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Editorial

As it is one of the goals of *APJED* to provide a platform for latest research findings and academic discussion, four articles are included in this issue, offering valuable insights and findings on topics from school governance ethos, teacher's professional development, internationalization of higher education, to education and fertility choice.

The first article addresses the issue of raising education quality and excellence with the demand of well educated workforce in an era of knowledge economy. Ghosh, the author of the article, scrutinizes different ways of conceptualizing the idea of school effectiveness though some seem more dominant. Schools therefore benchmark differently in their quality and achievement, for instance, high ranking in internationalized tests or competitions. Ghosh urges for a more egalitarian ethos of education and a more inclusive perspective of school excellence in this post-modern era. Ghosh points out that the key for raising school effectiveness is not by merely measuring learners' outcomes, but by providing teaching which caters to learners' diverse needs, cultures, or abilities. In doing so, the learners are empowered to develop skills for facing rapid changes, while educators and practitioners are re-defining the criteria of excellence to provide inclusive policies and pedagogy. The attempt to promote an egalitarian ethos that underlines diversity and multiple intelligences, however, often draws concerns from those who advocate standardized criteria and tests. It could be difficult yet vital to dissuade the view of seeing an inclusive policy as Psyche's life in the invisible castle. This paper provides sound basis for reinforcing the connection between excellence and inclusion.

The second article in this issue examines the significance of teacher's continuing professional development as well as the role of Singapore's sole educational institute in sustaining this development. The authors look at Kennedy's (2005) spectrum of professional development which includes three broad types of models. Based on the view of teacher development as an on-going process of transforming and involving practices, the authors propose a model which places the teacher at the heart of professional development. In order to put the model into action, a pathway is necessary for understanding a teacher's views of what to teach and change. As suggested by the authors, there must be dialogue between front-line practitioners and policy makers on the teaching content as well as objectives of teacher's professional development. In this article, three key elements are suggested as modifications to the current teacher development course of National Institute of Education (NIE) in Singapore: enhancing in-service course, initiating dialogues and sharing of knowledge, and forming "communities of practice" to facilitate teacher-led inquiry. The elaboration on limitations of current NIE teacher training courses and on the potential of a new model sets a starting point for more discussion and further investigation of a teacher's professional development, in Singapore as well as in other societies of the Asia-Pacific region.

A case study exploring the existing knowledge and possible challenges of double/joint degree programs (DJDP) is reported in the third article. As globalized economy becomes more intensive, student mobility and internationalization of higher education turns to be more relevant issues. Although joint degree programs are not new to European or English-speaking countries, it is still fresh a venture in Asia, and emerging issues needed to be addressed. As Chan found through the case study, a few problems are to be paid attention, such as imbalanced student mobility between Taiwan and other countries of Southeast Asia, and quality of DJDP which is closely related to the harmonization of collaborative institutes. Chan also points out the need for investigating a former assumption that programs such as DJDP can enhance students' professional skills and employability. The implications provided are not only relevant to higher education policy in Taiwan but in other Asian countries as well.

In the fourth article, the dispute of whether education has an impact on fertility decision is re-examined through a new statistic analysis model proposed by the authors. Albeit some empirical research has failed to confirm the link between health education and fertility rate, this study found poverty, which decreases the exposure to mass media and awareness of family planning, and education opportunities as strong predictors to fertility choice decision. The weight of education equity is once again highlighted and the collaboration between educational and health care system is urged.

Through the four articles on diverse yet related topics, issues relevant to latest educational development in Asia-Pacific region are attended to, hoping to raise further investigations and dynamic discussions.

School Effectiveness: Pursuing Excellence and Inclusion

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Abstract

With explosion in educational services to all eligible people in all countries of the world there is a serious concern about the quality of education. The global knowledge economy demands educated citizens, and a skilled and innovative workforce. But the quality of schools is deteriorating and education is unable to produce the workforce needed for the rapidly advancing technology and the world market. The focus has therefore turned to effective schools that will bring countries to the forefront of the global market through its educated citizens. Despite a variety of empirical and analytical research studies, there are no criteria that enable schools to identify factors that will improve the effectiveness of schools.

This brief paper is based on a keynote address given at the 2012 World Global Forum in Taipei and argues that in a world with globalization and rapid movement of populations, excellence in education must go hand in hand with educational inclusiveness. School effectiveness cannot be measured through international tests alone. Effective schools will use teaching strategies that are needed for students with diverse abilities, cultures and backgrounds for strong achievement in academic and other areas, but at the same time empower them with interpersonal/intercultural skills to face rapid change and life-long learning. To be effective, schools must strive for excellence with inclusion because excellence is enhanced and enriched by diversity.

Keywords: effective schools, inclusion, equity, excellence

1 The Urgent Need for Effective Schools

It is now globally recognized that education is an important policy objective, one that is essential for economic and social development as well as for enhancing individual capabilities. In the immense competition for globalization, education is seen as a product that can be traded. On the one hand, educational institutions are mushrooming in every country at all levels, from pre-school to university, due to the revolution of rising expectations and the increase in demand by individuals. On the other hand, knowledge is linked to improvement in productivity -- and in a

knowledge economy, education is the primary tool used by states to get a competitive edge in economic development. Global competition for political and economic power has led to demands for improvement in the quality of what is offered in educational institutions. School effectiveness research is premised on the belief that the basic goal of the school is to improve learning outcomes for students; and student performance and teacher quality are most frequently taken as measures of effective schools.

2 What is an Effective School?

In general, the public view of an effective school is one that produces excellent results and is ranked high in assessment tests. The idea of excellence is evident. However, with the democratization of education the focus has moved to promoting the progress of all students in a broad range of intellectual, social and emotional outcomes. An effective school then, is one that enhances the learning of all students. More attention is being paid to a flexible curriculum with clear goals (*what to teach*), and differentiated instruction (*how to teach a range of learners*) with fair assessment for the benefit of all students recognizing that each learner is unique. The issue of equal opportunity, and fairness or equity is also apparent. So, there are two concepts that appear conflicting to those who see excellence and equity in binary terms.

A major policy incentive of governments has been increase in student enrolment, especially in countries of the South (for example, the Education for All movement; United Nations Educational, Scientific and Cultural Organization, 2000a). The Education for All (EFA) movement is a global commitment by 164 countries to provide quality basic education for all children, youth and adults. The Dakar Framework for Action was announced at the World Education Forum in Dakar, Senegal in 2000 (United Nations Educational, Scientific and Cultural Organization, 2000b). Six goals were identified for achieving Education for All by 2015. United Nations Educational, Scientific and Cultural Organization (UNESCO) was mandated to coordinate the efforts of governments, development agencies, and the private sector. The UNESCO Statistical Institute (USI) based in Montreal,

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produces the Global Monitoring Report each year providing an account of the world's progress in meeting education for all citizens in 200 countries. It includes countries of the North and South because in the North many marginalized and vulnerable groups of students drop out of school; in the South governments need to expand opportunities but even when students are enrolled the challenge is to keep them in school and sustain their learning. The 2005 Global Monitoring Report focused on school quality in order to emphasize the need for students in the North and in the South to stay in school long enough to acquire the learning outcomes, values and skills needed to cope with the demands of a rapidly changing world.

Over the past "Literacy Decade" (2003-2012) the UN Commission on Human Rights has urged members states to implement the right to education and also guarantee that this right is exercised free from discrimination. Although the Educational for All (EFA) movement continues, spurred by considerable success in enrolment levels in most countries and intense competition at the global level, more recently the focus has turned from increasing enrolment to improving school quality. And quality of education is usually measured in terms of excellence in student performance and quality teachers. Research on effective schools has therefore tended to revolve around identification of indicators that are necessary for a high level of student achievement, as measured in international student examination scores.

School Effectiveness research emerged from the debate created by a path breaking study funded by the U.S. Office of Education and done by Coleman et al. (1966) who looked into the effectiveness of American public education and the nation's public schools. The Coleman Report was published in 1966 with the title: *Equality of Educational Opportunity*. Extensive studies, theories, and models, as well as meta-analyses of empirical research on effective schools and effective school leadership, have developed a large body of literature on the topic. *The International Handbook of School Effectiveness Research* (Teddle & Reynolds, 2000) provides an international and broad perspective on effective schools research. In a major study published by UNESCO, Shreenes (2000) does a meta-analysis of empirical research to identify factors that enable schools to attain the educational goals that will make a school effective. Ministries of Education have developed evidence-based indicators of successful practices in effective schools for educators. In Canada, for example, the Ontario Ministry of Education has identified evidence-based indicators of successful practice for effective schools for educators.

Various definitions of effective schools have emerged. Effective schools are defined in terms of student outcomes

such as achievement levels, content or organizational factors, and process factors. Organizational factors of an effective school include a high level of effective teaching strategies, strong school leadership, and strong relationships with the home and community. Process factors are clearly articulated goals and an inclusive school culture and environment with collaborative decision-making with stakeholders.

Despite a variety of empirical and analytic research studies, there are no criteria that actually enable schools to identify factors that will improve the effectiveness of schools. Moreover, there has been debate over whether there can be a universal definition of effectiveness that is applicable to all societies -- which have different cultures, histories, and needs, and are faced with different degrees of economic development. Needless to say, can there even be a single definition for all schools within the different regions of any one country?

3 International Tests

The current trend in the global competition for excellence in education is to benchmark a country's educational system through its ranking in international tests and to focus on high value added (HVA) teachers. Large-scale international assessment tests have been taken as measures of "high quality" teaching and learning practices in educational systems in competing countries. PISA which is the Program for International Student Assessment for Reading, Math and Science for 15 year old students is conducted by the Organization for Economic Co-operation and Development (OECD); PIRLS or Progress in International Reading Literacy Study conducts Reading for students in the 4th grade and is coordinated by the International Association for the Evaluation of Educational Achievement (IEA). TIMSS stands for Trends in International Mathematics and Science Study for students of 4th and 8th grades and is conducted by the Institute for Education Sciences (IES), U.S. Department of Education. Results from assessments such as PISA, TIMSS, and PIRLS are used to measure educational effectiveness and establish "normal" standards as countries are ranked in competition with one another (Creemers, 2006; Pongratz, 2006). In such assessments, school effectiveness is measured through student performance or achievement in subject areas such as math, science, and reading. But international tests create global standards for a global economy rather than for the needs of national curricula. The media sensation created by the publication of country ranking perpetuates "international standards," and the search for "best practices," "best educational systems," and "teacher quality."

Furthermore, the international tests as we know them today measure only two intelligences (linguistic and logical-mathematical) on Gardner's (1983) list of intelligences he proposes that children have and through which they understand the world. Gardner caused a paradigm shift in the theory of intelligence by questioning the idea that intelligence is a single entity that can be measured simply through tests. His proposition that people possess multiple intelligences has tremendous implications for education and how educational excellence can and should be measured.

4 Impact of International Tests

Although the test results are unable to distinguish which factors account for differences in results, and are unable to identify causal relationships between variables (Galczynski, 2010), educational reforms are influenced by policies of highly-ranked school systems of countries and externalization (import/export) of educational policies occurs (Schriewer, 1989, 2006). This happens even though the historical and economic conditions or the specific traditions and cultures of the ranked countries may be very dissimilar, and the conditions for teaching and teacher education are vastly different, especially between countries of the North and of the South.

5 Teacher Quality

Reforms identify teachers as a major factor in increasing learning and quality of performance. And international concern on teacher quality is focused on the key role of teachers in knowledge production. Widely cited by the media, a recently published study on high value added teachers asks the important question: Is the impact that teachers have on students' test scores ("value-added") a good measure of their quality? (Chetty, Friedman, & Rockoff, 2011). Do high value added (HVA) teachers improve the long-term achievements of students? HVA teachers are those successful in raising test scores. Furthermore, do test scores indicate teachers' impacts on student success in tests?

Mentioned by President Barak Obama of the United States in his 2012 State of the Union Address, this 20-year longitudinal study on one million American students (<http://www.columbia.edu/>) indicates that elementary school teachers have an impact on how much their students earn as adults and, by extension, on the nation's economy. While the new research may identify HVA teachers, it does not indicate what constitutes good teaching. Teacher quality may be the key to improving underperforming schools in poor neighborhoods but it is still not clear what teacher qualities make schools effective.

6 Societal Goals

In a technologically advanced global knowledge economy, the market-driven goals of a society are to have a competitive edge by achieving excellence, innovation, and creativity. Following the example of the business world, the most well-known educational institutions are putting emphasis on diverse school populations and interdisciplinary teams to get innovative ideas. Their aim is that a diverse student population will enrich the environment and lead the innovations. They will be empowered to deal with change and diversity as well as have the ability to define a future with societal peace and national security. With international migration, access to education for a variety of groups, and implementation of the right to education for every individual, schools are now more diverse than ever before.

Yet, notwithstanding the push to enroll all children in schools all over the globe, economically advanced and lower income countries alike are faced with high dropout rates, and many students find their educational options are either irrelevant to their lives or worthless for getting them jobs so that they fill the ranks of the educated unemployed. The problem is two-fold: First, there is the issue of marginalization when students drop out of the system causing wastage; second is the problem of tremendous expansion in schools at all levels due to unmet demands, mostly by private providers that are not subject to quality control. Expansion of education at all levels must be done with quality and relevance in mind because there is no point increasing access to a process that lacks standards and usefulness, and therefore will not result in benefits either to the individual or the society. On the contrary, worthless credentialing may lead to social unrest.

7 Educational Inclusion

Various groups of students are at risk of dropping out and being excluded from the educational system. Students from vulnerable groups drop out at the school level in economically poor countries for economic reasons but also because they do not see any relevance of education to their lives. In industrialized countries, schools are often seen as not being "safe" or "welcoming" to marginalized groups of students (such as socially or economically disadvantaged groups) who feel excluded from the process of education.

The move for an inclusive education was given legitimation at the Salamanca Conference on Special Needs Education in 1994, when it was stated that the best way to achieve education for all and combating discrimination was to build inclusive societies (United Nations Educational, Scientific and Cultural Organization, 1994). The meaning

of inclusive education was broadened from special needs education to a process which eliminates social exclusion resulting from negative attitudes and responses to diversity not only in physical and mental ability but also in race, social class, ethnicity and culture, religion, gender, and other differences.

Thus, an effective school would pursue excellence in the context of diversity -- all students must be prepared to deal with change and a life of learning with intercultural, interpersonal skills that will enable them to compete with diverse people and situations. The underlying philosophy must be that diversity is valued: that classroom dynamics offers greater learning opportunities for all to achieve their maximum potential. Schools must be inclusive. As Ainscow (2005) points out, educational inclusion, not merely inclusive education, means that effective schools are inclusive schools: it implies that inclusion is a process; it suggests identification and removal of barriers to education for some students; it involves the achievement of all students but places emphasis on students at risk of marginalization, exclusion, and underachievement.

