

Changing schools through exploring innovative pedagogical practices using ICTs

Ip Pui Shum

Caritas Rehabilitation Service

Caritas - Hong Kong

Robert Fox

Faculty of Education

University of Hong Kong

This paper explores innovative pedagogical practices through the use of information and communication technologies (ICTs) and school readiness to change. There is considerable public rhetoric, which declares that the use of ICTs is a key lever for educational reform and school change (eg Lankshear et al., 2000; EMB, 2004). Educational institutions are required to implement the reform agendas developed by governments and teachers are challenged to make full use of ICTs to improve student learning opportunities (Cuban, 2001). Different institutions address the reform agendas in different ways and with differing levels of success. This paper examines a series of case studies selected from Module 2 of the Second Information Technology in Education Studies (SITES M2), an international research project, and proposes a framework that locates individual school readiness for innovation and change. The framework identifies four main types of change and applies this framework to individual schools. The researchers propose that applying this framework to educational institutions may help them locate where they are in terms of their readiness to take up various forms of innovative practices using ICTs and therefore what factors should be considered in the planning to assist the school to progress towards their next stated goals.

Keywords: school disposition to change, innovative pedagogical practices.

Introduction

No two organisations are identical and no two schools develop in exactly the same way as individual schools are embedded within unique contextual backgrounds, which exert a continuous influence on them. The diversity and intensity of such contextual influences varies and the response of the educational organisation takes many forms. While schools have different cultures, traditions, leadership styles, resources, etc., the innovative pedagogical practices (IPP) they implement also differ. The main purpose of this paper is to explore school disposition to change in relation to the IPPs stimulated by the use of information and communication technology (ICT). Much use of ICT is not necessarily innovative but supports existing pedagogical practices (Cuban, 2001; Zemsky & Massy, 2004; Fox, in press). However, from a study of 174 cases from 28 countries, innovative practices are closely associated with the use of ICTs in educational institutions (Kosma, 2003). Without the use of ICTs, these IPPs would not have occurred (Yuen, Fox & Law, 2004).

This paper is divided into the following sections: an introduction to the study; a review of key literature; an exploration of IPPs and their association with school disposition and readiness to change; the methodological framework for the study; findings; and a conclusion.

According to current literature and theories on educational change; the concept of school disposition is articulated as: (a) the autonomy or self sufficiency in reaction to contextual influences; and (b) readiness to innovate and change (e.g. staff competence, availability of resources, etc.). These two conceptual dimensions – school autonomy and school readiness together generate a typology that highlights a school's disposition to change. Four different types of school are analysed in this study in terms of the innovative practices they implement, and in this way the relationship between school characteristics and the nature of innovation is established. In this study, cases from Module 2 of the Second Information Technology in Education Studies (SITES M2) (IAEEA, 2003) are selected for analysis. The methodology adopted in this study is a combination of case study research and content analysis. Typical cases were selected, analysed and reported. The data leads to the identification of four school types, namely:

assimilating and instituting change; exploring change under constraints; followers of change; and lastly, coping with change.

This paper sheds light on the importance of school autonomy in relation to IPPs, and individual school attempts in instituting change, considered crucial to the sustainability and transferability of IPPs and an alternative interpretation of the case data of the SITES M2 is offered. This paper applies Michael Fullan's (1993, 1999, 2003) perspective of educational change, which attends to change agents and change factors at all levels. However, instead of using complexity theories as Fullan (2003) suggests, this article adopts concepts from the 'new institutionalism' (Rowan & Miskel, 1999) to construct the theoretical framework. Fullan's idea of using complexity theories is based on theoretical concepts and is difficult to put into practice. We argue in this paper that the ideas from the 'new institutionalism' are compatible with Fullan's perspective in many ways, and provide an alternative theoretical foundation for studying IPPs and school disposition to change. Institutionalism also offers an alternative viewpoint to appreciate the impact of changes in the technical environment (Meyer & Scott, 1991) on organisational life.

Review of Fullan's theory on educational change and new institutionalism

The focus of change theories range from the macro-mezzo down to the micro levels. The question that legitimately follows is at which level should the present study of innovative pedagogical practices (IPPs) adopt? Since the unit of analysis is the school, it would appear straightforward that the level of analysis should be anchored to the system/school level (Newhouse, Trinidad & Clarkson, 2002). However, this conclusion is problematic, as Fullan (1992, 2001) points out as educational change is multidimensional and involves many levels (e.g. classroom, school, and district), and in each of these levels there exists a constellation of stakeholders such as students, parents and teachers that effect the implementation, form and type of change. These stakeholders engage in continuous interactions, while the dynamics between them is overwhelmingly complicated. Settling at one level of change, or focusing on one layer of change agents will yield only partial information.

Fullan in his trilogy of educational change (Fullan, 1993, 1999, 2003); constructed a perspective that incorporates a tri-level model of reform, which addresses respectively the school, the community and the district or state. Fullan's perspective looks at a holistic picture of change, and treats the context in which schools are situated as a dependent rather than a given variable (Fullan, 2003). Another important dimension in Fullan's theory of change is the concern of how to institutionalise change. In his work *The New Meaning of Educational Change* (1991), Fullan depicts change comprising of three phases: initiation, implementation, and finally institutionalisation. Later in the book *Successful School Improvement: The Implementation Perspective and Beyond*, Fullan (1992) analyses in detail issues encountered during the implementation of reform, where he sheds light on the idea of using staff development as a strategy to institutionalise efforts of school improvement. In a more recent work, Fullan (2003) places 'sustainable system change' high on the agenda, in addition to endorsing the idea of institutionalising change, he gives practical advice such as warning against policies to 'restructure' school systems while not at the same time gearing to 're-culture' schools (Fullan, 1993).

