always been supportive of all the volleyball games and matches.

The research described in this paper focused on major stakeholder attitudes to these PBL video triggers, specifically investigating:

a) the experience of these teacher educators when using this multimedia technology within PBL pedagogy;
b) their perceptions of the benefits and challenges in the process of applying the courseware in actual teaching situations; and
c) the possibility of the video-rich PBL cases being adjusted to suit better their needs and encourage wider use of PBL on the campus of this particular teacher education institution.

Method

Case-study research strategy

This investigation into the effectiveness of a newly developed educational product meets the three key criteria of being "critical" (in the sense that stakeholders were being asked to consider implementation of an unfamiliar educational innovation), "unique" (in that it reflects the situation in a particular institution at a specific point in time) and "revelatory" (because of the under-researched interaction between cultural, curricular and technological aspects) case (Patton, 2002; Yin, 2003). So, a single case research strategy was chosen for this study. The broadly constructivist theory (Cunningham & Cordeiro, 2006; Payne, 2009b) upon which PBL rests forms the theoretical foundations of the investigation. The investigation made use of both quantitative and qualitative methods in the exploratory design of the study, in the process of investigation and in the description of the findings.

To design and conduct a case-study successfully, it is important to consider comprehensively those factors related to its contextual environment and control (Blumberg, Cooper, & Schindler, 2005). As such, a case-study protocol has to be developed to allow the researcher to generate the details with regard to the procedure's administration and study requirements, to give clear direction and ensure reliability. The following protocol (see Figure 3) was adapted from the model devised by Yin (2009, p. 67). Each of the four stages consisted of the original component requirements and was then followed by the revised procedures designed specifically for this evaluation study. The research process followed the evaluation model outlined by Reeves and Hedberg (2003), which described the major development functions and the corresponding functions for evaluating an interactive computer-based learning system. Their model was applied in this study because it outlined the essential phases of carrying out an evaluation research for ensuring the quality of developing this video-based PBL courseware. An interview protocol was finally developed to ensure smooth and successful data collection of answers to the research questions as well as to ensure consistency among the interviews, and which serves as a yardstick as described below:

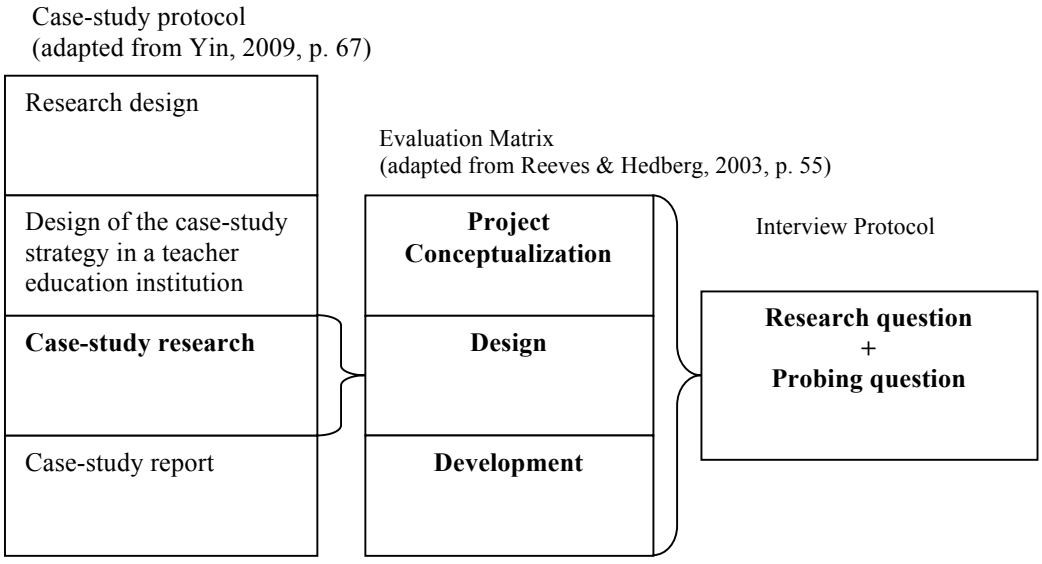

Figure 3. The research process.