8 The Complexity of Diversity

Inclusion implies making diverse groups of people part of the educational enterprise. The concept of diversity implies multiple differences. People are different from each other in different ways and simple classifications of people as black or white, as male or female, are crude and incorrect. For example, it would be incorrect to attribute gender characteristics in terms of what can be expected of boys and girls in school performance because there is as much variation among each group as between them. Moreover, a diversity of perspectives is derived from multiplicity and multidimensional differences and this is essential for innovation. Diversity is influenced by a variety of factors such as how an individual is located (country, region) and positioned (in terms of race, gender, religion, language, socio-economic class, and so on). But these are not fixed categories. Not only are they complex because they are crosscutting and overlapping; they are also fluid and changing.

9 School Effectiveness Is Linked to the Goals of Society

Despite the move through international testing for a world education standard, school effectiveness will ultimately be defined by the goals of a society and its resources. While each society will strive for a better standard of living for its citizens, egalitarian societies also strive to provide equality of opportunity to meet the

economic and social needs of each citizen. So, schools must strive for high quality education for all its students, and management for school effectiveness will mean providing equal learning opportunities to all students to achieve their maximum potential. This implies an inclusive school culture and worldview that pursues excellence by responding to the variety of intelligences, emotional and academic needs of all students irrespective of differences in intellectual ability, gender, socio-economic class, ethnicity, and culture.

10 Equal Opportunity and Equity

What does equal opportunity mean? Does it mean treating all children the same way? No, equality implies similarity rather than "sameness." Equal opportunity does not imply equal treatment; rather, it is equity and means fair treatment (Ghosh, 2012). Treating everyone the same would be blindness to differences. But human beings are diverse, not only in their inherent characteristics such as ethnicity, gender, age, physical and intellectual attributes and aptitudes, but also in their locations such as place of birth and socioeconomic background -- which result in unequal power relations (Ghosh, 2002, 2011). The effect of ignoring such differences, in fact, may be unjust and inegalitarian (Sen, 1992). Equal opportunity implies fairness, which is a fundamental principle of justice (Appiah, 1996).

At the policy level, issues of diversity, equity or fairness, and excellence are complex, and reforms aimed at equity clearly upset the status quo. At the management level, fundamental challenges of implementation involve all stakeholders. With the tremendous expansion of educational opportunity to diverse social and cultural groups and the democratization of education, questions arise regarding a conflict between equity and excellence. Is quality inevitably diluted when schools become socially and culturally inclusive? Can equity and excellence be pursued simultaneously without compromising one for the other?

11 Excellence and Equity

What is meant by the concept of excellence? First, excellence refers to quality and is a comparative term. In the public view it implies a standard and is the opposite of mediocrity. Furthermore, it can be defined both at the individual and collective levels. Western thinkers according to their values and characteristics have defined excellence subjectively. But definitions and meanings of words change with times, and post-colonial writers have raised the possibility of viewing Western and non-Western traditions and cultures on the basis of equality and

interaction. We now accept that cultures and people have multiple perspectives, multiple intelligences (Gardner, 1993), and many ways of knowing, doing, believing and valuing. Standards are of utmost importance, but definitions of excellence must represent plurality because the norms in use come out of the particular experiences of those who have the power to define standards and make the rules (Ghosh, 2012).

Excellence is often presented as conflicting with equity policies although there is empirical evidence indicating a positive correlation between the two (Bowen & Bok, 1998). Decline in the quality of education has been sometimes linked to the democratization of educational opportunities and the influx of diverse groups of students with difference in abilities. Both in countries of the North and of the South, a general deterioration in educational standards has focused attention on effective schools -- those that produce the best results. There is a competition to achieve "excellence" as seen in international tests in some countries. But how is excellence defined?

By its nature, excellence is a comparative term and is generally viewed as the opposite of mediocrity. There is the assumption of qualitative difference between what is excellent and what is average. So is excellence a mark of quality or a mark of privilege? In their book *Privilege and Diversity in the Academy*, Maher and Tetreault (2007) make the important point that excellence is not so much a mark of quality as a mark of privilege, as the elites who "control the norms of the scholarly enterprise (p. 4)" use their power to keep historically acquired group privilege at the expense of groups whose positions of race, color, class, gender and sexuality put them at a disadvantage. Those who have power and privilege define the standards of quality: they are the elites who shape the norms. In modern times, knowledge and standards of quality have come from European cultures in Western countries largely through colonization and imperialism. But in post-modern times, against the backdrop of international migration of knowledge workers, this definition cannot be fixed when we deal with diverse cultures which have multiple perspectives and different kinds of knowledge. In education, excellence should represent plurality, not only because of the idea of multiple intelligences but also because diverse representation enriches the educational environment. Not only is diversity of representation being now recognized as a defining feature of excellence, but there is also a shift towards interdisciplinarity because of the need for innovative approaches to solving problems (Maher & Tetreault, 2007).

12 Conclusion

Effective schools will surely strive for excellence, but an essential feature will be educational inclusion. Analysis of large cross-national, achievement data such as PISA and TIMSS indicates that nations with lower education inequalities (such as tracking or unequal funding) have higher overall achievement (Baker & LeTendre, 2005). On the other hand, teachers undoubtedly have a positive, significant, and wide-ranging impact on students. Strong leadership in schools is essential in creating inclusive school cultures. To be effective, schools must strive for excellence with equity because excellence is enhanced and enriched by diversity.

In 2012 we are confronted with the breadth and pace of change and democratic shifts. Furthermore, the present economic crisis has gripped the world making interdependence among nations and people even more meaningful. Globalization is now more than ever intimately connected to diversity, inclusion, and multicultural values and perspectives. Not only must schools cultivate educational inclusiveness, we need inclusive ways of conceptualizing school effectiveness. Keeping a post modern society and inclusion in mind, we will need to redefine excellence, re-examine what our goals will be for our future schools, and creatively measure the effectiveness of our schools.

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Re-examining the Role of Institutes of Education in Science Teachers' Continuing Professional Development: A Singapore Perspective

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Abstract

Continuing professional development for teachers is an important aspect of innovation and progress in any educational system. In this exploratory position paper, we examine the sole teacher education institution in Singapore as it re-examines its role in transforming teacher professional development. We propose a framework which can be used by Singapore's National Institute of Education to support the sustainable and transformative professional development of science teachers. Placing teachers instead of policy changes at the core of professional development, this framework illustrates how teacher-led inquiry and involvement in communities of practice can be integrated to support continuing professional development so as to impact teachers' practices and ensure the sustainability of professional development.

Keywords: institutes of education, continuing professional development, communities of practice

1 Introduction

A study carried out by McKinsey & Company and published by *The Economist* (2007) identified three common features of successful education systems in different countries: (1) successful education systems have excellent teachers; (2) successful education systems get the most out of their teachers; and (3) successful education systems have teachers who intervene to help students who show signs of lagging behind. These findings highlight the importance of ensuring the quality of teachers as professionals in helping education succeed. In this paper, we re-examine and propose a systematic way to reinvent the role of an institute of education to contribute in getting the most out of teachers through engaging them in continuing professional development.

Education is systemic in nature. The central role of teachers for sustaining, reinventing and improving the education system is undeniable. Besides attracting the best people into the education field and providing them with high quality pre-service programs, continuing professional

development plays a considerable role in ensuring currency and quality of education in schools. In recent years, educationists and policy-makers are increasingly recognizing the importance of continuing professional development and paying much more attention to research in this area. Teacher-proof curricula that are aimed at ensuring fidelity of curricular resources have attracted their fair share of criticism and teachers' practices are no longer formulaic (Atkin & Black, 2003). Innovation, change and creativity feature highly in teachers' practices in today's education systems, rendering knowledge that teachers gain during their pre-service training inadequate and outdated within a short span of time. In this position paper, we re-examine the role played by an institute of education in the continuing professional development of teachers and propose a model to illustrate how it can work in partnership with teachers to empower them in their continuing professional development so as to increase the relevance of professional development in their practice.

2 Literature Review

Given the complexities and diversity of continuing professional development for teachers in different cultural and educational contexts, we decided to review two key areas of research literature that are crucial to formulating a new model of continuing education. These areas are the ideas behind continuing professional development, and the professional knowledge of teachers.

2.1 Continuing Professional Development

The scope of continuing professional development is wide. Hassel (1999) defined continuing professional development as the process of improving staff skills and competencies needed to produce outstanding educational results for students. On a larger scale, it refers to *ongoing learning opportunities* available to teachers, and other education personnel, through their schools and districts (Edweek.org, 2006). Hewson (2007, p. 1181) presents four key areas that define teacher professional development: (1) how teachers interact with their students with regard to the curriculum, instruction and assessment; (2)

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teachers as professionals and their beliefs, values and the knowledge which they bear as a professional community of practitioners; (3) teachers themselves as learners who are in control of their working lives; and (4) teachers' epistemologies about science and the natural world. Loucks-Horsley, Love, Stiles, Mundry, and Hewson (2003) view professional development as a process of design, and examine (1) the content of professional development; (2) the strategies used for professional development; (3) the learning context; and (4) the media through which professional development takes place. Hewson gives the teacher the central position in her definition of professional development, while Loucks-Horsley and colleagues emphasize the process of professional development. Regardless of the emphasis, an improvement in teachers' practices appears to be the final goal of teacher professional development.

Given the scope of continuing professional development, different models of continuing professional development are proposed. Kennedy (2005) proposed a spectrum of continuing professional development that spans from a transmission model (training model; award-bearing model; deficit model; and cascade model) to a transitional model (standards-based model; coaching/mentoring model; and community of practice model) to a transformative model (action research model; and transformative model). As we move through the continuum of the three models, there is increasing capacity for professional autonomy of the teachers. Some of the models are a combination of both formal/informal and planned/incidental forms of teacher learning, while others are more homogeneous and consist of only one form of teacher learning.

Education is a dynamic enterprise that is largely shaped by societal and political forces. As such, educational reforms are ongoing and what follows every educational reform is teacher professional development. Information and new developments in education are traditionally passed onto teachers through in-service professional development courses (Kelly & McDiarmid, 2002). Intuitively, this is a popular mode, as it can reach out to many teachers and inform teachers about new pedagogies within a short period of time and with a high fidelity of information. The approach of training through short courses and workshops is efficiency driven, and seems to be suitable for information acquisition and the learning of procedural skills. However, research has shown that this approach is not always effective and rarely leads to changes in classroom practice (Hargreaves & Fullan, 2000). The strong central control of this mode of professional development stems from the need for standardization and could possibly result in a reduction of teacher professionalism and the diversity of experiences of teachers, students and school needs (Kennedy, 2005).

While Kennedy's view may be challenged by those who argue that fidelity and efficiency of educational change are crucial, it remains necessary to keep in mind the adverse consequences pointed out by Kennedy.

Further, it is difficult to establish the cause-and-effect relationship between inputs delivered at a course and subsequent changes in teachers' practices (Nicol & Turner-Bisset, 2006). The justification for taking teachers away from their school and attending an in-service professional development course run by an external agency or curriculum developer is often weak, as there is little evidence of teacher change as a result of attending in-service courses. Despite all the limitations, this form of continuing professional development is still universally recognized and often forms the dominant form of continuing professional development for teachers, because it is recognized as a form of planned and formal continuing professional development that can be officially documented.

Moving along the continuum from the transmission model to the transformative model of teacher professional development, we move into the realm of communities of professional practice. The theoretical framework of communities of practice was proposed by Lave and Wenger (1991), and studied by Wenger (1998), and Wenger, McDermott, and Snyder (2002). A community of practice (CoP) as defined by Wenger (1998) is a group of individuals sharing common ways of doing things, adopting and identifying with somewhat similar identities, and working with similar methods and tools. The key value proposition of a CoP in the professional development of teachers is that it empowers the teachers as agents of sustained self-directed professional development. The formation of CoPs is in contrast to the traditional approach of "training" teachers through short off-site courses or workshops as highlighted above. Participation in a CoP positions teachers to be inquirers into their own practices, and hence empowers them with the agency to change their practices.

Participating in a CoP is different from the traditional model of teacher professional development, as it does not view professional development as an isolated activity, but as an on-going collaborative effort in problem solving and improving practices within the school. These collaborative efforts have direct relevance for the individual and community, since participation within a community brings about ontological changes in learning (Lave & Wenger, 1991) and this degree of learning is directly proportional to the involvement of an individual within the community. Simply put, dynamic and expansive learning communities presuppose dynamic and expansive individuals; dynamic and expansive individuals presuppose dynamic and expansive learning communities (Lee & Roth, 2007). In a

CoP, learning is demand driven and learning is inextricably interwoven with doing -- the notion of practice. Brown, Collins, and Duguid (1989) argue that when a learner is motivated by an authentic demand of a situation, and if learning occurs in the same context, the contextual information may be implicitly or explicitly encoded as part of the knowledge gained. The contextual information is not ancillary to learning, but is an integral part of the knowledge. Decontextualized or defensive learning, which happens in many instances when attending mandatory courses in a training regime, leads to inert knowledge that is not applicable in a real world context; nor is it found to be personally meaningful. In short, participating in a CoP can be seen as an ideal continuous professional development process where: (1) participants are their own agents of learning and expansion of possibilities; (2) learning is demand driven and timely; (3) learning is contextualized and mindful of larger settings or structures; and (4) learning occurs through social collaboration with others at various levels of competency.

Contrary to the popular belief that learning is an acquisition and knowledge is a commodity, we argue for the need to view teacher learning as an on-going process of making sense of current practices and refining the practices as new situations arise (Engestrom, 2001). Moving away from the common understanding that learning consists of placing all the necessary content into the brains of the teachers, what is of value here is to document and understand the complex processes which teachers go through as they learn within the context of the school (as opposed to being taken away from the school), as well as how they can develop professionally by assimilating educational innovations into their teaching practices. Hence, for teacher professional development to occur, teachers need to take center stage for their own learning and not be marginalized as characters with things “done” to them. In this respect, teachers are given more autonomy to transform their practices, and they can do this through individual action research, personal reflection on their practices, contributing to different communities of practice as highlighted above, and mentoring or coaching activities.

2.2 Professional Knowledge of Teachers

In teacher professional development, it is important to note the different kinds of knowledge that teachers need to possess in order to improve their practices. For example, science teachers need to: (1) have current knowledge of the subject matter; (2) have the skills to carry out experiments in the science laboratory; (3) make decisions about the most effective strategies for imparting the subject matter to students (similar to having pedagogical content knowledge); and (4) have a clear understanding of their

students and how they learn best. Further, teachers also need to have knowledge of the science curriculum and its intended outcomes, the assessment modes that students experience, and the norms and expectations of learning within the school system.