The third thrust of Fullan's work is the significance he gives to complexity theory. He argues that change is complex and uncontrollable, and with reference to the work of Stacey (cited in Fullan, 1993), Fullan introduces into the field of education a theory that was originally developed in the natural sciences. The roots of complexity theory can be traced to the idea of 'emergence' and 'unpredictability' in the nineteenth century. The Open System Theory is considered a more recent forerunner of complexity theory. In a nutshell, complexity theory is a "holistic, connectionist and integrationist view of the individual and the environment" (Morrison, 2002, pp. 6-7). In addition to introducing new theoretical concepts, Fullan tries to bridge the language gap between the two disciplines. This alone is a formidable task. He tries to translate complexity theory concepts into terms that stakeholders in the education policy arena can make use of in policy discourses.

Fullan's work is inspiring yet we would argue that to translate complexity theory into a compatible education theory (Fullan, 2003), is more a collection of practical 'wisdom statements' than theoretical constructs that can guide empirical research. Fruitful insights can be gained from Fullan's work, yet it is not viable to put the concepts together into a single research framework. Those who attempt to apply complexity theory in their research encounter this difficulty. Reviewing the work of Byrne (1998), Morrison (2002) and McNaught (2003), some common problems are identified – for example the lack of

concrete measurements and vague concepts that often require the support of other theories. The applicability therefore of complexity theory is questioned and its adaptation into the social sciences and into the field of education in particular may still need more time and research to fully mature and to be applicable to guide empirical research.

Shifting focus from complexity theory to new institutionalism is justified by the following arguments: firstly, institutionalisation of change is also one of the major theoretical thrusts in Fullan's work (Fullan, 1992, 2003); secondly, research work using ideas of institutionalism are more readily found. These works can serve as exemplars (Rowan & Miskel, 1999). Thirdly, investigating the emergence of IPPs (innovative pedagogical practices), as well as their sustainability and transferability involves concepts that pertain to institutionalism. In fact, actors at all levels are surrounded by an institutional environment that limits their choices and actions (Rowan & Miskel, 1999); none of them can escape the culture and norm that surround them, and this brings home the fourth argument and perhaps the most critical argument for adopting the new institutionalism to this study – that Fullan's perspective and the new institutionalism are compatible in the sense that both encompass change agents and change at all levels. In this respect, both schools of thought settle at the same theoretical level when looking at phenomena, which makes them compatible.

Broadly, institutionalism is a reaction to the limitations of prior studies relying on individual rationality (Ginsberg, 1996). Rowan and Miskel (1999) suggest that in many social science disciplines, there is a rejection of models in which social actors are seen as engaging in unrestrained, rational pursuit of their interests. Many theories of change focus on the technicalities of implementing change and are often limited to a single level. This is insufficient as it fails to appreciate the complex dynamics between the individual and the context.

According to Rowan and Miskel (1999), institutionalism sees individuals, groups and organisations embedded in socially organised environments that generate rules, regulations, norms and a definition of the situation that constrain and shape action. Abell (1995) remarks that institutionalism is essentially a set of more or less agreed upon rules, which carry meaning for and determine the actions of some of the population of social actors. Scott and Christensen (1995) further point out that an institutional perspective emphasises the importance of psychological, social and political elements in the study of social phenomena generally and organisations specifically.

In essence, new institutionalism harbours the following ideas: (a) institution as a framework for individual as well as collective behaviour; (b) institution tends to limit future options of acting; (c) the importance of 'legitimacy' of action under a given institutional arrangement (March & Olsen, 1989) and (d) isomorphism, i.e. duplication and transfer is possible and often observed (Rowan & Miskel, 1999).

A review of the literature shows that there are successful examples of using institutionalism to study educational organisations. For example, Ogawa (1994) examines various actors in a particular institutional environment rallying for school based management. Rowan and Miskel (1999) quote examples of how institutionalism addresses the isomorphism of mass education. Scott and Meyer (1991) studied how institutional effects extend to the technical core of schools by means of the assessment and inspection systems. Rowan and Miskel (1999) also confirmed the function of institutionalism theory in uncovering factors that stabilise and institutionalise teaching practices. Institutional theory has also been used to understand the school system as a whole (Scott & Meyer, 1991).

If institutional arrangements of an organisation mean constraint and inertia, then how would institutionalism theories address the problem of change? Rowan and Miskel (1999) state that knowledge in this area is far from complete. There is, they point out, a genuine need for a theory of institutions and change. Attempts to study institutional variation and change can also be found. For example, Powell (1991) suggests five factors that may lead to institutional variation among organisations, and that organisations are not passive when faced with institutional demands; some institutions, he points out, are more capable of resisting pressures and of making autonomous decisions. The work of Cuban (2001) is another vivid example of employing the institutional perspective in accounting for how teachers change in their practices in relation to technology.