Data collection

Face-to-face open-ended interviews were considered to be the most effective tool to tap the thoughts and ideas of both the teacher educators and student teachers with regard to their attitudes towards the video enriched PBL (Yin, 2009, p. 90). The semi-structured nature of the interviews allowed interviewees to pursue any area of inquiry about which they felt strongly. The problems discussed include the attributes of these innovative media triggers, their perceived effectiveness, the interrelationships between the material developed and other components of a discipline, and possible future developments of these learning objects. Although it is sometimes considered to be subjective in nature (Shankar & Goulding, 2001), the open-ended approach encourages respondents to draw their own conclusions from their experiences and/or opinions during the project development stages. These expert- and peer- interviews actually helped to formulate the questionnaires for the student focus group research.

The qualitative data generated from the student focus groups proved to be particularly useful for this case-study because the focus-group activity was able to elicit explicit responses from the pre-service teachers who might otherwise feel reluctant to contribute. This approach was especially suitable for the Chinese students who are influenced by traditional Confucian culture, a belief system that values harmony. Chinese students in Hong Kong have been generally described as passive learners who are reluctant to speak out in class (Watkins & Biggs, 2005). Pre-existing groups of final-year students of the same disciplines were chosen because they already knew each other through learning or socializing together throughout their course of studies. From the informal interchanges, student groups were able to generate insights which might not be achievable through the conventional personal interview approach. Both students and teachers proved much more willing to share their perceptions in the relatively private context of the semi-structured interview than they were in open meetings, or in the survey used in another phase of this investigation.

Source triangulation

Source triangulation in this study involved collecting 360-degree feedback (Bookman, 1999) from the key stakeholders. The 360-degree investigation was adopted for this study to provide insights from a wide variety of people who have interaction with each other (Bracken & Rose, 2011) with regard to curriculum development and teaching practices. According to Bracken and Rose (2011), the intent is to facilitate data collection about various expectations, roles, and responsibilities. Data was gathered concerning the perceptions of students, teachers, administrators and the vignette production team. Student data was gathered through focus groups, while staff data emerged from individual interviews. Both focus group discussions and individual interviews were guided by the same protocol and carried out in the language with which the participants were most comfortable.

Table 2
Representatives of the major stakeholders

Representatives of the Major Stakeholders	*N*	Project phases
Senior management	1	Phase I of personal interviews to teacher education (*n*=10)
Instructional designer	1	
Multimedia designer	1	
Five teachers who served as the subject expert	5	
Two visiting academics with one specializing in educational technology and the other in teaching pedagogy	2	
Student teachers major in Early Childhood Education	16	Phase II of focus group interviews to ten student-teacher groups of 5 disciplines (*n*=87)
Student teachers major in Physical Education	17	
Student teachers major in Information Technology	19	
Student teachers major in Business Studies	17	
Student teachers major in Inclusive Education	19	
Total number of respondents:	97	

Five student focus groups provided student data, as there were five triggers of five different subjects. Interviews were held with representatives of senior management, instructional and multimedia design, five teachers who served as the subject experts and two overseas academics serving as visiting professors, who provided an international perspective. The qualitative interviews with these key stakeholders were expected to provide a contextual insight for formulating the questionnaires for the subsequent data collection from student focus groups. Representatives of the major stakeholders are given in Table 2. Staff participants were recruited on the basis of their role in contemporary innovatory processes at the Institute. The potential bias of this sample is counter-balanced by the actual roles that these people will take in any widened uptake of educational innovation. PBL and any potential technological enhancement are both at the trial stage. Implementation is being externally encouraged but widespread up-take is by no means certain. If this group responds positively to changes such as these, the changes are likely to be encouraged. Any concerns expressed by this group are likely to be much amplified in the wider staff community.

Background of the education professionals

A total of ten education professionals who served as the representatives of the major stakeholders participated in the in-depth personal interviews following the semi-structured questionnaires. As analysed in Table 3 below, a majority (60%) of these interviewees were Hong Kong-Chinese. A very high percentage of these teacher educators were very experienced (70%), with more than 11 years of teaching. Over 60% of them had worked in the Institute for more than ten years. It is important to note that all the expatriates (4 persons) reported that they had experience in using PBL but four out of the six local Chinese teachers reported that they had very little experience with PBL. This reflected the recent institute recruitment of expatriate staff with PBL experience. Four expatriates (40%) were using the problem-based approach whereas the remaining six local educators were either using problem-solving (30%) or problem-oriented (30%) approaches. The problem–oriented approach involved distribution of a set of problems that the local educators used to structure a basically transmissive curriculum with some local use of group work with relatively closed questions, while the expatriates used the more open, less well-structured dilemmas that characterise PBL. The three approaches are distinguished by the openness of problems presented to students and the extent to which student problem-solving strategies are allowed to influence subsequent program planning. Ninety percent of these teachers reported that they had high to medium involvement with the Blackboard learning management system in their daily teaching and learning activities. Table 3 provides a brief summary of the background of these teacher participants:

Background of student participants

The student focus group interviews were conducted with a total of 87 students in groups of 7 to 9 people. These student participants were chosen using a specific set of criteria. After obtaining a full list of final-year students from the Institute, groups of participants were randomly selected from the list of the same subjects. Since there were five vignette triggers, a total of 10 student groups were interviewed, involving two groups from the same subject.