This vast amount of knowledge that teachers need to possess for their professional practice is constantly changing; hence, it is essential to keep professional development up to date. Cochran-Smith and Lytle (1999) propose a systematic framework for examining the knowledge that teachers can acquire and be involved in for their professional development within a learning community. They suggest three essential types of knowledge within teacher learning communities: (1) knowledge-for-practice; (2) knowledge-in-practice; and (3) knowledge-of-practice. Knowledge-for-practice describes formal knowledge that is usually generated by university researchers for teachers to use to improve their classroom practices. Within a community of teachers, knowledge-for-practice is likely to include the ability to comprehend the rationale behind choices of strategies chosen and the ability to understand the cognitive demands that are made on different groups of learners. Knowledge-for-practice is theoretically grounded and supported by evidence from research.

Knowledge-in-practice is defined as practical knowledge. Among teachers, knowledge-in-practice describes how teachers make decisions in the classroom and how they go about crafting learning experiences with their students. Decisions made in the classroom include deciding when to move from teaching one concept to another; when to discipline a disruptive child; and how to assess student learning. It describes knowledge of teaching that is accumulated and developed as teachers are exposed to direct classroom interactions. As such, we argue that experienced teachers possess more knowledge-in-practice when compared with a beginning teacher. Knowledge-in-practice, while largely tacit, often directly guides and shapes pedagogical decision making. The importance of knowledge-in-practice in the professional development of a teacher is much diminished if teachers do not have the means and language skills to make this tacit knowledge explicit. As such, systems should exist to harness this form of knowledge for discussion and professional development.

Knowledge-of-practice is the least common type of knowledge among teachers, but it is likely to be the most important and meaningful. Knowledge-of-practice is defined as knowledge that teachers generate from their own practices when they work within inquiry communities to theorize their own practices. As such, this form of knowledge incorporates elements of knowledge-for-practice as well as knowledge-in-practice. To generate knowledge-

of-practice, teachers can work together in teams to reflect upon their practices, collect evidence from their own classrooms, and then make evidence-informed decisions when they are make changes in their teaching.

3 Conceptualizing a Sustainable Model for Continuing Professional Development

3.1 Current Situation

The National Institute of Education (NIE) is the sole teacher education institution in Singapore and works in close partnership with the Singapore Ministry of Education. Teachers at all government and some independent schools must receive teacher certification from the institute before they are allowed to teach. Similar to institutes of education elsewhere in the world, NIE offers comprehensive education programs for pre-service teachers. To complement the pre-service program, an array of in-service courses is offered to practicing teachers. These in-service courses range from one-day workshops, to 30-hour courses which stretch over 10 weeks, to more advanced and long-term courses that can last up to three years. Some of the courses offered lead to formal accreditation such as an advanced diploma or a master's degree in a specific discipline, while others merely award certificates of participation. All practicing teachers in Singapore are entitled to 100 hours of professional development time each year (Ministry of Education, 1999). This is the government's commitment to grooming a quality teaching force for the country. With this privilege, teachers examine their personal development needs, and in consultation with the school decide which courses they will attend each academic year.

The current role which the NIE plays in the continuing professional development of teachers works predominantly on a training model and largely fulfills the purpose of transmitting new subject matter and communicating changes in curricular reforms. The Ministry of Education identifies the training needs of teachers and suggestions are made to the NIE for in-service courses to be offered. For example, in the latest curriculum reforms in science, inquiry-based science learning (Curriculum, Planning and Development Division [CPDD], 2007) is being emphasized. As such, upon request by the Ministry of Education, an in-service course on using inquiry-based methods in science teaching and learning was developed and offered to interested teachers. This method of initiating change in teachers is efficient; systematic; adheres to the original intention of curriculum reforms; reaches out to many teachers in the shortest possible amount of time; and allows teachers to track their own training. However, this method has its limitations. Research carried out in schools

after the curriculum review found tensions and conflicts about teachers' ideas with regard to what constitutes science as inquiry (Kim, Tan, & Talaue, in press; Tan & Wong, 2012). Further, teacher autonomy, the impact of a course on school practices, and the transformation of teachers' practices are issues that are not addressed when courses are developed and taught. This popular training model requires materials to be transmitted from an "expert" (usually a faculty member at NIE) to the teachers, and this seemingly downgraded the teacher's role to that of passive learner (Kennedy, 2005). The standardized curriculum offered by these in-service courses failed to take into consideration the needs of individual teachers and the varied contexts in which they teach. Teachers' knowledge (tacit knowledge-in-practice) is usually not given a privileged position in these courses.

Until recently, in-service courses have been the predominant mode of professional development for teachers, and the NIE contributed by offering expert knowledge in the form of formal knowledge-for-practice to teachers. Learning circles and communities of practice have been introduced in many schools, but have not gained popularity and recognition similar to that of in-service courses. We hypothesize that the lack of systematic tracking and a means to measure the tangible outcomes of learning circles and communities of practices make them less attractive, both for the teachers as well as for policy makers. This is also a problem reported by Fraser, Kennedy, Reid, and McKinney (2007), who found that the lack of sustainability of these modes of professional development and the lack of knowledge of how these forms of professional development should work result in reduced adoption of this forms of professional development.

In an effort to help teachers move towards more reflective and evidence-informed practices, action research was formally introduced to 40 schools in Singapore in 2007 as a pilot project. The partnership between schools and the NIE in ongoing action research is being negotiated and investigated. In such a partnership across two different institutions, the issues of accountability, sustainability, knowledge ownership and logistical issues need to be addressed before a sustainable and collegiate working partnership can be established. Currently, the role that the NIE plays in supporting teachers to carry out action research in schools is to provide advice to the schools on the process of action research. As such, schools offer ideas from their practice perspective, while the NIE provides the theoretical domain. It is not evident how the theory helps to improve the practice or gets understood and assimilated by teachers. Similarly, there is little indication as to how researchers from the NIE use the practical knowledge offered by teachers to refine or theorize their practices.

Preliminary reports of action research in schools have shown that teachers welcome this form of professional development but more systematic planning needs to be done to ensure that such a partnership will be beneficial to all the parties involved.

Figure 1 summarizes the roles and power of the three parties typically involved in the professional development of teachers. At a glance, it appears that teachers in schools are recipients of policy changes and professional development courses from different institutions. The voices of teachers with regard to professional development are relatively quiet when compared with the Ministry of Education and the NIE. This raises the issue of increasing teacher agency in matters relating to their professional development. A partnership between the NIE and teachers can be established to enable teachers to systematically analyze and capture their valuable knowledge-in-practice and transform it into knowledge-of-practice so that they can progressively talk about and improve their practices in a methodical and critical manner. In the next section, we propose a framework for forging partnerships between teachers and the NIE, a framework which places the teacher (rather than the program) at the core of professional development activities.

3.2 Proposed Partnership for Professional Development

In this section, we explore the possibility of positioning the teacher at the heart of professional development between schools and the NIE. We argue that this will

enable teachers' ideas to be better understood and fulfilling teachers' needs have direct impact on the success of any educational programs. All educational change requires teachers to understand the change, negotiate the change in light of their personal experiences and practices and to change their practices to meet the requirements of the educational change (Lefstein, 2008). As such, we argue for a professional development pathway that aims to understand the current teachers' knowledge-in-practice and have it as the starting point for change. The essential feature for such a model is the participation of teachers as partners in the change process, rather than the teachers merely playing the role of implementers in the change process. As partners in innovation, teachers will engage in dialogue with educators from the NIE, creating a space for teachers' knowledge-in-practice to be amalgamated with educators' knowledge-for-practice. We hypothesize that this is likely to create knowledge-of-practice that is meaningful to both teachers as well as educators. Such a model is likely to succeed, since it creates a space for teachers' existing knowledge as a springboard for improving practice. Teachers hence become agents for changing their own practices.

In this section, we illustrate the possibility of such a framework using science education reform as an example. The Singapore science education curriculum underwent a curricular review in 2008, resulting in renewed emphasis on science as inquiry (CPDD, 2007). For teachers to change their ways of teaching science from one that is largely teacher-centric in nature to one which is more process- and

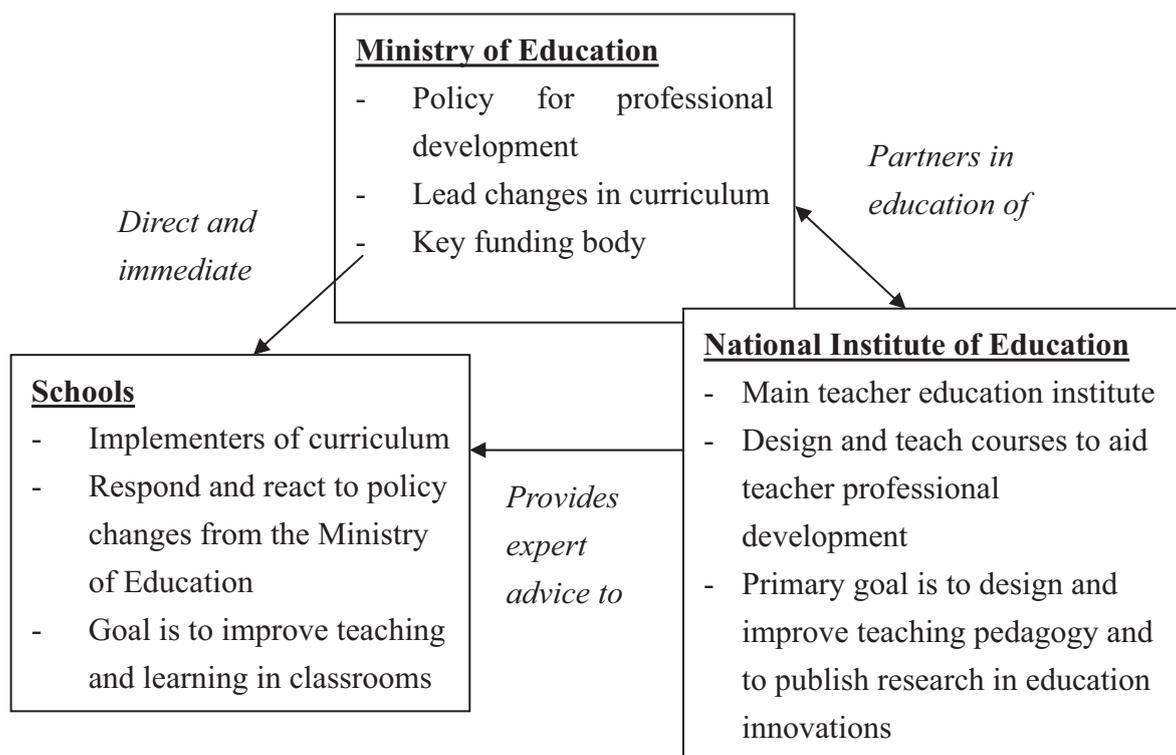


Figure 1 Current Tripartite Relationship for Teacher Professional Development in Singapore

student-centric requires both a change of mindset as well as professional development. Teachers report difficulties in understanding how science as inquiry looks like in the classroom and the types of student-teacher interaction that will constitute science as inquiry (Kim et al., in press). Their existing knowledge-in-practice of science teaching is one where teachers maintain tight control over the content as well as the pace at which learning takes place. This is done largely to ensure that they fulfill their institutional responsibilities in ensuring that students are well prepared for national placement examinations. However, the knowledge-for-practice provided by educators from the NIE and the new science curriculum encourage teachers to facilitate (rather than transmit) science learning in the inquiry process and to give students opportunities to explore science and be exposed to communication and argumentation in science. There exist some tensions between the knowledge-for-practice as advocated by science educators and policy makers and the teachers' knowledge-in-practice. As such, even though science teachers attended the professional development courses offered by the NIE and Ministry of Education (MOE), the implementation of science as inquiry in the classroom remains varied (Kim et al., in press). We argue that the limitations of these in-service professional development courses lie in the fact that their objective is one of mass communication of reform ideas (largely knowledge-for-practice) and that teachers knowledge-in-practice is usually not taken into consideration. As such, teachers find it difficult to reconcile their existing practices with those which the new reforms advocate.

In an earlier study carried out with 25 science teachers in Singapore, it was found that teachers view the formation and being involved in learning groups as impactful on their teaching, although they express less accessibility to a learning group as compared with in-service courses (Tan, 2008). Building on this information and also on the current difficulties faced by teachers in the implementation of science as inquiry, we propose a professional development framework that disperses the dominant power relationship between the parties involved in professional development (as highlighted in Figure 1). Instead, teachers are partners in the change process and there is an interdependent relationship between the NIE and teachers such that the professional development of teachers is a result of collaboration between NIE educators and teachers. This collaboration involves NIE educators bringing their expertise of knowledge-for-practice (such as characteristics of science as practice as described in curricular documents, frameworks for developing students' skills in science argumentations, etc.) in science education and dialoguing with teachers about the meaning and usefulness of

these ideas. Teachers will then try to understand their knowledge-in-practice from the lenses of the theoretical ideas presented, and then critique areas of limitations. The NIE educators and teachers will also form a community to collect evidence and explore ways of improving science practices in the classroom. Figure 2 summarizes the proposed model of professional development for science teachers.

The three key modifications suggested here are: (1) enhancing in-service courses to ignite change; (2) providing a platform for dialogue and sharing of different forms of knowledge; and (3) the formation of CoPs to share expertise to facilitate teacher-led inquiry. The triangles are the key players in the professional development process; the circles indicate the activities; and the squares reflect the outcomes or state of being after each professional development activity. In the next three paragraphs we describe how each of these modifications is useful in enhancing teacher professional development.

3.3 Enhancing In-service Courses

While we recognize the limitations of the traditional transmission model of professional development through in-service courses, we also recognize the potential that it has in infusing expert knowledge in science and science pedagogies into the practitioner community. Here we propose that in-service courses that are conducted by the NIE can serve as a starting point for new ideas and for the formation of communities of practice. For example, when primary science teachers attend an in-service course on inquiry based science teaching, instead of each teacher going back to their respective schools and engaging in isolated practice when the course ends, the course instructors from the NIE can facilitate the formation of these communities of practice by following up, over a fixed period of time, how teachers integrate the ideas that they have learned. Alternatively, an on-line discussion forum can be set up where teachers in the course can share their experiences of implementing the ideas from the course. Face-to-face sharing sessions can also be organized as part of the course, months after the course, for teachers to share how their practices have changed and new insights that they have obtained. As such, the in-service courses serves as a primer not only to transmit new content, policies, and ideas, but also as a means to allow teachers to meet like-minded individuals and to assimilate what they have learned in the courses into their own practices. The NIE can provide the expertise to conduct the courses, and also facilitate discussions, sharing sessions and even on-line forums. In this way, the in-service course serves as the first point for "renegotiation of professional meaning" (Fraser et al., 2007, p. 166).