Institutionalism has also been used to understand the effect of technical environment on organisations. Meyer and Scott (1991) developed a typology using institutional environment and technical environment

as the two axes of a matrix. Each of these dimensions has polarities of strong and weak effect. In their analysis, Meyer and Scott (1991) found that schools normally operate in a weak technical environment, meaning that the actual teaching and learning or the routine within a school are in general not technically sophisticated (e.g. in comparison to the routines in a hospital), on the other hand, the institutional constraints imposed on schools are strong, these include social expectation, public beliefs about what schools should be like, culture of teaching profession, as well as fiscal and statutory constraints from government.

Given such weak technicalities and strong institutional environment, Meyer and Scott (1991) opine schools will not attempt to closely control or coordinate their production activities (i.e. teaching), but will seek to buffer or de-couple these activities from organisation structures. This point is in fact in agreement with Weick's (1976) idea of schools as loosely coupled systems, only that Weick approaches the problem in a normative sense (i.e. Weick opines that the educational task cannot be fulfilled in a tightly coupled system) instead of treating the phenomenon as a resultant of the technical and institutional environment.

Defining innovative pedagogical practice (IPP)

This study uses Law's (2002) definition of innovative pedagogical practice (IPP) as the *product of change* as well as a *process*. As a product, IPP is an organisational response to demands exerted internally or externally on the school. When actualised in daily teaching, IPP becomes an artefact that can be shared, transferred, modelled and replicated somewhere else. IPPs have to be properly instituted to ensure that the effect can be consolidated and changes made are more meaningful (Law, 2002). IPP can also be considered as a process in which the curriculum is being implemented innovatively. In this sense IPP can be seen as an emerging practice. Thus by definition IPP is continuously evolving and open ended (Law, 2002). Researchers of SITES (n.d.) opine that an innovative pedagogical practice (IPP) possesses one or more of the following characteristics:

- Promote active and independent learning
- Competencies and technological skills to search for, organise, and analyse information, and communicate and express their ideas
- Collaborative, project based learning involving complex, extended, real world like problems
- Individualised, customised instruction
- Address issues of equity, including gender, ethnic, geographic or socioeconomic
- 'Break down the walls' of the classroom (e.g. time, space and participants in the teaching process)
- Improve social cohesiveness and understanding

When soliciting cases of innovative practice from all over the world, the researchers of SITES required participating countries to select cases: (i) in which technology plays a substantial role; (ii) with evidence that indicate significant changes in roles of teachers and students, the goals of the curriculum, assessment practices, and/or the educational materials or infrastructure; (iii) with evidence of measurable positive student outcomes; and finally (iv) the innovative practice shows sustainability and transferability (SITES, n.d).

Autonomy and readiness to change

School autonomy is defined as the self sufficiency of a school in relation to contextual influences. It signifies the degree of independence that a school exercises under resource and institutional constraints. School autonomy encompasses aspects such as the existence of leadership, resource mobilisation, as well as the school vision and goals in relation to external and institutional forces (which may be conducive or negative towards innovation). It also addresses the existence of a constellation of stakeholders situated at different levels. School Autonomy reflects how well a school can make decisions that may only have partial alignment with the interest of the stakeholders. Moreover, the tradition of the school, the school's vision and goals that form part of its institutional background can endow the school with more autonomy or hold it back.

School Readiness refers to the experience of the school and teachers, a culture or normative behavioural code that facilitates innovation, ICT infrastructure, as well as capabilities in overcoming terms of technical problems pertinent to the implementation of IPPs. School Readiness is the capacity of a school and also the capacity of individuals within the school to make IPPs happen.

Putting it all together: A typology of school disposition

The use of typology here is informed by the work of Meyer and Scott (1991), Wilson (1989) and Dalin (1997). The analysis of the relationship between school disposition types and IPPs is the central task of this study. Disposition originally refers to temperament, inclination or tendency, and in this study the disposition of a school is defined as a combination of ‘School Autonomy’ in the face of change and ‘School Readiness’ towards change. These two conceptual dimensions together generate a typology of school dispositions. Each of these concepts allows for polarities of ‘High’ and ‘Low’, and thus produces a two by two matrix, yielding a typology of four different school types (Figure 1).

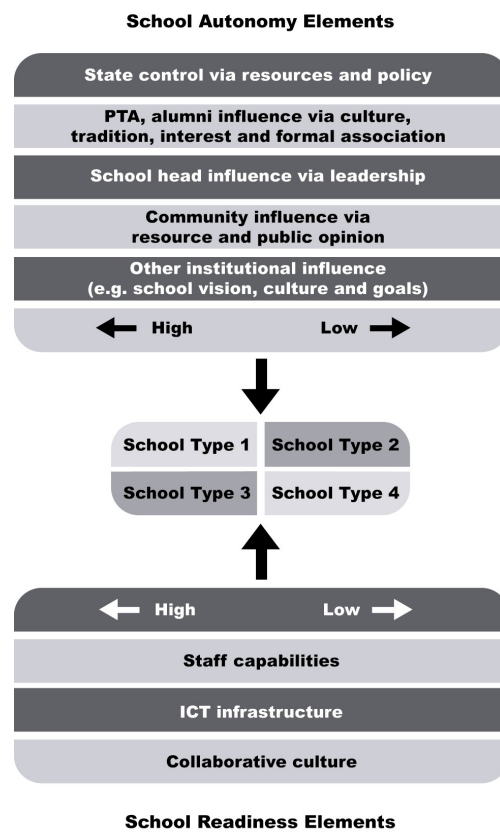


Figure 1. Initial theoretical framework of school disposition types

With this framework, typical cases from the SITES M2 are selected for analysis, and the relationships between IPPs and School Disposition are explored.

