An Exploratory Study of Teachers’ Perceptions of International Collaboration for Knowledge Building

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Abstract:

The purpose of the study is to explore how teachers’ perceive international collaboration for knowledge building in the process of international collaboration. The main research question is How do teachers perceive internationally collaborative knowledge building projects?, aiming at unfolding teachers’ perceptions and experiences about their participation in the internationally collaborative knowledge building projects during the academic year 2009-2010. This study uses a mixed-methods approach, consisting of an online open-ended survey, email messages, and online chat messages. The study was conducted from April to December 2010. This study drew findings in three aspects. They include: factors affecting teachers’ participation in internationally collaboration knowledge building project, teachers’ learning as well as teachers’ concerns. Teachers had positive attitudes towards their participation in international collaboratively knowledge building projects. This paper suggests that teachers require more support from schools in order to implement the innovations more effectively.

Keywords: international collaboration, knowledge building, teacher development, teacher learning, teachers’ needs, teachers’ motivation, teachers’ perceptions
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Background of the study

Knowledge building

Knowledge building (KB) is more than social constructivism. It is seen as creating or modifying public knowledge. KB is knowledge that lives ‘in the world’, and is available to be worked on and used by other people. It requires higher levels of interactions, exchanging ideas and sharing for rise-above of the ideas and creation of new ideas. There are twelve KB principles, including the following:

1. Real ideas and authentic problems. In the classroom as a Knowledge building community, learners are concerned with understanding, based on their real problems in the real world.
2. Improvable ideas. Students' ideas are regarded as improvable objects.
3. Idea diversity. In the classroom, the diversity of ideas raised by students is necessary.
4. Rise above. Through a sustained improvement of ideas and understanding, students create higher level concepts.
5. Epistemic agency. Students themselves find their way in order to advance.
6. Community knowledge, collective responsibility. Students' contribution to improving their collective knowledge in the classroom is the primary purpose of the Knowledge building classroom.
7. Democratizing knowledge. All individuals are invited to contribute to the knowledge advancement in the classroom.
8. Symmetric knowledge advancement. A goal for Knowledge building communities is to have individuals and organizations actively working to provide a reciprocal advance of their knowledge.
10. Constructive uses of authoritative sources. All members, including the teacher, sustain inquiry as a natural approach to support their understanding.
11. Knowledge building discourse. Students are engaged in discourse to share with each other, and to improve the knowledge advancement in the classroom.
12. Concurrent, embedded, and transformative assessment. Students take a global view of their understanding, then decide how to approach their assessments. They
create and engage in assessments in a variety of ways. (Scardamalia, 2002)

In line with KB, a computer-supported collaborative learning (CSCL) platform called Knowledge Forum (KF) is used for knowledge advancement which is facilitated with collaborative efforts. Undoubtedly, KF provides an interactive socially collaborative learning platform for students to learn, collaborate and create ideas together. With reference to Scardamalia (2002),

‘Yet in knowledge creating organizations it makes obvious sense. People are not honored for what is in their minds but for the contributions they make to the organization’s or the community’s knowledge.’

KF was invented by The University of Toronto, Canada. Schools of over 20 countries are now using KF as a learning platform for their students to inquire knowledge collaboratively. KF provides students and teachers with a unique collaborative space in which to share ideas and data, organize course materials, analyze research results, discuss texts, and cite reference material. KF is appropriately used in a widely-ranged spectrum, from junior kindergarten to graduate level education, and for a broad range of community, health-care, and business organizations involved in creative knowledge work.

On the basis of knowledge building theory, KF depends on the deep underlying similarity of the socio-cultural and cognitive processes of knowledge acquisition and knowledge creation. KF allows users to create a knowledge building community. KF includes the features of note-taking, searching, and organizational structure that allow any type of community to build knowledge.

Instead of a fragmented learning environment, a real knowledge building environment facilitates learning, in which learning is centered around ideas and deeper levels of understanding. KF is a collaborative database developed for this process of ‘knowledge building.’ Knowledge building process involves defining problems and hypothesizing, researching and collecting information, analyzing and collaborating. The structured environment of KF encourages exploration of ideas, sharing of new information, as well as creation of new knowledge. Different studies (Chuy et al., 2010; Resendes et al., 2011) show that this type of sustained inquiry fosters student interaction and inquiry, and knowledge building creates a level of student interaction for developing basic skills and metacognition.

