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Editorial

The articles of this issue focus on the ways for promoting education quality at national and institutional levels. Scholars from Hong Kong, Japan, Korea, India and Taiwan examine the trend of educational reform in their countries and provide suggestions for improvement of teaching and learning. Dr. Jung-Cheol Shin and Mr. Hoon-Ho Kim discuss who has paid for the increased expenditure in research productivity which eventually leads to the obtaining of the world-class university status under competitions for a world-class University in Korea. Dr. Wen-jou Hung reviews background information of indigenous language education in Taiwan, and analyzes its macro and micro contexts and forces. Dr. Yuki Amaki explores to what extent SES differences may be correlated with college destination among first-generation college-bound students in Okinawa, and also investigates parental influence on college selection in contemporary Okinawa society. Dr. Atanu Sengupta and Dr. Tusher Mukherjee take India as an example, indicate the data-adjusted literacy rate for introducing externality into the literacy rate without distorting the reality to a great extent. Dr. Chi-Shing Chiu and Dr. Jia-Wei Zhang pay attention to the business-university-school partnerships for school improvement in Hong Kong. Mr. Wai-Wah Lau and Dr. Flora L.F. Kan also analyze the trend of educational development in Hong Kong, but they focus on the reform of secondary technical education.

Dr. Jung-Cheol Shin and Mr. Hoon-Ho Kim review Korean tuition increases in the 2000s in relation to the global competitions for a world-class university. Although there are different perspectives on tuition rising, they especially pay attention to the perspective of global competition, which is related to regarding the university as a positional good, given that a top-ranking university has a superior position in obtaining talented students, professors, and financial resources. Under the context, they analyze the cost transfer between students' social classes. Students in low socio-economic contexts may lose the opportunity for a university education because of the merit-based scholarships. Therefore, policymakers should consider how to equitably share the increased costs between different students, by taking their socio-economic class into account.

In Dr. Wen-jou Hung's article, she points out indigenous language teaching in Taiwan has been embedded in a complicated context and impacted by macro and micro forces, such as economic globalization, cultural plights, history and current conditions of language policy, and school system. She asserts the importance of adopting indigenous-people-centered policy approach when planning and making decisions on indigenous language policies. Furthermore, teachers should acknowledge individual differences and implement various teaching styles accordingly. In addition, families and communities should be supportive for indigenous language learning.

The article by Dr. Yuki Amaki shows the positive and negative aspects of college selection among first-generation college-bound students in Okinawa prefecture. In this study, the patterns of high school students who advance to college are important indicators for the Okinawa government and local high schools as they seek to provide effective educational support programs to increase college advancement rates, particularly among students whose parents have less than a high school degree. Therefore, college awareness and preparation at an early stage do help first-generation students take steps to pursue higher education and increase the number of college-going students. High schools should provide more related learning supports, such as college preparation workshops to access college information, and school teachers should also explain the differences between high school and college settings.

Dr. Atanu Sengupta and Dr. Tusher Mukherjee indicate the limitation of studies on India's achievement is one-dimensional, that's why some other parameters of educational attainment have been used to supplement this uni-dimensional measure. They argue that introducing the data-adjusted literacy rate may be a realistic solution without distorting the reality to a great extent. The result shows that there is a complexity in the dynamic structure that is not discernable in the uni-dimensional exercise. Therefore, some further studies incorporating the micro-level features of literacy externality are required before any final conclusion can be reached.

Taking Hong Kong as an example, Dr. Chi-Shing Chiu and Dr. Jia-Wei Zhang adopt a case study approach to identify the underlying constructs of the initial stage of B-U-S partnership. They try to connect corporate commitment in social responsibility with the professionalism of the university to promote educational quality. According to their findings, the underlying constructs of the initial stage of B-U-S partnerships are rationales, operations, roles, interactions, and expectations. They points out common goals, sound organizations, proper distribution of resources, clear roles, effective interactions, and reasonable expectations are important for the B-U-S partnerships.

Mr. Wai-Wah Lau and Dr. Flora L.F. Kan also take Hong Kong as an example. In view of the uniqueness of Hong Kong in the decolonization literature, it is worth exploring why and how the Special Administrative Region (SAR) government reformed secondary technical education. They discuss the motives lay behind the changes and the characteristics of these

changes, in order to redefine the paradigm of technical education in the New Senior Secondary curriculum. According to their findings, the government referred to the recommendations made by international organizations and individual scholars, especially in the aspects of articulation between technical education and general education, broad and diversified technical curriculum, broadening of the pathways to work and tertiary education.

Finally, this issue provides precious experience of improving education quality in different countries. As a forum for sharing and discussing educational researches, APJED will continue to be a bridge between countries across the Asia-Pacific region.

Tuition Rising in Competitions for a World-class University: Cost Sharing or Cost Transfer?

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Abstract

This paper discusses tuition increases in the 2000s which was caused by competition within Korean higher education as universities sought to be ranked as a world-class university. The increased costs have been paid by students as well as by government and private sector and due to this, the share of student tuition in university revenues has been consistent over ten years. This implies that over the last decade, it was students who have been paying the costs for the increase in research productivity which eventually leads to the obtaining of the world-class university status for many universities. The share paid by students could be reasonably regarded as cost sharing, if students receive benefits proportionally to their payment. However, in reality, students in soft-disciplines pay more proportion than the benefit they receive when compared with their colleagues in hard-disciplines, e.g., medical science despite their benefit return rate is much lower. Likewise, students in undergraduate programs pay more proportion for increased expenditure than the graduate students, and students in low-tier universities pay more than the students in top-tier universities. Because of this, cost transfer between different groups of students is occurring.

Keywords: tuition rising, tuition by major, tuition by institutional mission, positional good, world-class university, global rankings

1 Introduction

Recent competition between universities to obtain higher status in the rankings has accompanied increases in university expenditure. This competition has been very noticeable since the mid-2000s when global rankings emerged and is related to Frank and Cook's the winner takes all society (1995). The principle of winner takes all applies not only to business but also to the university sector (Ehrenburg, 2000; Marginson, 1997). The top-ranking universities attract the best professors and students, and greatest funding. University managers know that rankings are not a reflection of organizational effectiveness, nor do they reflect the quality of education (Shin, 2011a). But they do know that a top-ranking brings huge benefits to the university.

The competition for a world-class university is a reason why tuition has been rising during the 2000s in Korea (Shin & Jang, 2013). To compete with top-ranking universities, universities at lower-tiers began to benchmark top-tier ones. For example, a university ranked at 500 might benchmark a university ranked at 100 to move up their global ranking. However, benchmarking requires considerable resources. A world-class university requires smaller class sizes, professors to teach fewer credit hours (usually about six credit hours per semester in many US research universities) to devote more time on research, and to reduce service hours on students (Altbach, 2009; Ma, 2008). In addition, a world-class university needs expensive equipment which most undergraduate students are unable to access, as well as an expensive library service that most undergraduate students do not need.

For that, the universities are expected to generate their own resources as well as seeking government support and are actively involved in generating fund through their revenues from copyrights, patents, campus business, lifelong learning, etc. (e.g., Harrison & Hatt, 2012; Ma, 2008; Mohrman, 2008; Slaughter & Rhoades, 2004; Teixeira & Koryakina, 2013). Another approach is to increase tuition to the extent that students can still pay it. The top-ranking universities are in a stronger position than other universities to do this because they have long student waiting lists and student enrollment is less affected by their tuition increases. Once the top-ranking university increases its tuition, the second-tier universities often increase their tuition to generate revenues to compete with the first tier universities (e.g., McPherson & Schapiro, 1998; Shin & Milton, 2006). In such context, the second tier universities no longer concern that they might lose their students through increased tuition because of the acceptance of increased tuition at the top ranking universities.

In the higher education market consumers do not occupy position that is superior to the providers (top ranked universities); rather, providers -- Especially highly reputed providers -- Have the power to decide the price since the

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academic degrees students receive are referred as positional goods (Hirsch, 1976). Colleges compete with each other to obtain a higher position that has greater power in the market. Because of the role of a university to provide positional goods, universities are inevitably sensitive to rankings (e.g., Marginson, 1997). As Ramsden (1999) found, top ranking universities attract high quality students and charge high tuition even though their students are not satisfied with their teaching quality. However, once students graduate from the top ranking universities, they are hired by well known companies and paid high salaries. As a result, the top-ranked universities are able to charge high tuition and students are willing to pay.

Because of the global competition and benefits from the world-class status, tuition increase may become a regular event to attain the desired level in the global rankings. Public universities are becoming private in terms of tuition charges because their increased tuitions will enable them to compete better with top-ranking private universities (e.g., Ehrenberg, 2000).

This study provides an overview of the tuition increase in Korean higher education and examines the changes in revenues of a highly selective university in relation with obtaining the world-class university status. Also, special focus is paid to find out how the expenditure has been paid differently by different groups of students, e.g., by their disciplines, their levels of education, and institutional missions.

2   The Contexts of Korean Higher Education

2.1 Tuition Increase: Massification and Global Competition

This study uses Korean higher education as an example of cost sharing in building world-class university. Currently, Korean parents and students pay the greatest share of college expenditure as a percentage of total higher education expenditure. According to Organization of Economic Co-operation and Development (OECD) data in 2005, the government provided only 24.3% of tertiary education expenditure while students and parents paid the rest (Shin & Harman, 2009). This high level of contribution by students and parents is caused by Korea having the highest student enrollment rate (80%) in the private sector among the OECD countries (Shin & Harman, 2009). In addition, university tuition has been increasing faster than the growth of GDP or inflation. Since 1990, the average tuition increase has been 7.2% yearly, whereas GDP growth was 4.9%. In this context, the increased rate of student payment is becoming a serious issue among policymakers as well as among students and parents.

Recent tuition increases have been caused by two factors. First, the tuition increases in the 1980s and 1990s were related to the enhancement of education infrastructures and environments. With the rapid massification of higher education, the Korean government gave priority to improving the quality of education (e.g., Shin, 2012). As Ehrenburg (2000) and many others have discussed (see, for example, Shin & Harman, 2009), mass higher education requires greater resources in order to educate students with differing levels of academic preparation, representing various age groups, and socio-economic backgrounds. The Korean government therefore adopted an accreditation system in 1994. This policy initiative contributed to an improved education environment (Korean Council for University Education, 2001) although such kind of policy initiative required considerable investment and led to tuition increases between 1980 and 1990 (see Table 1).

The tuition increase in the 2000s is related to the research and graduate education infrastructure. In the late 1990s, the Korean government aggressively pushed universities to enhance research productivity to compete with global universities (Shin, 2009a). Through this policy initiative, Korean higher education has shifted from teaching focused to research focused during the 2000s. Universities started to hire research productive professors and reduced their teaching loads in order to bring in more funding from the government (Shin, 2009a). In addition, Korean universities began to open new graduate programs to educate and expand research functions. Because of this trend as well as government policy, it was rare for Korean universities to identify themselves as teaching focused (Shin, 2009b). Therefore, many universities identify themselves as research-oriented universities regardless of their actual research capability. These universities placed strong emphasis on research productivity in order to receive more government fund and to attract talented students. Because of the situation, many Korean universities identify themselves as a research university although most of them are not much research productive.

The cost issue seems to be outside policymakers' interests, but establishing a research university is much more costly than policymakers expect (e.g., Altbach, 2009). The high cost of a research university is due to many factors. A research university pays a great deal of money to hire research productive professors, build new facilities, offer scholarships to attract talented students, and internationalizes higher education (e.g., Horta, 2008; Ma, 2008; Mohrman, Ma, & Baker, 2008). In the research university, professors stay longer in their office or lab, communicate mostly with graduate students, and reduce their available consulting time for their undergraduate students (e.g., Altbach, 2009). Because of the strong

Table 1 Higher Education Budget, R & D Expenditure, and Tuition

Year	Tertiary Enrollment	Grad. Enrollment	HE bud.	R & D exp. Total	Tuition
1965	127,126	3,842	1,915		32,270
1970	163,511	6,640	6,635	10,547	118,700
1975	221,277	13,870	20,439	42,664	420,200
1980	563,748	33,939	144,967	211,727	702,000
1985	1,192,172	68,178	196,691	1,155,156	1,147,000
1990	1,379,951	86,911	409,782	3,210,486	**1,572,500**
1995	2,212,852	112,728	1,105,913	**9,440,606**	4,254,500
2000	3,130,251	**229,437**	1,782,249	**13,848,501**	**4,905,500**
2005	3,208,645	**276,918**	2,537,458	**24,155,414**	**6,889,000**
2010	3,223,734	**316,633**	4,635,494	**37,928,500**	**9,041,000**

Data Souces: Report on the Survey of Research and Development in Science and Technology (Ministry of Education, each year); Annual Education Statistics (Ministry of Education, each year).
Notes: (1) Budget and education expenditure are in million Korean won, and tuition is in single Korean won.
(2) The tuition is based on the maximum tuition charged by any private university. The Annual Education Statistics provides data only on maximum and minimum tuition rates. Between the maximum and minimum tuition rates, I selected the maximum tuition because most regular universities set tuition close to the maximum tuition level whereas setting it at the minimum tuition level is quite exceptional.

research orientation, students especially undergraduates, often feel isolated from the university community including professors and graduate students. All these factors require considerable funding and student tuition has been increased two times in the ten years between 2000 and 2010 in Korea as shown in Table 1.

2.2 Revenue for World-Class University

The revenue resources for the increased expenditure have been paid by the government, student, and private sector. The Korean government has increased its higher education budget and research funding from the late 1990s. During the ten years between 2000 and 2010, Research and Development (R & D) expenditure has been dramatically increased in Korea. These statistics show that the Korean government has indicated their support for a world-class university by providing research funding. However, the R & D investment also requires a similar level of contribution from students. During the last decade, student tuition has increased twice in order to build and maintain new facilities, hire and pay high salaries to professors, install expensive equipments, and internationalize their campus.

The case of Seoul National University (SNU), the leading research university in Korea, demonstrates these issues too. Government appropriation fund for SNU has increased 1.9 times, student tuition 2.1 times, and external research funding 3.7 times.

The ratio of government appropriation fund to total revenue for SNU, however, has gradually declined from 57.1% in 1993 to 43.7% in 2011, although the total amount has increased since 1993 as shown in Table 2. It is because the amount of overhead from external research funding, tuition and fees charged by SNU, and benefits from

university development fund have increased more rapidly. The share of the external research funding to the total SNU revenue has grown from 26.3% in 1993 to 70.3% in 2011 due to such a change in the government financial support policy to higher education. Only about 10% of the external research funding is from the private sector. During the same period, the share of total revenue coming from student tuition fees has increased from 23.5% in 1993 to 26.1% in 2010 and 24.6% in 2011. University development fund has increased at a faster rate than any other revenue sources. The amount of revenue from the university development fund has recorded an almost nine-fold increase compared to 1993. This means that the increased expenditure to build a world-class university in the 2000s has been paid proportionally by government, students, and the private sector.

Although we agree with the argument that research is a core function of the modern university, our primary concern is with identifying the principle agent to pay and cover for the increased expenditure. If the increased costs are not related to undergraduate education, undergraduates should not be required to pay for the increased costs. Although there are controversies on the nexuses between teaching and research (e.g., Hattie & Marsh, 1996), academics who have studied the relationships with empirical data found that there is very weak or no relationships between teaching and research. According to Marsh and Hattie (2002), research productivity does not contribute to teaching quality in an Australian university context. Even, Shin (2011b) found that international journal publication has negative impacts on the classroom teaching of junior professors in a Korean university. If there is no clear evidence that academic research contributes to classroom teaching, then college

Table 2 University Revenues by Sources (SNU)

Year	Tuition & fees	Government appropriation	External research fund	University development fund	Total revenue
1993	37,892,796	92,189,448	42,405,779	14,128,922	161,525,849
1995	53,833,146	121,111,107	78,629,411	35,578,801	238,372,272
1997	70,202,899	171,486,656	104,120,251	65,854,015	326,488,652
1999	76,894,031	156,337,665	124,142,418	65,638,757	315,126,552
2001	96,553,121	185,061,573	169,309,232	68,858,790	370,400,989
2003	119,857,076	210,868,939	231,109,599	62,429,949	433,520,749
2005	140,665,357	200,200,833	283,121,256	106,069,564	497,896,972
2007	158,730,254	262,661,327	346,902,488	136,310,732	614,671,692
2009	175,167,760	312,742,735	420,033,696	115,146,731	670,538,429
2011	183,950,540	327,386,757	526,755,061	125,584,376	748,821,490

Source: Seoul National University (1993-2012).

Notes: The currency is Korean Won in thousands. The total revenue consists of government appropriation, tuition and fees, overhead from research funding, benefits from university development fund, etc. SNU has an independent research corporation which manages the external research funding. The research corporation charges overhead by contracting with the fund raiser and transfers the overhead to SNU. Therefore, only limited percent of the total research fund is transferred to education and general budget account of SNU and the total revenue does not include the total research fund.

students are not benefiting from the research orientation even though they pay the increased tuition for a world-class university.