Methodology: Case study and content analysis

To explore the data sets of SITES M2, a case study strategy was needed to establish the rationale for case selection; while the data comes mostly from documentary accounts, techniques of content analysis were also employed for coding and identification of the empirical evidence.

According to Bassey (1999), a distinguishing feature of a case study is that the unit being scrutinised possesses a certain wholeness or integrity, instead of a ‘loose collection of traits’. In other words, the case itself is a bounded system, in which the boundary may be temporal, spatial or social. As Schwandt (2001) puts it, a case is typically regarded as a specific and bounded (in time and place) instance of a phenomenon selected for study. Against this background, the data sets from SITES M2 qualify as cases of IPPs in that they possess a relatively clear timeframe (e.g. implementation period of the IPP) and boundaries (e.g. school boundary). Additionally, the researchers of SITES M2 had clear criteria to screen the cases before their intake into the database, thus it can be safely assumed that the cases possess a high degree of wholeness (Kosma, 2003).

There are 174 case accounts in the SITES M2 database. To conduct analysis, a “prior development of theoretical propositions” as proposed by Yin (2003, p.14) was needed. The two by two matrix using School Autonomy and School Readiness as dimensions circumscribe the elements to be investigated in each individual case, and thus it serves the purpose of a theoretical framework as suggested by Yin (2003). Purposive case sampling (Gall, Gall & Borg, 1999) and coding is based on this framework. The SITES cases are screened with the help of the online search engine in the website of the International Association for the Evaluation of Educational Achievement (2003).

As many of the SITES M2 schools are not identifiable, it is difficult to trace the informant or artefacts, that is necessary for forming a chain of evidence. Thus, a reliable and systematic way to scrutinise the contents of the SITES M2 cases was essential in this study. The strategy of content analysis was adopted (Markoff, 1997), while the development of the coding instrument and improving on its reliability referenced the process model proposed by Neuendorf (2002).

This instrument is divided into three sections; the first part records the background information of the case. The second consists of thirty two items for assessing and evaluating the school’s autonomy and readiness when implementing the IPP(s). The third and last part of the instrument is an overall analysis of the direction and intensity of institutional forces influencing the IPP.

With reference to the field test requirement proposed by Hodson (1999), when developing the coding instrument, two coders separately coded two cases – one case came from Hong Kong, while the other was randomly selected. Items concerning School Autonomy and School Readiness were checked for inter-coder reliability. The Percent Agreement (PA_o) of both dimensions was satisfactorily high, ranging from 84.2-92.3%. The Cohen’s *kappa* was calculated to evaluate the reliability when the factor of pure chance is included. The average coefficient values for the two dimensions are respectively .777 and .605, which is considered acceptable (Banerjee et al., 1999).

Handling of data

Where the school selected was identifiable, additional data collection work such as searching the Internet, searching and reviewing school documents, etc. was done to enrich and to triangulate evidence.

Yin suggests three basic strategies for analysing case study evidence, namely “relying on theoretical propositions”, use of a “rival explanation” framework for contrast and lastly if the above two strategies cannot be put to use, one should consider “developing case descriptions” instead (Yin, 2003, pp. 109-115). In addition, the ideas and steps of interpretational analysis put forward by Gall, Gall and Borg (1999), Bassey (1999) and Potter (1996) are incorporated into the process. The analysis process is an organic whole, while the “primary tool of research is the interpretive capacity of the scholar” (Potter, 1996, p.120). It is inevitable that the findings being reported eventually involve both *etic* and *emic* elements.

A discussion of findings: Features of the school disposition types

From a preliminary screening of cases using the elements of the school autonomy and readiness concept (Figure 2), more than 30 cases were selected with the help of the online search engine in the website of the International Association for the Evaluation of Educational Achievement. These case reports were reviewed in detail, and from these a total of 22 cases were coded using the instrument (altogether nine local cases and 13 overseas cases), which is approximately 12.6% of all 174 SITES cases.

The data led to the identification of four school types, namely: assimilating and instituting change; exploring change under constraints; followers of change; and lastly, coping with change (Figure 2). Furthermore, an analysis of case data also led to a refinement of the theoretical framework, i.e. the presence of innovation initiator(s) was considered relevant to the overall readiness of the school.