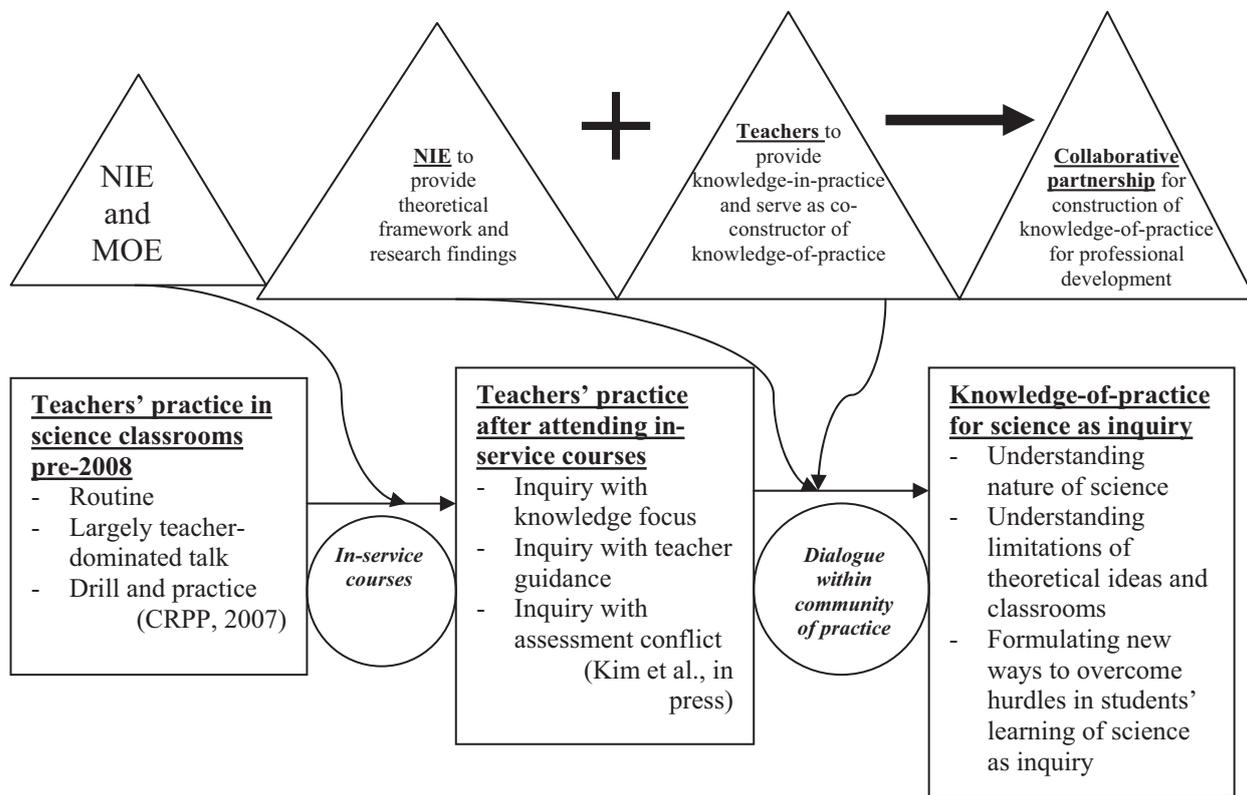


Figure 2 Proposed Framework and Roles for Sustainable Professional Development

3.4 Primer for the Formation of Communities of Practice

As described above, while providing in-service courses, the NIE, can serve as an incubator for new ideas within communities of teachers who share common practices. The formation of communities of practice that stems from common experiences allows for self-directed learning that can be seen as a continuity and coherence of what the teachers have learnt in the in-service course, as highlighted by Wenger (1998). The teachers can form themselves into a group of individuals sharing common ways of doing things and working with similar methods and tools. The formation of these learning communities should originate from within the practitioner, rather than being initiated from an expert outside the community. This would ensure sustainability of the efforts (see Loughran & Gunstone, 1997).

As individuals, teachers also belong to different communities of practice, hence cross fertilization of ideas becomes possible. Besides gaining ideas and developing in their professional practice, the interactions in which teachers are engaged allow the social domain of teacher development to be taken care of. Involvement in communities of practice allows for teachers to develop the discourses (Gee, 2005) that will enable them to identify what is acceptable within the community. The role of the NIE in this is to provide the platform for the formation of these communities of practice so that they can further develop into self-sustaining communities.

3.5 Sharing Expertise for Teacher-Led Inquiry

Teacher-led inquiry takes the form of action research or lesson studies and is a means to make professional development more transformative in nature (Kennedy, 2005); it also gives teachers' knowledge-in-practice a privileged position. However, teacher-led inquiry based completely on practitioners' knowledge has its limitations. As such, as can be seen in Figure 2, we propose that the learning space for teacher-led inquiry needs to take place within a community of practice where different areas of expertise and kinds of knowledge exist. The expertise to facilitate teacher-led inquiry can come from both the teachers as well as experts from the NIE. In this way, a dialectical relationship between practitioners' knowledge and theoretical knowledge exist, and this can enhance the sense-making and innovation process in science education for both practitioners and researchers alike.

In-service courses can also present ideas for teacher-led inquiry into different science-teaching pedagogies. For example, if a teacher, after attending the inquiry-based in-service course on science teaching, decides to examine the impact of the strategy of "predict-observe-explain" (POE) on her students, she can collaboratively design a study with the researcher from the NIE. Data collection and data analysis can be done in consultation with the NIE and findings can be discussed with other teachers who are working on similar strategies through participation in the community of practice.

4 Concluding Remarks

Continuing professional development in any domain is an expensive and complex enterprise. While the teachers' professional development role is often justified as instrumental for educational reforms and its potential is bountiful, it is necessary to cast a critical eye to examine the roles each of the different parties involved in professional development play in ensuring the coherence and relevance of science teachers' professional development. The proposed framework for the role of the NIE as a teacher education institution is not without concerns. There are areas which need to be addressed, either through research or policy change, to ensure the successful implementation of the proposed framework. Honig (2006) pointed out that administrators need to ensure that planning and implementation of new policies and initiatives are examined, and that issues like people, places and policies need to be carefully considered. In presenting this proposed framework for the role which the NIE will play in the continuing professional development of science teachers, several issues need to be addressed. These issues include: (1) sufficient manpower (experts) who are hired by the teacher education institution (NIE) but who are actively working with teachers in schools; (2) sufficient experts with authentic experience in schools; (3) balancing the systematic tracking and evaluation of the impact of action research with the obsession of producing an action research report for accountability purposes; (4) the balance between the collective good of the school as opposed the individual teachers' aspirations in participating in continuing professional development; (5) sufficient time and cost for extensive and prolonged professional development; and (6) formal accreditation for teachers. Unique to science education would also be the concern of how scientists who have little or no pedagogical training communicate their knowledge to teachers and distill their knowledge into a form which is suitable for school science.

The purpose of this paper is to present a proposed framework on how the sole teacher education institution in Singapore can contribute to continuing professional development of science teachers. As illustrated above, continuing professional development is a complex issue which includes different parties with different agendas. While there are different models of continuing professional development, we have presented here a model designed to work in a context of strong central control, but one which also encourages individual innovations in professional development. Though this proposed model has yet to be tested, the ideas presented in this paper could perhaps stimulate conversations between researchers working on university-school partnerships and teacher education

practitioners as they embark on reinventing themselves for the 21st century. The ideas presented in this paper can also serve as an agenda for further research in the area of continuing teacher education.

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Going International: Double/Joint Degree Programs in a Taiwanese University

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Abstract

In their pursuit of international competitiveness and reputation, many universities have been internationalizing their campuses through a wide range of initiatives. One popular cooperative platform is double/joint degree programs (DJDP), where providers in different countries collaborate to offer a program. Despite the increased popularity of such programs, few studies have concentrated on them in relation to internationalization. In this wider context the current article used a case study approach to examine DJDP at a private university in Taiwan. In addition to better understanding how these programs are run, some critical issues and challenges emerged, including student mobility, program design, quality assurance and academic alignment, language use and domination, organizational restructuring, professional capacity enhancement, and employment. These discussions deepen existing knowledge about DJDP.

Keywords: internationalization, higher education, double/joint degree

1 Introduction

When people begin to classify the different types of internationalization in higher education, numerous approaches can be used. Knight (2008a), who proposed one often used typology, regarded internationalization as a kind of cross-border educational activity that included four categories of mobility: people, programs, providers, and projects. The most common form of internationalization is related to the mobility of students, scholars, researchers, experts, and consultants. The mobility of programs usually refers to a situation in which a partnership arrangement between international and domestic providers is reached to provide courses for local or other countries' students. A new trend has emerged among educational providers in different locations at the national level -- namely, branch campuses and virtual universities, which have grown significantly since the 1990s in line with the intensification of globalization. In addition, a wide range of research

projects, curriculum, technical assistance programs, and educational services transcend the national jurisdiction and are provided as forms of development aid, academic linkages, and commercial trade.

The increasing popularity of mobility in people, programs, providers, and projects highlights the growing importance of internationalization in higher education. Compared to people and provider mobility, program mobility more commonly retains the advantages of relatively low costs with high customer orientation. Many universities regard program mobility as an effective instrument for greater internationalization. A large majority of both U.S. institutions and EU institutions (more than 85%) plan to develop more joint and double degrees in the future (Kuder & Obst, 2009). The key motivations for launching joint and double degree programs appear to revolve largely around advancing the internationalization of the campus and raising the institution's international visibility and prestige (Kuder & Obst, 2009). However, an in-depth examination of the program mobility indicates that various forms of cooperation are involved with similar or overlapping connotations.

Most studies on internationalization of higher education have focused on national policies, student movements, and intercultural learning and teaching. Very limited empirical literature exists on dual/joint degree programs (DJDP) despite their growing importance around the globe. The current study aims to address this literature gap by examining the DJDP at a private university in Taiwan. The selection of this non-elite institution, referred to herein as M University, can reflect typical responses of universities in Taiwan. In addition to better understanding how M University employs DJDP to internationalize its campus, some critical issues and challenges emerge during the investigation, including student mobility, program design, quality assurance and academic alignment, language use and domination, organizational restructuring, professional capacity enhancement, and employment.

This article is divided into the following sections. First, we conduct a literature review on program mobility in general and DJDP in particular. Second, we discuss the national context for internationalization policies

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and regulations, with special reference to DJDP. This is followed by a brief section on research design and methods. The fourth part of this article centers on the institutional profile of M University, detailing its commitment to internationalization. We then depict the overall picture of DJDP at this investigated university. Finally, we focus on the emerging issues and challenges drawn from the empirical data of document analyses and interviews.

2 Internationalized Higher Education: The Mobility of Degree Programs

Knight (2008a) proposed six types of program mobility at the international level: franchise, twinning, double/joint degree, articulation, validation, and virtual/distance. In the current article, we devote our attention to twinning, double/joint degree, and articulation, which are conceptually intertwined and related, in order to provide some clarity on the meaning and key issues involved (Knight, 2008b). In addition to the virtual/distance program aspects, other types of program mobility involve some sort of cooperation between foreign and local providers/institutions. In the case of franchises, foreign providers authorize a local collaborator, as a protector of quality assurance, to run the course/program/service and award the qualifications. As such, local collaborators only copy and implement the program exactly without having the right to provide academic credentials. The main essence of twinning refers to developing an articulation system by allowing students to take course credits at both foreign and local institutions. However, only one qualification is awarded by the initiator, implying that all arrangements for this twinning program usually comply with the national regulation of the initiator. In fact, this definition is similar to another type of program mobility: articulation. Under the framework of articulation, quite flexible measures and mechanisms can be designed among all participating institutions while enabling students to gain credits from all collaborators. Therefore, it seems that articulation, by definition, is broader and more flexible and can cover the meaning of twinning.

Double/Joint degree program have proved very popular, yet problematic in terms of how the course/program/service is provided. In general, double/joint degree program indicate that two institutions collaborate to offer a program for which a student can receive two degrees respectively from each institution or a joint qualification from all participating providers. In practice, such collaborative courses or programs can be run jointly or separately, resulting in different implications. When the program is organized by much joint effort in course design, forms of faculty involvement, mutual credit recognition, quality assurance and marketing, this collaboration can create

organic, systemic, and productive learning experiences for students. However, when the double/joint degree program is loosely established, the most extreme outcome may become rough articulation due to the fact that students simply study abroad and earn credits at foreign collaborators in order to receive their qualifications. Therefore, the degree of integration among collaborative partners in double/joint degree programs is decisive and has a profound impact upon the students' learning experiences and outcomes.

Furthermore, although these courses and programs seem to be internationally mobile in relation to national jurisdiction, many students usually need to physically move to another country to earn the credits. This highlights the fact that double/joint degree programs available to students are still largely confined within the national boundaries in terms of physical form, requiring extra cost or payment from students for this benefit. Nevertheless, considering the differentiated meanings and complicated forms of these different types of program mobility, the term *double/joint degree program* (DJDP) will be used throughout this article to cover the majority of transnational cooperative degree programs and will be applied to the Taiwanese context in general and to the case study university, M University, in particular.

Among the major regions, Europe is by far the most active in developing DJDPs, thanks to the European Commission's (EC) funding programs (Erasmus Mundus Programs, 2004-2008), followed by Asia and the U.S. (Knight, 2008b). The fundamental principle of the Erasmus Programs initiated by the EC lie in the spirit of encouraging student mobility within Europe in an attempt to broaden students' regional and international perspectives and strengthen the European identity for the next generation through double/joint degree courses. Student enrolled in such programs are required to take courses from at least two participating universities to undertake such transnational learning experience. In a transatlantic survey reported by Kuder and Obst (2009), among the 180 higher education institutions surveyed, only 13% of American institutions and 26% of European institutions offer joint degrees; the figures increase to 68% and 76%, respectively, for double degrees. Thus, double degrees are more common than joint degrees. A large majority of both American institutions (87%) and European ones (85%) plan to continue to offer more joint and double degrees (Kuder & Obst, 2009). These survey results provide direct evidence of the continuous growth and popularity of double degrees among universities. The EU respondents' major partners for double/joint degrees come from the U.S. or other European counterparts, such as France, Spain, Germany, and the U.K. American respondents' collaborators mainly originate from the EU, such as Germany, France, and Spain, and Asia,

such as China and South Korea. A strong connection exists between EU countries and the U.S. in establishing these cooperative programs. However, among those established joint programs, European and American universities are favored by their Asian counterparts, including Taiwan. This tendency indicates that Asian countries are inclined to choose advanced and industrialized countries for partnership.

The strong demand for establishing DJDPs across the globe results in benefits for participants. Based on his field experience at Georgetown University, Stearns (2009) summarized the twofold benefits for such joint ventures. Cooperative partners can integrate valuable faculty from both sides and provide better teaching fellows for students. Furthermore, implicit knowledge, such as operational culture, students' learning styles and attitudes, and marketing strategies can be easily transferred to partner institutions to better promote the program in the local market. For some natural sciences and engineering programs, double/joint degree programs can share expensive equipment and instruments and integrate physical resources so as to reduce operational costs. Individual students' primary benefits come from the presumed effects of earning two/joint degrees, acquiring international credentials, having access to expanded teaching faculty, and developing a better understanding of local knowledge for employment.

