Leading Curriculum Innovation in Primary Schools

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Curriculum innovation has been regarded as an essential strategy for educational reform throughout the era of educational change. Because of the changing nature of the knowledge age, students need to develop ways of dealing with complex issues and problems that require different kinds of skills and knowledge that they have ever learned. Given the advancement of information and communications technologies (ICT), a number of models of learning communities have been advocated in recent years. Realizing the impact of this new learning culture, six primary schools in Hong Kong participated in a curriculum innovation project, in which students were engaged in building learning communities and constructing knowledge through Knowledge Forum, a computer mediated communication platform. This paper reports the results of data analysis based on interviews of principals, teachers, and students to explore how the innovation initiated a change in learning culture as well as the leadership issues arising from the project implementation.

Keywords: learning community, computer-mediated communication, curriculum innovation
Introduction
During the past decade there has been an exponential growth in the use of information and communication technology (ICT), which has made pervasive impacts both on the society and education. In addition to the growth of ICT use, the emergence of the knowledge society has also brought about a much greater emphasis on economy and education. In response to these challenges, a number of policies on ICT in education have been produced in many countries (Pelgrum & Anderson, 1999). Such policies reveal that educational innovations in ICT have been increasingly embedded within a broader framework of education reforms that aimed to develop students’ capacities for self-learning, problem-solving, information seeking and analysis, and critical thinking, as well as the ability to communicate, collaborate and learn, abilities that figured much less importantly in previous school curricula (Law et al., 2000; Yuen, Law & Wong, 2003). Curriculum innovation using ICT has been regarded as an essential strategy for educational reform throughout the era of technology and educational change over the past decade.

As an institutional response to external challenges, rational planning approach to change initiative, which comprises elements such as need analysis, research and development, strategy formation, resource support, implementation and dissemination, and evaluation (Lueddeke, 1999), has been considered in many schools. Such systematic approach is certainly helpful to decision-makers to identify actual concerns and to engage teachers and stakeholders in the change practices. However, change in schools is complex and chaotic (Fullan, 1999), it “will always fail until we find some way of developing infrastructures and processes that engage teachers in developing new understanding, deep meaning about new approach of teaching and learning” (Fullan, 2001; p.37). Apart from institutional change agents, there are a number of crucial factors that drive school change and help to bridge external challenges and internal practices. However, in response to the challenges of ICT in education, we cannot avoid questions such as “How does ICT challenge organizational structures; reshape assumption about leading; affect resource allocation; and foster new forms of leadership development? (Webb, 2003)”

If ICT is to be integrated into the school curriculum, the meaning of educational leadership and the role of the school principals within a technological change must be redefined (Bennett, 1996). Kearsley and Lynch (1992) believe that a cultural view of leadership is most useful in the discussion of ICT integration in education, in which leaders are expected to shape the culture of individual school by creating new visions that organizational members can believe and act upon. Then, what considerations must be made to effectively plan and implement ICT integration in schools? Bennett (1996) argues that both cultural as well as physical environment within a school are important factors to be considered in ICT integration. Flanagan and Jacobsen (2003) provide a contextual framework with which
school principals can undertake new responsibilities and roles as technology leader, including leader of learning, leader of student entitlement, leader of capacity building, leader of community, and leader of resource management.

This article presents experiences and reflection upon a number of issues that emerged when schools and individual members of staff collaborated with external agents in response to external challenges for curriculum innovation associated with the use of ICT. Firstly, this article provides a brief description of the curriculum innovation project in connection to building learning communities through a computer-mediated communications (CMC) platform called Knowledge Forum (KF). Then, it reports the results of the analysis of data collected from principals, teachers, and students during the implementation of the curriculum innovation to explore how the KF initiated a change in the learning culture in schools. Leadership issues arising from the innovation project are also discussed.