Assimilating and instituting change: autonomous schools with high level readiness

Two typical cases respectively from Canada (SITES M2 case code: CA001) and Singapore (SG002) are identified. What stands out from the case data is that the two schools readily assimilated changes that unfolded and developed along with the implementation of the IPP. They were capable of instituting work processes, structures and mechanisms that served to consolidate change, as well as to fortify the further

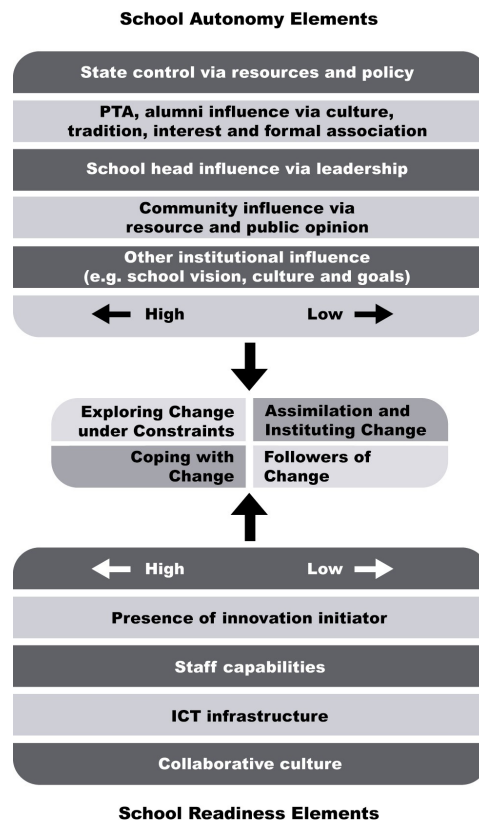


Figure 2. A revised theoretical framework of school disposition

propagation of the IPP. The IPP virtually became an integral part of the school life, it started as a new initiative, but did not linger as a special project, and instead, it blended into the background of the organisation. It resembled to a certain extent the Cultural Integration Model discussed in the works of Law et al. (2000) and Yuen, Law and Wong (2003).

The Singapore school, for example required both students and teachers to possess web literacy skills, and this 'literacy' demand was also imposed on the parents. Students were required to stay on the tasks assigned in class, to search the online repository for information to complete work sheets, etc. Teachers were required to develop online learning resources. The school had the capability to extend the IPP to all subjects and across all levels except primary one and two. In a single stroke, the IPP was assimilated into daily school life. The school administration developed work processes and instituted changes that came along with the operation of the online school portal. As for the Canadian case, a collaborative team named 'triads' was specially and permanently formed by teachers in order to run the IPP; the school even took steps to literally alter the physical setting of the library and classrooms to facilitate the change.

Exploring change under constraints: autonomous schools with low level readiness

In typical cases of autonomous schools with low level readiness (e.g. **CL003** and **SK006**), it was found that the actors experienced relatively few institutional constraints and could decide on the uptake and development of IPP in a rather autonomous manner. Neither the authorities nor other stakeholders seemed to impose stringent requirements on them. Institutional factors at the school level such as history and culture also appeared to be conducive to autonomous actions. Nonetheless, these schools were bounded by a low level of readiness to change. This could have been due to the lack of finance, difficulties with interpersonal relationships, staff qualifications and resistance towards additional workload, etc. Cases **CL003** and **SK006** led us to a tentative conclusion that under this disposition type, the actors behave in a self sufficient and independent manner with regard to the choice of making change. The actors may even choose not to give support to the IPP (e.g. in the Chilean case, the innovator was in fact a 'lone ranger' (Bates, 2000) with neither support from the school administration nor her peers). The scale of the innovator's work is circumscribed by resources, as well as personal readiness to change. Unfortunately,

under these conditions the degree of assimilation or integration of the IPP into the school organisation seems to be minimal.

Followers of change: less autonomous schools with high level readiness

Two typical cases from Singapore (**SG003**) and Australia (**AU003**) are identified as followers of change. These two schools were similar in several ways; for example, the IPPs were initiated at a higher level (e.g. the state), and the moment the schools joined the IPPs, the directives and obligations involved bounded them. These schools were testing grounds for the state led innovation. Under the directives, the IPPs were merged into the daily operation of the school (e.g. via timetabling and staff deployment). Nonetheless, this sort of organisational change was not primarily for the benefit of the school, but for a bigger cause articulated by the state. Inevitably, IPP adopted obligation may have resulted in alienation of the school level actors. Towards the end of the IPP implementation, the schools actors in both **SG003** and **AU003** expressed the need to rethink their commitment to the innovation, and the authentic need of the school. The question of school autonomy was raised in the form of a discussion about the centralisation versus decentralisation of decision making regarding the IPPs. These schools were classified as being followers of change during the entire implementation process.

For example, in the case **AU003**, the IPP was called Virtual Schooling Services, which is part of a larger education project in Queensland. The schools involved in this project were bounded by directives and obligations the moment they joined the IPP. As a state led initiative, minimal leeway was allowed for schools to intervene with the design and delivery of the IPP. In addition, the application of distance learning and the communication infrastructure were under the administration of several partners or government agents; this state of affairs further circumscribed the schools' autonomy in the IPP.