In the collaborative KF environment, all students are creators of knowledge in the learning community. They are expected to pose questions, define their own learning goals, acquire and build a knowledge base, and collaborate with one another. Built-in scaffolds help guide students to the thinking strategies in sharing and enhancing information. Students contribute public notes, ‘build-on’ to others’ ideas, and ‘reference’ the work of peers. The ongoing practice of these advanced operations, combined with teacher support and coaching, helps students acquire the sorts of learning strategies that characterize expert learners (Knowledge Building in Action, 2010).

Towards 21st century: international collaboration in an online environment
International collaboration in education does not only appear at the student level but also at the teacher level. On the student level, students can exchange ideas and interact with each other via joint work. In the 21st century, learning is no longer limited to within-classroom. Instead, learning occurs at anytime and anywhere. There is no boundary for learning. With the advanced technology in the new era, technology is widely used in facilitating communication in the global world and thus international collaboration has been promoted and implemented in an easier way. International collaboration plays a significant role in developing students’ international-mindedness, global citizenship and cultural understanding (Lam, 2009; Wan and Lam, 2009). Basically, collaboration means the process of ‘sharing and generating new knowledge together with one’s peers’ (Slotte and Tynjälä, 2005:193). Effective collaboration ‘involves interactions with other people, reciprocal exchanges of support and ideas, joint work on the development of performances and products, and co-construction of understandings through comparing alternative ideas, interpretations, and representations’ (Wiske, Franz, and Breit, 2005:105). Shimizu, Mashiko, and Shiwaku (2009) conducted an international collaboration project in art education. In the project, international exchange enables students to enhance their observation and develop their confidence in cooperative activities. But they found that the effectiveness of international exchange depends on the conditions of the partners.

On the teacher level, teachers can learn together in the community of practice which is not restricted to one region. For example, through an online environment, lesson preparation, lesson observation, discussion and reflection, and so on. Teachers join to learn and grow together in such a professional learning community (Nelson and Slavit, 2007). iEARN (2005) concluded that the benefits of international collaboration to teachers, especially for language teachers, include:

- Teachers are able to face students with real English speaking audiences.
- Teachers are able to involve students in writing and reading with a purpose.
- Teachers get students engaged in meaningful learning activities.
- Teachers provide students with opportunities to communicate and interact in the target language in real communicational activities.
- Teachers have a tool to create intrinsically interactive, motivating activities. In this guide we will explore some of the possibilities that Internet collaboration offers for the fields of ESL and EFL.

Teachers as collaborative partners are able to learn with each other as they can discuss and share pedagogical ideas in the teaching planning. Lemke and Lesley (2009) added that teachers can be more actively engaged in international online collaboration projects in which the online environment supports their discussion, inquiry, and reporting of progress via data sharing and writing. Collaboration is regarded as “the mutual engagement of participants in coordinated, synchronous activity in a continued attempt to construct and maintain a shared conception of a problem.” Collaboration is more than coordination. Lemke and Lesley (2009) further explain that coordination only results in the delegation of work to various individuals or team who complete their tasks and then combine them into a final work, while collaboration requires ongoing interaction among members who work together continuously to find a solution.
Factors affecting teacher participation in innovations

Teachers act as a core key player in innovative practice. Their competence is a basic foundation to support innovative practice. Mishra and Koehler (2006) created a framework for teacher knowledge where the interplay amongst content knowledge, pedagogical knowledge and technological knowledge are catalysts and have to be aligned for transformation of practice during the process of adoption of a new innovation. In other words, teachers’ knowledge in aspects of contents, pedagogy, as well as technologies affects teachers’ participation in new practice.

Past studies attempted to find out factors affecting teachers’ motivation and participation in innovative practice. Schellenbach-Zell and Gräsel (2010) showed that the attachment of significance to the innovation is an important factor concerning the motivation to participate in a project of school innovation. They indicated that the basic needs (for autonomy, competence and relatedness) captured resulted in different kinds of influences for motivational types based on self-determination.