The students had the following characteristics in common:

- pre-service teachers in their final-year of full-time studies;
- Hong Kong born Chinese with education received locally;
- ranging from 23 to 26 years of age;
- having their own computers at home; and
- possessing basic IT skills and having fulfilled the Hong Kong Government's requirement of basic IT Competency level for graduation.

Table 3
Background of the education professionals

Category	*Category*	*No.*	*%*
National origin	Local teachers	6	60
	Expatriates	4	40
Gender	Females	3	30
	Males	7	70
Years of teaching	1-5	1	10
	6-10	2	20
	11-15	3	30
	16-20	4	40
Years at this Institute	Nil	2	20
	1-5	1	10
	6-10	1	10
	11-15	3	30
	16-20	3	30
Years of experience with Blackboard learning management system	Nil	0	0
	1-5	4	40
	6-10	1	10
	11-15	3	30
	16-20	2	20
Years of experience with PBL pedagogy	Nil	0	0
	1-5	4	40
	6-10	2	20
	11-15	2	20
	16-20	2	20

Summary of findings

The interviews and focus groups were digitally recorded and then manually transcribed. The transcriptions were then analysed with NVivo and emerging nodes were used to identify and describe common features. NVivo analysis was based on text presented in English. Table 4 indicates the frequency of quotes such as those that follow, suggesting their representativeness.

The participants unanimously expressed the view that the technical complexity of the videos was of a very high standard and that they were equally impressed by the authenticity of the cases presented in the videos.

> The extremely technical complexity of the videos is of a high-standard. The triggers produced are carefully designed in order to address the aims and the goals of that particular course for the students. The selected problems are intended to provide a realistic scenario for students to think about deeply. Most of these scenarios are outside the students' experiences. These are the goods things which can be found with the media. (Educator A, a teacher of Information and Applied Technology)

Educator B, an overseas academic expressed similar views,

> The media triggers are really rich resources, because in the short videos of 15 to 30 minutes, there are so many layers of understanding that the learners can achieve. In the videos, students can examine what is the nature of problem, what is the dynamic that the figures bring to the problem, what are the possible ideas that can help to solve the problems.

The above feedback of the teachers matched with the original idea of the Instructional Designer for creating these triggers.

> These PBL triggers could be aimed for teaching and learning in the form of learning objects as the cases were packaged in a certain way so that they could be reused as a whole set, or in broken parts, or just only a little part of it only. (Educator C)

Some of the respondents commented further that using video triggers was a good way to introduce students to the concepts, difficulties and complexities that they would face in real teaching and learning situations. This was especially true in cases where the teachers did not have the facilities to take the students into the school to meet with the counsellors, in-service teachers who had real experiences, or other related people. There might also be the issues of confidentiality, as well as of protecting the students' and parents' rights.

A teacher of Physical Education (Educator D) stated,

> Using video in teaching was good because it helped students put themselves into the situation easily. It could also make the teaching more attractive, and it was more useful than using a lot of words.

However, he commented also that extensive training would be required for those teachers with no technological background to develop their own multimedia teaching materials. Another teacher of Early Childhood Education (Educator E) said,

> It was meant to get students talking about things. It was also intended to be used in a face-to-face setting, so that students could talk and try to work out the issues. Among these issues there was no right or wrong views but the discussion would help the students to be sensitized to these authentic issues.

The informants also put forward valuable opinions concerning the promotion and further enhancement of these newly developed PBL objects. The major findings of this study have been summarised in Table 4, which provide answers to the specific evaluation questions to the evaluation framework adopted for this research. The positive theme that the courseware was good for novice teachers occurred most often. This is an important result especially for the project development team because it shows that the courseware had achieved what it intended to promote and had a wide acceptance in the campus. The negative theme that was seen in the results of the open-ended questions mainly concerned the need for a balance between the effort spent and the achievable outcomes of PBL. In order to fulfil the stringent course requirements, efficiency of the learning process became a major topic of discussion.