Coping with change: less autonomous schools with low level readiness

Two cases respectively from Germany and Chinese Taipei (**DE012** and **TW006**), were identified as having low autonomy and readiness towards change. In the German case, the school attempted to link its school goals to the use of education technology, yet the process of such integration had barely started. The teachers, who were largely insecure about using technology, muddled through the change imposed by the school management. They tried to cope with the demand while the school management sought a clear resolution of how technology should be integrated with teaching and the school goals. It was reported that there was "no official consensus among the teaching staff regarding the acceptance of the usage of computers". The staff team appeared to be quite ambivalent towards the role of ICT in education; and there was no obvious alignment between the ICT development and the school goal of serving the 'socially deficit'. As reported, "one factor inhibiting many colleagues from integrating ICT into class works is lack of knowledge". The school was state regulated and funded, and its immediate institutional context had plenty of bureaucratic hurdles. The bureaucracy that the school had to deal with was described as 'complex and slow functioning'. For example, the school had to engage in lengthy negotiations with different municipal authorities only to relocate the Internet access point to another room so that computers could be installed in a new computer room.

In the Chinese Taipei case, the school administrator and the majority of the staff were less concerned with consolidating the IPP; rather passively they allowed the IPP to be driven by resource from the outside (e.g. funds from the government). Whether or not the IPP could become an integral part of the organisation was not on the agenda. Furthermore, the school in fact implemented an initiative that was not of its own making, but rather a pet project advocated by an individual enthusiast – the technology acquired for the IPP turned out to be the personal turf of the innovative teacher, whose work was widely recognised by the education authorities in Taiwan, but ironically received little support in her own school. The school in this case could be described as taking a minimalist stance and only 'coping' with the change that came from within it.

Summarising the findings in two typical cases of low autonomy and readiness (**DE012** and **TW006**), it was found that the sustenance of the IPP in the German case hinged on "teachers feeling responsible for the work" (SITES Report No. DE012, p.12). While in the China Taiwan case, the IPP was 'owned' by the case teacher and was seen as her 'personal tool' (SITES Report No. TW006, p.9). In both cases, the schools represented the 'coping with change' school type.

The innovation initiators

According to the SITES M2 final report (Kozma, 2003), 'innovation champions' are contributing factors for sustainability but they are not essential. In the present study it became clear that among the typical cases, enthusiasts could be found in schools with both low level of readiness (e.g. CL003, TW006) and high level of readiness (e.g. ZA003, CZ005). A tentative explanation for this is that, the enthusiast(s) might have been effective in contributing to readiness at a micro or individual level, but the overall readiness of a school depends on the chemistry of a broader range of factors, such as a suitable culture and the capabilities and skills of the majority in the staff team, etc.

On balance, in many of the cases reviewed in this study, the initiation of IPP can often be attributed to individuals (e.g. CN003, DE010, DE005). These key players exhibited different levels of organising skills, some were successful in rallying popular support, while some fought a rather lonely battle. They were the entrepreneurs of IPP, they invested time, expertise, took on additional workload and perhaps most of all they were the ones who tackled the uncertainty and risk that came along with the innovation. As Fullan points out that charismatic leadership cannot help to institute or consolidate change (Fullan, 2003), the good work and momentum created by these dedicated people may not be sufficient to bring the entire school to a state of readiness, yet their presence is crucial in setting things into motion.

Innovation sustenance

In the discussion of IPP sustenance the SITES M2 final report adopted a sustainability model that demarcated the essential factors (e.g. teacher support, school head support, etc.) and contributing factors (e.g. funding, innovative champions, etc.) for 'innovation sustenance' (Kozma, 2003, p.133). The essential factors for IPP sustenance are geared exclusively to the micro or individual level, while other contextual aspects are classified as having a contributing effect. This argument attributes the sustaining of innovative practices to personal capacities. Some scholars have already pointed out that consolidating change needs to deal with the 'institutional counterpart' (Fullan, 1993, p.12), or at least it should be viewed in an 'institutional change context' (Law et al., 2000, p.26).

Meyer and Scott (1991) comment that schools are typically situated in an environment that is technically weak but with strong institutional requirements. This results in a loosely coupled organisation (Weick, 1976) where teaching activities are not closely controlled or coordinated. Educational technology is extensively employed in the IPP as identified in cases discussed in this paper. In this sense, the sustenance of these practices will steadily move the school towards a technically stronger environment. This suggests that a loosely structured organisation will become more structured. Similarly, Telem (1999) found that administrative computerisation in school can lead to a tightening of relationships among work units within the school.

The above speculation is echoed by Wilson's typology of agencies (1989); that schools are by nature less observable in terms of their output process (e.g. the school head can virtually monitor a very small portion of all teaching activities that happened). With technology applied, the teaching plans and students' work are easily available on the school's intranet, and the teaching process is more readily documented/videotaped and retrievable, everyone who logs in to the system can have his or her online behavior recorded, the output process of a school can become more apparent. According to Wilson (1989), this will result in more emphasis on working procedures within the organisation, for example, the format of electronic teaching plans and project work may be standardised, the procedures for accessing ICT equipment are more clearly spelt out as the IPP develops. All these points relate to Meyer and Scott's theory that an organisation's life becomes more regulated. Whether the sustenance of IPP causes institutionalisation of practices or vice versa seems hard to pin down. Nonetheless, it is impossible to evade the organisation level or the institutional level factors when dealing with sustainability of innovative practices.