On the other hand, some academics may argue that undergraduate students in a research oriented university may benefit from a world-class university and research competition because they are the main beneficiaries of their university's reputation. Presumably, students in research focused universities share the benefits from the tuition increase necessitated by emphasizing research productivity; on the other hand, students in teaching focused universities may not share the benefits despite the fact that they pay for the research productivity. Regardless of this reality, however, most Korean universities including teaching-focused ones, charge similar tuition rates. The teaching focused universities are pressured to enhance their research productivity in order to attract more research funding, which is 8.2 times larger in size than general higher education budget (see Table 1). As a result, students in the teaching focused universities also pay for the competition between universities in relation to research.

3　Cost Sharing or Cost Transfer?

3.1 University Expenditure by Discipline, Level, and Mission Type

The cost sharing is widely applied in many countries including in Europe (e.g., Agasisti, Pérez-Esparrells, Catalano, & Morales, 2012). Although there may be philosophical disputes (e.g., Link & Scott, 2011) about the university as a public good, policymakers tend to adopt a user pays approach when facing financial constraints

(e.g., Johnstone & Marcucci, 2010). Even ex-communist countries and China charge student tuition. This paper is not arguing that students should not pay for their university education but is concerned with whether the students' share is proportional to the benefits they received from the university. The benefits can be viewed from an economist's perspective as the rate of return in higher education (e.g., Berger, 1988; Eide & Waehrer, 1998; Montmarquette, Cannings, & Mahseredjian, 2002). This paper, however, focuses on whether students are paid back during their university study with respect to the expenditure of their universities. If undergraduate students pay, but the university uses the increased tuition revenue for graduate students, there is an issue of equal payment between students.

If students pay proportionally according to the benefits they receive, there might be less controversy about the cost sharing between government, the private sector, and students. However, if students do not pay proportionally according to the benefits they receive, cost sharing may appear less logical. This section therefore focuses on whether students pay similar proportion according to the benefits they receive as measured by college expenditure. In a college expenditure study, it is difficult to assign shared expenditure (e.g., the expenditure related to university administration) to each unit (e.g., graduate vs. undergraduate, each academic unit etc.) (Ehrenberg, 2000; Johnes, Jones, & Thanassoulis, 2008). A comprehensive study on college expenditure in the US has been conducted by Middaugh, Graham and Shahid (2003). The study is referred to as the "Delaware Study," based on the title of the paper. The study collected expenditure data from

175 universities according to academic discipline levels. The participating universities are in different categories of the Carnegie Classification and thus the data provides expenditure data across mission types.

Middaugh et al.'s (2003) study shows how much colleges spend resources differently based on their academic disciplines and mission types. As shown in Table 3, college expenditures for humanities courses given by comprehensive universities are three times higher than those of medicine courses by research universities. A similar study but at the individual university level has been conducted in Korea. Unfortunately, the Korean study does not provide tuition differences by mission types. As the table shows, although university expenditures are slightly different between Korean universities and US universities, the rank order of expenditure between disciplines is the same in the two countries. The disciplines of humanities and social sciences are the cheapest followed by the natural sciences, arts and physical sciences, engineering, and medicine in respective order. In the table, expenditure is standardized by dividing the lowest tuition by the lowest mission type. In the Delaware Study, for example, the tuition in each cell is divided by the tuition of humanities and social sciences in a comprehensive university because it is the lowest tuition in the study.

There are not many studies on the expenditure differences between undergraduate and graduate education. Even the Delaware Study did not include graduate programs. Technically, it is quite difficult to split expenditures by undergraduate and graduate courses. In the US, 40 state governments have developed a funding formula for budget allocation purposes (e.g., Mullin & Honeyman, 2008). The formula includes disciplinary differences and levels of programs (e.g., lower undergraduate, upper undergraduate, master, Ph.D., and professional degree courses). For example, the State of Texas developed a funding formula to allocate budget within the state (Texas Higher Education Coordinating Board, 2008). According to the formula, graduate education for a pharmacy major was assigned 25.3 times more state funding than that for undergraduate education for a liberal arts major.

Unfortunately, there are few studies on expenditure differences between undergraduate and graduate education in the Korean university context. This is because graduate education has only been expanding since the late 1990s when the knowledge-based economy began emerging. With this reason, graduate education was not properly developed in Korea up to the late 1990s although Korean universities were awarding Ph.D. degrees. The expenditure on Korean graduate education does not provide much insight for this study. Even Seoul National University does not provide expenditure data for its graduate education. This is mainly because graduate education is not independent from undergraduate education in most Korean universities.

In 2009, the Korean government began to provide tuition data of individual university to public through the university information providing service. The data include the cost of tuition for each university by its discipline. This enables an analysis of how student tuition differs by institutional mission and discipline. The notion of institutional mission in Korean universities was suggested by Shin (2009b) and the mission classification scheme has been applied in many other studies including international comparative studies (e.g., Changing Academic Profession

Table 3 University Expenditure by Discipline and Mission

Research on College Expenditure		Humanities & Social Sciences	Natural Sciences	Engineering	Medicine	Arts & Physical Sciences
Delaware Study	Research	1.3	2.0	2.8	3.2	2.0
	Ph.D. granting	1.1	1.6	2.3	2.8	1.6
	Comprehensive	1.0	1.2	2.4	2.7	1.2
	Average	1.0	1.4	2.2	2.6	1.5
Korean Universities	Yun (1995)	1.0	1.3	1.1	4.2	1.3
	Kim, Ham, & Lee (2001)	1.0	1.2	1.0	3.8	-
	Kang & Shim (2008)	1.0	1.1	1.1	3.3	-
	Han & Kim (2002)	1.0	1.5	1.5	-	-
	Choi, Park, & Kim (2005)	1.0	0.7	1.8	-	-
Average exp. per student		1.0	1.2	1.3	3.8	1.3

Notes: (1) In the Delaware Study, medicine includes only nursing as a major because nursing is the only available medicine discipline in the study. (2) Humanities and social sciences are the criteria for standardizing expenditure. In the Delaware study, the expenditures of academic disciplines are standardized by dividing the expenditure of each discipline by the humanities and social sciences of a comprehensive university. In Korean universities, humanities and social sciences are the criteria used to transform the expenditure to a standardized score in each case. (3) The standardized tuition of the Delaware Study is the average of each discipline in each category. For example, the standardized tuition of humanities and social sciences is based on the average of 15 majors in the Delaware Study.

study in 2008). According to Table 4, tuition per student is the highest for research universities, followed by Ph.D. granting, and comprehensive universities. Also, student tuition differs by discipline. Student tuition is the lowest for humanities and social sciences, followed by natural sciences, arts and physical sciences, engineering, and medicine.

3.2 Cost Sharing or Cost Transfer?

This section focuses on how universities charge tuition according to academic majors, levels of education (graduate vs. undergraduate), and different mission types (research, Ph.D. granting, and comprehensive university). For this purpose, the study uses college expenditure data from the currently available literature to determine how much expenditure is reflected in tuition rates across disciplines, levels, and institutional missions.

3.2.1 Between Academic Disciplines

The benefits of increased college tuition differ by students' major areas. Students in hard disciplines benefit more than their peers in soft disciplines because they can use expensive equipment and labs, technological equipment, etc.; on the other hand, students in soft disciplines may benefit less from the increased tuition and college expenditure (e.g., Casper & Henry, 2001; Middaugh et al., 2003; Smith, 1992). Although many Korean universities apply different tuition rates for different academic majors, the tuition differences between disciplines are smaller and the increased expenditure is not equally paid by the students (for details, see Table 3 and Table 4). As shown in Figure 1, students in medicine benefit more from university expenditure than the students in other disciplines. In the figure, the tuition and expenditure are standardized by dividing the expenditure (or tuition) by the lowest expenditure (or tuition) -- In this case, humanities and social sciences.

In fact, a university does not proportionally increase tuition according to the expenditure of each discipline or to students' tuition elasticity (for details, see Shin & Milton, 2008). For example, a university prioritizes resource investment in medical education because of increasing demand for highly qualified doctors, even though students in medical education are not tuition elastic comparing with other disciplines. This is similar in many other countries (e.g., Australia) where universities set relatively lower tuition for medical education even though it incurs high costs. In addition, in the competition for high rankings, the medical field is important because over 40% of the papers in ISI are in bio-medical areas (Leydesdorff & Shin, 2011).

In the ranking races and world-class university competition, a question arises with the issue as to why students in soft disciplines should pay the same proportion of increased expenditure as others, given that they benefit less from it than their peers in the hard disciplines. This is the core issue in discussing cost sharing. If a government prioritizes medical education and provides more resources for medical education, then the equality of cost sharing is less controversial; however, if it's the students in other disciplines who pay the increased costs for medical education, it raise an issue of equality in cost sharing. Clearly it depends on the practice in each country. As Figure 1 shows, costs (expenditure) are transferred to students in other disciplines because the Korean government does not provide more resources for medical education and as a result students in other disciplines share the increased costs.

3.2.2 Between Graduate and Undergraduate Education

It is quite unclear as to whether increased tuition benefit students especially undergraduates. Graduate students are more likely to benefit from the increased tuition because they have more opportunity to access expensive equipment, work with their professors, and develop their research

Table 4 Undergraduate Student Tuition per Student in Korea (2011)

Mission Types		Average	Humanities & Soc. Sciences	Natural Sciences	Engineering	Medicine	
Research (21 Universities)	Public	4,679	4,034	4,659	5,127	5,898	5,313
	Private	8,118	7,120	8,438	9,444	11,045	8,929
Ph.D. granting (26 Universities)	Public	4,275	3,645	4,422	4,781	6,147	4,827
	Private	7,843	6,704	8,027	8,761	10,155	8,171
Comprehensive (20 Universities)	Public	4,122	3,612	4,189	4,523		4,473
	Private	7,562	6,705	8,001	8,585	9,679	8,660
Average	Public	4,390	3,787	4,449	4,844	6,637	4,918
	Private	7,823	6,811	7,612	7,392	10,407	8,719
	Total	6,873	5,974	7,062	7,625	9,379	7,615

Source: University Information Providing Service (n.d.).
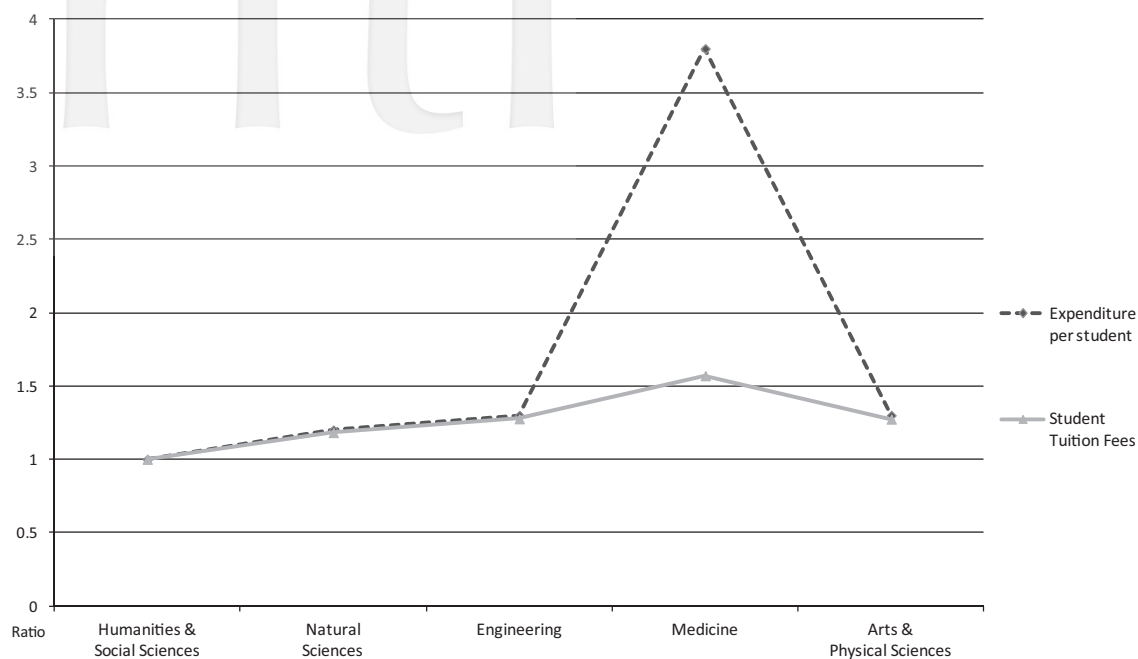Notes: The currency is Korean Won in thousands.

Figure 1 Expenditure per Student and Student Tuition by Disciplines

Notes: (1) Expenditure per student is based on the average in the Korean literature (Table 3). (2) Student tuition is based on the average tuition of 67 Korean universities (Table 4).

capability through collaboration with faculty and classmates (e.g., Bloom, 1983; Smith, 1992). Further, they have a better chance of obtaining scholarships because professors and universities tend to provide better scholarships and research assistantships to graduate students, especially Ph.D. program students, who are critical in conducting research projects. After their Ph.D. degrees, they are likely to be hired as post-Doctoral researchers. Clearly, graduate students benefit from a world-class university.

Many US state governments apply different weightings in their funding formulae to undergraduate, master's, and doctoral programs. If undergraduate students pay a similar level of tuition as graduate students, it means that undergraduate students actually pay much more because universities' actual expenditure for undergraduate education is considerably lower than that of graduate education. This gap in education expenditure becomes quite large when a university spends its resources to build a world-class university.

It is difficult to analyze the differences in university expenditures between the graduate and undergraduate education in Korea because of lack of data on expenditure on graduate education. We may use a funding formula for graduate education as a proxy of expenditure for graduate education. The funding gaps between graduate and undergraduate education in Figure 2 is based on the Texas funding formula. Although this does not reflect the Korean higher education context, the figure has its implications in interpreting the expenditure differences between undergraduate and graduate education. For example,

natural sciences and engineering require more resources for graduate education than for undergraduate education. On the other hand, the requirements for humanities and social sciences programs do not vary much between graduate and undergraduate education.

The figure implies that a university invests much more in graduate education than undergraduate education while charging slightly higher tuition for graduate students. The investment in graduate education is due to increase in competition to attract talented students, provide better scholarships and assistantships for the students, and to purchase expensive equipment for their education in order to compete for the world-class university label. This produces a cost transfer from graduate students to undergraduate students because undergraduate students benefit less from the increased tuition.

3.2.3 Between Research Focused and Teaching Focused Universities

Expenditure in a top-ranked university is much higher than that of a teaching focused university. According to the Delaware Study of 2003, a research focused university uses more resources for its education than its peers in Ph.D. granting or comprehensive universities, as shown in Table 3. In the US, the differences in university expenditure between a research university and a comprehensive university are significant, as shown in Figure 3. However, universities tend to charge a similar rate of tuition whether they are research or comprehensive universities in Korea. These findings can be interpreted in two ways. One interpretation is that research universities charge low tuition because
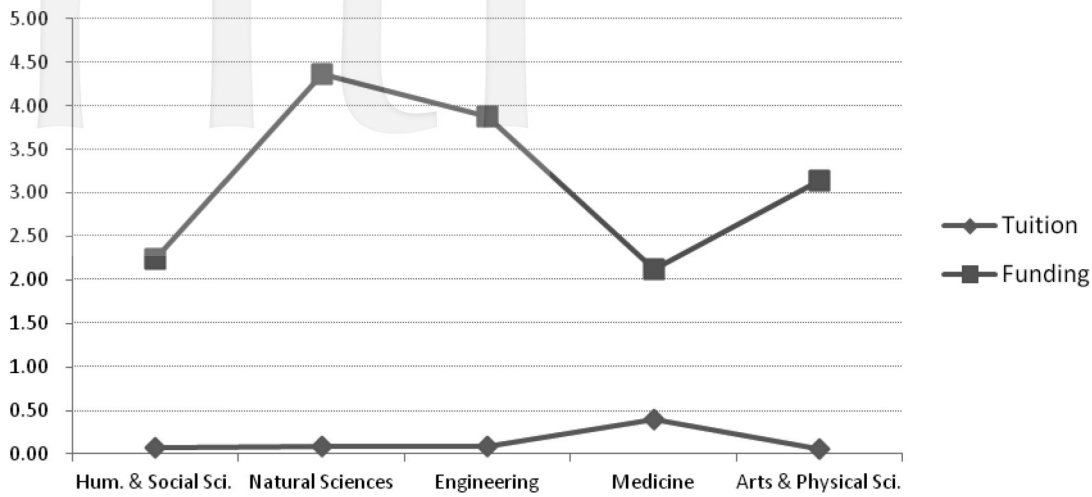
Figure 2 Gaps between Graduate and Under Graduate Students in Tuition and Funding by Disciplines

Notes: (1) The tuition line represents the tuition gaps between graduate and undergraduate students. The funding line represents the funding gaps between graduate and undergraduate students. (2) Student tuition for graduate students is based on the average from 67 Korean universities. The average tuition for a graduate program in thousands of Korean Won in the humanities and social sciences is 6,385, natural sciences 7,590, engineering 8,151, medicine 10,837, and arts and physical sciences 7,994. (3) Funding is based on the funding formula of the state of Texas for 2010-2011.
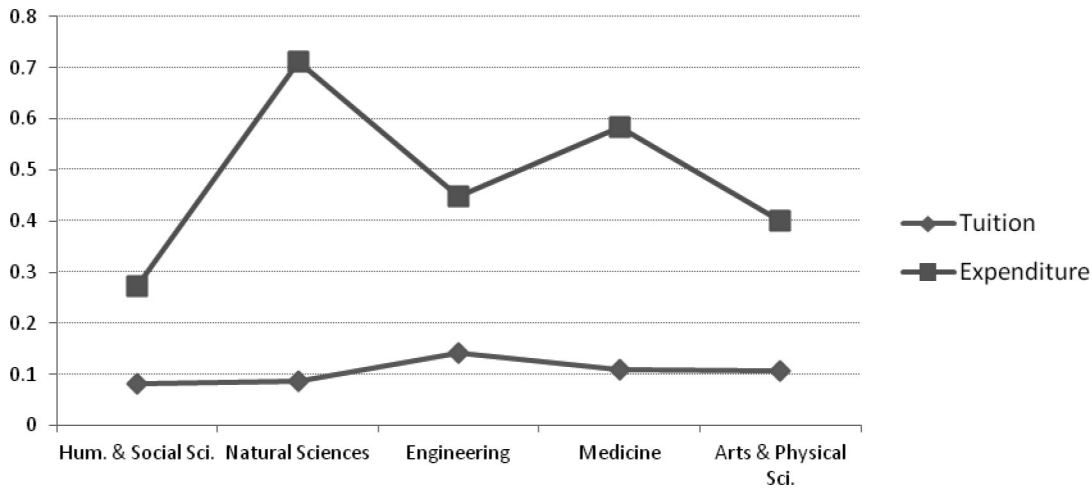

Figure 3 Gaps between a Research University and a Comprehensive University

Notes: (1) The tuition line represents the tuition gaps between a research university and a comprehensive university. The expenditure line represents the expenditure gaps between a research university and a comprehensive university. (2) Student tuition is based on the differences between the averages charged by research universities and comprehensive universities (see Table 4). (3) Expenditure is based on the differences between the averages spent by research and comprehensive universities in the Delaware study (see Table 3).

these universities have sufficient external funding sources (such as research funds). The top-ranking universities are relatively better positioned to bring in funds to cover the increased expenditure than those universities situated at the lower end, because they are generally well supported by government, and have better external funding sources. As a result, the top ranked universities tend not to directly transfer the increased expenditure to their students whereas the low-ranked universities do.