Building on similar experiences in North Carolina State University, Li (2010) explained why his university develops dual degree programs with foreign universities: to develop a "strategic approach for international collaboration in higher education" and "enhanced learning experiences and global competence" for students. He believed that such joint initiatives can build strong and long-lasting partnerships with foreign institutions, promote curriculum integration with global perspectives, and engage faculty in global exchanges and scholarship. In light of enhanced learning experiences, DJDP is able to produce more degree-seeking students than typical exchange programs, enhance academic learning with global content and competence, increase cross-cultural and international understanding, and improve students' employability in the globalized economy. For example, the University of Hong Kong's cooperation with Oxford University and Cambridge in the senior executive program shows that their courses are composed of intensive 5-day workshops using interactive lectures, case analyses, discussions, and group work by incorporating expertise both from the U.K. and Hong Kong (Fong & Postiglione, 2011). Such course design to some extent seems to be consistent with the expected benefits Li (2010) proposed.

Although international DJDPs have been rapidly expanding in recent years (Kuder & Obst, 2009), little academic literature has analyzed such initiatives, particularly in Asia. Two articles have dealt with cooperative cases from China and Russia as well as Hong Kong's collaboration with its counterparts in the U.S. and the U.K. Uroda (2010) examined the development of two sets of partnerships developed by four higher education institutions in Harbin, China, and Vladivostok, Russia. These were not traditional elite universities located in the big cities; indeed, one of the participating institutions does not bear the title of university. In these two cases, the Chinese institutions were more active, and both pairs of institutions focused their programs primarily on Chinese students. In one partnership, the flow of students is one way only: China to Russia (Uroda, 2010). Instruction is carried out in Russian and Chinese, with specialties in information science, civil engineering, food technology, and economics. According to Uroda (2010), the success of the joint dual degree programs can be summarized as follows:

- (1) Strict central control imposed on the institutions' curricula
- (2) Mutual recognition of educational certificates and degrees signed in 1999
- (3) Legal status of students during their course of study and amount of time they are expected to reside in the host country
- (4) Use of Russian and Chinese as medium of instruction

In another case, Fong and Postiglione (2011) aptly pointed out that the main driver for the University of Hong Kong (HKU) to run joint degrees with prestigious universities is to enhance its global branding. Meanwhile, the foreign universities wished to tap into a new unmet market demand in the Asia-Pacific region in addition to generating additional revenues. HKU is able to learn from the high-quality faculty and curriculum provided by leading universities' business schools. In turn these cooperative initiatives can promote Hong Kong as a leading international center for the study of economics and business in Asia and serve the development needs of Hong Kong as an international financial center. Therefore, the construction of a cooperative relationship through double/joint degree programs can be strategic with long-term vision, which is not only beneficial to students and participating institutions, but also to local economic development and social prosperity.

Despite the many claimed benefits, implementing DJDPs actually faces a wide range of major challenges, ranging from national policies and regulations to institutional differences and extra administrative work at the personal level. Li (2010) concisely presented these points as follows:

- (1) Different higher education systems/regulations and accreditation requirements
- (2) Difficulty in coordinating academic requirements, credits, and quality assurance
- (3) Different tuition and cost structures between participating universities
- (4) Difficulties related to the legal review, approval process, and administrative supports
- (5) Heavy workload during preparation and set-up that often produces very few students

Faced with the varied legal and administrative requirements of academic standards and quality assurance procedures, participating institutions have to struggle with these diverse conditions and attempt to co-design mutually agreed-upon programs to meet the needs of all providers.

Some have question whether the final outcome of these DJDPs is worth such efforts. A survey aiming to examine strengths and weaknesses of a sample of programs at the graduate level in engineering produced mixed results (Culver, Puri, Spinelli, DePauw, & Dooley, 2012). According to the survey, all stakeholders were positive about these dual programs, but gains were indicated in personal dimensions (e.g., self-reliance) rather than professional ones. Even worse, employers were unclear about what dual degree programs were and did not tend to view graduates as more marketable. In other words, the advantages originating from dual degree programs are not related to the hard knowledge and skills learned transnationally, but instead to personality or individual attributes. In addition, there seems to be no relative market strength for graduates from such cross-border programs compared to domestic ones. These preliminary findings would constitute major challenges or barriers for international double degree programs in the long term.

3 National Context for Internationalization and Double/Joint Degree Programs

By analyzing the development of higher education in Taiwan during the past two decades, it becomes evident that decision makers and university leaders have paid less attention to the issue of internationalizing the higher education sector despite the numerous scholars trained by the Western system. It was not until the 21st century that Taiwan's government became aware of the internationalization of higher education in relation to the increasing international competition and national competitiveness (Song & Tai, 2007). In 2001, the *White Paper on Higher Education* formally pointed out that "the degree of internationalization is insufficient (Ministry of Education, Taiwan, 2001, p. 54)." The

Ministry of Education in Taiwan (MOE Taiwan) subsequently accelerated the implementation of relevant internationalization measures through efforts such as Enhancing International Competitiveness of University Plan and Improving English Proficiency of Higher Education Students in 2002. In addition to these two projects, recruiting international students become one of the main objectives while achieving internationalization. Increasing the number of foreign students in Taiwan was classified as a key component of the National Development Key Plan by the Premier of the Executive Yuan in 2004 (Wu, 2008). In an attempt to improve the effectiveness of recruiting non-local students, the Foundation for International Cooperation in Higher Education of Taiwan (FICHET) was established in 2006 in order to coordinate joint efforts between universities and governments and provide extra funds for setting up Taiwan's Education Center to act as a platform for providing information on studies in Taiwan.

The MOE Taiwan issued its *Study in Taiwan Enhancement Program* in 2011 and encouraged higher education institutions to recruit more students from Southeast Asia. Two major strategies were identified (Ministry of Education, Taiwan, 2011): (1) providing a friendly environment to international students, such as by offering full English courses, a supportive administration system, relaxed requirements for admission, and the ability to remain in Taiwan after graduation; and (2) marketing the advantages of studying in Taiwan, such as a single service window, memorandums of understanding (MOUs) signed with other governments, enhanced international visibility, and the promotion of Chinese learning. The underlying aim of such administrative assistance was to export the higher education industry to Southeast Asia so as to enhance international competitiveness, secure diplomatic relationships, and broaden local students' global outlook. Moreover, the newly elected President Ma Ying-Jeou announced in 2011 that he expects to build Taiwan into a key center of higher education in Southeast Asia. It is against this wider national context that transnational double degree programs become a primary indicator for assessing university internationalization. MOE Taiwan calculated the number of double degree programs as a countable measurement for determining the degree of internationalization for each university from 2002 to 2009. The direct link among internationalization, foreign student recruitment, and double degree programs can be found under this grand policy discourse at the national level.

However, the very concept of a double or joint degree in Taiwan has not been so clearly defined. Before 1998, the regulation entitled *Running Joint Degree Program between Domestic and Foreign Institution* aimed to help overseas Chinese students articulate their university education from

the third year or above in Taiwanese higher education institutions. Thus, the initial motivation mainly targeted Chinese students in Southeastern Asia, although the design of degree programs are articulation in essence rather than offering joint courses or even double degrees. Given the rapid development of IHE (Internationalization of higher education) in Taiwan, a wide range of universities wish to expand the scopes and sources of their incoming foreign students in the form of DJDPs. The original regulation, principally based on the needs of overseas Chinese students in Southeast Asia, was outdated and needed to be revised in order to meet the greater needs of diversified non-local students. Two former Ministers of Education in Taiwan, Professor Chao-Hsiang Yang and Professor Wei-Fan Kuo, have urged that a new cooperation model be established to set up double degree programs with foreign university. Thus, the old regulation was abolished in 2004.

The subsequent Article 29 of *The University Law* became the major baseline regulating international DJDPs. *Regulation Regarding the Assessment and Recognition of Foreign Academic Credentials for Institutions of Higher Education*, enacted as a result of Article 29, indicates that the enrollment periods at both local and foreign universities can be held concurrently for different degrees. At least 32 months of enrollment are required for a bachelor's degree while 12 months of enrollment are the minimum standards for a master's degree; 24 months of enrollment are required for doctoral degrees. In addition, course credits taken at either university shall be no less than one third of the total course credits. In other words, a local student seeking to earn two degrees from both universities has to complete at least one third of all course credits at both universities. International partners for DJDPs have to be universities accredited by the responsible authorities of their local governments or by foreign accreditation agencies and listed in the database of foreign universities coordinated by the MOE Taiwan. The requirements clearly state that quality assurance and official recognition are important considerations for choosing cooperative partners from the national policy perspective. However, the list of officially recognized foreign universities does not cover all countries, and only 41 universities in Mainland China have been recognized, which prevents Taiwanese universities from establishing cooperative programs with many Chinese institutions.

4 Research Design and Methods

A case study approach was used in this study to examine the DJDP at a private university. The focus of a case study is a case in its own right, taking its context into account (Robson, 2002). Stake (1995, p. xi) asserted that “a

case study is the study of the particularity and complexity of a single case, coming to understand its activity within important environment.” He did not emphasize the quantitative measurement by paying attention to “episodes of nuance, the sequentiality of happenings in context, the wholeness of the individual (p. xii).” Yin (2009) also indicated that a case study is an empirical inquiry that “investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (p. 18).”

The advantages of a case study allow us to include in-depth context analyses and holistic perspectives of an organization and its subunits to developed a deeper understanding of the dynamic relationship between the single case and its wider environment. The only case included in this current study is a private university in Taiwan. We explored how this university used double degree programs to purchase its own strategic mission and vision for greater internationalization. The focus of the investigation was the motivation, strategic positions, implementation strategies, difficulties, issues and challenges of the DJDP involved. In order to garner sufficient information to answer the identified questions, several data collection methods were used, including document analysis and semi-structured interviews. Materials collected for further analysis included promotion documents and flyers, meeting minutes, university regulation and guidelines, program documents, website information, the university's magazine, and *Newsweek*. Such documents contain abundant information and can provide relevant answers to the research questions.

Another major source of data was semi-structured interviews. The interviewees included two faculty members in administrative positions in charge of the double degree program, three full-time administrators responsible for running the double degree program, two academic faculty members teaching in the double degree programs, and five students (two are foreign) enrolled in the program. These 12 people were interviewed between February and early May 2012. Each interview lasted from 60 to 90 minutes. E-mails were also employed to communicate with students regarding their learning experiences in the international programs.

5 Institutional Profile: Commitment to Internationalization

This private university, called M University, was established in 1957 as a junior college. It is located in Taipei city. The mission of the institution, as detailed on its website, is to serve as a teaching-intensive university

supplemented by research in order to be an internationalized comprehensive institution. This mission statement demonstrates that it is not a traditional elite university, but rather is still in pursuit of international development and global outreach. Indeed, the seed of internationalization was deeply rooted in the belief of the institution's founder, who actively participated in unofficial diplomacy, international academic exchanges, cultural interactions, and women's soccer on the global stage. These pioneering activities in the early stages illustrate the fundamental characteristics of this internationally oriented organization. Along with advances in globalization and liberalization, M University realized that everyone has to engage this global village and immerse him-/herself into this new world economic and social network. From the perspective of the labor market, students should not be confined to the domestic vacancies but rather utilize their capacities on the global stage. Due to the worldwide competition for individual career and mobility, M University intends to educate students with international vision and outlook in a combination of theory and practice, helping them acquire better positions in the global labor market.

Against this wider institutional recognition and perception, M University pays special attention to strengthening international education. In line with this grand idea, recruiting international students and providing English courses have become essential measures in promoting educational exchanges and cooperation with foreign universities in the form of sister universities. Other relevant initiatives that M University is undertaking include hosting academic conferences, offering study abroad, hosting exchange students, and promoting academic and cultural exchanges. In order to provide institutional support, several administrative and academic units have been created to assist in the development of greater internationalization and double degree programs in particular. The International Education and Exchange Division was set up in 2001 with the function of handling relevant administrative affairs while the Office of International Student Service, established in 2002, aims to provide consultancy, discipline, visas, and health assurance. In order to enhance the capacity of providing courses and training fully taught in English, the International College (IC) -- with seven undergraduate programs and one graduate program¹ -- was created in 2004 and began to admit both local and foreign students. The double degree program students who participated in this study were enrolled in this college.

¹ These programs include applied computing program, travel and tourism program, international affairs and diplomacy program, international business and management program, journalism and mass communication program, international trade and management program, department of finance, and Graduate School of International Affairs.

Thanks to such efforts, the number of international students has gradually increased to 579 by 2011, making it the third largest in Taiwan after National Chengchi University and National Taiwan University. In addition, with the governmental funding support, M University established Taiwan Education Centers in Mongolia and South Korea to export its educational industry, offering Chinese courses and recruiting other countries' students. These two centers are effective administrative units for fostering greater internationalization for M University. In fact, in order to better comply with international standards, M University has consistently sought accreditation by an American higher education accreditation body since 2006, ultimately succeeding in 2010 when it was officially recognized by the Middle States Commission on Higher Education (MSCHE) in the U.S. After being officially accredited, the current president even declared they want to be an "American University in Asia" with the hopes of becoming an internationalized university (Lee, 2007, p. 201).

6 Double/Joint Degree Program as a Means of Internationalization

The establishment of double degree programs with foreign universities has been primarily inspired by the needs of greater internationalization, providing more study choices for domestic students and recruiting more foreign students (Interviewees 1, 2 & 5). However, available information reveals that earlier DJDPs at M University concentrated on Malaysian universities since 2001 (Ministry of Education, Taiwan, 2011) because these programs are customized for overseas Chinese students in Malaysia for their further study in Taiwan. These students transfer or articulate their studies to M University and do not finish their degree at the sending university in Malaysia. In other words, this double/joint degree arrangement usually does not result in two degrees for Malaysian students. Nevertheless, M University still retains a strong desire to internationalize its campus through DJDPs with other countries.