Pelgrum (2008) found out ten factors affecting teachers’ motivation in participating in new innovations. These factors include national and/or regional policy, principal’s leadership, school policy, human resources, information and communication technology infrastructure, teachers’ competence, technical support, community resources, parents, and students. Lam and Woodhead (2012) explored that eight domains of e-leadership are contributing factors affecting teachers’ participation in innovation practice. They include: curriculum leadership and management, curriculum, learning and teaching, assessment, professional development, extending opportunities for learning, resources and impact on student outcome. Law (2000) further identified three contextual factors contributing to emerging and sustaining pedagogical practices. These contextual factors include community (national and regional educational policy), school (leadership, school culture, support from parents, alumni and community) as well as classroom level (the interplay of the intended, taught and learnt curriculum in which the roles of teachers, students and technology are important). These three levels of contextual factors are interacting to each other while it is hard to determine the boundaries among them.

Using an ecological metaphor, Law et al. (2011) discuss and conclude that sustainable change, the co-evolution of the crop species (general practice) and the key stone species (new initiative) is important. Members of the organization not just interact as mentioned above for organizational learning, but also work interdependently. Law et al. (2011) studied four innovation schools and illustrated the importance of interdependence for the sake of organizational learning. For instance, the various teams within the school, namely technical support, student support and information technology coordination teams work seamlessly for ICT-oriented innovation. The encouragement of collaboration amongst the teams and amongst individuals facilitates the teachers to gain a better understanding of the initiative from others’ perspectives. In any school setting, interdependence of individuals and different group of teachers and staff serves as the infrastructure for learning in order to share the vision, understanding the systemic elements and nourish a climate and momentum for change.

Knowledge Building International Programme (KBIP)
Knowledge Building International Programme (KBIP) are new initiatives in extending collaboration around the global world. They were first introduced at the Professional Development Network for Knowledge Building (KBTN) as organized by the Centre for Information Technology for Education, The University of Hong Kong and funded by the government. In this study, the authors were project coordinators of the projects. Participating teachers in this study were involved in three different internationally collaborative knowledge building projects which were designed on the basis of the above KB principles. All of the projects were carried out during the period 2009-2010. The themes of the projects were about environmental sustainability, including alternative energy and ecological footprint. The projects were carried out at one Spanish school, three Mexican schools and one Singaporean school. Students in the projects underwent different learning journeys, that is, greetings on KF, inquiry discussion with partner schools via KF, as well as two video conferences where students had cultural exchanges and introduction to the initial findings during the first video conference while they reported their findings to each other at the second video conference. Before the start of the project, teachers planned the lessons and agreed on a working schedule. Project coordinators in different countries exchanged progress via email for communication. The whole project lasted for 20 sessions (approximately 90 minutes in each session).

Methodology

The aim of this paper is to unfold teachers’ perceptions and experiences about their participation in the internationally collaborative knowledge building projects. In order to explore how teachers’ perceive international collaboration for knowledge building, the main research question is How do teachers perceive internationally collaborative knowledge building when they are involved in the Knowledge Building International Programme (KBIP) projects? The KBIP projects include: Exploring Alternative Energy Project and World Healer Project, in which teachers from different countries like Hong Kong, Spain, Mexico and Singapore were involved. In these two captioned projects, the role of the researchers is the facilitator in coordinating the whole process of implementation and evaluation. The projects are developed and facilitated by the two researchers and it is the responsibility for them to understand how the other partner teachers view about the projects, find out their needs for support and make suggestions for improvement.

This study took a qualitative approach with the use of multi-methods, which included an online open-ended survey, email messages, and online chat messages that contain interviews with participating teachers. This study is exploratory in nature. The key informants of the study were the teachers joining the internationally collaborative knowledge building projects. The participating teachers were invited to join the study on a voluntary basis. The data collection contained two phases. Phase One was the online survey to participating teachers. The survey was conducted in April 2010. The online survey was conducted to the teachers who were engaged in the internationally collaborative knowledge building projects. The teachers included one Mexican, four Spanish and one Singaporean, who had been engaged in some internationally collaborative knowledge building projects during the academic year 2009-2010. After the survey, qualitative analysis was done by the use of colour coding method. The key
words or phases of the open-ended answers in the survey were highlighted and some key findings were generated. With the use of the key findings of the survey, there was a follow-up individual interview through online chat messages and email messages with the participating teachers for the purpose of triangulation and cross-checking the data.

**Findings**

The results of the study are reported according to the following three sections, teachers’ motivation, teachers’ learning and teachers’ needs. These three sections were based on the findings in the online survey, semi-structural interviews via online chats and emails with individual teachers.