Building Learning Communities through ICT
The notion of knowledge society has been advocated in recent years. As Drucker (1999) pointed out, “the most valuable asset of a 21st century institution, whether business or non-business, will be its knowledge workers and their productivity” (p.79). Education, as central to a knowledge society, must produce people who are able to create and gain advantages from the new knowledge (Bereiter, 2002). Because of the changing nature of the knowledge age, students need to develop ways of dealing with complex issues and problems that require different kinds of knowledge that they have ever learned. The idea of learning communities has been introduced more than two decades (Caverly & MacDonald, 2002). Given the advancement of ICT, a number of ways have been proposed to bring students and teachers together in learning communities, such as knowledge-society, telementoring, connected-classrooms, teacher-community and shared-passions, in which students are involved in a collective effort of understanding with an emphasis on diversity of expertise, shared objective, learning how to learn and sharing what is learned (Bielaczyc & Collins, 1999).

Knowledge Forum, the second generation product of the Computer-Supported Intentional Learning Environment (CSILE) project (Scardamalia & Bereiter, 1991), is a CMC platform designed to facilitate the inquiry process, knowledge construction and enhance effective collaboration. KF allows users to create knowledge communities. KF adopts the approach of collaborative inquiry and continuous improvement for knowledge construction (Scardamalia & Bereiter, 1996). The basic idea of the KF environment is that knowledge is brought into the environment and something is done collectively to it that enhances its value. The goal is to maximize the value added to knowledge - either the public knowledge represented in the community database or the private knowledge and skill of the individual
learner. The common feature of KF projects is that learning is seen from the perspective of participating in a knowledge building community (Scardamalia & Bereiter, 1991).

Knowledge building as carried on in schools, it is likely to be viewed and evaluated as a learning activity (Bereiter, 2002). However, knowledge building is different from traditional learning that focuses on individual assignments and various other individual displays of knowledge ability. Realizing the impact of this new learning culture, six primary schools in Hong Kong in collaboration with a local tertiary institution engaged in a curriculum innovation project which focused on building learning communities and constructing knowledge using KF.

**Method**

This study was a case study focused on exploring the issues of leading curriculum innovation in six primary schools based on the different ways that principals and teachers experienced the process of the project. A case study does not attempt to “describe everything” (Yin, 1998), rather it is an intensive description and analysis of a “bounded system” (Smith, 1978) for the purpose of gaining an in-depth understanding of the situation and meaning those involved. The current case study particularly aims to depict qualitatively different ways and variations of how principals, teachers, and students perceived various phenomena during the implementation of curriculum innovation in schools.

![Figure 1: A view of KF knowledge base](image)

Knowledge Forum Client version 3.4 was used throughout the study. The central activity of the KF community is students’ contributions to the communal knowledge bases (Fig. 1), and contributions can take the following forms: (a) individual note, in which students state problems, advance initial theories or improve theories; (b) build-on, which allows students...
to connect new notes to existing notes; and (c) rise-above, which allows students to summarize and synthesize a group of related notes. About 800 primary 5 students from six primary schools in Hong Kong participated in inter-school science project works during the second semester in 2002. Students’ projects were around three topics, namely, formation of oil and coal, why there are twins, and development of a well-planned city. Using the KF, students from different schools engaged in discussion and knowledge construction, and thus collaborative learning communities were formed.

Data collection included principals’, teachers’, and students’ interviews. By the completion of the project, six principals (labeled as Principal A to F in the results) were invited for individual interviews, and eleven teachers as well as 24 students from six schools were participated in small group interviews. During the interview, principals were asked about their experience in leading the innovation project in particular issues at school level. Teachers were asked to reflect on their roles and responsibilities in conducting the project. Students were asked to report on their learning experience during the processes of their engagement. These semi-structured interviews were collected and analyzed using grounded theory (Glaser & Strauss, 1967; Strauss & Corbin, 1990) to conceptualize themes of variations in their perception, understanding and reflection of their participation in the processes of the curriculum innovation.

Results
Four major themes were found from the iterative analysis of teachers’, principals’, and students’ interviews, namely, school culture, principal leadership, school strategies, and impact of innovation. Data analysis resulted in the emergence of categories for these themes.

School Culture
The implementation of innovation is affected by the idiosyncratic elements associated with the school culture. School culture is fundamental to the implementation of the innovation. Collaborative culture and strong parent support were apparent across the schools. The collaborative culture can be illustrated by the followings.

“Teachers’ collaboration and quality is important in this project. Our school is quite successful and has advantage (in maintaining teachers’ quality) since we are a private school” (Extract from interview of Principal E). “We have a tight cooperation (between schools for this project) and this is quite successful as well, I think. In the past, different schools are working by themselves” (Extract from interview of Principal A).