Since 2004, it has sought to diversify cooperative partners. This diversification approach is not just attempts to provide more mobile destinations for local students, but also expand international linkages at the institutional level (Interviewees 1 & 2). The interviewees in charge of DJDP believe that local students can benefit from cooperative programs as a consequence of receiving better teaching quality, expanded global outlook, and employment prospects in both countries. These beliefs inspire this university to take an active view in expanding such programs. Table 1 illustrates the rapid progress made

Table 1 Double/Joint Degree Programs with Foreign Universities until 2010

Date of Signing	Country	Institutions	Agreement
Oct. 19, 2001	Malaysia	Hanxing Academy of Journalism and Communication	Joint Degree Cooperation Agreement
Nov. 1, 2001	Malaysia	Han Chiang College	Joint Degree Cooperation Agreement
Dec. 31, 2001	Malaysia	Southern College	Joint Degree Cooperation Agreement
Jan. 15, 2002	Malaysia	Central Academy Art College	Joint Degree Cooperation Agreement
Feb. 1, 2002	Malaysia	Baruvi Academy of Communication	Joint Degree Cooperation Agreement
June 13, 2002	Malaysia	New Era College	Joint Degree Cooperation Agreement
Sept. 12, 2003	Malaysia	In-House Multimedia Academy	Joint Degree Cooperation Agreement
May 15, 2004	U.S.A.	Saginaw Valley State University	Statement of Articulation Principles
Sept. 1, 2004	U.K.	Northumbria University	Articulation Agreement for Advanced Entry
Sept. 26, 2006	U.S.A.	Park University	Interim International Academic Agreement
Sept. 29, 2006	Vietnam	Vietnam National University	Cooperation Agreement of Joint-Degree Program
May 23, 2007	U.K.	University of Bedfordshire	Dual Degree
June 1, 2007	Malaysia	Malaysian Institute of Art	Joint Degree Agreement
July 25, 2007	Mongolia	Otgontenger University	Joint Degree
Nov. 14, 2007	Vietnam	Hanoi University of Business and Technology	Cooperation Agreement on Joint-Degree Program
Jan. 25, 2008	South Korea	Suwon Science College	Cooperation Agreement on Joint-Degree Program
April 21, 2008	U.K.	Northumbria University	Articulation Agreement
Aug. 13, 2008	Vietnam	Foreign Trade University-Vietnam	Application for Joint-Training Program License
March 26, 2009	Latvia	School of Business Administration Turiba	Agreement for Realisation of Double Degree Programme
April 23, 2009	Malaysia	New Era College	Renewed agreement
April 23, 2009	Malaysia	Dasein Academy of Art	MOA Joint Degree
April 1, 2010	Vietnam	Dai Nam University	Cooperation Agreement on Joint-Degree Program
May 3, 2010	South Korea	Suwon Science College	Cooperation Agreement of Joint-Degree Program (renewed)
May 5, 2010	Vietnam	Hanoi University of Business and Technology	Cooperation Agreement on Joint-Degree Program (renewed)
June 14, 2010	Mongolia	Global Leadership University	Cooperation Agreement on Joint-Degree Program

Source: Ministry of Education, Taiwan (2011).

over the past decade. The countries included are the U.S., the U.K., Vietnam, Malaysia, Mongolia and South Korea, concentrating on English-speaking countries and Asian neighbors. Alumni of American and British universities at M University play major roles in helping to negotiate such programs in the early stages of collaboration while other DJDPs have evolved from solid cooperative relationships, such as sister universities. Moreover, the Taiwan Education Centers set up by M University in South Korea and Mongolia have also provided an effective platform for establishing DJDPs in the long term.

Among these programs, most are referred to as “joint” degrees while very few are called “double” or “articulation.” These titles of agreement seem to indicate

that “joint” is a more common arrangement in Taiwan. However, a deeper examination into these agreements reveals that “articulation” is only used with universities in the U.S. and the U.K. because students at M University wish to be transferred to these English-speaking countries for articulation. Interviewee 1 clearly expressed that this is a “one-way street,” with only out flowing students and no inflowing ones from these Western universities. Despite having signed so many programs, some are more active while others are dormant due to the lack of student participation. Some programs are not as popular among domestic students and thus lack stable student sources. The interviewees also indicated that undergraduate programs are more feasible than postgraduate ones. The major difficulties

faced by postgraduate students are time constraints and academic issues. Earning two degrees within two years requires two quality dissertations, including one in English (Interviewees 2, 3, 11 & 12). These would pose significant challenges to Taiwanese students. In contrast, there are a range variety of undergraduate double/joint programs with different combinations, such as 3 + 1 and 2 + 2. The former requires students to study in Taiwan for 3 years and spend their final year at foreign universities while the latter divides students' time into half at both campuses. Even with sufficient time to adapt to the European and American learning environments, students still suffer from problems of languages, curriculum articulation and recognition, and academic capacity, which will be discussed in greater detail in subsequent sections of this paper. When asked which subjects are most popular among students participating in these cooperative degree programs, business and management, tourism, and language specializations stand out.

In terms of joint degree programs with Asian countries, usually no outflow students leave M University as no one is interested in studying in Vietnam, Malaysia, or Mongolia. The inflow students from Asia are allocated into different departments and grades of IC at M University according to their previous studies and application intention. In fact, these departments and programs are created as parallel systems so as to entirely serve the needs of double/joint degrees seekers, foreign learners, and local students interested in the courses taught in English. In other words, there are similar departments and programs exist with regard to organizational structure -- notably, business management or journalism. This design not only avoids the large-scale transformation of current operational structures, but also effectively provides essential support for greater internationalization with respect to admitting more foreign degree seekers. When it comes to the curriculum design of these DJDP, courses are provided separately at both universities, thus lacking co-teaching activities. When a student wants to earn a degree he/she has to get certain credits in compliance with regulations or requirements of both universities. This may create institutional barriers for mobile students to finish their study. Moreover, there seems to be no coherent or systemic synergies among collaborative partners in sharing issues of teaching load, management matter, academic regulations, marketing, websites, or registration. Students are required to move across national borders in order to finish their studies. The pattern of provision, therefore, is not nicely coordinated and planned by both sides. Despite coordinating so many double/joint degrees programs, M University has not enacted *Implementation Guidelines for Offshore Dual/Joint Degree Programs* for internal reference. This deficit is obvious, and additional effort is required.

7 Issues and Challenges Faced

The rapid emergence of DJDP at M University indicates that it has become one of the major channels for internationalization efforts. However, the strategies and practices used also cause a wide range of concerns. These concerns occur at different levels, ranging from systemic and institutional issues to individual levels that must be addressed. Some concerns arise as important issues and might need official assistance. Others might constitute lasting challenges for M University in particular and other institutions in general. In this section, we will focus on these concerns, issues, and challenges.

7.1 Patterns of Student Circulation: A Relay Model

In terms of DJDP at M University, cooperative universities cover industrialized countries and Asian counterparts. However, a deeper analysis reveals that the student mobility among these programs is uneven and imbalanced. Interviewees confirmed that no or a very limited number of students from English-speaking countries have enrolled at M University through such joint efforts, representing a unidirectional mobility. The literature review demonstrated that collaborative partnerships between China and Russia in joint degree were one way as well (i.e., from Harbin, China, to Russia). For these Western collaborators, they have net inbound students into their campuses and can generate extra income. The benefits for M University are to help their students gain "higher credential values as well as better employment prospects (Interviewees 6 & 7)." Through these institutional linkages, M University also enhances its branding and attractiveness in the competitive higher education market in Taiwan. Therefore, mutual benefits become the basis for both sides.

In the double/joint degrees programs with Malaysia, Vietnam, and Mongolia, there are net inflow students for M University as no local students move out for further study. Here, another type of uneven student mobility is taking place: University M -- similar to Western universities -- has become an attractive destination for these Asian students. The DJDPs play a role in articulating their studies in Taiwan. Such hierarchical or unidirectional relationships between M University and cooperative universities in Asia and the West are vertical in mobility with respect to student flow (Chan, 2012). Taking all these collaborative programs into account, M University seems to act as a relay station receiving inbound students from Asian countries and sending out local students to English-speaking ones. The mobility of students in this network is circulatory, where M University is increasingly internationalized due to the frequent involvement of learners across the national borders. What people do not discover is that, within this

circulation network, developing countries such as Vietnam and Malaysia are still likely to suffer from brain drain (Chiang, 2012).

7.2 Characteristics of Double/Joint Degree Programs

Few studies have discussed how DJDPs are implemented (Fong & Postiglione, 2011; Uroda, 2010). Previous analysis of such joint programs at M University indicates that most are joint or articulation in nature. Students are required to start their courses at domestic institutions and finish or complete part of the courses at cooperative institutions. They have to earn credits first from domestic and then foreign institutions. For students, the program can be divided, fragmented, and scattered if effective coordination is absent. The degree of integration of the DJDP in course design, forms of faculty involvement, mutual credit recognition, quality assurance, and marketing becomes very essential in helping students continue through these difficulties. Based on the interviews with five students, M University probably needs to make extra effort in harmonizing the different systems, such as rules or regulations for transfer credits. Students sometimes face difficulties in gaining sufficient credits for graduation. These technical issues relate to the consistence of curriculum articulation in mapping exercises, the total learning hours for each credit, and even physical education. Such concerns were voiced by the outflow students interviewed; more input from inflow students is needed in the future in order to understand how to design such mechanisms better.

7.3 Quality Assurance/Accreditation: Academic Alignment Issues

The previous literature review in this article indicated that different regulations, accreditations, and quality assurance can pose a serious challenge to international DJDPs. Our findings from fieldwork interviews and document analyses confirm this point. Some practical constraints and challenges emerge from the differences in national policies, institutions, and regulations among the participating universities. For example, the mutual recognition of universities and educational programs among different countries is essential for establishing DJDP (Hou, 2012). M University encountered difficulties in expanding its DJDP with universities in China and some Asian countries, such as India, due to accreditation issues. The minimum requirement of one third of credits being completed at both universities also dictates the behavior of M University and forms of DJDP undertaken. Interviewees also mentioned that more flexibility and support are needed to adjust to the differences of different systems while complying with national policies and practices. Therefore,

although educational authority in Taiwan is keen to encourage further internationalization in higher education, balancing quality assurance and institutional autonomy for internationalization remains a tough issue to consider.

7.4 Language Issues

The implementation of DJDPs is closely related to the medium of instruction. In promoting further internationalization, M University had to strategically use English as the official language for teaching at IC and all inflow students through DJDP. This raises concerns over the English proficiency of students and teachers at IC. As the mother tongues of most involved students and teachers is not English, the teaching and learning quality sometimes could be doubtful. Similar situations have occurred among outbound students studying in the Western countries, as their language proficiency was good enough to adapt to the learning environments and finish their degrees (Interviewee 7). This problem could be exacerbated if academic requirements are not met while students insist on undertaking DJDPs. Using English as a medium of instruction seems to be challenging for both students and staff at M University. This also provokes a debate as whether such a move would result in “Anglicisation” or “English imperialism (Knight, 2008b, p. 21).” In combating such developments and stressing the rise of China, the Department of Teaching Chinese as a Second Language was also created in 2006. Local learners and inflow students from Asian countries are encouraged to take Chinese courses, thereby enhancing their competitiveness. This diversion development along with the emphasis of English popularity has created a dual system where English dominates the scene while Chinese is gaining in importance.

7.5 Organizational Restructuring: A Parallel Development

To promote greater internationalization and more inflow students through DJDP, some organizational units have been added to existing structures since 2001, including the International Education and Exchange Division, the Office of International Student Service, and IC. As Li (2010) asserted, DJDPs tend to create a heavy workload in preparation and set-up, but often produce very few students. The three added units, therefore, intend to meet the challenges of inbound and outbound students. The appearance of IC and its departments and programs at M University indicate a parallel development for incorporating international dimensions and have multiple implications for higher education management. It is quite understandable that some faculty and staff resist accepting too many foreign students and in turn use English as the teaching language. Thus, IC can act as a conduit for accepting international

students and prevent the dramatic transformation of the university as a result of internationalization. Moreover, Chinese teaching can be reserved mainly for local students at the original departments and programs. This parallel development might indicate a new organizational trend for non-English-speaking universities around the world and be worth investigating further in terms of its function, operation, culture, and tension with other subunits within the organization, particularly similar departments that can be taught in Chinese.

7.6 Professional Learning and Employment Prospects

One of the prominent attractions for mobile students of DJDPs is related to the enhancement of professional knowledge, skills, and employability in the job market. The participants we interviewed confirmed that the main motivations and expected advantages for joining such programs relate to the previously mentioned capacities, such as broadening the international outlook, strengthening (English) language ability, transition to foreign postgraduate programs, and acquiring better employment prospects (Interviewees 8, 11, & 12). All interviewed students agreed that foreign credentials are more valuable than local ones, helping them occupy a better position in the labor market. One faculty member in charge of DJDPs at M University mentioned that their graduates scatter comprehensively in diverse occupations across the countries. This also implies that an international DJDP is able to provide better skills for transnational employment. Therefore, we can assume that DJDP is effective in raising professional capacity and improving employment opportunities at the global level. This assumption is based on a clear identification and higher value of DJDP from the perspective of employers. However, a recent survey rejected such a positive prediction by saying that employers do not regard such graduates as more marketable (Culver et al., 2012). These authors even asserted that the gains are not in professional growth or enhancement. Given the lack of solid data and systematic tracking of such graduates, we might need further information in order to determine the final outcome and effectiveness of the labor market.

8 Conclusions

For the past two decades, we have been witnessing more internationalized initiatives and programs across the globe. Knight (2008a) once classified these activities into four types of mobility: people, programs, providers, and projects. Within program mobility, DJDP has gained wide popularity as many universities in Europe and America are seeking to launch such initiatives in the future. M University, a non-elite private institution in Taiwan, has devoted itself

to greater internationalization since the late 1990s due to the increasingly globalized economy and transnational competition. DJDP, therefore, has been adopted by this emerging university for international aspiration and reputation enhancement. This special channel of cooperative relationship with foreign universities provides diverse benefits for both institutions and individuals involved.

However, a deeper examination into the strategies and practices of M University reveals that there are some issues and challenges to be addressed. In terms of internationalization, the patterns of student mobility seem to be uneven and imbalanced, representing a hierarchical relay model by receiving students from Asian countries while exporting Taiwanese ones to English-speaking countries. Moreover, the characteristics of DJDP in large part are organized in a form of loose articulation with foreign collaborators; thus, extra harmonization between institutions is needed. This problem becomes exacerbated due to the quality assurance regimes that national policies dictate and the lack of mutual recognition with some countries. Language issues plague DJDP further. In addition to the concerns over English proficiency among students and faculty, how to balance the English teaching for international competitiveness and Chinese learning for local needs becomes an emerging task for M University to tackle. The temporary solution has been a parallel system with the creation of IC, focusing on institutional dimensions and teaching. This organizational restructuring has diverse implications for higher education management and is worth studying in greater depth. Finally, does DJDP enhance professional skills and employability in the labor market? Our limited information seems to be positive, but comprehensive evidence is needed to verify these assumptions.

In addition, we understand that the experiences of this private university may not be inclusive and somehow differ from other institutions' in Taiwan. However, it is also clear that some of these issues and challenges identified from this only case can be common among non-English speaking countries in Asia while implementing internationalization. For example, the imbalanced student mobility and the use of dual language can be a serious concerns for Korea and China. Our findings based on Taiwanese university actually retains wider implications for other countries or universities and make up the literature gap as we indicated previously.

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Education and Fertility Decisions in India: A District-Level Analysis

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Abstract

The relation between education and fertility choice is a contentious issue in any discussion on development. However the debate often loses much of its fire due to the non-availability of crucial data and/or improper emphasis given to various aspects. For example, in most of these studies, the end variables (such as fertility, child mortality, gender disadvantage, etc.) are given more emphasis than the actual choice (such as proportion of births of higher order). In this paper, we study the relationship between some of these parameters culled from different sources at the district level. Our analysis reveals a strong relationship between these variables and that efficiency in the education delivery system fosters informed fertility choices.