Summary and conclusion

To sum up, this article discussed the use of Michael Fullan's theory of educational change, together with ideas taken from the school of 'new institutionalism' (Rowan & Miskel, 1999) to analyse cases of innovative pedagogical practices. The analysis led to the identification of four disposition types, namely: assimilating and instituting change; exploring change under constraints; followers of change; and lastly,

coping with change in relation to the implementation of IPPs. The formulation of school disposition types, as well as the institutionalism perspective towards analysing IPPs can be used to inform the process of policy making, and may also has relevancy to the choice of IPPs. For instance, to implement IPPs that required sophisticated coordination and adaptation (e.g. in timetabling and assessment), school with high level and autonomy and readiness is more preferable. Take for another example, if it so happens that education authorities would like to experiment some territory wide IPPs, then the participating school to be chosen should be prepared to surrender some of its autonomy and be a willing *Follower*, as in the cases SG003 and AU003. An unwilling staff team can cause legitimacy crisis of the IPP. On the other hand, to ensure a better chance of success, these state led strategies should also be experimented in schools with relative high level of readiness, for example, in terms of infrastructure and staff capabilities and collaborative culture, otherwise, as we seen from the cases of TW006 and DE012, the teachers will be just *coping* with orders and unable to deliver the desired outputs. All in all, with the understanding of the four school disposition types, decision makers (both at the school level as well as those at the higher level) can match the nature of the IPP with the conditions within the school.

The typology of school disposition provides a simple frame of reference for assessing the readiness and autonomy of a given school in relation to the change (or IPP) schools face. For any given school, its current disposition can be described along its autonomy and readiness to change axis, and with this disposition as a reference, actors within the school (e.g. school administrator) or outside the school (e.g. education authorities) can appreciate how the school behaves in the face of change. Put in another way, given there is a need to attain a particular policy goal or state of change, the change agents can identify the direction in which the school should progress so as to best attain its objectives. Though this research focused at the school level, the authors believe that lessons can be learnt from such a study and applied to the tertiary education sector.

References

- Abell, P. (1995). The new institutionalism and rational choice theory. In W.R. Scott & S. Christiansen (Eds), *The Institutional Construction of Organizations: International and Longitudinal Studies*, (pp. 3-14). Thousand Oaks, CA: Sage.
- Banerjee, M., Capozzoli, M., McSweeney, L. & Sinha, D. (1999). Beyond kappa: A review of interrater agreement measures. *Canadian Journal of Statistics*, 27(1), 3-23.
- Bassey, M. (1999). *Case Study Research in Educational Settings*. Buckingham, Philadelphia: Open University Press.
- Bates, A.W. (2000). *Managing Technological Change. Strategies for college and university leaders*. San Francisco: Jossey-Bass.
- Byrne, D. (1998). *Complexity Theory and the Social Science: An Introduction*. London and New York: Routledge.
- Cuban, L. (2001). *Oversold and Underused – Computers in the Classroom*. Boston: Harvard University Press.
- Dalin, P. (1998). *School Development: Theories and Strategies, an International Handbook*. New York: Cassell.
- Education and Manpower Bureau (EMB) (2004, March 7). *Information technology in education – way forward*. Printing Department: Hong Kong Government. [viewed 5 Jul 2004]
http://www.emb.org.hk/ited/consultation_ited/file/eng/wayforward.pdf
- Fox, R. (2004). SARS epidemic: Teachers' experiences using ICTs. *Beyond the comfort zone: Proceedings 21st ASCILITE Conference*. Perth, 5-8 December. <http://www.ascilite.org.au/conferences/perth04/prog/fox.html>
- Fullan, M. (1991). *The New Meaning of Educational Change* (2nd ed.). New York: Teachers College Press.
- Fullan, M. (1992). *Successful School Improvement: The Implementation Perspective and Beyond*. Philadelphia: Open University Press.
- Fullan, M. (1993). *Change Forces: Probing the Depths of Educational Reform*. London: Falmer Press.
- Fullan, M. (1999). *Change Forces: The Sequel*. London: Falmer Press.
- Fullan, M. (2003). *Change Forces with a Vengeance*. New Fetter Lane, London: Routledge Falmer.
- Gall, J.P., Gall, M.D. & Borg, W.R. (1999). *Applying Educational Research – A Practical Guide*. (4th ed.). USA: Addison Wesley Longman, Inc.
- Ginsberg, R. (1996). The new institutionalism, the new science, persistence and change: The power of faith in schools. In R.L. Crowson, W.L. Boyd & H.B.Mawhinney (Eds), *The Politics of Education and the New Institutionalism: Reinventing the American School*, (pp.153-166). London: Falmer Press.
- Hodson, R. (1999). *Analyzing Documentary Accounts*. Thousand Oaks, California: Sage Publications.
- International Association for the Evaluation of Educational Achievement (IAEEA) (2003). Second Information Technology in Education Study: Module 2 (SITES M2). [16 Jul 2004] <http://sitesm2.org/>
- Kozma, R.B. (2003) (Ed.). *Technology, Innovation, and Educational Change: A Global Perspective*. Oregon: International Society for Technology in Education.
- Lankshear, C. & Snyder, I., with Green, B. (2000). *Teachers and Techno-literacy: Managing Literacy, Technology and Learning in Schools*. St Leonards, Australia: Allen and Unwin.