Apart from the government support, the community often represented by stakeholders such as parents and alumni may also contribute to the formulation of the innovation as well as to
the provision of enriched technology infrastructure and support. These schools had a strong emphasis on parent support: “if parents know more about how to use information technology to communicate, their children will also be more positive in using information technology. Therefore, we emphasize on parent education a lot” (Extract from interview of Principal B).

During the project, students found that searching information and knowledge construction are closely related. They also realized the KF provided a new learning experience for their project works, as a student said: “We learn about computers when using KF. We also learn how to search information, unlike the past experience of doing projects. Now we have to search information from the Internet or library. Throughout the search process, we learn more knowledge and thereby we gain a lot” (Extract from students’ interview). Principals understood that home-access was extremely important in realizing such learning experience for students. Thus, they put a lot effort to communicate and clarify the curriculum innovation to the parents. This can be demonstrated by the following interviews.

“Yes, we should give a clear message about our project’s objective to our parents and show that assessing the web is essential in this project. As they thought that their children could use the schools’ computers and finished everything, they did not let their children use computers at home. So some students told me that their computers were locked or could not assess to the Internet at home” (Extract from interview of Principal D).

“At first, we encounter some difficulties in getting parents’ support. But towards the end, maybe they have found out that the project is meaningful. We did not need to lend the facilities to our students. This means that maybe the parents had already brought the computers (to support their children in doing KF). We can see that the parents are willing to spend if they can foresee the outcome can help their children. If they find out that this project is worth doing, they will be very co-operative” (Extract from interview of Principal A).

Principal Leadership
“A leader can do many things to facilitate the successful implementation of change” (Yukl, 2002; p.300). In the process of innovation, principal leadership at the school level involves the provision and management of different factors associated with values, strategies, and planning. The findings indicated that principals of the six schools were in general supportive with clear understanding of the innovation and roles of the principals, as Principal E said, “As a member of the steering committee, I am a leader of the innovation project. In other word, the guidance provided by us is similar to a building’s structure”.
Principals were very supportive and involved in the innovation project. “In dealing with different cases, I think a school principal will help the teachers if one can do. If the teachers need to communicate with parents, we will then do it (arrange for meetings or teacher-parent communication)” (Extract from interview of Principal C). Some principals even made special arrangement for the curriculum innovation. “For example, if I need a double period for students to do KF, we will ask the teachers concerned to make the arrangement” (Extract from interview of Principal C).

Collaborative development of shared knowledge is the focus of knowledge construction through the KF. Students learned from each other through collaboration on the KF. Examples of students’ interview are given: “We pose notes, mutually complementary to each other on KF” (Extract from students’ interview). “Yes, exactly. Others teach me, I teach others. This is what we learn from each other on KF” (Extract from students’ interview). “Without co-operations, I can’t know why I have made mistakes and never know the answers” (Extract from students’ interview).

As a leader of learning (Flanagan & Jacobsen, 2003), it is important that principals demonstrate a thorough understanding of the innovation. It is found that principals also demonstrated clear understanding of the innovation project, such as they realized “student-centered” as the crucial element: “I think teachers do not need to help the students to find out the answers but have to guide them. I think this process is essential at the beginning. But when everything is stable, teachers’ participation should be as little as possible. I think this project should be student-centered” (Extract from interview of Principal A).

School Strategies
Obviously, the school strategies are very much influenced by the principal leadership as this determines the change priorities and resource deployment. School strategies are clearly essential to the leading of the innovation. The results demonstrated that the principals took different approach to the implementation of the innovation in terms of school strategies.

Principal A took a top-down and systematic approach for the project: “From my point of view, the principal’s role is helping the teachers feel comfortable before doing this project. Making sure that they will not be doing a lot of in this project. Or in other word, their work is worthwhile. This can be done by providing teachers a vision and technical back-up. The school will try its best to support them, reorganizing the school timetable, for example”.

However, Principal F delegated the leading responsibilities of the innovation project to some senior teachers: “Mr. X is responsible for this project assisted by Mr. Y. Mr. X is responsible for organizing and making contact with the project coordinator. He also needs
to follow students’ report, whereas Mr. Y is helping him then. Yes, they will cooperate and work together”.