On the other hand, comprehensive universities charge high tuition in order to be recognized as a world-class university. Once a top-ranking university increases its tuition, it results in a tuition increase for most of other Korean universities. The tuition increase by low-tier universities is related to the homogenization of Korean universities, i.e., low-ranking universities tend to follow top-ranking universities. Because Korean universities are sensitive to ranking status, they tend to copy new initiatives attempted by a top-ranking university including tuition setting. As a result, the increase in tuition in a top-ranking university seeking to be a world-class university has an impact on low-ranking universities. Students in low-tier universities (Ph.D. granting and comprehensive universities) pay for the increased expenditure that comes from building a research focused university. In this context, there is a cost transfer between students from high-tier to low-tier universities.

4 Conclusion

This paper has discussed tuition increases in the 2000s in relation with global competitions for a world-class university. Although there are different perspectives on tuition rising such as political factors and higher education as a labor intensive sector, this study highlighted tuition rising from a global competition perspective. The global competition to obtain a world-class university status is related to the university as a positional good, given that a top-ranking university has a superior position in obtaining talented students, professors, and financial resources. Because of these benefits, Korean universities are competing to become a world-class university. The main discussion focus of this paper is based on who has paid for the increased expenditure in the 2000s. One source has been government funding. The Korean government has aggressively increased research and development funding since the 1990s. This increased funding for higher education has no doubt enhanced education quality in Korea.

Increased research funding has also led Korean universities to focus on research productivity. This research-orientation on the other hand has resulted in some Korean universities to lose their original mission, and as a result it has strengthened rigid hierarchy between universities based on research productivity. The increased costs have been paid by students as well as by government and private sector. Because of this, the share of student tuition in university revenues has been consistent as shown in the Seoul National University case. This implies that over the last decade, it was students who have been paying the costs for the increase in research productivity which eventually allows the obtaining of the world-class university status for many Korean universities. Although the empirical evidence for this study is based on limited data of Korean universities, the discussions explain who actually paid the increased expenditures during the 2000s when Korean universities were actively involved in the global ranking race.

The share paid by students could be seen as cost sharing if students pay proportionally according to the benefits they receive. However, in reality, this is not the case. Instead, students in soft-disciplines pay more proportion than the benefit they receive when compared with their colleagues in hard-disciplines. Likewise, students in undergraduate programs pay more proportion for increased expenditure than the graduate students, and students in low-tier universities pay more than the students in top-tier universities. Because of this, cost transfer between different groups of students is occurring. Policy makers and university leaders are recommended to consider the caveats in their tuition settings. Specifically, the

differences in college expenditure across disciples, levels of education, and institutional mission should be considered in budget allocation at government policy level, and these differences also should be considered in institutional budget reallocation process.

Followings are some proposals for future studies which can improve current study's limitation. In fact, there was relatively little empirical evidence in the discussion about the cost transfer in this study because there is not enough university expenditure data in Korean higher education contexts, but further study with better data will provide more insight for the issue of cost transfer between students.

Another topic which should be explored is the cost transfer between students' social classes. Students in upper social classes are not burdened by tuition increases but students in lower classes are (e.g., Christie, Munro, & Rettig, 2001; Harrison & Hatt, 2011; Paulsen & St. John, 2002). Because of the merit-based scholarships, students in low socio-economic contexts may lose the opportunity for a university education. Although the Korean government adopted in 2009 the Income-Contingent Loan (ICL) program, the loan designed with a deferred payment system, increased tuition still leads to over-burdening low-income students because such a loan program only postpone students' burden into the future, not solve their problem.

Finally, policymakers are recommended to pay attention to the increasing costs when seeking to be a world-class university and also to cost sharing between government, students and parents, and other funding sources. As discussed, if students in soft-disciplines, undergraduate programs, and low-tier universities pay a disproportionate share compared with other groups of students, policymakers should consider how to equitably share the increased costs between different entities and groups of students, by taking students' socio-economic class into account. Building a world-class university is both an issue of cost transfer as well as an issue of strategy for a competitive university.

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A Macro and Micro Contexts, Forces and Challenges for Indigenous Language Education at Elementary Schools in Taiwan

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Abstract

In Taiwan, many indigenous languages are endangered. The major contexts and forces behind this state of affairs are previous assimilation policy, the impact of English as a global language, the colonized, marginal and low socio-economic status of most indigenous populations, societal and parental attitudes toward indigenous people and languages, the shortage of qualified teachers, the lack of resources, and the lack of consultation with indigenous peoples themselves. This article first outlines the global and local contexts and forces of indigenous language education in Taiwan, Republic of China. The focus is on elementary schools due to the reason that the indigenous language teaching has mainly been delivered at primary education level. It then presents a reflective analysis of indigenous language education, based on literature review, document analysis, observations of indigenous language teaching in some elementary schools in Bunun and Seediq tribes, and interviews of indigenous language teachers. Finally, it proposes some possible strategies to improve indigenous language education.

Keywords: indigenous language education, globalization, Bunun, Seediq, Taiwan

1 Introduction

In Taiwan, many indigenous languages are endangered and some of them are dying (Huang, 1995 as cited in Chang, 2001). Although the Taiwan government and indigenous peoples have worked hard to preserve indigenous languages, the achievement seems limited, and much remains to be done. To understand the teaching of indigenous language and the challenges that indigenous language education practice faces, the author regularly observed indigenous language teaching in a Bunun (one of the indigenous peoples of Taiwan) elementary school for four months (two hours every two weeks) in 2005, irregularly observed other Bunun and Seediq elementary schools in 2006, 2008 and 2012, and also interviewed five indigenous language teachers and one non-indigenous-language teachers.

The first part of this paper gives some background information about Taiwan, and analyzes the macro and micro contexts and forces in which indigenous language teaching in Taiwan is embedded. Secondly, the author explores the challenges of indigenous language teaching as they emerged in the cases studied and literature. Finally, the author proposes some possible ways of improving indigenous language teaching.

2 Background Information about Taiwan

Ethnically, the peoples of Taiwan consist of two main groups: An indigenous minority of Austronesian origin, who were originally the only inhabitants of Taiwan (G.I.O., 2007a), and a Han majority whose ancestors came from China (G.I.O., 2007d). Some scholars divided them into four primary groups according to the languages: Mandarin language, indigenous languages, Haka, and Southern Minnanese (Chao, 2005 as cited in Sung & Hsiung, 2010, p. 1). In 2011 there are approximately 520,000 indigenous people, making up about 2 percent of the total population of 25 million. There are 14 major and officially recognized indigenous peoples in Taiwan: Amis, Atayal, Bunun, Kavalan, Paiwan, Pinuyumayan, Rukai, Saisiyat, Sakizaya, Thao, Truku, Tsou, Yami (also known as the Tao) and Sediq (C.I.P., 2013). Many indigenous people live on mountainous reservations. Others live in metropolitan centres far from their home towns, cultures and languages. Each indigenous people have their own language, and tribes within each language group may have different dialects. The indigenous peoples didn't have writing systems until the Dutch Era (1624-1662 A.D.) and therefore, indigenous peoples continued to pass on their socio-cultural knowledge and traditions by oral means (Pawan, 2004).

In Taiwan, for historical and political reason, Mandarin is the current official language, while Holo Taiwanese (also known as Taiwanese or southern Minnanese) is spoken widely. Austronesian languages are spoken by indigenous peoples, but are slowly disappearing because of cultural assimilation.

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The population of Bunun, the indigenous people on whom this paper focuses, is around 52,824 in 2011. Because they live among Taiwan's highest mountains, the Bunun have been called the "real mountain people." Their practices of shifting cultivation and hunting have led to a complex system of beliefs, rituals, and taboos. Characteristic cultural features include a patriarchal system, skills at making clothing from animal hides, and ancestor worship (C.I.P., 2013; G.I.O., 2007a; Huang, 1992). The Bunun are particularly noted for their "pasibutbut," the polyharmonic choral singing of prayers for good harvests.

The population of Sediq, another focus of this paper, is about 10,000. They live in the central and eastern parts of Taiwan. They share unique customs and traditional rituals. The most unique trait is its equal right, i.e. the most intelligent and capable persons are the leaders regardless of gender and social status. The viewpoint of adoring Utux, the spirits of ancestors, has extended to conscientious living rules called gaya/waya and has developed different culture, for example, tattoo, hunting, weaving, music, language, songs and dance (C.I.P., 2013).

3   The Context and Forces of Indigenous Language Teaching

Indigenous language teaching in Taiwan has been embedded in a complicated context and impacted by forces which can be described in four macro and micro layers. The first is the economic globalization and English as a global language. The second is the social, economical, political, and cultural plights of indigenous peoples in Taiwan society. The third is the history and current conditions of language policy. The fourth is the school system. Each of these layers is dealt with in turn.

3.1 Economic Globalization and English as a Global Language

In the era of economic globalization and information capitalism, information technology, the knowledge-based economy and marketization are trends of development and progress in many nation-states. Everything that has market value or is seen as the key to knowledge or information technology is valued (Hung, 2009).

As some educationists have pointed out, indigenous languages in Taiwan have been regarded by some indigenous parents, teachers and students as having little market value and have been considered useless from the viewpoint of utilitarianism and pragmatism (e.g. Huang, 2009; Pawan, 2004). By contrast, Mandarin has much more market value, and offers better access to highly-valued fields such as information technology. In other words, Mandarin constitutes more economic, social and cultural

capitals both in Taiwan and in the global world. In this context and force, indigenous languages are becoming less spoken and less transmitted to young generations that they are losing their communication value.

David Crystal (1997) talked about "English as a global language." This concept reflects the importance and widespread use of English; it also possibly accelerates the marginalization, exclusion, or death of minority languages. When a language dies, the associated culture always dies or is dying too (Hung, 2009).

In Taiwan, English used to be a required subject only at the level of secondary education. Since 2001, English has been required at primary education level. School students have to learn three languages, and two of which are not their everyday languages. Many parents, students and schools value English more than indigenous languages because it is more "useful" -- For example, it might help to get higher scores in national examinations and allow entry to better senior high schools or universities; it might also help to obtain better jobs and higher salaries. The Han teachers in our interviews even thought English was regarded more important than others. In addition, all indigenous teachers interviewed mentioned the interference of learning English and indigenous due to the similar phonetic symbols and burden of learning three different languages. Indigenous languages are more marginalized under the impact of English. The majority of schools, even the indigenous schools, there are bilingual environments consisting of Mandarin and English.

3.2 The Plights of Indigenous Peoples in Taiwan

Generally speaking, indigenous peoples in Taiwan have been disadvantaged in many areas, including economics, politics, culture and education. They have higher rate of unemployment, lower salaries, higher rates of single parenting, lower academic achievement, and so on. This disadvantage is mainly due to the long history of assimilation policy and repression strategies, in the course of which their traditional ways of making a living (e.g. hunting) have been prohibited or destroyed, traditional prosperous lands and resources deprived. They were forced to move and the remaining lands have been taken away and established as reservations. Indigenous peoples have been undervalued as barbarians, and their mother languages and ancient knowledge system belittled and forbidden at education system (Hung, 2006; Pawan, 2004).

Most indigenous peoples used to live in mountainous areas and some still do. This is why their languages and cultures have to some extent been preserved. But more and more young indigenous peoples have moved to the cities for jobs, and left their indigenous languages and cultures behind. Their languages and the cultures are also disappearing as a result of the pattern of disadvantage.

After the lifting of martial law in 1987, there was a democratic climate in Taiwan society, and human rights became the major issue. What followed were social movements for the rights of minorities, such as returning lands to indigenous peoples. In the meantime, the localization movement started and aroused the consciousness of local cultural revitalization (Hung, 2009). In 1992, under these appeals, the *Amendment of the Constitution* was enacted and the government was required to "provide assistance and encouragement" for indigenous peoples' "educational, cultural preservation, social welfare and business undertakings." A law approved by the Legislature Yuan in 1996 allowed the indigenous groups to restore their traditional tribal names (Tsao, 1997). That same year, the Council of Indigenous Peoples was established under the Executive Yuan to aid indigenous groups in Taiwan. The Education Act for Indigenous Peoples was enacted in 1997 to safeguard the education rights of indigenous peoples and upgrade indigenous education and culture, according to the will of the indigenous peoples themselves. The Indigenous Peoples Basic Act, 2005, stipulates that the government should provide resources to help indigenous peoples develop a system of self-governance, formulate policies to protect their basic rights, and promote the preservation and development of their languages and cultures. An indigenous TV station funded by C.I.P. also started to broadcast in 2005.

3.3 The History and Current Conditions of Language Policy in Taiwan

Taiwan was ceded to Japan in April 1895 under the Treaty of Shimonoseki. Compulsory Japanese education and cultural assimilation were implemented. The colonial government adopted a Japanization (Kominka) policy to acculturalize Taiwan's residents as Japanese citizens. The use and practice of Mandarin and indigenous dialects and customs were discouraged, and Chinese-language schools were closed (G.I.O., 2007b). There are still some Taiwanese and indigenous elders who can speak Japanese, and in both Taiwanese and indigenous languages, there are many words derived from Japanese.

In 1945, following Japan's defeat and surrender at the end of World War II, the Republic of China assumed control of Taiwan. From 1946 to the lifting of martial law in 1987, the assimilation policy of language was strictly implemented (Huang, 1994 as cited in Huang, 2002). From 1956 to 1987, because KMT (Kuomintang, the National Party) government enacted may laws and regulations to solitarily advocate the status of Mandarin, Mandarin was the sole language permitted in all education settings (Sung & Hsiung, 2010).

In New Zealand, Australia, the United States, Britain and Scandinavia, minority children are reported to have been subjected to physical punishment in school for speaking their home language (Tsao, 1997). This also occurred in Taiwan. Students were punished and denigrated for speaking their mother tongues at school. This could take the form of corporal punishment, or hanging signs around the student's neck with humiliating words on them, which could be taken off only when the student found somebody else violating the rule.

Both Japanization and Mandarinization meant that not only was the learning of one language, Japanese or Mandarin, emphasized, but other languages and associated cultures were undervalued, stagnated, or even prohibited. Since World War II this internal colonial condition has kept the Han people, its culture and Mandarin in a dominant status on the one hand, and indigenous peoples, their cultures, and languages in a subordinated status on the other.

Nevertheless, following Taiwan's democratization in the late 1980s, social diversification was accompanied by a growing emphasis on local languages. Public and private efforts have been devoted to teaching students their mother tongues and preserving the languages and dialects of smaller ethnic groups (G.I.O., 2007c). For example, in 1987, a language clash took place in provincial council and made those improper language policies suspicious and challengeable. Wulai junior high and elementary school in Taipei County began its indigenous language instruction experiment in 1990 (Pawan, 2004; Sung & Hsiung, 2010).