- Law, N. (2002). Leadership, change management and good pedagogic practices. Paper presented at the APEC Cyber Education Cooperation (ACEC) International Workshop on e-Educational Leadership in ICT. Bangkok, Thailand, March.
- Law, N., Yuen, H.K., Ki, W.W., Li, S.C., Lee, Y. & Chow, Y. (2000) (Eds) *Changing Classrooms and Changing Schools: A Study of Good Practices in Using ICT in Hong Kong Schools*, Hong Kong: Centre for IT in School and Teacher Education, The University of Hong Kong.
- McNaught, C. (2003). Identifying the complexity of factors in the sharing and reuse of resources. In Littlejohn, A. (Ed), *Reusing Online Resources: A Sustainable Approach to E-learning*. London and Sterling VA: Kogan Page.
- March, J.G. & Olsen, J.P. (1989). *Rediscovering Institutions: The Organizational Basis of Politics*. New York: Free Press.
- Markoff, J. (1997). A matter of definition. In Roberts, C.W. (Ed). *Text Analysis for the Social Sciences – Methods for Drawing Statistical Inferences from Texts and Transcripts*, (pp. 9-31). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Morrison, K. (2002). *School Leadership and Complexity Theory*. London: Routledge Falmer.
- Newhouse, P., Trinidad, S. & Clarkson, B. (2002). *Quality Teaching And Learning Practice With Information and Communications Technologies (ICT): A review of the literature*. Perth, Western Australia: Specialist Educational Services.
- Neuendorf, K.A. (2002). *The Content Analysis Guidebook*. Thousand Oaks, California: Sage Publications, Inc.
- Ogawa, R.T. (1994). The institutional sources of education reform: The case of school-based management. *American Educational Research Journal*, 31, 519-548.
- Potter, W.J. (1996). *An Analysis of Thinking and Research About Qualitative Methods*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Powell, W.W. (1991). Expanding the scope of institutional analysis. In P.J. DiMaggio & W.W. Powell (Eds), *The New Institutionalism in Organizational Analysis*, (pp. 183-203). Chicago: University of Chicago Press.
- Rowan, B. & Miskel, C.G. (1999). Institutional theory and the study of educational organizations. In J. Murphy & K.S. Lewis (Eds), *Handbook of Research on Educational Administration*, (pp.359-383). San Francisco: Jossey Bass.
- Schwandt, T.A. (2001). *Dictionary of Qualitative Inquiry*. (2nd ed.). Thousand Oaks, California: Sage Publications, Inc.
- Scott, W.R. & Meyer, J.W. (1991). The organization of societal sectors. In P.J. DiMaggio & W.W. Powell (Eds), *The New Institutionalism in Organizational Analysis*, (pp. 108-140). Chicago: University of Chicago Press.
- Scott, W.R. & Christensen, S. (Eds) (1995). *The Institutional Construction of Organizations – International and Longitudinal Studies*. Thousand Oaks, London, New Delhi: Sage Publication.
- SITES (n.d.). *ICT and Educational Innovations*. The University of Hong Kong Centre for IT in Education [viewed 12 Sep 2004] http://sitesdatabase.cite.hku.hk/ict_innovation/main.asp?PP_1=1&#PP_1
- Telem, M. (1999). A case study of the impact of school administration computerization on the department head's role. *Journal of Research on Computing in Education*, 31(4), 385-401.
- Weick, K.E. (1976). Educational organizations as loosely coupled systems. *Administrative Science Quarterly*, 21, 1-19.
- Wilson, J.Q. (1989). *Bureaucracy: What Government Agencies do and why they do it*. USA: Basic Books.
- Yin, R.K. (2003). *Case Study Research Design and Methods*. (3rd ed.). Thousand Oaks, California: Sage Publications, Inc.
- Yuen, H.K., Law, N. & Wong, K. C. (2003). ICT implementation and school leadership: Case studies of ICT integration in teaching and learning. *Journal of Educational Administration*, 41(2), 158-170.
- Yuen, H.K., Fox, B. & Law, N. (2004). Curriculum innovations and multi-level e-leadership requirements: Putting research into practice. *Asia-Pacific Cybereducation Journal*, 1(1), 1-12.
http://acecjournal.org/current_issue/article/article_show.php?article_name=06_Yuen_Fox_Law_I1.htm&article_id=article_01_01_01&show_mode=2 [verified 30 Oct 2004]
- Zemsky, R. & Massy, W. F. (2004). Thwarted innovation. What happened to e-learning and why. A final report for the Weatherstation Project, The Learning Alliance, University of Pennsylvania. [viewed 29 Sep 2004]
<http://www.thelearningalliance.info/Docs/Jun2004/ThwartedInnovation.pdf>

Please cite as: Ip, P.S. & Fox, R. (2004). Changing schools through exploring innovative pedagogical practices using ICTs. In R. Atkinson, C. McBeath, D. Jonas-Dwyer & R. Phillips (Eds), *Beyond the comfort zone: Proceedings of the 21st ASCILITE Conference* (pp. 444-454). Perth, 5-8 December.
<http://www.ascilite.org.au/conferences/perth04/procs/ip.html>

Copyright © 2004 Ip Pui Shum & Robert Fox

The authors assign to ASCILITE and educational non-profit institutions a non-exclusive licence to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The authors also grant a non-exclusive licence to ASCILITE to publish this document on the ASCILITE web site (including any mirror or archival sites that may be developed) and in printed form within the ASCILITE 2004 Conference Proceedings. Any other usage is prohibited without the express permission of the authors.