**Factors affecting teacher participation**

*Students’ needs*

One of the major factors affecting teachers’ participation in joining international collaboration projects is catering for students’ learning needs. They highlighted the importance of the opportunities to widen students’ English language learning via Knowledge Forum and video conferences in which students have to use English to communicate with each other. Teachers in the study mentioned that,

“It is interesting using English to talk about subjects that we work at school. It is also important to know about other cultures and countries opinions and also its routines.” (Online Survey, T2, Apr 2010)

“In international projects English is necessary and my students use language to communicate ideas and that's not a meta linguistic fact.” (Online Survey, T4, Apr 2010)

Apart from language learning, teachers also alerted that students’ generic skills such as organization skills and information technology skills, as well as values and attitudes like respect can be enhanced through the collaboration process. The following are the examples of what teachers expected from the international collaboration knowledge building projects.

“Speaking and writing in English, cooperating with other schools from overseas, cooperative learning between students and teachers. Improving critical thought via working with each other. Being more autonomous learners, and consequently reaching self-learning. The pupils have learnt to organize their work, and respect and wait for their turn to talk, respect and tolerate their different ideas.” (Online Survey, T6, Apr 2010)

Interestingly, one teacher insisted that age was also one of the concerns in participating in the projects. He said that, “... age of pupils (has) to be matched to their peers, allowing for similar areas of interest.” (Online Survey, T1, Apr 2010)

“If my students collaborate in projects, they have to use computers, the internet, KF and other kind of collaborative tools.” (Online Survey, T5, Apr 2010)


**Exchanging ideas and sharing**

Opening ways to idea exchange and sharing plays a role in affecting teachers’ motivation in participating in the international collaborative knowledge building projects. Teachers would like to exchange ideas and sharing in the learning community network while they can have interactions with other teachers around the world in developing and extending ideas together. Apart from teacher level, they also reflected that students could have more exposure with other students in the foreign countries. This teacher shared that,

“The idea of giving pupils to exposure to interact with overseas students, getting pupils from different culture to exchange ideas with each bringing their experiences to share, is highly enticing for us to join in the international collaboration project.” (Online Survey, T1, Apr 2010)

Besides, teachers appreciated a chance to work together as the projects allowed everyone on the network to share and develop ideas towards critical global issues such as ecological conservation for environmental sustainability. This teacher expressed that,

“The fact of being part of a network of ecological awareness of the phenomenon we are experiencing worldwide and be part of a scientific community for healing and General Terms of improving life on earth.” (Online Survey, T4, Apr 2010)

It is found that teachers’ motivation in joining international collaboration originates from availability of opportunities for collaboration and sharing on the teacher and student levels respectively.

**Communication with partners**

In line with the above, teachers also alluded that good communication with partners affected their willingness to participate in the projects. For example, this teacher expressed that,

“Having good communication with my international partners is a key to continuing on the project. I also had the experience of a far more complicated communication process with another of my partners and neither of us seems willing to continue the project. In the two projects I had with Hong Kong communication was great and I am eager to start new projects together. In another instance communication was good, not great but still I’m willing to give it another try.” (Email, Teacher A, Sept 2010)

“I believe it (communication) is very effective, by now we both know the best way to reach the other. We have non KBIP communication by now, read each other’s tweets and even are Facebook friends.” (Email, Teacher A, Sept 2010)

Therefore, communication lays the basis for the project which requires mutual understanding and compromise with each other.

**Pedagogical design**

Teachers chose to join international collaboration projects because they were attracted
to the pedagogical design of the projects. They appreciated much about the freedom for students to get engaged in the learning process where students can communicate themselves and build on knowledge together.

“Knowledge Building is a central part of the pedagogical model at the schools I work in and KBIPs (Knowledge Building International Programmes) are great ways to get the students engaged in knowledge building experiences and to improve their use of KF.” (Email, Teacher A, Sept 2010)

“I’d rather say that more than a specific subject I felt quite attracted by the methodology used in the project. It was very interesting to have an opportunity to work on a specific topic through the eyes of students from all over the world.” (T2, Online Survey, Apr 2010)

“That set me thinking about what we do in KF: Yes, I like the idea that pupils are discussing and questioning each other in KF.” (Google Chat, T1, June 2010)

Teaches cherished that the projects enabled their students were engaged in learning processes with autonomy. The following experienced teacher agreed that,