Promoting the teaching and use of indigenous tongues has been an important aspect of Taiwan's educational reform since the 1990s. In 1998, local language and culture education named "place-based curriculum" was organized into formal curriculum guidelines. In 2001, local languages was organized into national language learning area of Grade 1-9 Curriculum and became a required course for elementary students and an elective course for junior high school students. Foreign language education is also being promoted so that Taiwan's people may better compete in a globalized world (G.I.O., 2007d; Huang, 2009; Sung & Hsiung, 2010). Among foreign languages, English, as an imperialist language and global language, has been regarded as being as important as Mandarin. English was added to the curriculum of fifth- and sixth-year primary school students in 2001, and to the third- and fourth-year in 2005.

In 1995, after investigating 1,000 junior high school students in 25 schools, Jin-Pao Lin found that only 37 percent of indigenous students said that their indigenous languages were spoken most frequently at home. While 68 percent said that they could speak their parents' language,

only 16 percent claimed fluency (Tsao, 1997). A telephone survey conducted in 1999 by the United Daily Newspaper found that only 9% of indigenous children were fluent in indigenous languages. And several researchers found in 1990s that, among the indigenous peoples of Taiwan, language loss was evident among those who were 50 years of age and younger, and among people of 20 years of age residing in urban areas (Pawan, 2004).

New generations growing up in cities are usually not as fluent in their ancestral languages as they are in Mandarin or Taiwanese. To help preserve indigenous culture and language, the Taiwan government has included the study of indigenous languages in Taiwan's compulsory education system. Since 2001, primary school students have been required to take one native language course. For junior high school students, such language courses remain elective. The government supports such courses with funding at various levels and aspects, e.g. Ministry of Education's funding for hiring indigenous teachers and implementing indigenous education, Council of Indigenous Peoples' funding for conducting an annual accreditation of indigenous language proficiency and related training courses, some city governments' supporting the language nest plans, and so on. Courses in indigenous studies have also been gradually established on university campuses (G.I.O., 2007a; Pawan, 2004).

3.4 Micro Context and Force: The School System

The elementary school regularly observed by the author has 137 students and 12 staff members. The student number of other schools is around 70. Almost 99 percent of the students are Bunun or Sedig. The majority of teachers are Han, including the principal. The schools are located in a mountainous area in Nan-tou County. The nearest town is only a half-hour's drive away, and this relatively short distance exposes the students to the Han culture and lifestyle.

These schools are "indigenous priority schools." According to the Education Act for Indigenous People and its regulations, an "indigenous priority school" is a school with an indigenous student intake exceeding one-third of the total student population. This kind of school can apply for an extra grant for implementing indigenous programs or improving the disadvantaged conditions of its students.

The micro context in a school environment is a reflection of macro power structure in a society/nation-state. Indigenous language teaching in the formal school system is marginalized, if not excluded. One elementary school's director of academic affairs office interviewed by the author, who is a Han, mentioned that "generally we don't think about the importance of indigenous languages since most of teachers at our school are Han. We can't

speak any indigenous language and don't know what to do to promote it."

Although an indigenous language course is now required at primary education level and is an elective course at secondary education level, most indigenous language teachers are part-time teachers. They are not "mainstream" staff in schools and generally do not have the power to voice their opinions. They might have the authority to some degree to decide their curriculum and teaching strategies, perhaps because indigenous language is not a "mainstream" subject in schools both for students and parents; it is not a subject in national exams, and no guidelines and requirements are set up for indigenous languages. Indigenous language teachers have lower levels of support and resources from schools, the government and even the communities than teachers of "mainstream" subjects. Indigenous language is allocated only one period of 40 minutes per week.

4   Challenges for Indigenous Language Teaching

4.1 Subordinated Indigenous Cultures and Undervalued Indigenous Education

In Taiwan society, Han culture is the mainstream and dominant culture, and indigenous cultures are the minority and subordinated ones. After a long period of assimilation policy, the space for indigenous cultures is restricted, and indigenous education undervalued.

In the assimilation period, from 1895 to 1987, indigenous peoples were encouraged to mix with non-indigenous people so that they would "open up" to Han culture. Their assimilation with the rest of the nation was reinforced through the compulsory learning of Japanese and Mandarin.

Fortunately, after the lifting of martial law, many scholars and the public spoke up, calling for the use of indigenous languages in education and indigenous perspectives in teaching materials. Government agencies did respond to these calls (Tsao, 1997). In 1988, the Ministry of Education (M.O.E.) established the Indigenous Education Committee, with the objective of "adapting to modern life and maintaining traditional culture." It also launched programs to promote aborigine culture and funded research on the tribes. In 1993, the five-year program to develop and improve indigenous education was drawn up. In 1998, the second five-year program to develop and improve indigenous education was launched. The program was included in the educational reform movement project, with funds dedicated to the implementation of indigenous education. In 2003, the National Education Development Conference announced the objectives of the program as

"respecting aboriginal identity and developing aboriginal tribal education." Afterward, Ministry of Education issued the third five-year mid-term individual program to develop and improve indigenous education (2006-2010) in 2005, the forth five-year mid-term individual program to develop and improve indigenous education (2011-2014) in 2011, and the white book for indigenous education in 2011 (Ministry of Education, 2006, 2011).

However, a great deal remains to be done. Stereotypes for indigenous peoples and cultures still exist. They are thought to be primitive, inferior and underdeveloped. Some research findings point out that indigenous students have low levels of cultural identity, self-identity, understanding of their indigenous cultures and knowledge, and inadequate competence in their indigenous languages.

The subordination of a culture does not mean only that the dominant culture is learned widely and the subordinated culture is assimilated to it but that the subordinated culture and people are denied. Similarly, the subordination of a particular kind of knowledge means the adoption of the dominant education perspective, learning styles and skills, and the evaluation of the subordinated knowledge by the dominant perspective's criteria.

The subordinated status of indigenous language is evident. For example, in some schools, the course is taught at unofficial period such as after school session or lunch time, and the reason for this arrangement is not to interrupt the official courses (Huang, 2009). As the director interviewed suggested, teaching indigenous language at home rather than schools was not to squeeze the time for learning the national language, i.e. Mandarin, and foreign language, i.e. English.

4.2 The Debate over the Indigenous Language Skill Certificate and Its Linkage to National Examinations

According to the indigenous peoples language skill certification procedure, the certification examination procedure is though executed by the respective certification task force organized by each indigenous tribe, there are still some issues about dialects and the writing system (to be more specific, the phonetic system). Some tribal members are disadvantaged because of their dialects. The issues become even more critical when the certificate is related to "preferred admission status" for indigenous peoples.

Indigenous students have had preferential policy toward admission to senior high schools and universities since 1946 (Chen & Ou, 2010). According to the year 2001 edition of regulations regarding preferred admission status for indigenous students and government scholarships for indigenous people to study overseas, indigenous students have preferred admission status. They receive an additional 25 percent added to their original scores in the senior high school entrance examination and college entrance examination. There are also guaranteed places for indigenous students in senior high schools and universities.

However, in year 2006, the Ministry of Education and Council Of Indigenous Peoples nnounced changes to the regulations. From the academic year 2007, students who pass the indigenous language test and receive the indigenous peoples language skill certificate will receive an extra 35 percent added to their scores in the national entrance examinations and those who don't will still get an extra 25 percent during the academic years 2007-2009; however, the rate of extra marks will be gradually diminished after that. Furthermore, the latest revised regulation stipulates the extra 35% marks for indigenous students passing the certificate test and only 10% for those who fail.

In March 2007, the first "culture and language test for indigenous students to get preferred admission status" was held by the Council Of Indigenous Peoples. Almost 70 percent of the candidates passed. On the one hand, the policy is valuable for it enhances indigenous students' competence in indigenous language and diminish the doubt whether they will receive the extra marks, although the elder female indigenous teacher interviewed found students only memorized for the test and soon left the language behind. On the other, it may become a burden on indigenous students and reinforce their disadvantage. Indigenous scholar Pawan (2004) also revealed the burdens on both learning and teaching. The burden for students came from learning of three languages and studying for the entrance examinations at the same time. The burden for teachers was that they were held responsible for implementing the instruction of Grade 1-9 Curriculum and many new issues and had to take on extra administrative tasks.

In addition, challenges of different dialects and different writing systems remained though the Ministry of Education had been devoted to establishing a common system since 1992 and developed two systems (Huang, 2009). The reasons for this predicament are that some indigenous peoples have had their own writing system developed by Dutch or other missionaries for years, indigenous teachers didn't learn the MOE's writing systems (e.g. the teachers interviewed) and the MOE's systems didn't suit the specific indigenous languages.

4.3 Language Teaching with Limited Cultural Foundation and Implications

The Ministry of Education has delegated the production of indigenous language textbooks first to indigenous taskforces and secondly to National Chengchi University. In the first edition, the content was too difficult in some

respects and too easy in the others. Some teachers did not know there were such textbooks or were not supplied with them at all. The second edition is thought to be too easy and simplistic by some teachers, including all indigenous teachers interviewed by the author.

These new textbooks are also available on-line, with Mandarin translations. They are language learning texts without any cultural meaning and foundation. The content of the various textbooks for each indigenous tribe is the same, based on phrases such as "I am a student," "you are a teacher," "good morning," etc.

The actual teaching of these languages shows similar characteristics. Some teachers do relate the language teaching with their culture, and try to tell stories about their ancestors and festivals, but some completely focus on teaching "language" only. Among the indigenous teachers interviewed and observed by the author, the elder teachers inclined to embed their cultural knowledge and history in their curriculum, while the younger ones tended to teach communicative and daily conversation. Overall, indigenous language textbooks and teaching are unsatisfactory for the limited cultural foundation and implications. One of the reasons is that the teachers themselves do not have enough cultural knowledge or the confidence to use them. During their own schooling, they were not allowed to learn anything about their own culture and language. Two young female indigenous teachers talked about their limitation of knowledge about their own culture and history. Other reasons may be that they don't know how to incorporate such knowledge, or are just too busy to get prepared. For those elder teachers, there are more possibilities for weaving cultural material into language teaching. They attribute their limited share of indigenous knowledge and tradition to the students' insufficient proficiency of their mother tongues and their inadequate knowledge of their tribes and ancestors.

4.4 Teaching for Further Understanding of Indigenous Language Traits

The author taught foreign learners Mandarin for three years. She found it was helpful to understand the traits of students' mother tongues, because with that understanding the teacher might then be able to predict and recognize the problems students (might) encounter. Teachers could also then analyze and explain to students the differences between the two languages and help them resolve or minimize the problems.

Tan (1996) concluded that there were four factors which influenced educational achievement of minority students. They were students' cultural capital, language forms and traits, cultural identity, and social class.

In Bunun, there are more guttural fricatives and glottal stops than in Mandarin. Most of the Bunun students are so used to Mandarin that they do not recognize these traits, and cannot pronounce the language correctly. In addition, there seem to be only two tones in Bunun while there are five in Mandarin. There are also similarities and differences between Bunun and English. Students easily get confused.

4.5 Understanding and Responding to the Need for Different Learning Styles

There has been much research on the learning styles of indigenous students in Taiwan over the last decade (e.g. Tan & Lin, 2002). This may help teachers to have better understanding of and responses to students' needs; it may however be harmful if teachers acquire fixed beliefs about the learning styles of all indigenous students, without understanding individual differences.

Teachers themselves have varying teaching styles. For example, one of the male teachers observed was a hunter, and he seemed to teach in a way similar to hunting in that he followed the students' "tracks," in the form of the questions they raised or the comments they made. Other teachers did not have this characteristic. They generally ignored questions and comments not relevant to the set themes, or kept reminding students to focus on the theme under discussion.

Research indicates that if students' learning styles fit teachers' teaching styles, they can learn better (e.g. Bennett, 1995; Tan & Lin, 2002). In the author's observation, sometimes teachers could understand students' learning styles and respond well, but at other times they could not and felt frustrated. In the limited period of time available for indigenous language teaching, how to teach effectively and efficiently is much more important.

4.6 Problems with Teacher Training and Shortage of Teachers

According to the education act for indigenous peoples and education act for indigenous peoples implementation procedure, those who hoped to become qualified teachers of indigenous tribal languages must pass the Council of Indigenous Peoples' aboriginal language skill certification Test and take courses in multicultural education or indigenous education. The Ministry of Education offers 72-hour curriculum for indigenous seed teacher education and the Council of Indigenous Peoples offers 36-hour curriculum for indigenous languages supportive faculty every year since 2002 (Huang, 2009; Sung & Hsiung, 2010). The government also supports schools' mother-tongue programs with various levels of funding for the compilation and publication of teaching materials, teachers' handbooks and teaching seminars.

Despite this range of support for indigenous language teachers, problems exist. For example, there is a shortage of qualified teachers. There are not enough opportunities for pre-service and in-service indigenous teacher training, and most of those which do exist are too difficult to reach for many prospective or in-service indigenous language teachers. There are also insufficient indigenous language teachers for every specific language so schools have to divide indigenous students into the language class which doesn't teach their mother tongues, or conduct mix-age teaching (Huang, 2006; Hung, 2009; Pawan, 2004).

Many teachers of indigenous language have problems in classroom management, making curriculum and teaching plans, getting access to teaching resources, and so on. The majority of indigenous teachers interviewed encountered this challenge and almost all indigenous teachers who took part in this author's research thought it would be helpful to attend teaching seminars for the increase of their knowledge of teaching. More could also be done to enhance their understanding of respective groups of indigenous peoples, the culture and history of these peoples, the characteristics of students, and so on. However, for most of them, teaching is just a low-paid part-time job; some have other jobs and do not have time to travel long distances to attend teaching seminars.

4.7 The Need for Developing a Consistent and Coherent Curriculum Plan

In her study, Pawan (2004) found the teaching content included family, numbers, body parts, animals, the sky, food, living tools, native plants, names, the name of the tribal village, and songs. Similar to her findings, most indigenous language teachers the author interviewed or observed came from the same communities as their students and many used their own life experiences and the resources of their communities to teach, such as introducing Bunun or Sedig food by bringing in vegetables gathered from neighbouring fields or telling stories about hunting in the mountain area. It is good for learners to develop new learning on the base of their everyday life experiences.

But due to the time pressure, limited knowledge of teaching and other reasons, there was a lack of consistent, coherent and holistic curriculum planning for the respective class and for the whole school. For example, based on the author's observation, alphabets and the organs of the human body were taught in three different year groups -- Years 2, 4 and 6 -- Without any new material added. The reasons for this are the shortage of time spent in curriculum design, the difficulty for teachers to get together and discuss the whole framework of curriculum, the limited professionality of designing curriculum and teaching language, and the lack of assistance from the schools.

4.8 Problems with Textbooks and Learning Materials and the Lack of Teacher Handbooks

There are few learning and teaching materials, and even if there are, there are problems in the levels of difficulty (as outlined above). There is also a "missing link" between indigenous teaching/learning and indigenous cultures/ societies. Handbooks for teachers would help to fill this gap. Teaching materials also need to be developed. Though some teachers are willing to do this, they need more help and would also need to discuss this development with other indigenous language teachers, and school support are needed.

Some non-indigenous teachers believe it is not their business to learn about indigenous peoples, like the Han director interviewed, even though their students come from these groups. Others simply do not know how to help and support indigenous language teaching. Many teachers have never taken a course in multicultural education or indigenous education. Besides, teacher mobility and turnover in indigenous and/or country schools (which largely overlap) has been significant, and the workload is often higher than it is for teachers in other schools. This minimizes teachers' opportunities for professional development and restricts their understanding of students and communities.

Indigenous teachers, despite the fact that they have generally fewer teaching resources, have to develop their own curriculum, design their own teaching, and try to find or make the teaching and learning materials they need by themselves, without help from the school or other teachers. Principals do have some knowledge of multicultural education, but there is much to do in order to construct a multicultural environment and an education setting which can genuinely support indigenous language education.

4.9 Non-Supportive Families and Communities

Family and community are important sources of support for a younger generation's learning of mother tongues. In Taiwan, this foundation for indigenous languages has been eroded.

According to researches, many indigenous parents do not support their children's learning their mother tongue (Huang, 2009; Hung, 2006; Pawan, 2004). One reason is that parents consider learning indigenous languages a burden, which will lower their children's academic achievements. Another reason is that they believe the indigenous language is worthless and learning it would be a waste of time. Moreover, many indigenous parents cannot speak their indigenous language well. The majority of indigenous teachers interviewed mentioned that parents didn't speak mother tongues to their children and grandparents had to learn Mandarin in order to

communicate with their grandchildren. There are many indigenous families moving to cities, where they have few chances to speak their mother tongue. There are more and more interethnic marriages, and these couples speak Mandarin at home. In these non-supportive environments, indigenous students speak Mandarin and even Taiwanese better than they do their own indigenous languages.

5   Some Possible Strategies for the Development of Indigenous Language Teaching

Educationally, the specialists who met in 1951 under the sponsorship of UNESCO (Fishman, 1968) unanimously agreed that the mother tongue was the best language for literacy. They also strongly recommended that the use of the mother tongue in education be extended to as late a stage as possible. It has been proven by experience (UNESCO Meeting of Specialists, 1951, 1968) and by experiment (Ramirez, Yuen, & Ramey, 1991) that the teaching of mother tongue in the way proposed would not slow down students' acquisition of national language (cited in Tsao, 1997).