Expectations of the video-rich PBL courseware

"The World has Changed, so must the Education System!" This was the statement starting the chapter on "Background to the Education Reform" in *Learning for Life, Learning through Life: Reform Proposals for the Education System in Hong Kong* (Curriculum Development Council, 2000). The education reform carried out since 2000 aims at nurturing students with a broadened knowledge base of academic subjects, as well as developing the essentials skills of independent learning, interpersonal relationships and lifelong learning. As one of the educators, who also represented the administrators of the Institute, said,

> …as Hong Kong turns into a knowledge-based society and faces an increasingly globalised economy, where knowledge learned at school could be outdated upon graduation, it is important to ensure that our students will learn how to learn. Equally important is to ensure that students will develop an international outlook, a broader understanding of the society beyond the school environment, as well as excellent problem-solving skills.

With regard to the use of PBL pedagogy in teacher training and the perceived learning benefits of the video triggers, the teacher educators showed considerable interest in whether new capabilities supported by video scenarios could change what and how people learn. They were all open to the benefits of PBL namely, (a) authentic learning, (b) use of prior knowledge, (c) student-centred learning, (d) collaborative learning, (e) independent learning, and (f) deep-learning enhancement and considered that all may be achievable through these newly developed PBL video triggers. By viewing the video episodes, participants could already observe benefits of the PBL approach on their professional training. The

overseas academic stressed that it was the teachers' responsibility to be creative in developing contexts which would engage student interest in lessons. He illustrated,

> It is a process of developing interactive skills, critical thinking skills, and reflective skills….to become more sophisticated in their learning. The PBL video triggers help develop those skills essential for the students to address their own needs even after they have graduated from the programme.

However, it was crucial to note that a consistently recurring theme in almost all discussions with the educators was their concern about how much time and effort the PBL pedagogy would require. For example, they were concerned about how to assess the learning outcomes. As Boud and Feletti (1997) maintain, it is not sufficient to have a teaching approach which is problem-based; assessment of students' performance needs to be consonant with the method of teaching.

> In the PBL process, the students are required to develop certain skills or abilities. You could assess those skills or abilities according to different criteria…usually you have to assess both the process and the product in PBL, because the process may be similar but the product or the learning outcomes will be different…there should be criteria for both. (Educator H)

Also, the teacher educators were worried about the steep learning curve during the adaptation to, and implementation of, a new teaching approach in various school practices. Their concern was echoed by the student respondents in the focus group interviews. This anxiety was intensified in the local context where the teaching professionals have a heavy teaching workload. Mastery of a new teaching method could only come with the accumulation of considerable experience and investment of time. While pre-service teachers could master new teaching concepts and ideas relatively easily, the prospect of having to master a new teaching approach could be daunting for some of the teacher educators, whose professional training had occurred in much more thoroughly Confucian contexts that placed much more emphasis on effective transmission and accurate repetition. Thus, the teacher trainers expressed their worry that they might end up spending more time on adopting a new pedagogy than on developing the students' subject knowledge to meet the rigid curriculum requirement. Educator I said,

> …the assessment tools of my language subjects are pen and pencils. In an institutional level, if one just knows the teaching and learning theories with no academic knowledge, one would manage well in the classroom but be weak in knowledge delivery.

Results generated from this study indicate that it is rarely possible to translate any approach from one context to another without considerable modification. Student A said,

> The real issue with problem-based learning would be getting a balance between efficiency in terms of learning and higher orders of learning outcomes. I mean, PBL might not be suitable for everyone and not everybody wants to learn through the problem-solving approach all the time…it requires a very high degree of self-motivation…and sometimes people do not want to use [the problem-solving approach] by going through a sequence of steps and being engaged in a particular task for a lengthy process. Most of the students just want to be told. You know, this is the traditional [way of] knowledge transfer [which has been] used since long time ago.