“I study all the educational processes and international projects are processes too. I don’t mind about the theme but what I like the most is observing how students manage to communicate each other and building knowledge from the internet, books, teachers, etc. Students re-do new knowledge and they try to be scientists.” (Online Survey, T3, Apr 2010)

“I will certainly continue (the project). The experience was great and we all learnt so much from it that I’m sure our next experiences can only be better. I was extremely satisfied with the results that students could succeed in learning, and feel compelled to keep on working this way.” (Email, Teacher A, Sept 2010)

It is thus implicitly discovered that teachers’ successful experiences in the previous projects reinforced their motivation in continuing to join the next projects where they witnessed that their students were able to build and scaffold knowledge together.

Choice of topics

Nevertheless, the choice of topics may also affect teachers’ motivation in joining the projects. Some teachers found certain topics suitable for their own subject teaching and therefore they decided to join the project that fits their teaching context. For example, this teacher mentioned that, “Forests and sustainability, because it is better related to literature and we are more interested in this subject.” (Online Survey, T6, Apr 2010)

Availability of experts

Support from experts was regarded as one of the factors affecting teachers’ motivation in the projects. Some teachers in the study regarded that support from experts allowed them to be confident in joining the projects. They expressed that they could learn from experts although formerly they did not know much about knowledge building or Knowledge
Forum. According to one teacher,

“The people I need to learn from about KB (knowledge building) are all around me... I feel like I’m fixing a puzzle... It’s strange how I know nuts about KB, but surrounded by experts...” (Google Chat, T1, Jan 2010)

The availability of experts reinforced teachers to stay in the projects and experts’ support helped them to learn about knowledge building.

**Teachers’ learning**

**Exploring new learning methods**

Teachers expressed that they had more exploration on new learning methods such as cooperative learning approach. With lots of collaboration opportunities in the projects, teachers underwent cooperative learning and found its advantages. Through authentic experiences, teachers themselves understood how their students learnt with the cooperative learning approach. The below are the examples of what teachers said about their learning experiences.

“Of course, I always learn when I collaborate: putting yourself in other minds is a good way of learning.” (Online Survey, T5, Apr 2010)

“It is a new way of learning and teaching in a more dynamic way, more cooperative and you can build your knowledge with the help of other people.” (Online Survey, T3, Apr 2010)

“I have learnt many things. First and foremost how to organize and manage an international project but also how to use wikis, VLA; about Hong Kong culture and its education system.) (Email, Teacher A, Sept 2010)

“We have learnt how to deal with new technologies and how to apply them in our work and tasks. We should work with projects tasks because it involves all kinds of knowledge and it is also more attractive and interesting for our students.” (Online Survey, T6, Apr 2010)

In this connection, teachers learnt about how dynamic learning and teaching works with the use of new methods such as how to facilitate knowledge building via teacher facilitation in helping students to scaffold and build on knowledge with each other.

Therefore, under an authentic learning environment, putting themselves in their students’ shoes, teachers act as learners who could reflect on their learning experiences and attempt to design their teaching better to cater for their students’ learning needs.

**Better teaching ideas**

Surprisingly, teachers discovered better methods in English teaching throughout the project. They found that teaching English in context was more effective in helping their students to learn English as English is not their native-speaking language. This teacher highlighted that,
“I have learnt that it's much more effective to teach English using a topic-based method than a more traditional language class. Their vocabulary is contextualized and it increases dramatically.” (Online Survey, T2, Apr 2010)

The hands-on experiences created opportunities and space for participating teachers to explore and reflect on their own classroom teaching.

**Common humanity in the world**

Some teachers in the study became more aware of the commons of people, cultures and concepts. One of the teachers stated in an expressive way, saying that,

“We are a part of the same planet with different characteristics of culture, intelligence and concepts, but we have a coincidence that makes us brothers, we live on earth.” (Online Survey, T4, Apr 2010)

**Teachers’ concerns**

**Support and sustainability**

Teachers in the study raised their great concerns about support to sustain the continuum of the projects. They hoped that there would be different kinds of support, including technical support, research support and institutional support. Facing big challenges in dealing with the ongoing projects, one of the teachers reflected that,