For these reasons, as well as for strengthening the self-esteem and cultural identity of indigenous students and preserving indigenous languages and cultures, improving the practice of indigenous language education is an important project. In response to the challenges that teaching of indigenous language faces in Taiwan, the author proposes some possibilities for improvement as follows.

5.1 Adopting an Indigenous-People-Centred Policy Approach

In planning and making decisions on indigenous language policies, the participation of indigenous communities and teachers is necessary. The main concern of the policies should be the well-being of indigenous peoples, and they should therefore be indigenous-people-centred. The previous process of policy-planning and decision-making was top down -- Only Han elitists' opinions counted.

This situation is changing. Some indigenous elitists may take part in the process and act as a voice for their peoples; however, they do not necessarily understand the difficulties and desires indigenous communities and schools have. Even if they do, they do not necessarily take these views and perceptions into account.

Top-down decision making, even "for the good" of indigenous peoples, is a form of domination. It leads to the reproduction of unequal power relations and inner colonization. An indigenous-people-centred policy approach might help more because it takes into account

the desires, difficulties, strengths, and uniqueness of indigenous peoples. Official policies on the development of indigenous cultures and languages, indigenous teacher training, indigenous skill examinations and so on, will not succeed unless indigenous communities and related persons are included in both the formation and the implementation of such policies.

5.2 Designing Integrated and Culture-Related Planning of Curriculum and Teaching Materials

Language and culture are intertwined. It might be helpful to combine indigenous language courses with local culture courses so that local culture can be learnt through indigenous language. This will not only provide more time for indigenous language teaching and learning, the indigenous language learned will also be grounded in cultural meanings and understanding, and relevant to the everyday life of the people.

Indigenous teachers are passionate about delivering their knowledge of indigenous language and culture. However, there are ways of empowering them more effectively. First, the school can cooperate with indigenous teachers to set up an integrated curriculum for all grades (Years 1-6). Those planning the curricula need to take indigenous culture and tradition into account and regard it as the core. If there is a common theme for different year groups, collaborative teaching can be designed. If there is a festival in the community, the school and teachers can cooperate with the community and teach something relevant. Through this approach, indigenous teachers can disseminate their knowledge and learn to design integrated curricula with colleagues. The school will be more involved in indigenous language teaching and provide better support for the teachers and students.Secondly, more and better teaching and learning materials as well as handbooks for teachers are needed. These should not become mandatory, but should give teachers the flexibility to decide what and how much to use. They should be a resource for teachers and students, not a burden, and should not deskill teachers.

5.3 Responding to Language Traits and Learning Characteristics

Indigenous languages have similarities with and differences from the dominant languages -- In this case, Mandarin and English. To find out what these are and to provide this knowledge to teachers might benefit teaching and learning.

Generally speaking, indigenous students prefer lively and visual texts for learning, and prefer learning through interactions, activities (with some body movements), and group work. Many indigenous students have high musical intelligence. Liu and Lin (2001) did experimental research

on setting new vocabulary and phrases to melody. The research findings indicate indigenous students learn better in these ways than in the traditional ways.

However, it is dangerous to take for granted that indigenous peoples always have particular learning styles. Sometimes the differences within ethnic groups are bigger than those between ethnic groups. It is necessary for teachers to acknowledge individual differences and implement various teaching styles accordingly.

In addition, although the indigenous language taught is generally students' mother tongue, it is actually more like their second language. Indigenous language teachers might need some knowledge of second language teaching.

5.4 Providing Effective Teacher Training and School Support

Indigenous teachers need to have access to a range of forms of teacher training, for example long-term and short-term, seminar and workshop, and a range of types of content, such as education theories, teaching practices, classroom management, indigenous culture, indigenous language teaching, second language teaching, etc.

One particularly important goal would be to establish a multicultural school to encourage teachers to learn indigenous culture and history and to encourage the appreciation of indigenous culture and identity. It is not only indigenous language teachers who need further teacher training; non-indigenous language teachers also need in-service training to learn more about other cultures and respect for others. It is necessary for non-indigenous teachers to take courses in multicultural education and indigenous education. It would be even better for teachers to learn about indigenous peoples and their cultures. Multicultural education is not only necessary for teachers. It should be required for everyone who lives in a multicultural and multiethnic world.

Schools can provide some supports to teachers, such as inviting other teachers to assist the indigenous language teacher. The assistance may include providing access to teaching resources, helping to get them prepared for teaching and managing the classroom, and learning the indigenous language with students, and so on. Through these methods, indigenous language teachers will get more resources and support from the school, and other teachers in the school will learn more about indigenous culture and language. This will form a learning organization to engage in the development of indigenous culture and education.

There is an example for creating an indigenous language friendly environment. The Han principal of a Bunun elementary school the author visited has started a teachers' study group, designed to provide introductory knowledge of the Bunun people and culture. A regular story-telling morning has been set up for elders from the community to tell Bunun stories. The principal himself has learnt Bunun and gives lectures in Bunun occasionally.

5.5 Supporting Families and Communities to Play Major Roles in Indigenous Language Learning

Parents and communities play an important role in indigenous language learning. For learning a language, it is not enough to have a one-hour course per week in school. As Fishman (1985 as cited in Chang, 2001) pointed out, schools could help language preservation, but families and communities were the keys to transmitting indigenous language. Schools have three limitations: They are not the key factor for language preservation; learning the language at school is too little and too late; and it achieves only the communication function. The functions of indigenous language as a cultural symbol, a sign of identity, and the medium for relationships with indigenous societies are lost.

The Taiwan government now financially supports local governments to set up language nests and indigenous language learning workshops in order to encourage communities and families to engage in indigenous learning (C.I.P., 2007). Churches, too, can play an important role in indigenous teaching. Around 70 percent of indigenous people are Christians. Prayers and sermons are chanted in Bunun, and in the observed district, the Sunday school also teaches children Bunun.

Nevertheless, indigenous languages are dying. To preserve these languages and their associated cultures, we need more support from the whole society and every possible resource.

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Postsecondary Educational Decision-Making among First-Generation College-Bound Students in Okinawa Prefecture

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Abstract

Currently, approximately fifty percent of high school students across Japan go on to attend universities or colleges. In Okinawa prefecture, however, that figure is only thirty-six percent, the lowest regional rate in Japan. Taking into consideration the various social and psychological factors that affect the college decision-making process, such as Socioeconomic Status (SES) and parental influence, this study focuses on the experience of first-generation college-bound students on the premise that such students are more numerous in Okinawa than in many other prefectures in Japan, and that family legacy is therefore a significant factor in the prefecture's low rate of advancement. According to a 2012 report by the Japanese Statistics Bureau, Okinawa has in recent years been suffering from severe unemployment rates relative to the average rates in Japan as a whole. The economically difficult situation in Okinawa might therefore engender a belief among many parents, especially those who have never attended college themselves, that their children would be better off attending vocational school after graduating from high school in order to quickly secure practical employment and begin providing for the family. This study explores to what extent SES differences may be correlated with college destination among first-generation college-bound students in Okinawa, and also investigates parental influence on college selection in contemporary Okinawan society. The target population for this study consisted of four hundred college-bound high school seniors in Okinawa. Survey questionnaires were distributed to these four hundred seniors in five high schools in Okinawa to determine the primary factors that influenced their decisions to attend college. The results of this research reveal both the positive and negative aspects of college selection among first-generation college-bound students in Okinawa.

Keywords: first-generation student, post-secondary education, socio-economic status (SES), transition to college, academic achievement, cultural capital

1 Introduction

In Okinawa prefecture, only thirty-six percent of students decide to go on to college, the lowest rate in Japan, even though Okinawa has the highest fertility rate (Japan's Ministry of Health, Labor and Wealth, 2012). Various factors can offer insight into why many high school students in Okinawa do not want to go on to college. Japan has 47 prefectures, and Okinawa prefecture is located in the southern part of Japan. The prefecture is composed of three island groups (Okinawa Islands, Miyako Islands and Yaeyama Islands); this research targets the largest among these, the Okinawa Islands, where the capital city Naha is located.

This research examines how various social, cultural and psychological factors, such as Socioeconomic Status and parental influence, affect a first-generation college-bound student's decision to go to college. According to the National Center for Education Statistics (NCES) in the United States, first-generation college students are defined as "those whose parents' highest level of education is a high school diploma or less" (Nunez & Cuccaro-Alamin, 1998). In the United States, most first-generation college students share similar experiences, such as a low level of educational support from their parents, a low level of personal commitment to study, and poor knowledge and information about college options (Tym, McMillion, Barone, & Webster, 2004). This research explores to what extent socio-economic status (SES) may be correlated with college advancement among first-generation college-bound students in Okinawa, in addition to the parental and regional factors which may affect college selection in contemporary society. What social and regional factors might negatively influence the college-decision making process among high school students in Okinawa? According to the Okinawa Prefectural Board of Education, there are forty public general academic high schools leading to college or jobs after graduation, five private general high schools, and twenty public vocational high schools leading directly to employment, such as technical and agricultural high schools. Approximately 54,000 students are enrolled in high schools. There are also four public universities,

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three private universities, and two two-year private colleges in Okinawa.

This research focuses on the experience of first-generation college-bound students in Okinawa, and explores how they make decisions about college. The essential questions of this study were, given that many first-generation students have a low level of family support, a lack of knowledge and information about university education, and a low level of personal commitment, what motivates first-generation students to attempt to go to college? How can high schools in Okinawa help increase the rate of students who go on to college? If more first-generation students are to seek opportunities to study at institutions of higher education, universities and colleges may need to work on improving financial aid programs and other support programs for them. By considering first-generation students' decision-making factors, this research examines what factors are particularly influential on first-generation students' educational and occupational aspirations. It also explores factors influencing the low college attendance rates of Okinawan high school students.

2   The Concept of First-Generation College Students in Japan

It is important to note that the concept of the first-generation college student is not common in Japanese high schools or higher educational institutions, because many Japanese believe that parents' educational and financial backgrounds are not necessarily associated with a student's academic achievement or educational aspirations. Many American researchers have conducted surveys about first-generation college students (Tym et al., 2004), but in Japan not much research has focused on this group. Kawano (2003) states that universities and colleges will have to become more proactive in undertaking educational reforms for attracting more first-generation college-bound students.

Nishimoto (1998) notes that Japanese society is a meritocracy, and that admission to Japanese higher educational institutions is based on a meritocratic means of selection. The entrance examinations of Japanese universities and colleges only measure how much information students have memorized. The Japanese education system emphasizes a test score-oriented approach, and many Japanese do not see family background characteristics as a significant factor in students' academic success. By contrast, American researchers have found that parental educational background has a significant and direct effect on their children's academic achievement. As parental education levels increase, children are more likely to go to college (Hossler & Stage, 1992; Hossler, Schmit, & Vesper, 1999; Stage & Hossler, 1989). Hossler, Schmit, and Vesper (1999) also find that parents with college degrees tend to

value education and to transmit their educational values to their sons and daughters more than do parents with only high school degrees or less. Through their own college experience, parents of non-first-generation students can better explain to their children what college is like and how to prepare for the university entrance examinations. Considering these facts, it seems that parents' educational background significantly influences students' educational aspirations.

3   Problem

In Japan, the recent advancement rate of high school students to college has reached approximately fifty percent. Between 2000 and 2012, the percentage of high school students who advanced to college increased from 39 to 53.6 percent (MEXT, 2012). Since the number of young students has been dramatically decreasing in Japanese society corresponding to an overall decline in population, the quota of students to be admitted to college has become almost equal to the number of applicants for college admission. In such a situation, universities and colleges are no longer as concerned with enrolling the best students, and many are satisfied with merely finding students to fill their classrooms and to purchase their services. As college admission becomes less competitive, students may act more like consumers and view themselves less as candidates competing for admission. Many more first-generation college-bound students are entering universities and colleges and have a new set of expectations. Yet, in Japan the concept of a "first-generation college-bound student" does not exist. Japanese high schools and universities now need to understand the nature of first-generation college students and need to consider ways to ease the transition from high school to college.

In Okinawa, although college admission is becoming less competitive, only 36.7 percent of high school students decide to go on to college. The rate of students in Okinawa who go on to college is the lowest in Japan (Japanese Ministry of Health, Labor and Wealth, 2012). Whether this is because many students and their parents in Okinawa cannot afford college expenses, or because many parents do not value higher education, it is important to note that the unemployment rate in Okinawa is consistently the highest in Japan every year.

In Okinawa, many people work in tertiary industries, such as tourism, and individual annual income levels rank lowest in Japan. Income disparity between the annual income in Okinawa and the average annual income in Japanese society as a whole is significant. Considering this, it may be difficult for many parents to send their children to a private high school. According to the Okinawa Prefectural Board of Education, prefectural high school is free, whereas private high schools charge US$4,000 per year. This reality

may reflect the low number of private high schools in Okinawa. There are only three private high schools, all of them successful academic-track schools that place over two-thirds of their students in colleges or universities. Given these success rates in comparison to the overall rate of college attendance, it is important to consider how SES differences may be related to access to private high schools leading to college. Considering these social and cultural factors, it is not unreasonable to assume that many high school students in Okinawa may be the first members of their families to apply to college. Even though, in light of recent population trends, students might no longer struggle to the same degree under the psychological pressure of entrance examinations and college competition, they are still likely to face concerns over who will cover their first-year college expenses.

4 Theoretical Perspective

There are many external and internal factors that work together when a first-generation college-bound student is deciding whether or not to go to college, and the intensity and strength of these forces may differ from student to student. A theoretical model (Anderson's Force Field Analysis) addresses students' decision-making factors and helps in understanding the many causes of behavior that work together. Using Force Field Analysis helps to identify the driving forces (forces that push toward the fulfillment of goals) that influence a student's decision to go to college, as well as the restraining forces (forces that resist and impede change) that hinder a student's achievement and persistence once in college. According to Edward Chip Anderson's (1985) 'Forces Influencing Student Persistence and Achievement,' "force field analysis" can be used to explain how these forces work to yield either attrition or persistence, and helps with establishing programs aimed at increasing academic persistence and achievement (see Figure 1). Some possible external forces affecting a student's decision to go to college include parents, peers, culture, availability of information on college, teachers and counselors, and contact with people who have a college education and who are potential role models. Some possible internal forces affecting a student's decision to go to college include academic skills, motivation to succeed and persist, pure enjoyment of learning, and confidence to undertake the challenges of college.
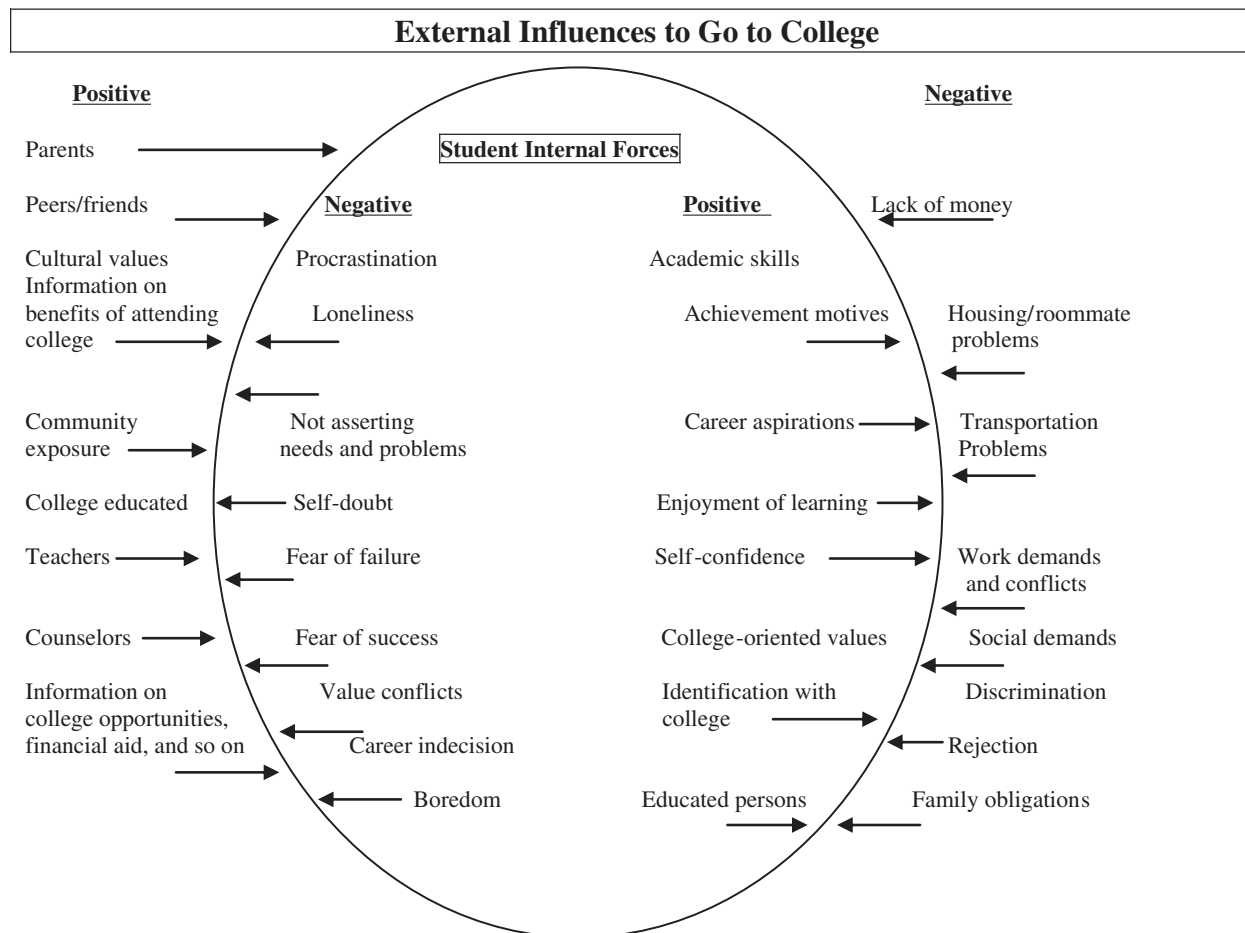

Figure 1 Force Field Analysis

Source: Anderson (1985, p. 50).