The discussion in the student focus groups was less wide-ranging and tended to reflect individual student teacher reactions to the uses of problem-solving techniques to which they had been exposed during their course of teacher training, and the feasibility of promoting the PBL pedagogy in their future teaching work. Some students liked the concept of PBL when they saw its potential and relevance to their teaching mode. They realized the benefits of taking the emphasis off the rote learning by which they had been trained, and with which they had become familiar, and putting it on the latest teaching concepts and skills. However, a number of student teachers were worried about practical problems and reported that they felt intimidated when the PBL videos were put into practice without adequate technical support from their attached schools or any specific training on their part in the new pedagogy. They also discussed the problems of implementing PBL in classrooms, such as the large class size in Hong Kong, difficulties with

the dynamics of local student groups, time constraints, assessment of learning outcomes, and cultural influences. Student B said, "It will be particularly difficult for me as a novice teacher…because I'll need to manage the large class size and take care of classroom management at the same time". Student C expressed,

> I could foresee the difficulties in using PBL in my future teaching work. The resources required for PBL can be very demanding. I will have to spend substantial time and effort to change my teaching style but my students may find it difficult to cope with the new way of learning.

As PBL was still at its early introductory stage in the Institute, the student focus-group participants expected more information about the requirements of their teacher and how they would be assessed. In addition, they wanted to be provided with ideas and guidelines to assist them in problem identification and problem-solving. Based on the interview findings, the concerns expressed by those informants were about the frustration and fear that might be generated when they struggled with fitting PBL into both their academic curriculum and their personal understanding of teaching gained from the traditional way of teacher training. As student D said,

> Chinese cultures place much value on diligence, working hard, and making an effort to memorizing information. Same as my [parents], most Chinese parents strongly believe that one's efforts determine one's grades. Success at school by obtaining good grades is the only objective of schooling for their children.

Culture lies in the shared patterns of values, beliefs and practices that are shaped by the individual members of the group or organization mutually and collectively. Culture is important for people to identify themselves as members of a group, to share practices and foci, and to give mutual support (Watkins & Biggs, 2005). As Student E recapitulated, "We were brought up in a way of competing with each other to get higher marks."

Suggestions for future enhancement

Regarding possible future enhancements, the student teachers suggested that more real-life cases be explored, such as the scenarios of classroom management in local schools, interaction and coordination with other teachers in school, and stress and time management in the teaching profession. The informants seemed to be interested in developing similar video enhanced PBL courseware in other areas. They seem to value the way such material triggers student construction of defensible responses to common dilemmas. Student F said,

> The videos could include those types of problems of interpersonal relationship between students and their supporting teachers in a new school environment and even among their peers during their teaching practice. When designing the cases, these non-academic problems should also be taken into consideration because these types of problems are really challenging to student teachers. We certainly need more help and training in this specific area before we start our teaching practice.

His teacher gave further comments,

> The issues that my students are worrying the most about are classroom management and their cooperation with the subject teachers. They are eager to look for some suggested solutions to their daily problems in schools and to find out whom they should talk to when they encounter difficulties at work. Things they struggle with the most are when they have to develop a lesson plan for every lesson of the day. It is not an easy task for a novice teacher. They always wonder whether they should develop the lesson plan or prepare some special teaching materials first.

Implications

Different stakeholders perceived video-enhanced PBL in different ways. The administrator seemed committed to the implementation of an innovation that was externally mandated and, consequently, was positive about an enhancement that made such implementation more likely. The developers were enthusiastic about an application of their expertise into another area of pedagogy. The teachers were impressed by the authenticity, and consequent usefulness, of the video triggers but cautious about change in their own practice. The students were likewise enthusiastic about authenticity but cautious about the time-efficiency of PBL in a content heavy curriculum.

The opinions obtained from the semi-structured interviews appear to confirm that these video-rich PBL triggers were well received by the participants. By viewing the video episodes as examples, both the teacher educators and student teachers could already appreciate the potential benefits of this approach for professional teacher training. However, knowing the benefits of any courseware may not necessarily mean that the teachers will adopt it in the classroom. The findings suggest that it is important to provide training for both trainers and trainees in order to help them understand the potential benefits of innovations such as PBL pedagogy.

A summary of the positive and negative themes discussed above and generated by the NVivo qualitative software is shown below:

Table 4
Summary of findings

Summary of findings	Frequency of responses		Quotes made from
	Educators (*n*=10)	Students (*n*=87)	
• The videos presented authentic, meaningful, and interesting cases	6	43	Educator D
• High technological complexity with detailed scripts written	7	51	Educators A, B & C
• The videos help introduce the concepts, difficulties and complexities that novice teachers would face in real teaching and learning situations.	8	59	Educator F
• The videos are good for PBL beginners to develop their problem-solving skills	6	47	Educators E & F
• The videos can serve as exemplars for developing further into other teacher-training areas.	7	53	Educators G & J Student F
• Long time and effort for the teachers to prepare for the videos	6	49	Students A, B & D
• Teachers have to change dramatically their teaching style and assessment methods.	7	59	Educators H & I/ Students C & E
• Requiring a high degree of self-motivation and self-discipline from the local students; this is considered to be difficult.	8	63	Students A & E
• Insufficient resources in terms of technical support and equipment in local school settings.	6	48	Student B
• Changing the learning style of local students who get used to being given answers.	8	61	Students A, C & D