Keywords: multi-dimensional appraisal, educational attainment, fertility decisions

1 Introduction

Development economists are concerned about the relationship between education and health, especially reproductive health. It is frequently argued that an expansion in educational facilities should help to improve public awareness of reproductive health, reduce the fertility rate, and close the gender gap. Empirical research has, however, failed to confirm this relationship unequivocally (Murthi, Guio, & Drèze, 1995). There are often claims and counterclaims giving contradictory results. This discrepancy between the theoretical assertions and empirical reality is a paradox that the development economists have to take into account.

The relationship between education and fertility choice is quite complex and susceptible to a number of open-ended questions. Fertility rate and gender disadvantage are a result of a long social process that includes factors that are external to the actual decisions (such as the availability of proper medical facilities). Hence the emphasis should be on the more immediate choice-related variables (such as the proportion of births of a higher order) that have a direct bearing on both the health of the mother and her babies, rather than on other indirect variables, as most of the earlier authors have done.

In this paper, we study the relationship between some of these parameters culled from different sources at the district level. We use the data on reproductive health published in the Third District Level Household Facility Survey (DLHS-3)-2008-09 conducted by the Ministry of Health and Family Welfare, Government of India.

We first present a brief discussion of the various relevant issues. In Section 3 we give a detailed description of the data. In Section 4 we describe the model and the variables. The results of the regression analysis are given in Section 5. Our conclusions are presented in the last section.

2 The Nexus between Education and Reproductive Health – A Brief Survey

There is a general consensus that there is an inverse relationship between education and fertility rate. However, this relationship is not simple and clear, resulting in a lot of arguments and counter arguments about the exact nature of the relationship between education and fertility. What is clear is that there are widely divergent views regarding the factors responsible for fertility reduction.

The economist's standard logic seems to be based on the quality-quantity tradeoff developed by Becker, Duesenberry, and Okun (1960) and others (e.g., Galor & Moav, 2002; Galor & Weil, 1999, 2000; Rosenzweig & Wolpin, 1980). The point is succinctly put forward by Lucas (2002). In a traditional society, there is little return on human capital. As such, emphasis is on the quantity of unskilled labor. The result is positive fertility and a Malthusian gloom. The industrial revolution changed all this. It brought about a paradigmatic shift in the nature of and demand for the capital of human labor. As investment in human capital and the importance of skill formation rises, fertility falls and the quality of life improves.

Similar to the way in which education has a direct negative effect on fertility, fertility rate also has a direct effect on the educational levels attained by the children in a given household. This is because the number of children in a household determine to a certain extent the quality and standard of education of those children. This two-way phenomenon between education and fertility is known as the child Q-Q (Quantity-Quality) tradeoff

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and was first noted by Becker et al. (1960) and later modified and extended by others. In a more recent work, Becker, Cinnirella, and Woessmann (2009) points out that this famous Q-Q trade off indeed existed before the demographic transition started in Prussian countries.

Sociologists have a differing view on this subject¹ (Jaffe, 1959; Cochrane, 1979, 1983; Encarnación, 1974; Stycos, 1965). They opine that only after reaching a certain minimum threshold of education among women does the negative association between these two variables become prominent. Baily (1989), in a study of married women aged 15-49 from the rural part of Sierra Leone, has further strengthened the threshold proposition of women's education. He estimated the education threshold of this region to be six, below which greater education brings a higher fertility rate per household.

Education may reduce the fertility rate, but its role itself is a function of other socioeconomic or demographic factors. The impact of education on fertility in rural areas may be somewhat smaller than that of the urban areas, because of cultural or attitudinal differences. Caste or religion sometimes reduce or neutralize the effect of education, and may even lead to a positive association between education and fertility. An economic crisis or upswing can also have an indirect negative effect on fertility. Wasao (2001) found that in Africa educational opportunities coupled with religious beliefs, health facilities, and economic position all have a joint or simultaneous effect on fertility decisions. In this respect, the following observation of the United Nations (1985) on 30 developing countries should be kept in mind. The reverse 'U' shape, or positive association between education and fertility, is a common feature in underdeveloped countries, whereas widespread fertility reduction in more developed states is the outcome of greater educational opportunities, particularly for women.

Actually there is whole set of factors that may influence fertility. The history of fertility in the Western world cannot be ascribed solely to an increasing level of education. For it is clear that various other factors have also contributed to the fertility decline in the West, including changes in occupational patterns and living space, technological advancements, health care improvements, the spread of democracy and civil rights, and government policy. Even in the developing world, governments do not see expanding education as the sole way of reducing fertility.

Governments typically try to mitigate the problem of uncontrolled population growth in one of two ways. One approach is to adopt a strong-hand family-planning policy, enacting laws which force people to have less children,

a system which has been in place in China for several decades. This approach is most effective if it includes appropriate rewards or punishment, so that at some future period of time people can realize for themselves that having a smaller family is for their own benefit. The other approach is to attempt to indirectly reduce fertility rates by implementing various programs and initiatives, the results of which will encourage people to have less children. Examples include programs designed to improve health facilities, educational opportunities, or job opportunities.² Direct government intervention to reduce the fertility rate is beyond the scope of our paper. In this paper we concentrate our attention on the second approach, particularly the impact of greater access to education or better socioeconomic conditions.

In the African context, Serbessa (2002) has shown that the level of female education has an important role in determining the fertility level in the household. In this work it is surprisingly observed that mere primary education among the female population not only doesn't lead to fertility reduction, but is actually associated with increased fertility. Education beyond the secondary level can create a negative impact on fertility from two different points of view. Firstly, a higher level of education delays the age of marriage and reduces the child-bearing age span of the women, resulting a reduced fertility rate for educated mothers. Secondly, higher education gives women more control over resources, increases their independence, and reduces their dependency on their children in old age. These two effects of female education on fertility are minimal among the primary educated women, because they are overshadowed by other effects of education, such as reduced lactation, improved fecundity, and reduction of child mortality.

By analyzing the Indonesian government's extensive educational data, Breierova and Duflo (2002) reaches the same conclusion as Serbessa (2002) and others that education, particularly female education, is strongly correlated with the fertility level in a society. Higher average years of schooling in the family or higher parental education can reduce the level of fertility to some extent. A closer view establishes the fact that female education is a major factor behind fertility reduction. This is proved by Breierova and Duflo (2002) work in the Indonesian context, where it is seen that disparity between the education level of a husband and wife is positively associated with fertility rate.

Tuman, Ayoub, and Roth-Johnson (2007), in their work in two Latin American nations, found that women's exposure to sex education has a clear negative effect on

¹ Recently many economists have also questioned the Q-Q approach (Banerjee & Duflo, 2011, p. 108).

² However, recently Banerjee and Duflo (2011) have shown the limitation of such indirect measures of controlling fertility.

fertility. Greater female educational attainment not only improves their self-reliance and self-confidence in various aspects of life that have a clear positive impact on fertility reduction, but also can enhance their knowledge about reproduction and contraceptives. Formal education along with sex education, if introduced in the early stage of education, particularly among females, has a definite impact on fertility rate.

Another empirical work, based on the Indian context, by Imai and Sato (2010), further strengthens the proposition of the negative association between education and fertility rate. They have pointed out that a preference for sons in Indian society greatly aggravates the fertility problem. Higher female education coupled with greater male literacy together can bring a downward trend in the fertility rate by reducing gender bias.

Contemporary analyses so far have shown an unambiguous negative association between education level and the reproduction rate. But there is a serious debate regarding the validity or uniqueness of this relationship among the researchers.

Soomro and Mahmood (2003), examining Pakistan's Census data, have argued that education and fertility exhibit a negative trend, but the rationale behind this association is much more complex than it originally looked. The family-planning program introduced by the government of Pakistan promoted the use of contraceptives much more among educated women than illiterate women. As a result, the impact of education on fertility may not reveal the actual situation, since a better target-oriented family planning program could reduce the fertility rate among the illiterate women and also offset the greater reliance on education.

By examining the world-wide trends in fertility rates, Basu (2002) explored the relationship between education and fertility in a larger dimension. Greater education or schooling of women creates some power or autonomy which helps them to take appropriate decisions regarding family planning. Higher female education increases the cost of raising children, and awareness of this issue has prevented educated women from having more children, which has effectively reduced the fertility rate in highly educated societies. The effect of increased education on declining mortality rates or rising aspirations of women has a clear indirect effect on fertility reduction (Basu, 2002).

In this entire debate it is very clearly noted that the diminishing trend of fertility in a society is a function of a host of socioeconomic, demographic, and cultural factors which act and react upon each other in a process that halts the cumulative progression of fertility. In this paper we are not trying to explore the role of one specific factor on fertility or reproduction, but rather examine the impact

of all the possible issues or factors that have a direct or indirect effect on fertility or other related reproductive health factors. A major cause of the apparent paradox between education fertility relations is the emphasis on female education as the only determinant of reproductive health. Reproductive health decisions are always a family decision. The role of woman in such a decision making exercise depends on a lot of factors that cannot be determined in advance. Even an educated mother with all her good intentions may fail to influence the family's decision. However, a rise in overall awareness might help to tilt the family decision in her favor. The emphasis here should be on general awareness rather than just female awareness. Hence the overall educational parameters seem to be more important than just female-related educational parameters while assessing the nexus between education and reproductive health.

The relation between these two variables is mediated through economics. It is well documented by international data on per capita GDP (Gross Domestic Product) and infant mortality (Ray, 1998). However, the relation is far less clear for gender disparity (Sen, 2006). There is no monotonic relation between these two factors. In China, for example, substantial improvements in economic performance since the inception of economic reform have been associated with a sharp increase in gender disparity (Drèze & Sen, 1989). Again, Sen (2006) demonstrates that the fast-growing East Asian countries have a very dismal record with respect to child sex ratios, a reflection of sex selection bias at birth. In India also, in wealthier states such as Gujarat, Maharashtra, and Punjab (the state with the lowest recorded poverty) the child sex ratio is much below that of the poorer states of Bihar and Orissa. Even Kerala, the star performer in human development, is not doing very well in economic perspectives.

Again, the debate here is inconclusive (Murthi et al., 1995). There are a number of authors who argue that gender bias is less prevalent among poor households (Das Gupta, 1987; Krishnaji, 1987; Miller, 1981). The empirical findings may be justified on the grounds that poor families invest little in their children. Their so-called "neutrality" is motivated by their complete neglect in child care due to the pressure of appalling poverty. However, as the family income rises, the ugly face of gender discrimination begins to be seen. Agarwal (1986) argues the contrary. To her, less poverty reduces gender discrimination. The justification for this result is also obvious. Reduction of poverty reduces much of the heavy familial duties that a girl child has to perform. Moreover, a general improvement in the household income improves the food intake (both quantity and quality) of the girl child. In both ways, her survival is enhanced.

As argued by Murthi et al. (1995), the reason behind the confusion is the inability to locate the set of factors that are dominant in any particular situation. In such a situation, they suggest a multivariate analysis. They cite an earlier study by Kishor (1995), who also used census data for this purpose. However, use of census data seriously restricts the estimated model. From a census, we find information of end variables (such as child mortality and female bias). The more immediate variables are gauged from the behaviour of these end parameters. In our model we have tried to address this problem by incorporating more relevant choice-related variables.

3 Data Analysis and Information about Variables

3.1 Reproductive Health Variables

The District Level Household and Facility Survey (DLHS-3) is a nationwide survey covering 601 districts from 34 states and union territories of India. This is the third round of the district level household survey which was conducted between December 2007 and December 2008. The survey was funded by the Union Ministry of Health and Family Welfare, United Nations Population Fund (UNFPA) and United Nations Children's Fund (UNICEF).

The data was collected from 720,320 households from 34 states and union territories of India (excluding Nagaland). In these households, 643,944 married women aged 15-49 years and 166,260 unmarried women aged 15-24 years were interviewed. This report is based on the data collected from these women.

The DLHS-3 survey collected a wide array of information regarding reproductive health and the environments in which women live. It provides rich documentation of various aspects of the lives of married and unmarried women. It describes the environments in which they live, their family and educational backgrounds, and many other factors which influence a woman during her fertility period. It also collected information about their awareness regarding various health facilities related to the fertility period. The survey also includes data about the health infrastructure and the quality of health delivery that are so necessary for a woman and her child in order to safely pass to a healthy environment. The main goal of the NHRM (National Rural Health Mission) is to reduce the infant mortality rate (IMR) and maternal mortality rate (MMR) by promoting new bond care, immunization, antenatal care, institutional delivery, and post-partum care. DLHS-3 survey is aimed at understanding the factors that determine these ends variables.

From this wide array of data we have selected only a few for our analysis. This selection is based mostly on the

importance of the factors in reducing infant mortality and revealing the patterns of female discrimination.

The most important institutional parameter is the availability of a health clinic within three kilometers. Normally, it is an Indian custom to seek health facilities for pregnancy only at a very late stage. In such a case, the distance as well as the availability of services required are equally important.

This is an important factor that determines both IMR and MMR, but was thoroughly missed by earlier authors. Notably, this factor typically does not depend on the educational awareness of the population in some major way. Even a highly conscious mother or her family may fail to prevent the risk of still birth and/or physical or mental damages to the newborn when these facilities are missing. By incorporating them in our model, we sought to filter out the effect of these "education-neutral" variables in accessing the relationship between education and fertility decisions. However, this factor is not important of all types of fertility choices. For example, it has no bearing on the marriage age of females.

3.2 Socio-economic Variables

Another important factor is the poverty rate. The influence of poverty on reproductive health has created a lot of confusion, as argued earlier. However, in our case, this confusion should not arise.

The variables that we have selected for our study to capture reproductive health should have a direct negative correlation with poverty. This is because the variables we choose are unambiguously related to the families' economic conditions and their response to it. Unlike the earlier studies, the causation here is direct and there is no space for alternative formulations. Hence, we can steer ourselves out of the confusion that mars the standard exercise. Moreover our poverty estimate is direct, unlikely earlier studies.

The poverty estimate used by Murthi et al. (1995) is ad hoc. "The poverty indicator used here for each district is the Sen Index of rural poverty for the region in which the district is situated."

The DLHS survey gives us the proportion of people on the lowest wealth quintile at the district level. In order to construct the household wealth index, DLHS considers three aspects: household amenities, assets, and durables. Among the household amenities, the DLHS includes access to safe drinking water, sanitation facilities, fuel used for cooking, type of house, and per capita space in the house. The quality of housing is measured by the materials that are used in its construction -- concrete, sheet metal, straw, bamboo, etc.

Among the household assets, the DLHS includes fans, radios/transistors, sewing machine, televisions, telephones, motorcycles, and cars.