There are many obstacles and requirements that stand in the way of a college degree for many first-generation college-bound students, including rejection by family and friends who do not value college education, ethnic/racial discrimination, unfamiliarity with how to complete the admissions procedure, transportation problems, and so on. Anderson (1985) identifies two general categories of negative internal forces that hinder a student's ability to obtain a college degree: (1) self-defeating perceptions and behavior patterns and (2) confusion or indecision. Other possible negative internal forces include procrastination and other self-management problems, inability to assert needs and ask for help, fear of failure, fear of success, fear of rejection, and value conflicts. Anderson notes that, "students may feel that both success and failure can lead to rejection. Some family members and friends may reject a student just for going to college; this may make persistence very unlikely." He also notes that, "students from low-income homes may experience conflict because college keeps them from working to help support their families." Furthermore, he says that when a student moves away from home, he/she is also moving away from positive external forces, making it even harder to overcome these obstacles.

Using force field analysis can help to dissect these numerous external and internal causes in order to establish and implement appropriate programs to counter attrition. When it is used to explain attrition among low-income students, external factors include parents, peers and environment. Parents may not want their children to go to college because the children's income is needed at home or they may not see the importance of a college education. The peers of students from low-income groups are unlikely to attend college, which means that there is no culture of influence or peer pressure promoting college application. These low-income students may live in environments that provide little information about the value of a college education. Also, there may not be as many college-educated individuals in these communities that low-income students can look to as role-models. Furthermore, considering internal factors in the force field analysis, low-income students often have lower academic skills, and may be less likely to be interested in college. They may expect to have careers that do not require post-secondary education, while high-income students may attend schools with better teachers and curricula that promote greater interest in college.

5 Literature Review

5.1 First-Generation College Students in Japan

Many American researchers have conducted surveys about first-generation college students, but in Japan not much research has focused on this group. Kawano (2003) states that universities and colleges will have to undertake more proactive educational reforms if they are to attract more newcomers, such as first-generation college-bound students. Kawano examines to what extent first-generation college students and non first-generation college students have different experiences in making decisions to advance to higher education. In the course of her study, Kawano conducted a paper survey of about 160 first-generation and non first-generation college students majoring in education at Japanese universities (this is called P in her study). She defined a first-generation college student as a student whose father did not graduate from a four-year university. She did not analyze individual student experience based on Socioeconomic Status (SES). In this study, she found that the ratio of male first-generation college students was slightly higher than the ratio of female first-generation college students. Also, many first-generation students graduated from middle- and small-size high schools (less than 300 students), and they did not go to high schools where ninety percent of students advance to four-year institutions. Approximately forty percent of first-generation college students came from high schools where less than fifty percent of students go on to college (Kawano, 2003).

Kawano also conducted a survey to explore the reasons behind the choice to advance to four-year institutions, and she found that the most cited reasons of first-generation college students were, "to study my own favorite subjects at college," "to obtain a Bachelor's degree," and "correlation with career choice." Another interesting finding is that only thirty percent of the first-generation students chose "to obtain a broad education." Thus, first-generation students are not likely to have an ambiguous reason for attending college, such as the general benefits of a liberal arts education.

Kawano, in her study, also found that most first-generation college students were likely to seek "teacher's advice" and "academic and career counselor's advice" regarding decisions about college, much the same as non-first-generation students. In this study, by contrast, most first-generation and non first-generation college students did not seek any advice from private cram school teachers, while their high school teachers played an important role in college decision-making.

Kawano's study indicates that parental pressure is not the most significant factor in college decision-making among either first-generation or non-first-generation college students. However, Kawano does not take into consideration SES factors. Over seventy-five percent of college-bound students in her study chose national universities with lower tuition and higher prestige. Twenty percent of both first-generation and non first-generation applicants also cited the

reason, "I can commute from my home" as their decision to apply. Given that most students cited both the fact that "the institution is a national university" implying exclusivity and "I can commute from my home" as deciding factors, is it then possible to conclude that these students may be classified as belonging to middle or low Socioeconomic Status (SES) families, in the absence of an explicit statement on SES status by Kawano? If Kawano had explored SES differences between first-generation and non-first-generation college students, the result in this particular study might have been an extremely effective illustration of how SES factors influence the decision making of first-generation college students.

6   Research Questions

(1) How do first-generation college-bound students make decisions about attending college?
   a. What are the differences between first-generation college-bound students and non-first-generation college-bound students regarding college planning?
   b. What are the primary factors that influence decisions about attending college?
   c. What externally and internally motivates first-generation and non-first-generation college-bound students to attempt to go to college?
(2) Given the constraints imposed by social background factors, what role do external factors, such as SES differences and parental influence, play in the decision-making of first-generation college-bound students in Okinawa?
   a. Are there any differences between the educational experiences of first-generation college-bound students from lower SES families and those of higher SES families?
   b. How do gender differences affect decision-making in Okinawa, especially in relationship to socioeconomic differences?

7   Procedures

In this research quantitative surveys on paper were conducted at five public high schools in Okinawa. In Japan, the most successful academic-track high schools are measured by the number of students who are placed in elite universities. According to the Okinawa Prefectural Board of Education, four prefectural high schools have a college placement rate of over two-thirds of their students, and are classified as successful "high academic-track high schools." The other prefectural high schools in Okinawa are classified as "low academic-track high schools," where over two-thirds of the students do not go on to college.

There are three private high schools in Okinawa, and all of them are classified as successful academic-track schools. Since all the private high schools in Okinawa are successful academic-track schools, it was not possible to compare students from successful academic-track private schools with those from low academic-track private high schools. For this reason, the survey was conducted only in public high schools.

To conduct this research, it was necessary to contact a principal at each high school for permission to proceed. However, the principals were reluctant to grant permission to administer the questionnaires. Formal written requests were made to forty-one high schools in Okinawa via postal letter, e-mail and FAX, but responses were received from only five high schools. With their permission, the quantitative survey was conducted.

This research was conducted between October and November, when most seniors had already decided their future educational plans, whether academic or vocational. The quantitative survey took approximately 15 minutes to complete, which students did in class. Each high school has approximately 300 students in its senior class, and the questionnaire was given to approximately 100 seniors at each of the five high schools.

8   Quantitative Study

The questionnaire included questions on students' educational background; the occupations of their parents; their choices regarding college; their attitudes toward their choices; and when they first considered going to college. Even though college admission is becoming less competitive in Japan due to an overall decline in population, many students in Okinawa still choose not to attend college. Since most existing research on college decision-making in Japan has not focused on parents' education, this survey, in focusing on Okinawa, where college attendance rates are low, addressed first-generation college-bound students whose parents have high school degrees or less, in the interest of understanding the reasons for their decisions to apply to college.

In order to identify first-generation college-bound students of higher and lower SES families, the questionnaire asked the following questions: "what are your parents' occupations?" "what is your parents' annual income?" and "what is the highest level of formal education obtained by both your father and mother?" However, all five high schools were very uncomfortable with these questions, which were perceived to be sensitive because of Japan's personal information protection law. In today's high schools, most teachers are not allowed to ask for personal information concerning their students' family

life. Fortunately, it was possible to ask about their parents' occupations and education levels, though only on the questionnaire.

Socio-Economic Status (SES) has a significant influence, and the main indicators of SES are parents' annual income, their highest level of education, and their occupations. Because of the restrictions on personal questions, SES was determined on the basis of only two indicators: Parents' occupations and their highest levels of formal education (see Table 1, Table 2 and Table 3).

9   Results

9.1   Description of the Sample

In this study, 543 high school seniors responded to a survey distributed in five high schools. Of the 543 students, 420 were college-bound, and 123 were vocational-track students who had decided not apply to college. Since this study examines college decision-making among college-bound students, only the data of college-bound students was used. The survey was relatively balanced with regard to gender (160 male students, 193 female students and 67 students who did not specify their gender). Thus, there were 353 responses (160 male students and 193 female

students), and the percentage of response was 84.0%. At Northern high school, 71 college-bound students (39 male, 32 female) responded. At Central high school I, 53 college-bound students (21 males, 32 females) responded, and at Central high school II, 48 students (38 males, 10 females) responded. At Urban high school, 94 college-bound students (26 males, 68 females) responded, while at Southern high school, 87 college-bound students (36 males, 51 females) provided responses.

9.2   First-Generation and Non-First-Generation College-Bound Students

College-bound students were asked about the highest level of education obtained by their parents. 5.7% of their fathers were at most a junior high school graduate, and 43.3% stopped their education after their high school graduation and had obtained only a high school degree. 6.2% of their fathers had attended a vocational school after high school. 1.7% of their fathers had earned only an associate degree, and 38.5% had earned a bachelor's degree. 2.5% of their fathers had earned a Master's degree or a Ph.D. With respect to the educational level of their mothers, 4% graduated only from junior high school, while 40.2% were high school graduates. 12.3% of their mothers

Table 1 Socio-Economic Status (SES) Classification

SES Classification	Total Score (both father and mother)	Expected Annual Income (US$1 = JPN\80)
High SES	19-24 points	More than $75,000
Middle SES	10-18 points	$25,000 to $75,000
Low SES	1-9 points	Less than $25,000

Table 2 SES Indicator-1

The Highest Level of Formal Education	Score
Junior high school graduate	1 point
High school graduate	2 points
Vocational school graduate	3 points
Associate degree	4 points
Bachelor's degree	5 points
Graduate degree	6 points

Table 3 SES Indicator-2

Group	Parents' Occupations	Score
Group 1	Part-time worker, manufacturing, construction, truck driver, agriculture and forestry	1 point
Group 2	Mechanic, carpenter	2 points
Group 3	Store clerk, sales person, waiter, chef, beautician, receptionist, independent business person	3 points
Group 4	Technician, engineer, nurse, office clerk in a company, homemaker	4 points
Group 5	Teacher, police officer, firefighter, military	5 points
Group 6	Lawyer, medical doctor, certified public accountant, executive level position within a company	6 points

were vocational school graduates. 21.4% of their mothers had earned only an associate degree, and 21.4% had earned a bachelor's degree. Only 0.9% of their mothers held a master's degrees or higher.

In this study, college-bound students were classified into two groups: (1) students whose parents completed only high school or less and (2) students whose parents earned associate's degrees or higher. If one parent completed college and the other only high school, these students were classified into group. (1) Among college-bound students thus classified, 41.9% were first-generation college-bound students whose parents had completed high school or less ($N = 148$). 58.1% were non-first-generation college-bound students whose parents had earned an associate's degree or higher ($N = 205$). Of the first-generation students ($N = 148$), 47.3% were male ($N = 70$), and 52.7% were female ($N = 78$). Among the non-first-generation students ($N = 205$), 43.9% were male ($N = 90$), and 56.1% were female ($N = 115$).

9.3 Parents' Occupation

In the survey, college-bound students were also asked about their parents' occupations, age and hometowns. Parents' occupation and income are likely to affect a student's decision to go to college. Using Japan's occupational prestige rankings, parents' occupations were categorized into six groups (see Table 4).

Many fathers of non-first-generation students in Okinawa belonged to the managerial, professional, technological, or bureaucratic categories, which require a bachelor's degree or higher for entry. On the other hand, many fathers of first-generation students belonged to the skilled labor, law enforcement/security, and industry and transport categories, which do not require a bachelor's degree. With respect to mothers, many mothers of non-first-generation students in Okinawa belonged to the professional, technical, and bureaucratic categories, though many were also full-time homemakers. By contrast, many mothers of first-generation college-bound students belonged to the marketing, service industry, skilled labor, and industry and transport categories.

9.4 Socio-Economic Status (SES) Differences and Parents' Education

Differences in socio-economic circumstances are associated with differences in values among families, and also with different educational aspirations (Trent, 1970). SES factors thus can be expected to have a significant influence on student's decisions to go to college. SES was determined from two indicators (parents' occupations and highest level of formal education) among college-bound students in Okinawa (see Table 5). 56.8% of first-generation college-bound students were classified as belonging to a low SES family, and 43.2% to a middle SES family. None of the first-generation students were classified as belonging to a high SES family. On the other hand, 20.1% of non-first-generation students were classified as belonging to a high SES family, 76.3% to a middle SES family, and only 3.6% to a low SES family. The low-SES group of non-first-generation students is categorized as Group 1 (part-time worker, manufacturing, construction, truck driver, agriculture and forester). Where parental education levels are higher, the family's SES is high as well. Thus, the data indicates that Socio-Economic Status (SES) hinges on parents' education, and there is a causal relationship between SES and parents' education in this study.

Looking at the relationship between SES differences and parents' education, the two-sided asymptotic significance of Pearson's chi-square test is 0.000 (see Table 6). Where parental education levels are higher, the family's SES is high as well. Thus, the data indicates that Socio-Economic Status (SES) hinges on parents' education, and there is a causal relationship between SES and parents' education in this study (see Figure 2).

9.5 Investment in Supplemental Education for Elementary School Students

The next data analysis focuses on how long parents of college-bound students had their children enroll in supplemental education classes while they were elementary school students. Do only students with high- and middle-SES backgrounds attend supplemental education classes? Are there any SES differences in parents' educational

Table 4 Parents' Occupations

Group	Occupations
Group 1	Part-time worker, manufacturing, construction, truck driver, agriculture and forestry
Group 2	Mechanic, carpenter
Group 3	Store clerk, sales person, waiter, chef, beautician, receptionist, independent business person
Group 4	Technician, engineer, nurse, office clerk in a company, homemaker
Group 5	Teacher, police officer, firefighter, military
Group 6	Lawyer, medical doctor, certified public accountant, executive level position within a company

Table 5 College-Generation SES Cross Tabulation

		SES			
		High SES	Middle SES	Low SES	Total
First-Generation College-Bound Student	Count	0	54	71	125
	Expected Count	14.5	77.8	32.7	125.0
	% within College Generations	.0%	43.2%	56.8%	100.0%
Non-First-Generation College-Bound Student	Count	34	129	6	169
	Expected Count	19.5	105.2	44.3	169.0
	% within College Generations	20.1%	76.3%	3.6%	100.0%
Total	Count	34	183	77	294
	Expected Count	34.0	183.0	77.0	294.0
	% within College Generations	11.6%	62.2%	26.2%	100.0%

Table 6 Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.156E2	2	.000
Likelihood Ratio	136.786	2	.000
Linear-by-Linear Association	108.228	1	.000
N of Valid Cases	294		

Notes: 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.46.

(Causal relationship)

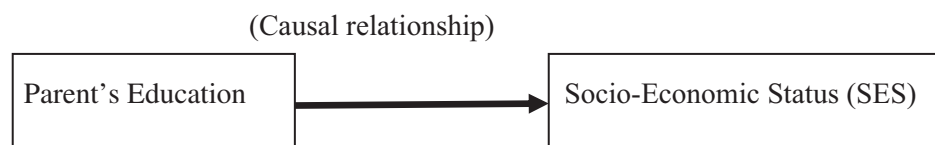| Parent's Education	→	Socio-Economic Status (SES)

Figure 2 Model of Socioeconomic Status and Parents' Education

values with regard to elementary education? Many college-bound students attended private cram schools for lessons, including calligraphy, abacus, and piano, when they were in elementary school. Are there then any causal relationships between SES, parents' education, and investment in supplemental education? Did only high-SES and middle-SES families with college degrees send their children to private cram schools in Okinawa? Were parents with college degrees more likely to take an interest in their children's education than parents with high school degrees? The data indicates that 80% of parents of college-bound students sent their children to supplemental education classes when their children were in elementary school. 80% of first-generation college-bound students from low-SES backgrounds attended supplemental education classes, while 67% of non-first-generation college-bound students from low-SES families did so. In the middle SES groups, approximately 80% of first-generation students attended supplemental education classes, the same as for non-first-generation students. Using the Pearson's chi-square test to compare the proportion of SES differences

and the investment of supplemental education classes as an elementary school student, the two-sided asymptotic significance of the Pearson's chi-square test is 0.430 in the low-SES group (see Table 7). The data indicates that there is no causal relationship between parents' education and the investment in supplemental education, and also no causal relationship between SES differences and investment in supplemental education. Even low-SES parents with no college degrees were likely to spend money to enroll their children in supplemental education classes. Here is a model of parents' education, SES, and attendance of supplemental education classes among low-SES families (Figure 3).