Almost all of the participants involved in this study believe that certain skills were necessary for successful implementation. These included managing the PBL process, case analysis and problem identification, solution development and assessment of learning results, as well as techniques in handling

the large class size and the group dynamics. Their concerns echo those of Simone (2008) whose study outlines some major difficulties of PBL for the teacher, claiming that the whole process is more time-consuming than traditional methods because of the reliance on developing the appropriate problem to be solved to ensure success, and the extra effort required in developing an alternative student assessment method.

During the PBL process, student teachers have to be encouraged to form groups and take a team-oriented approach to resolving the problem. However, prior to the focus group interview, it appeared that the majority of the participating students had limited training in effective group dynamics. This is an alarming issue because PBL is supposed to simulate actual professional practice during a professional preparation programme. Student teachers who do not properly contribute during group-based PBL sessions might not be reliable as future PBL teachers and colleagues. This is especially true when these student teachers become teaching professionals - they will spend much of their time working with groups of people, such as other members of teaching staff, school principals/administrators, government officials and various educational committee members. Developing effective group skills and experience are, therefore, crucial ingredients of PBL training because group work is often a good way to improve communications, impact team learning, and increase acceptance of decisions. An understanding of group dynamics and real experience in working in groups are equally important to the teacher trainees before they enter the profession. The comments and discussion appearing above indicate that the video-rich scenarios appeared to be successful in triggering effective student joint construction in response to realistic professional dilemmas.

Conclusion

The study probed the perceptions of stakeholders of a teacher education institution regarding a particular educational product, namely, video enhanced PBL courseware in the particular context of a teacher education institution in Hong Kong, and stakeholder attitudes to the latter's potential technological development in fostering student-centred learning in general and problem-based learning in particular. The study suggests that critical appraisal of the video-rich PBL triggers may make it possible to design courseware which will equip students for the world of practice.

PBL has the potential to enrich the teaching and learning process across various disciplines and the curriculum within the teacher-education sector (Ma, O'Toole, & Keppell, 2008). The results of this investigation revealed consistently positive responses to the authenticity allowed by the use of recorded vignettes as prompts for PBL. They suggest that media-rich educational triggers might offer a means of providing authentic scenarios for assisting pre-service teachers in developing approaches necessary for teaching practice, helping teacher-students to bridge the gap between theory and practice. However, it was the authenticity of the triggers that attracted the most positive response, and the wider applicability of PBL in the local context was less consistently supported. There was general concern regarding the time and effort required to implement an innovation that seemed to run counter to traditional ways of learning in this culture.

The results show that previous training can exert a significant influence on the adoption of PBL by these Chinese teachers and students. Almost all of the participants involved in this study believe that certain skills of management, analysis, identification and assessment were prerequisites to success in handling the dynamics within the large classes that characterise local schooling. Their concerns echo those raised earlier by Harwell and McCampbell (2002) whose study outlines some major difficulties of PBL for the teacher: the whole process is more time-consuming than traditional methods because of the reliance on developing the appropriate problem to be solved to ensure success, and the extra effort required in developing an alternative student assessment method.

A number of things emerging from this study seem to merit deeper consideration. The interaction between "openness" and the reception of particular vignettes may be of further interest to material developers. The various uses of video to trigger group construction as opposed to providing a virtual immersive experience also suggests further curriculum work. The cultural components that emerged in the course of this investigation may hold the greatest general interest. The extent to which pedagogies that purport to rest on universal features of human learning are applicable across cultural boundaries requires considerable further work. As Watkins and Biggs (2005) elaborated, culture lies in the shared patterns of

values, beliefs and practices that are shaped by the individual members of the group or organization mutually and collectively. Culture is important for people to identify themselves as members of a group, to share practices and foci, and to give mutual support. In order to raise the quality of teachers who were regarded as key to quality education, a change in organisational culture to embrace the adoption of this new area of pedagogy for both the in-service and pre-service teachers would be required.

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