The wealth index is thus comprehensive and covers a wide array of possessions. There is wide a regional variation in the distribution of population according to the wealth index.

Further, we used several social features (such as the proportion of people belonging to Scheduled Castes and Scheduled Tribes, and the proportion of people living in urban areas). Lastly, the zonal dummies were used to capture the zone-specific effects.

4 The Empirical Model

To assess the impact of the socioeconomic variables on the demographic reproductive health factors, we first constructed the linear multiple regression model specified below:

$$Z_i = \beta_0 + X_j \delta_1 + e_i$$

Where Z_i is the dependent reproductive variables whose responsiveness with the vector of independent variables (X_j) is being verified separately by using a variable-specific regression model of the above-mentioned form.

The dependent variables that we have incorporated in our regression analysis are given below:

- (1) Number of birth order 2 and above (BTH)
- (2) Proportion of females married before legal age (MRG)
- (3) Proportion of any modern methods of family planning (MOD)
- (4) Proportion of institutional delivery (INS)
- (5) Proportion of children 12-23 months who are fully immunized (IMMU)
- (6) Proportion of mothers who have made at least three antenatal care visits during the last pregnancy (ANTE)

In order to estimate how these reproductive health issues are influenced by the various socioeconomic variables we have used the following independent variables in our regression analysis.

- (1) Literacy (LIT)
- (2) Wealth (WLTH)
- (3) Social group (SC, ST)
- (4) Urbanization (URB)
- (5) Public health Centre (PHC)
- (6) Regional dummies (DD, DW, DE)

The dependent variables concerning reproductive health are choice variables, except to some extent institutional birth and antenatal care visits. These factors may depend on the availability of institutions. All the others are more or less influenced by educational achievement coupled with other economic factors.

By analyzing the regression we try to determine whether the following relationships exist or not:

- (1) Whether education reduces the birth rate, and whether education can improve the consciousness of the people in terms of realizing the importance of family planning, institutional delivery, the need for an antenatal visit to the doctor, or the necessity of immunization of the newly born babies.
- (2) Whether poverty (explained by the wealth index) can have any desirable impact on the fertility choice decision.
- (3) Whether urbanization can play any crucial role in determining the fertility behavior.
- (4) Whether greater availability of the PHC has any impact on reproductive health issues.
- (5) Whether zonal differences have any significant impact on describing the relationship between the variables.

There are several ways to tackle the problem. The baseline is obviously a multiple regression technique incorporating White heteroscedasticity-consistent estimates. These estimates are discussed in Table 1. However, as pointed out by numerous researchers, there are problems in using these simple methods. The relationship between education and fertility decisions are complex and are mitigated through a number of socio-economic constraints. Keeping in view these complexities, authors have routinely used the IV method in understanding the relationship. However, use of the IV method is seriously constrained by the choice of appropriate weights. The problem is multiplied in a cross-sectional analysis such as ours.

In its stead, we utilize a new method developed by Basu, Das, and Dutta (2010) (henceforth, BDD), an approach which offers several improvements over White's method. It utilizes the fact that within a cross-section, there are some region-specific effects that may affect the overall relation. The method filters out such systematic effects so as to make the relation between cross-section variables more succinct and clear. It is also better than the IV method, since no a priori weight has to be chosen. These results are depicted in Table 2.

5 Results and Discussion

Before discussing the regression techniques, we first present our basic data in Table 3. The table shows wide regional variation in the variables. In proportional terms, the Southern zone seems to have been a case apart from other zones. The North-South demarcation is well marked here. It is clear that there are region-specific systematic factors that have crucial effects. Thus the BDD technique seems to be appropriate here.

We first ran a step regression to choose our relevant variables. This procedure helped us to identify the factors that are of greater relevance for this study, and also

Table 1 Multiple Regression Results

Independent variables	Dependent variables					
	Proportion of births of order 2 and above	Proportion of population using any modern method of birth control	proportion of girls' marrying before completing 18 years	Proportion of institutional delivery	Proportion of children fully vaccinated	proportion of mothers having three antenatal care visits during pregnancy
	OLS-Step N = 601					
Proportion of lowest wealth quintile	0.0966** (2.11)	-0.2473* (-4.767)	0.1084* (2.196)	-0.2541* (-3.793)	--	-0.1847* (-2.465)
% of SC population in the district	--	--	0.0774* (24.625)	-0.0679 (-2.922)	0.1026* (3.732)	--
% of ST population in the district	--	0.0869* (4.379)	--	-0.0996* (-4.341)	--	-0.0906* (-3.695)
LIT	-0.2542** (-3.580)	--	-0.8765* (-10.64)	0.4827* (4.678)	0.4829* (4.317)	0.4127* (3.530)
PHC	Not used	Not used	Not used	-0.1351* (-3.081)	-0.3881* (-7.011)	-0.2780* (-5.555)
Urbanisation	0.1119* (2.618)	-0.2916* (-5.066)	--	-0.2694* (-4.245)	0.3322* (-4.362)	-0.3211* (-4.566)
Northern dummy	0.0059 (0.1948)	0.0994* (2.488)	0.0032 (0.091)	0.2504* (5.577)	0.1694* (2.934)	0.2146* (4.248)
North Eastern dummy	-0.0008* (-2.652)	0.0015* (3.30)	0.0020 (0.5824)	0.007* (14.15)	0.0034* (5.971)	0.0077* (13.89)
Eastern districts dummy	0.59591* (5.751)	0.5829* (4.16)	0.3310* (2.847)	0.5067* (3.374)	0.7193* (3.703)	0.5049* (2.933)
Western dummy	0.0725 (1.245)	-0.1253** (-1.710)	-0.0273 (0.4543)	-0.1764** (-2.122)	-0.1094 (-1.034)	0.0275 (-2.883)
Constant	0.1431 (1.406)	0.00	0.4935* (4.221)	-0.2718** (1.869)	-0.2719 (1.480)	-0.2323 (-1.395)
Adjusted R ²	0.3117	0.4080	0.5811	0.6980	0.4205	0.6419

Note: *significant at 1% level; **significant at 5% level.

Table 2 A BDD Structure

Independent variables	Dependent variables					
	Proportion of births of order 2 and above	Proportion of population using any modern method of birth control	Proportion of girls' marrying before completing 18 years	Proportion of institutional delivery	Proportion of children fully vaccinated	Proportion of mothers having three antenatal care visits during pregnancy
	OLS-Step N = 601					
Proportion of lowest wealth quintile	0.4104* (9.921)	-0.1790 (-4.064)	0.3967* (11.96)	-0.4216* (-7.185)	-0.1520* (-2.664)	-3015* (-5.303)
% of SC population in the district	0.7799* (10.02)	1.060* (12.80)	0.4655* (8.374)	0.6385* (5.651)	0.5206* (4.639)	0.4201* (3.837)
% of ST population in the district	0.1502* (5.49)	0.2612* (8.972)	--	0.1885* (3.127)	0.1391* (3.698)	0.1622* (4.419)
LIT	0.3069* (12.39)	0.2215* (8.402)	-0.6155* (-3.248)	0.1989* (5.155)	0.2448* (6.402)	0.2997* (8.016)
PHC	--	--	--	0.3424 (8.799)	0.3653* (9.459)	0.3875* (10.28)
Urbanisation	--	--	--	0.2811* (3.737)	--	0.1728** (2.372)
Northern dummy	-0.5992** (-2.463)	-0.0935* (-3.611)	-0.0042 (-0.215)	-0.1612* (-4.809)	-0.0661** (-1.986)	-0.2328* (-7.167)
North Eastern dummy	-0.0356 (-1.024)	-0.0651* (-1.760)	-0.018 (-0.633)	-0.0755 (-1.568)	-0.1447* (-3.023)	-0.1389* (-2.975)
Eastern districts dummy	-0.935* (-3.53)	-0.1846* (-6.560)	-0.0201 (0.94)	-0.1648* (-4.502)	-0.1341* (-3.689)	-0.2572* (-7.251)
Western dummy	-0.0896* (-3.340)	-0.0948* (-3.321)	-0.031 (-1.425)	-0.1422* (-3.786)	-0.11 (-2.949)	-0.2272* (-6.241)
Constant	0.0947* (4.705)	0.1222* (5.705)	0.0408 (2.49)	0.1219 (4.321)	0.0781* (2.791)	0.1521 (5.565)
Adjusted R ²	0.4898	0.4228	0.3635	0.4375	0.4312	0.5258

Note: *significant at 1% level; **significant at 5% level.

Table 3 Descriptive Statistics

Zone district	Proportion of total literate population (Age 7+)	Proportion of lowest wealth quintile	Proportion of girls' marrying before completing 18 years	Proportion of births of order 2 and above	Proportion of any modern method	Proportion of mothers who had at least 3 antenatal care visits during the last pregnancy	Proportion of institutional births	Proportion of children (12-23 months) fully immunized	Proportion of children breast fed within one hour of birth	Proportion of villages having a sub-centre within 3 km	Proportion of PHC functioning on 24 hours
Northern zone											
<i>Mean</i>	0.70	0.16	0.22	0.65	0.47	0.41	0.42	0.53	0.33	0.74	0.46
<i>SD</i>	0.10	0.17	0.18	0.12	0.18	0.22	0.18	0.22	0.20	0.13	0.30
North-Eastern zone											
<i>Mean</i>	0.81	0.13	0.11	0.61	0.40	0.53	0.46	0.37	0.56	0.60	0.53
<i>SD</i>	0.07	0.13	0.07	0.10	0.17	0.17	0.19	0.23	0.19	0.23	0.37
Eastern zone											
<i>Mean</i>	0.67	0.33	0.33	0.65	0.36	0.43	0.36	0.56	0.43	0.77	0.59
<i>SD</i>	0.12	0.19	0.16	0.10	0.11	0.18	0.17	0.18	0.24	0.14	0.27
Western zone											
<i>Mean</i>	0.69	0.20	0.22	0.61	0.57	0.55	0.52	0.54	0.48	0.61	0.67
<i>SD</i>	0.10	0.16	0.12	0.08	0.09	0.22	0.21	0.21	0.11	0.12	0.24
Southern zone											
<i>Mean</i>	0.75	0.07	0.16	0.57	0.61	0.90	0.84	0.77	0.60	0.70	0.43
<i>SD</i>	0.14	0.07	0.13	0.09	0.09	0.10	0.17	0.14	0.16	0.27	0.26

decreases the impact of multicollinearity. Our results are summarized in Table 1 and Table 2.

Several features are imminently clear from the study. First, poverty is negatively correlated with the desirable features of fertility choice decision (MOD, INS, IMMUN, and ANTE) and positively with the undesirable ones (BTH, MRG). A greater access to resources increases the awareness of the family members in terms of reproductive health issues. For example, reduction of poverty increases the consumption of luxury goods such as TVs, radios, computers with internet facilities, etc., all of which increases exposure to the mass media. This increases knowledge about the reproductive system and increases awareness regarding family planning, particularly in the developing world (Ramesh, Gulati, & Retherford, 1996; Westoff, 1999; Westoff & Bankole, 1999). This effect may be stronger than the education effect on fertility, though the measurement issue is quite complex (Basu, 2002). Our result in this matter further strengthens this proposition and has strongly pointed out the importance of wealth on making fertility decisions among the households.

The importance of education to the reproductive health system was also found in the regression analysis. Greater educational opportunities have an indirect negative impact on premature female marriage and positively influence all the desirable fertility choice variables, such as use of modern contraceptive, greater proportion of institutional delivery, higher proportion of antenatal care visits to hospitals, and greater immunization of newly born babies. This feature of education in terms of giving better health consciousness or improved awareness regarding family planning decisions clearly demonstrates the key role of education in improving fertility conditions in a society.

In the regression other exogenous variables such as social group, urbanization, and availability of PHCs had an ambiguous or mixed relationship with the reproductive variables. For example, from the regression results given in Table 1 it is observed that birth rates are higher in the SC community. This may be the outcome of early marriage of the girls in this group. Surprisingly, this phenomenon is quite rare among the STs, and from our regression result (given in Table 1) it is seen that early marriage is not prevalent among the STs. One most encouraging feature that is coming out from this regression analysis is that the government initiative to promote modern methods of family planning has made some inroads in the SC and ST communities. But this hasn't had much impact on the final desirable outcome of fertility reduction, simply because of poverty and lack of awareness in major health related issues. The importance of antenatal care during pregnancy periods is negligible among the SCs, which strengthens the proposition that lack of awareness prevents desirable

outcomes in fertility matters amongst people in the lower sectors of society.

The role of urbanization and the availability of PHCs have failed to have any significant impact on reproductive health, except in increasing institutional delivery and the antenatal care visits. The effect of urbanization is positively related to both of these variables, while institutional delivery and antenatal visits do not depend on the availability of nearby PHCs. Again, all the zonal dummies are more or less significant, indicating that zonal differences persist in various reproductive health matters.

6 Concluding Remarks

There has been a worldwide debate about the association between education and fertility transition. In fact, it is a well accepted view that education can have a serious impact on fertility decisions, but the magnitude and/or direction of this association is questionable. Any other demographic or economic factors collectively or independently of education can create a bigger role in the achievement of desirable reproductive decisions among families. In this paper we try to examine the impact of various social factors along with educational attainability on the fertility decisions of households in the Indian context. We conclude that each and every factor that we have incorporated in our analysis has a sizable impact on different reproductive issues to some extent.

This analysis has raised some important policy prescriptions for the government. Firstly, the impact of poverty (as measured by the variable "proportion of lowest wealth quintile") on the fertility choice variables are imminent in our study. Poor people are generally less eager to take fertility control decisions than others. This clearly calls for a more target-oriented poverty alleviation program for the improvement of the socially deprived sections of the population. Secondly, the fertility choice decisions are less favorable in the relatively backward areas (such as the rural areas) where knowledge about modern birth control measures is limited and/or the information regarding the prospective benefits of lower fertility is weak. Thus, awareness relating to health-related issues should be improved, and for this purpose the mass media should come forward more deliberately than before. Thirdly, literacy rate comes as a dominant factor in fertility choice decisions. Hence, government expenditure on education should be increased and education policies of the government should be more specific so that a greater educational impact across the nation over all sections of the population can ultimately solve the problems of reproduction. If these initiatives are taken by the government, then in the long run increases in human capital due to increased educational facilities,

coupled with downward fertility pressure as a result of improved consciousness regarding health-related issues, can sustain steady and balanced growth in the future.

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Gregory claims:

Coefficient alpha is an index of the internal consistency of the items, that is, their tendency to correlate with one another. Insofar as a test or scale with high internal consistency will also tend to show stability of scores in a test-retest approach, coefficient alpha is therefore a useful estimate of reliability. (Manning & Munro, 2006, p. 25)

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And still others see globalization as an assault on traditional notions of society and the nation-state whereby the very nature of citizenship and social change is dramatically altered (Castells, 1997; Touraine, 1988).

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