However, the data does indicate that there is a causal relationship between parents' education and the attendance of supplemental education classes in the middle SES group. The data indicates that the two-sided asymptotic significance of the Pearson's chi-square test is 0.014 in the middle-SES group (see Table 7). In the middle SES group, if the parents held college degrees, they were more likely to send their children to supplemental education classes than parents with high school degrees or less. Below is a model

Table 7 Chi-Square Tests

		Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
High SES	Pearson Chi-Square	.[a]				
	N of Valid Cases	34				
Middle SES	Pearson Chi-Square	6.058[b]	1	.014		
	Continuity Correction	5.077	1	.024		
	Likelihood Ratio	5.700	1	.017		
	Fisher's Exact Test				.021	.014
	Linear-by-Linear Association	6.025	1	.014		
	N of Valid Cases	182				
Low SES	Pearson Chi-Square	.623[c]	1	.430		
	Continuity Correction	.070	1	.791		
	Likelihood Ratio	.559	1	.455		
	Fisher's Exact Test				.599	.364
	Linear-by-Linear Association	.615	1	.433		
	N of Valid Cases	77				

Notes: [a] No statistics are computed because College Generations is a constant.
[b] 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.09.
[c] 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.25.
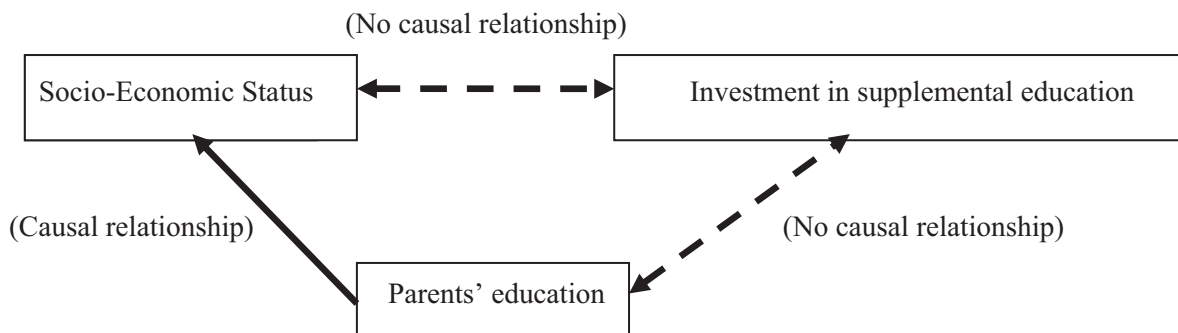

Figure 3 Model of Parents' Education, Socioeconomic Status, and Attendance of Supplemental Education Classes

of SES, parents' education, and investment in supplemental education for elementary school students in the middle-SES group (see Figure 4).

Thus, attending a private cram school does not necessarily hinge on Socio-Economic Status, and it also does not always hinge on parents' education. Since there was no high SES family among first-generation college bound students, it was not possible to determine whether there exists any relationship between high SES families, parents' education and investment in supplemental education classes.

9.6 Investment in Supplemental Education for High School Seniors

In Japan, many high school students attend a private cram school during their senior high school years because students and their parents think that their high schools may not provide enough classroom time to prepare students for university entrance examinations. Also, most high schools do not offer any tutoring services after class, so some students with low-academic performance may need to attend a private cram school to catch up with their everyday lessons. The senior year is very important for college-bound high school students in Japan. This is when they prepare to choose and apply to a college. Many students attend supplemental education classes during this year, until they take the university entrance examinations. This section addresses the question: Are college-bound students from low-SES groups equally as likely to attend a private cram school to prepare themselves for the university entrance examinations as college-bound students in high-SES and middle-SES families? The data indicates that 33.8% of first-generation and 33.3% of non-first-generation students from low-SES families attended a private cram school. The two-

sided asymptotic significance of the Pearson's chi-square test was 0.981 in the low SES group (see Table 8). In the middle-SES group, 35.2% of first-generation and 42.6% of non-first-generation students attended supplemental education classes. The two-sided asymptotic significance of the Pearson's chi-square test was 0.349 in the middle SES group (see Table 8). Thus, the data indicates that there is no causal relationship between SES, parents' education, and attending a private cram school as a high school junior. The following is a model of the relationship (see Figure 5).

Considering that even first-generation students from low-SES backgrounds attended a private cram school, it can be said that neither SES differences nor parents' education necessarily influenced investment in supplemental education. It is important to note that the data indicate that gender differences also do not necessarily influence financial investment in supplementary education. Regardless of SES differences and gender differences, parents in Okinawa seem likely to spend money and time to enroll their children in private cram schools.

9.7 Student's First-Choice College

College-bound students were asked about their first-choice colleges. The majority of college-bound students in Okinawa were likely to apply to the University of the Ryukyus, a national university in Okinawa. An additional 24% were likely to choose a private university in Okinawa. On the other hand, 20% of the college-bound students planned to leave Okinawa to attend a public or private university located elsewhere. Considering that 60% of first-generation, college-bound students belonged to low SES families, the presumption was that most first-generation students would plan to apply to a low-cost public university in Okinawa as a first-choice college instead of applying to private universities where the cost of tuition is higher. The data indicate that 40% of low-SES first-generation students were likely to apply to private universities in Okinawa, while only 30% were likely to apply to the public University of the Ryukyus. Moreover, only 20% of first-generation students from low-SES backgrounds were likely to apply to high-cost private colleges outside of Okinawa. Compared to first-generation students, 70% of non-first-generation students from low-SES backgrounds were likely to apply to a private college outside of Okinawa. 40% of both first-generation and non-first-generation students indicated that they would rely on scholarships. Apparently their families were unable to afford to pay for their children's college education, so these students were planning to rely on student loans to finance the high cost of college tuition. Thus, the cost of tuition was not necessarily a significant factor affecting a student's college decision-making process.

9.8 First Year's College Expenses among College-Bound Students

The data given above raises the issue of how students and their parents in the low-SES group pay college expenses. With regard to first-year college expenses (tuition,
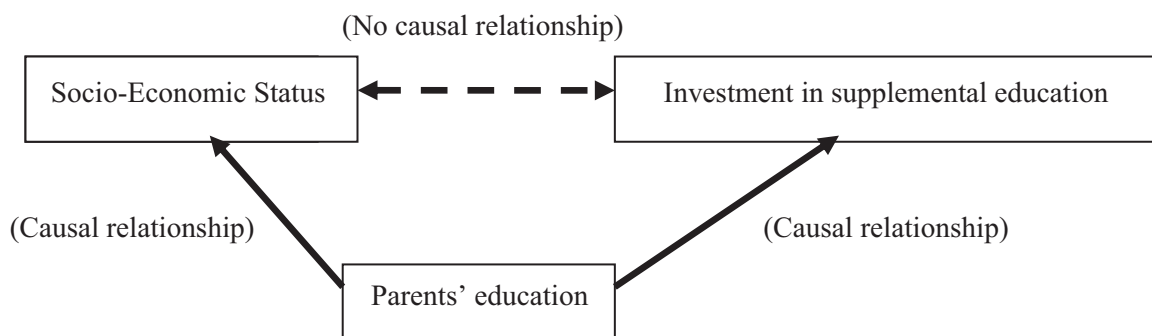

Figure 4 Model of Socioeconomic Status, Parents' Education, and Investment in Supplemental Education for an Elementary School Student
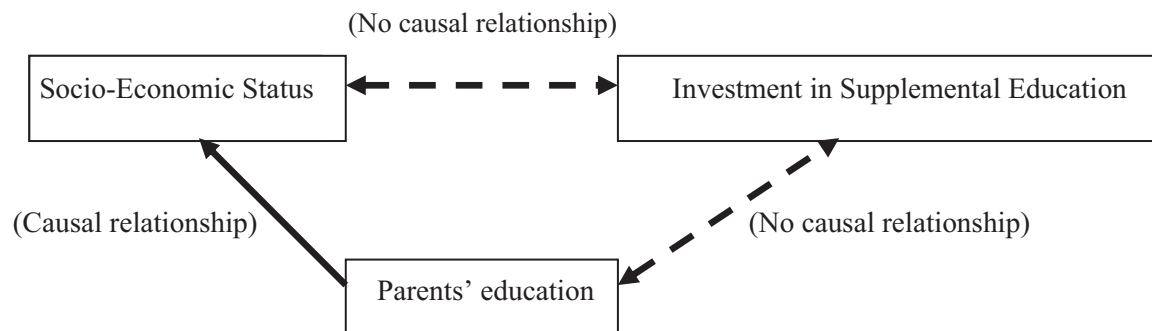

Figure 5 Model of Socioeconomic Status, Parents' Education, and Investment in Supplemental Education for a High School Junior

most significant force influencing non-first-generation students' decision to go to college. In the middle- and low-SES groups, first-generation students indicated that peer influence had a strong positive relationship to college decision-making, and it seems that school environment was a primary influence for students whose parents had never earned college degrees. If students in the high- and middle-SES groups had elder siblings who attended college, these siblings often affected a student's decision to go to college. The encouragement of junior and senior high school teachers did not necessarily influence college decisions. Furthermore, it is important to note that neither gender differences nor SES differences played a significant role among either first-generation or non-first-generation college-bound students.

9.10 When Students First Consider Going to College

Non-first-generation students may make the decision to apply to college earlier than first-generation students because their parents are familiar with college life and also encourage them. In this study, 30% of non-first-generation students from high-SES backgrounds indicated that they first considered going to college while they were in the third year of junior high school, 20% while in elementary school, and 20% while in the first semester of their freshman year in high school. In the middle-SES group, 15% of first-generation students first considered going to college while they were in the third year of junior high school, and 15% while in elementary school. The majority of non-first-generation students from a middle-SES background indicated that they first considered going to college while they were in the third year of junior high school, and 20% while they were in elementary school. In the low-SES group, the majority of first-generation students first considered going to college in the third year of junior high school, and 15% while in the first semester of their freshman year in high school.

In the high- and middle-SES groups, many first-generation and non-first-generation students first considered a college education when they were in elementary school or in the third year of junior high school. In Japan, junior high school students in the third year have to decide whether to apply to a college-track high school or a vocational-track high school. This is why most college-bound students would first consider higher education in the third year of junior high school. From the data, it appears that first-generation students from low-SES backgrounds are likely to make college decisions slowly, compared with students in the high- and middle-SES groups. There was no causal relationship between the parent's education and the time students first considered a college education. Also, according to the data analysis, gender and SES differences were not significant factors.

9.11 Socioeconomic Status (SES) Differences in Reasons for Going to College

The influence of SES differences is one possible external factor affecting a student's decision to go to college (see Table 9). The data show that parents' encouragement was a factor across SES groups. There were no significant differences in the father's influence between SES groups. However, the mother's influence among first-generation students from low-SES backgrounds was slightly higher than in any other SES groups. Takeuchi and Fukuyama (1996) found that in Japan parents' college experience influences their children's college decision-making both directly and indirectly through parental involvement and investment in education. Parents with college degrees are more likely to invest in their children's education. Takeuchi (2003) also notes that if parents have less than a high school degree, their children are expected to earn an associate's degree or higher. The logical expectation would be that the children would earn only an associate's degree or lower, but what the results of the present study show that in Okinawa children of parents with no higher education tend to earn higher than an associate's degrees.

SES differences were also analyzed in relation to the influence of high school teachers. Except for non-first-generation students from high- and low-SES backgrounds, high school teachers were moderately influential in the college decision-making process of both first-generation and non-first-generation students. High school counselors were also moderately influential. Except for non-first-generation students from high and low-SES backgrounds, over 20% of students thought that their academic and career counseling teachers influenced their decision to go to college.

Looking at SES differences in peer and classmate influence, the rate of peer influence was very low among non-first-generation students from high-SES groups. In other groups, there were no significant SES differences in peer influence. However, the influence of classmates was much higher. First-generation students from low-SES backgrounds and non-first-generation students in the middle-SES group indicated classmate influence more than students in any other SES group.

The data indicate that most students wanted to go to college to expand their knowledge. Except for non-first-generation students from low-SES backgrounds, over 80% of both first-generation and non-first-generation students in the respective SES groups indicated that they wanted to expand their knowledge in college. This was most striking among non-first-generation students from high-SES backgrounds. Many non-first-generation students also indicated that they wanted to go to college in order to have free time to themselves. Many non-first-generation students cited various reasons for believing that college would give them more free time.

Table 9 Reasons to Go to College

Reasons to go to college	First-Generation College-Bound Student		Non-First-Generation College-Bound Student		
	Middle-SES "Agree" or "Somewhat Agree"	Low-SES "Agree" or "Somewhat Agree"	High SES "Agree" or "Somewhat Agree"	Middle-SES "Agree" or "Somewhat Agree"	Low SES "Agree" or "Somewhat Agree"
My father influenced my decision.	24%	28.2%	32.3%	32.6%	16.7%
My mother influenced my decision.	29.7%	42.3%	38.2%	37.2%	33.3%
My high school teachers influenced my decision.	31.5%	29.6%	17.6%	34.9%	16.7%
My academic and career counseling teachers influenced my decision.	25.9%	22.6%	14.7%	23.3%	16.7%
My peers influenced my decision.	11.1%	16.9%	8.8%	20.4%	16.7%
Most of my classmates planned to go to college.	24.1%	35.2%	26.5%	31.8%	16.7%
I wanted to live by myself.	16.7%	24%	23.5%	21.7%	33.4%
I wanted to expand my knowledge.	81.5%	81.7%	93.6%	87.4%	66.7%
I wanted my own free time.	27.8%	22.3%	44.1%	53.5%	50%
I wanted at least a B.A. degree in order to get a good job.	88.9%	88.8%	85.3%	88.4%	66.6%
I have always taken it for granted that I would go to college.	50%	47.2%	52.9%	51.9%	33.3%
I just had the desire to go to college.	35.2%	21.2%	29.4%	30.2%	0%

Students were also asked whether they decided to go to college because they "just had the desire" to do so. Both first-generation and non-first-generation students from low-SES backgrounds were less likely to indicate that this was the case. Regardless of SES differences, many college-bound students indicated a belief that it is important to have at least a Bachelor's degree in order to get a good job, and that they wanted to go to college in order expand their knowledge through higher education.

The relationship between gender difference and SES difference in a student's decision to go to college was also analyzed. There were some significant gender differences in relation to the father's and mother's influence. The father's encouragement influenced male and female students differently. The rate of paternal influence in male first-generation students from middle- and low-SES backgrounds was higher than among female first-generation students. Also, paternal influences were more common among male non-first-generation students from high-SES backgrounds than among female non-first-generation students. The same was true of maternal encouragement. The rate of maternal influence was much higher for males than for females among first-generation students from middle- and low-SES backgrounds as well as among non-first-generation students from high-SES backgrounds.

Another important finding was that regardless of SES differences, male students were likely to consider college because they wanted to live by themselves. In these cases, college may be seen as a way to get parental permission to move away from home. Only in the three reasons outlined above were there significant gender differences in college decision-making factors.

10   Conclusions

This study has considered how external and internal factors affect Okinawan first-generation students' college decision-making process. A quantitative study was conducted with one hundred forty-eight first-generation students who indicated what external and internal factors influenced their college decision-making. Two hundred five non-first-generation students also responded to the survey. In spite of financial disadvantages, many first-generation students from low-SES backgrounds were likely to apply to college. Gender was also not a significant factor among first-generation low-SES students in this study. On the other hand, the findings indicate a positive relationship in middle-SES families between socioeconomic factors and parental involvement.

The findings also reveal that especially low-SES students do not themselves consider SES significant, and they do not consider the financial limitations associated with their own SES group when applying to college. Forty percent of first-generation students from low-SES families are likely to apply to high-cost private colleges within Okinawa, and thirty percent to the public University of the Ryukyus in Okinawa. An additional twenty percent of low-SES first-generation students are likely to apply to high-cost private colleges outside of Okinawa. This demonstrates that the cost of tuition is not necessarily significant with regard to their college selection process. Most first-generation students from low- and middle-SES families also indicated that they would rely on their parents' support to cover their first-year's college expenses.

Regional and cultural factors must also be taken into consideration with respect to their influence on college decision-making and college selection among first-generation students. Okinawan students receive traditional cultural values from their parents and their local communities, and most first-generation and non-first-generation students expressed a strong sense of Okinawan identity in this study. They planned to apply to Okinawan colleges and seek employment within Okinawa after college because they were very proud to have grown up in Okinawa and hoped to remain there. Considering these factors in college decision-making, it is clear that first-generation students in Okinawa are influenced by a number of external and internal factors in their everyday life.

11   Limitations

More research is needed to understand the characteristics of first-generation students and their parents. In this study there were two main limitations. The first is related to the target population. There are forty-one academic-track high schools in Okinawa, but the questionnaire was circulated at only five of these high schools. A total of five hundred forty-three high school seniors from the five schools responded to this survey, but only four hundred twenty were college-bound students. If there had been participation in this study by more students from successful academic-track high schools with greater than two-thirds college placement rates, as well as from lower academic-track high schools with only fifty-percent college placement rates, a large amount of data on the characteristics of first-generation students in Okinawa could have been collected and shared. Under the circumstances, it would be difficult to generalize the results of this study.