With the belief that both principal and teachers should have a role to play in the innovation project, Principal C represented a model of collaborative strategy: “We work and discuss together. Then we finish the work cooperatively. There is a spirit among us. We actually do everything like this. There is a part for the principal and a part for teachers. Then we will finish our part cordially”.

Impact of the Innovation

The results reflected that the impact of the innovation was an important factor contributing to the implementation of curriculum innovation. First, principals found that positive changes in teacher-student relationship. Some teachers realized their roles have been changed from knowledge provider to providing guidance and directions for students in the discussion, as illustrated by the following teachers’ interview: “I’ve done more things. For instance, give them guidelines. So they’ve got directions for discussion. Before, the teacher’s role was that teachers asked questions. But now when learning science through KF, students actively learn to ask questions whilst teachers need give them valuable help especially finding relevant web contents for them” (Extract from teachers’ interview). This is also reflected in the students’ interview: “We’ll find out correct solutions and show others where they made mistakes. KF provides chances of communicating with others. It is because the better the communications means, the more frequent they would ask you how you acquire knowledge. It is possible to encounter incompatible viewpoints with other school partners. We’d like to investigate how we co-construct knowledge” (Extract from students’ interview).

“In fact, our role is being changed. We don’t dominate learning. Knowledge sources are no longer from us or textbook, but we’ve played a very important role” (Extract from teachers’ interview). Such change provided a stepping-stone for expanding students’ learning.

 Principals found the innovation provided opportunities for students to learn beyond classrooms: “In the past, (our students) would only write with pen and paper and wouldn’t share to others. But now, everyone can see what they are writing. It gives more pressure to them. Besides, this project is a bit different from the others, it makes students’ learning beyond classrooms” (Extract from interview of Principal B).

Both teachers and students realized that the innovation project could advance student learning and provide self-learning opportunities. Students found that teacher is not the only source of knowledge (Yuen, 2003). “Now, I realize at the beginning, we needed to guide our kids step by step. But now it is unnecessary. Once they know how to carry out ongoing
discussion on KF, they can develop further by themselves. Currently, I just read their notes to see their progress without any interruption” (Extract from teachers’ interview).

Finally, the innovation project also provided opportunities for parents’ change: “I think parents’ role is very important. Since a mother can look after her child in many ways, remind him, for example. If parents care this project more, it is actually helping them to communicate with their children better” (Extract from interview of Principal F).

**Discussion**

How does the KF initiate a change in the learning culture in schools? This study has attempted to explore the contributing factors for such change within six primary schools. Within the frameworks of Bennett (1996) and Flanagan and Jacobsen (2003), four factors, namely, school culture, principal leadership, school strategies, and impact of innovation were observed. The following section aims to further discuss issues in connection to these observations.

**The Change Agent**

The Hong Kong Special Administrative Region government’s five-year strategy on ICT implementation in schools launched in late 1998 (EMB, 1998) shares the aforementioned broader educational framework in much the same as other countries. With this launch, Hong Kong entered a very exciting period of rapid expansion and development in this area. The challenge involved was not simply a case of technological adoption, but rather a process of innovation, which required both financial and training support for schools, as well as cooperation between teachers and school leadership to ensure success (Law et al., 2000). The results of this study demonstrated that principals and teachers as core change agents in schools were committed to making continuous improvement and development in this regard.

In the discussion on the innovative development of technology-augmented pedagogical practices in education, Taylor (1998) argued that the approach based on isolated enthusiasts is inadequate as the institutional response though it leads to valuable outcomes in some cases. The dependence of external agents in school innovation and change has become prevalent in recent years (Goodman, 1994; Fullan, 2001). What is the role of external agents in the innovation projects? The most common role that external agents assume is that of a “merchant”. This approach to change involves identifying particular information that schools needed and then asking a consultant to provide the necessary services. Another role that external agents assume is that of a “medical examiner”. This approach of change is often seen as valuable when the performance of a particular school has declined and consultants are brought into the school to determine what is wrong (Goodman, 1994).
Similarly, Fullan (2001) provides a comprehensive discussion on the role of consultant using labels of “inside-out” and “outside-in”.