“We (our schools) had a few meetings but it never really took off. That was one of the biggest challenges because most partners didn’t conceive themselves as such but rather as mere helpers so they didn’t become as engaged in the projects as they could have.” (Email, Teacher A, Sept 2010)

Teachers pointed out their working conditions were not favourable for supporting them to continue the projects. One teacher expressed that,

“We need more support from the principal and the headmaster, also from the pedagogical coordinator and the computing coordinator. The teachers working in the same also need a common timetable for working together and aiming our goals and objectives. We have been demanding this in our school for three years, and they haven't taken it into consideration. The principal and its team have sabotaging and boycotting the project, we don't know if there are pedagogical reasons for it, but we doubt it.” (Online Survey, T6, Apr 2010)

Another teacher also expressed the need for support from his working school is necessary. He said that,

“I think that everything is fine. I am thrilled to continue in the future. Maybe more support from my own school would not hurt.” (Online Survey, T1, Apr 2010)

Some teachers expressed that the school should trust and show supportive attitudes to the participating teachers. This teacher said that,
“I only need people near me who really believe in what I'm doing. Directors and other teachers should be understanding with these kind of projects.” (Online Survey, T4, Apr 2010)

Apart from school support, teachers also expressed their needs for technological and technical support in the implementation of the projects.

“More support on new technologies and more computing network.” (Online Survey, T2, Apr 2010)

“Technology support, research, institutional support, broaden the cultural horizon with respect to you and to approach science from social perspectives, technical and environmental.” (Online Survey, T5, Apr 2010)

Seemingly, schools play a very crucial role in sustaining and supporting teachers’ participation in the projects where its support is not only from an administrative and management perspective but also from a humanistic perspective. School administrators, including principals and school board members, are expected to show their trust and understanding towards the participating teachers.

Discussion

Extrinsic and intrinsic factors affecting teacher participation

This study identified six factors affecting teachers’ participation in the innovation, internationally collaborative knowledge building projects. They include: catering for students’ needs, exchanging ideas and sharing, communication with partners, pedagogical design, choice of topics, and availability of experts. Some of the factors are extrinsic ones while some are intrinsic. Extrinsic factors are pedagogical design, communication with partners, choice of topics and availability of experts. Intrinsic factors are catering for students’ needs and exchanging ideas and sharing. The interplay of the extrinsic and intrinsic factors enhances teachers’ motivation in participating in the new initiative. The two intrinsic factors are very much related to teacher’s professionalism and job satisfaction in terms of student learning. Consistent with the study by Schellenbach-Zell and Gräsel (2010), teachers are made aware of the relevance of the topic of the projects that promoted their self-determination towards the projects.

Schools’ roles in supporting teachers: changing schools, changing teachers

This study showed that school support was highly expected by teachers in the adoption of the projects. Teachers showed their big concerns about different levels of support, ranging from technical to technological support, from resources to management, from trust to understanding. This is relevant to most of the literature stating that support is essential to making changes from old practice (for example, Guskey, 2002; Goodall et al., 2005; Timperley, 2008).

Teachers’ urgent calls for school support reflect that the current school situation may not be favourable for the promotion of new practice. Carre (1993) and Lave (1993) observed that the organizational culture of the school will affect teacher progress. The
term ‘culture’ is well-defined by Day (1999:78) as “people in the organizational setting, characterized by the ways in which values, beliefs, prejudices and behaviours are played out within the micro-political processes of school life.” Thus schools should pay attention to teachers’ lives, their development needs and working conditions (Day, 1999) so as to give adequate support to teachers during the innovation process. According to Guskey (2002:388), “Learning to be proficient at something new or finding meaning in a new way of doing things is difficult and sometimes painful” and “support allows those engaged in the difficult process of implementation to tolerate the anxiety of occasional failures no matter whatever teachers teach or whatever their professional background is, there should be sufficient support to teachers in effective curriculum implementation”. It is essential to build up a friendly, supportive and cooperative learning culture in the school to back up their teachers and strengthen long-term teacher motivation in innovative practice (Schellenbach-Zell and Gräsel, 2010).

**Teachers’ concerns and needs**

In line with the above, teachers’ high concerns over the availability of support reveals that teachers may not have adequate knowledge in aspects of technology, content and pedagogy according to the Technological-Content-Pedagogical Knowledge (TCPK) framework (Mishra and Koehler, 2006), which focuses on the interplay of different types of knowledge in transforming current practice to new practice. This hidden problem reveals that teachers may not be ready for new practice and this may cause obstacles towards implementation processes. Many failures of innovation are due to teachers’ imbalance in the TCPK. In other words, teachers should be well prepared in the TCPK under favourable conditions, including sufficient provision of support and coordination as well as collaborative cultures in the school.