The innovation project described in this study is neither a model of “merchant” nor “medical examiner”. We strongly believe that teachers and principals should be informed participants in the project implementation. Therefore, we tried to engage teachers and principals in the innovative practices in order to keep a balance of internal practices and external connections. Sharing sessions had been held for teachers involved in various stages of the projects to discuss their concerns and impact of the projects in relation to curriculum and classroom practices.

Change and innovation is always to be initiated from a variety of different sources (Fullan, 2001). In general, change in schools is driven by a number of forces, including the demands of school management, government policy initiatives and attempts by individual teachers to meet the changing needs of students (Hannan, English & Silver, 1999). The project in this study is an example of successful collaboration and collective effort between institutional agents (from schools) and external agents including external consultants from a tertiary institution and parents.

Support and Change

School support is important to change and innovation in schools. First of all, school administrative support concerns with the way school administrators can facilitate change through resources, structures, and staffing. In this project, some school principals did make changes for time-tabling and re-deployment of teaching loads to foster curriculum change in their schools. Secondly, in the planning of the project, a flexible vision was kept in mind in order to accommodate possible opportunities for the development of different schools. Thirdly, people need to see that their hard work is leading toward progress, thus visible actions are important change process strategy. The implementation of this project had a clear schedule and the processes were transparent to all participants. Finally, staff development, a set of programmatic efforts to build new capacities and understanding within teachers, was extremely important to change processes. Besides professional development for teachers, the project also provided training for student participants.

Apart from the institutional support, understanding institutional culture in order to develop and match strategies for change are fundamental to an effective change process. Thus, change agents need to attempt to become “cultural outsiders” (Kezar and Ecel, 2002), that is, to keep an outside perspective on the schools. To achieve such outside perspective, strategies included: (a) working with a network of institutions, (b) using outside resources, (c) bringing in new idea of curriculum leadership among schools, and (d) participating in
exchange and sharing workshops or seminars to broaden the horizons of teachers and students. These strategies were reflected in this innovation project.

**Professional Development for Teachers and Principals**

Schools are weak at knowledge sharing within and across schools though the notion of school as learning organization has become increasingly prominent during the last decade (Fullan, 1993; Senge et al., 2000). In contrast to this sharing culture in schools, there is a new learning culture underlying the project, in which learning is driven by vision (Senge et al., 2000) and students are involved in a collective effort of understanding with an emphasis on diversity of knowledge, learning how to learn and sharing what is learned (Bielaczyc & Collins, 1999).

The implementation of learning communities in classrooms posed challenges to the conventional pedagogy, in which conventional pedagogy takes the assumptions that learning is viewed as an individual pursuit than group (Krechevsky & Stork, 2000), learning is a “fragmentary act of receiving and giving compartmentalized bits knowledge” (Howard & England-Kennedy, 2001; p. 78), and instructional activities focus on the transmission of the textbook’s or teacher’s knowledge to students without any encouragement of knowledge sharing (Bielaczyc & Collins, 1999). During the implementation of the project, teachers experienced changes in pedagogical practices, in particular their roles in teaching and learning.

To foster such change, teacher development is extremely significant as “knowledge use and teacher development is inextricably linked to curriculum development and change, whether it be through the development of curriculum materials and instructional practices or through beliefs and understanding about curriculum” (Hall, 1997). The current project aimed to bring students into learning communities as well as to bring teachers into a professional community with new learning culture. However, professional development opportunities for principals are equally important and needs to be addressed in the future.

**Final Remark**

ICT has triggered demands for systemic changes in schools (Flanagan & Jacobsen, 2003). In leading curriculum change in schools, the alignment between external demands and internal practices is important. This article presents experiences arising from a curriculum innovation project using ICT in Hong Kong. This project provided opportunity for teachers and students to integrate curricula and ICT on one hand, and on the other hand, they brought about ways of developing processes that engage teachers in developing new understanding, deep meaning about new learning culture. Though this learning culture is not currently emphasized in Hong Kong schools, we believe this project has provided a breakthrough to existing classroom practices. However, not all school changes are intended
to endure and have long-term effects. The sustainability of such innovation is still a challenge and needs further attention in research and development.

References


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