**Knowledge building across the world**

Knowledge building happened not only at the student level but also the teacher level across different countries. Based on the findings of this study, the benefits of international collaboration to teachers include improvement in language development, building up higher-order thinking skills like critical thinking, strengthening collaboration skills. The findings of this study is consistent with other studies (e.g. iEARN, 2005; Lam, 2009; Wan and Lam, 2005). Teachers observed that their students were engaged in generating new ideas collectively and shared mutual responsibilities in the process of using KF. Students’ diverse ideas became more critical while teachers improvised their teaching ideas with collaborative efforts and energy.

**Situated learning in action**

Teachers in this study showed their learning about cooperative learning and discovery of new teaching ideas through communication and collaboration with other partner teachers. Teacher learning occurred in an authentic way. It is consistent with the literature about authentic learning which occurs when teachers are actively engaged, participate and collaborate with each other (Landt, 2002). This authentic way of learning in practice is called situated learning that is fundamentally situated in the context of the practice
leading to the betterment of learning and teaching (Lave and Wenger, 1991). In the projects, teachers put what they have learnt into practice and new learning through social construction and negotiation of meanings by means of sharing, collegiality and reflection (Lave, 1988, 1996; Brown et al., 1989; Jones et al., 1992). In this learning process, collaboration is significant in shaping effective teacher learning (Schon, 1983; Fullan, 1993; Hargreaves, 1997; Gordon, 2004). Collaboration is the basic of the creation of professional learning communities as collaboration creates teachers’ professional confidence and allow for interactions amongst teachers (Harris, 2002, 2003). As the projects provided opportunities for participating teachers of different countries, teachers could work together and learn from each other (Harris, 2002). There are possibilities for teachers to get gains in terms of teachers’ professionalism and wellbeing as collaboration creates a collective professional confidence that allows teachers to interact more confidently and assertively (Harris, 2002; Vandenberghe, 2002).

Global education on the right track: education and environment

On the learning and teaching level, collaborative learning amongst students and teachers is no longer bounded within a local school. Instead, learning occurs at anytime, anywhere. Teachers in this study showed their appreciation upon the pedagogical design. They realized that such kinds of internationally collaborative knowledge building projects enabled them to get chances of sharing and exchanging teaching ideas with partner teachers, and enabled their students to construct knowledge across different countries. On this point, it implicitly showed that teachers accepted and recognized the role of global education in supporting their student learning and their own learning.

On the project level, the internationally collaborative projects with shared global environmental issues are helpful to arouse students and teachers’ environmental awareness via discussion over the same environmental issues. This further assures the importance of global education which helps supporting the rise of eco-friendly awareness and shedding lights on international cooperation over global environmental issues.

Conclusion

This paper presented the findings of a study that demonstrates teachers’ perceptions of factors affecting their participation, their learning, as well as their needs and concerns in participating in internationally collaborative knowledge building projects. Teachers’ motivation in participating in internationally collaborative knowledge building projects was high. Factors affecting teachers’ participation in the internationally collaborative knowledge building projects included: Students’ needs, exchanging ideas and sharing, pedagogical design, choice of topics, availability of experts, as well as communication with partners. Teachers’ decision-making in participating in the project originates from their love of student learning and professionalism. This study sheds a light on how international collaboration and knowledge building can be further developed in the future. Teachers’ concerns and difficulties encountered shall be offset by the open-up of more opportunities for situated learning whereas teachers are action researchers who plan, implement, assess and reflect in a double-loop cycle (Arghyris and Schön, 1974) while being supported by schools sufficiently.
Due to time constraints, it is unavoidable that the data could not be collected over a longer period of time. Even so, this study investigated factors affecting teachers’ participation in innovation, teachers’ learning, as well as concerns and needs for supporting internationally collaborative knowledge building projects. Further studies can be conducted to unfold teachers’ concerns, their authentic classroom experiences in facilitating students’ knowledge building, relationship between teachers’ motivational factors and student learning, impacts of teachers’ motivational factors on student learning outcomes, and so on.

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