The second limitation of this study is that the survey was conducted while students were in the second semester of their senior year in high school, and it was difficult at that point to examine whether these first-generation college-bound students were admitted by their chosen universities and colleges to become first-generation college students. A longitudinal study is needed to explore what type of college these first-generation students actually decided to attend, within or outside of Okinawa, and what kind of employment they would seek after college. However, because of Japan's personal information protection law, it was impossible to ask for information such as student's home address or e-mail address in order to conduct longitudinal research following the completion of students' high school degrees.

12   Implications

The patterns of high school students who advance to college should be important indicators for the Okinawan government and local high schools as they seek to provide effective educational support programs to increase college advancement rates, particularly among students whose parents have less than a high school degree. The aforementioned data show that the characteristics of first-generation students whose parents have never enrolled in college differ from those of non-first-generation students. High school teachers should identify first-generation college students in order to support them in their college preparation during high school.

Furthermore, college awareness and preparation at an early stage would help first-generation students take steps to pursue higher education and would help increase the number of college-going students in Okinawa. The aforementioned findings indicate that the majority of students first considered going to college while in the third year of junior high school. This was true without regard to gender, SES or first-generation/non-first-generation status. The third year of junior high school is a very important time, because this is when junior high school students have

to choose whether to go to an academic-track high school leading to college or to a vocational high school leading directly to employment. College information and advice is needed for junior high school students, particularly students whose parents have never enrolled in college. With adequate information, parents could better help students understand the steps their children need to take during the three years of high school in order to apply to college. Students whose parents have earned a college degree have an advantage in this respect, because they benefit from their parents' knowledge in preparing for college admissions. Junior high schools in Okinawa should provide more related support, such as college preparation workshops to access college information, and junior high school teachers should also explain the differences between high school and college settings. Based on my findings, I believe longitudinal research is needed to determine how third-year junior high school students in Okinawa make decisions about attending college. This research should focus on early college awareness and college preparation programs, and the decision between an academic-track high school and a vocational high school.

Acknowledgments

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Proximate, Isolate, and Raw Illiteracy Some Issues in Method and Measurement with Application to a State-Level Study from India

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Abstract

Literacy is an important concept in the development discourse. Unfortunately, this concept is still surrounded with mazes of ambiguity. For example, in addition to determining the number of adult literates, it may also be necessary to determine their influence on their families (Basu & Foster, 1998). Living in close proximity to literate persons will undoubtedly benefit an illiterate person. Most studies want to extend the simple literacy rate to include these externalities (Basu & Foster, 1998; Basu & Lee, 2008; Kell, 2008; Maddox, 2007; Mukherjee & Gupta, 2003; Subramanian, 2004, among others). The standard problem in these approaches is the specification of the externality parameters. Depending upon on the specified values, the resulting literacy indices vary considerably. In this paper, we have attempted to remove this drawback by introducing data-driven weights. Further, we consider some aspects of the dynamics of the literacy rate and its extended components. Our results depict some interesting dynamic features. Further, the data-driven weights bring less dramatic changes in the literacy rates.

Ever since independence, Indian policy makers have emphasized the attainment of a decent standard of living, its prime component being literacy. However most of the available studies on India's achievement on this front are one-dimensional. In recent years some other parameters of educational attainment (such as years of schooling) have been used to supplement this uni-dimensional measure. This new approach to literacy brings new depth to the assessment of literacy itself. Literacy is not merely a matter of how many (or what proportion of) people are literate, but where they are. It makes a lot of difference if the literate persons are well distributed across the families, rather than being concentrated in a few pockets. A person in a family with no literates is an "isolated literate," while those in a family with some literates are "proximate literates."

Keywords: literacy rate, externality, PCA, proximate and isolated illiteracy, two-dimensional dynamics

1 Contextualization of the Distributional Issues

In an interesting paper, Basu and Foster (1998) argue that the simple literacy rate cannot capture the effect of externality that it generates. Living in close proximity to literate persons will undoubtedly benefit an illiterate person. Of particular concern is the literacy status of the family in which an illiterate person dwells. A sharp distinction is made between proximate illiterates and isolated illiterates. The former refers to those illiterate persons who reside in a family with at least one literate person. The isolated illiterates are persons in a family with no literates. Effective literacy rates should take these externalities into considerations.

Thus Basu and Foster (1998) introduced a new component to literacy analysis. Three questions immediately emanate from such an analysis:
(1) An analysis into the dynamics of the new component?
(2) Implications of the new component in the dynamics of the traditional (raw) literacy rate?
(3) Incorporation of the new component into the traditional literacy framework?

Since then, a number of studies have been developed covering these issues. First, we considered the dynamics of this new component -- Isolated illiteracy. These dynamics have generally been neglected in the existing literature. Our data spanning over three points in time gives us ample scope for such a study.

Most such studies were, however, involved in the incorporation issue. They wanted to extend the simple literacy rate to include these externalities. The first attempt was by Basu and Foster (1998) themselves, whereby certain weights were granted for proximate illiterates as opposed to isolated illiterates. In an interesting development, Subramanian (2004) argues that such an approach pushes up the literacy rate without really changing anything. This may give misleading comfort to the policy makers by enhancing the literacy rate without any change in the reality. Subsequently, he posits a fine for isolated illiteracy and constrains the new measure below the simple rate. Kell (2008), on the other hand, describes literacy as a "distributed

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capacity" among persons who are not traditionally literate. Maddox (2007) in his anthropological study emphasizes other associations besides family that may be considered in defining proximate illiteracy.

Recently, Basu and Lee (2008) tried to make the concept flexible enough to capture non-family associations. However, a major lacuna of these studies is that they specify the proposed weights rather *a priori*. This neglect is strange given the huge policy implications that externally weighted, literacy generate.

There are a few studies stressing other family characteristics that may determine this ally weighted literacy (Mukherjee & Gupta, 2003). However, even this study uses *a priori* weights in its empirical exposition. Almost no attempt is made to utilize the data to generate the external weights, even though there is enough information regarding the factors that the authors themselves identified as important determinants.

The first study to develop the data-driven externality parameter (a) was that of Gibson (2001). From the logic of Basu and Foster (1998) it follows that the externality in literacy rate will be felt in terms of some measurable variables. For example the rate of adopting agricultural innovations will depend both on the number of literates and the influence they have on illiterate persons. In a society where there is no literacy, agricultural innovations may be difficult to adopt. However, if some members of the society attain literacy, then they can certainly help others adopt the new technology.

There are numerous studies incorporating the impact of family externality on literacy (Basu, Narayan, & Ravallion, 1999; Iversen & Palmer-Jones, 2008, etc.). Some have made effective literary a function of family literacy (Dutta, 2004; Sengupta, Sengupta, & Ghosh, 2004; Valenti, 2002). These measures are useful. But they need strong data, a requirement that may be beyond the capacity of most national-level macro surveys in underdeveloped economies.

For the empirical estimate, Gibson (2001) used the data of Papua New Guinea to generate such external effects. However, he argued that the value of a will depend on the choice of the dependent variables. For example, a is unlikely to be high if we consider individual returns, while it is higher if we take into account some aspects of family welfare (such as children's health).

Gibson's method, though noble, largely depends on the choice of variables. Moreover, it might not be easy to segregate between individual returns and collective welfare. It is also not advisable that the effective literacy measure depends on such case-specific parameters.

Sengupta, Sengupta, and Ghosh (2008) also used data-driven weights to generate the level of learning index depending on a set of family features. However, they did not use it to derive the extended literacy measures. As

a practical user of these indices, the situation is highly unsatisfactory.

Another neglected issue in this entire discussion is that of dimensionality (the implication issue). The approach of Basu and Foster (1998) is novel not only because its gives us a better measure of literacy, but also extends the concept of literacy from one-dimension to a two-dimensional framework. Literacy does not merely mean the average proportion of persons who are literate, but also means how they are distributed among various families. Hence the dynamics of literacy becomes complex. It implies not merely a change in the magnitude of literacy proportion, but also a change in the inter-family distribution of literacy. This second aspect is completely neglected in the standard debate, where the emphasis is only on fathoming a "better" aggregative measure, rather than the simple literacy rate. In the present paper, we take up this neglected issue in analyzing the multidimensional dynamics of literacy.

In this paper we try to correct these shortcomings. This paper is divided into four sections. In the next section, we give a brief review of the existing literature on externally adjusted literacy rate and the related analytical questions. Section 3 gives the empirical results for the new types of "effective literacy rate" suggested by us. It also gives the multi-layered dynamics. The conclusion is provided in Section 4.

2   Technical Underpinnings

2.1 Externality Adjusted Literacy Rate – The Major Controversies

It was traditional to measure the adult literacy rate simply by determining the percentage of adult population who are literate. By "literacy" we mean the ability to read and write. It has recently been argued (Basu & Foster, 1998) that the impact of literacy can not be entirely captured by the simple measurement of literacy rate. The argument is that literacy has positive effects that overflow its measured dimension. In its stead, Basu and Foster (1998) introduced the concept of effective literacy (p). They distinguish between illiterate persons living in a family with at least one literate person and those where there is none. The former are referred to as "proximate illiterate," and the later as "isolated illiterate." The proximate illiterate enjoys some of the advantages of literacy. Hence, with a proper weighting, they should be included under the extended concept of literacy. Thus Basu and Foster use positive externality of literacy -- The benefit that an illiterate person gets by being in close proximity to a literate person. However, many dramatic changes in the ordinal ranking of units occur when we move from ordinary to effective literacy.

The raw measure of literacy is:

$$R = r/n \qquad (1)$$

Where r is the total number of literate persons in a society, and n is the total number of adults in the society. This measure is one-dimensional. There is no degree of independence. R contains all information about literacy. Hence, the policy target should be exclusively on R itself.

In the new approach, we define proximate illiteracy rate as:

$$R^p = r^p/n \qquad (2)$$

where
r^p = total proximate adult illiterates.

The externality attached literacy rate (R^E) is:

$$R^E = f(R, R^p) \qquad (3)$$

Now the debate is on the exact form of the function f (…). The first of such a function form is given by Basu and Foster themselves (BF-1998). The BF measure of effective literacy is defined as:[1]

$$R_{BF} = R + aP \qquad (4)$$

where P is the proportion of proximate illiterates.

However, there is a group of authors (Basu & Lee, 2008; Subramanian, 2008) who question the magnitude validity of the new measure with the argument that it is greater in dimension than ordinary literacy. This may give a false impression to policy makers, since it significantly increases the magnitude of literacy without anything happening to literacy. To quote Basu and Lee (2008), "as will be evident later, it is not clear why the normalization of our new measure should be such that effective literacy is higher than the standard literacy rate."

These considerations have given rise to "constrained externally induced literacy" (R^S) (Subramanian, 2004, 2008). The constrained effective literacy rate (R_S) according to Subramanian (2008) is:

$$R_S = R(1 - I) = R - RI \qquad (5)$$

where I is the proportion of isolate literates.

These results penalize the region by deducting the proportion of isolated illiteracy. A region may have a high R, but a small R[*] compared to another region if such comparison involves the weightings of isolated illiteracy.

In a recent development, Basu and Lee (2008) generalized the externality in literacy from families to other social networks in which an individual may be webbed into. In this new concept the population size, number of literates, and number of isolated illiterates are the three constituent parts. Basu and Lee derived a mapping from the three-dimensional analogy to the two-dimensional fields. This permitted them to use a new measure of effective literacy (R_{BL}) that is significantly different from that used by Subramanian (2004).

Basu and Lee (2008)[2] constrained the effective literacy given by

$$\begin{aligned} R_{BL} &= \frac{(1-\alpha)R}{\{(1-\alpha)+\alpha I\}} \\ &= \frac{R}{\left\{1+\left(\dfrac{\alpha}{1-\alpha}\right)I\right\}} \quad (\alpha \neq I) \end{aligned} \qquad (6)$$

2.2 Data-Driven Weights and Externality in Literacy

In the standard exercises the parameter α is specified in an *a priori* manner. Various authors have used different values of literacy. These values produce indices which differ widely from the raw literacy rate. A lot of controversies have been generated as a result. It is our contention that much heat could have been avoided if the alternative values of α were based on some objective rational premises. In this regard the data-driven weights that are used in indexing in the social sciences could be helpful. Principal Component Analysis (PCA) has been used by many researchers to generate the proportional weights of various factors in constructing an overall index. The PCA technique may provide a means by which the debate on literacy can be amicably settled. In this paper, we turn to PCA to generate the standard weights that are used to measure the rate of externally induced literacy.

PCA is widely used to generate the weights that are necessary in the construction of several socio-economic indices (Johnson & Wichern, 2001). There are numerous instances where these weights give a better index than the alternative techniques. Algebraically, principal components are the linear combination of a set of random variables which are constructed according to a certain rule. Put simply, the rule is to choose the weight so that the variances are maximized, subject to certain constraints on the covariance and the weights themselves. It is possible to get a number of principal components from the available data set. Each PCA generates the weight by maximizing the corresponding variances, while constraining the relevant

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[1] This measure satisfies a number of axioms proposed by the authors.

[2] In fact, there are a large number of such measures, of which we here mention only a few.

covariances and the linear weights themselves. Empirically speaking, a set of eigen values are generated, from which weights are to be calculated. "The weights for each principal component are given by the eigenvectors of the correlation matrix, or if the original data were standardized, the co-variance matrix" (Vyas & Kumaranayake, 2006).[3] The calculation of weights becomes troublesome if some of them turn out to be negative (Vyas & Kumaranayake, 2006).[4]

Thus, in our case (4) can be written in a slightly different way

$$R^{*}_{BF} = R + w_1P \qquad (4^{*})$$

Where w_1 is the weight generated by the PCA between R and P.

In our case we changed (5) slightly and weighted it in the form of

$$R^{*}_{S} = R - w_2I \qquad (5^{*})$$

where W_2 is generated by the PCA of R and I.

In our case the slightly different form of effective literacy rate (6) is

$$R_{BL}{}^{*} = \frac{R}{(1+W_3I)} \qquad (6^{*})$$

where W_3 is a weight generated by the PCA of R and I.

In our paper we generate all the four measures of literacy (R, R_{BF}, R_S, R_{BL}) using the specification as suggested by the respective authors. However, in each case the externality weight is generated from the data rather than being fixed *a priori*. We used PCA to derive the weights in each case. Our measure is better than the traditional approaches, where it is specified abruptly. It is also better than that used by Gibson, in that it does not vary depending on the choice of a particular variable. We next turn to the issue of dimensionality and dynamics.

2.3 Dynamics of the Basic Indicators-Issue of Dimensionality

In the literature on education externality, the dimensionality and dynamics issues are neglected and pushed into background. However, they are of paramount importance. In order to understand the ground realities with respect to literacy, the movement of the literacy component over time is omnipotent. In the traditional approach, the

focus is on the dynamics of simple literacy rate. However, under the new approach, this would be a wrong way to think about literacy.

Consider a country which is segmented into two population subgroups with respect to the literacy, one with a high level of literacy, and other with an abysmally low level. Now suppose over a period of time, the literacy rate of the endowed segment rises, while that of the deprived section fails to register much improvement. It is certain that the overall literacy rate of the country will rise. However, there is now a question of deprivation. Even though the second section has registered some meagre improvements in welfare, they might still feel that they have been "somewhat left behind" in the process of development. If we visualize social welfare as derived from individual welfare and not as an abstract concept (Sen, 1970), then this should have serious implications for development policies. In fact, many ethnic disturbances in India and elsewhere have been built up on such concepts of deprivation. In fact, the sense of deprivation may increase for those who are left behind. Hence the simple dynamics gives a distorted view of literacy gains.

Thus, in order to understand the dynamics properly, the movement of the literacy rate (R) should be corroborated with the dynamics of proportion of isolated illiteracy (I). Such a multi-level analysis will surely help us to understand the situation better. The externality debate raised by Basu and Foster has added an extra space to the conventional literature. We first turn to this multi-level analysis.

However, to understand the complexity of the dynamics of literacy, we should juxtapose the various dimensions of literacy as presented in the recent discussion. There are two dimensions that are very important -- The raw literacy rate (R) and the percentage of isolated literates (I). In order to bring these two dimensions within a single framework, we utilize the standard technique of comparison developed by Ranis and Stewart (2000, 2001).

A cross-sectional unit can have various combinations of R and I. Literacy has two dimensions -- Magnitude and spread. While the simple literacy rate measures the magnitude, the extent is measured by isolated illiteracy. Following Ranis and Stewart (2000, 2001), we can compare a unit's performance in both R and I with respect to the average performance in these dimensions. If a unit has R above the average level, we denote it as "high R." Similarly for I. In short, we can consider following four scenarios in respect to R and I.

(1) Virtuous -- High R, Low I (both attainment and distribution satisfactory).

(2) Lopsided R -- High R, High I (satisfactory attainment, unsatisfactory distribution).

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[3] For a detailed mathematical derivation, one can consider Johnson and Wichern (2006). For socio-economic studies a good reference is Vyas and Kumaranayake (2006).

[4] In our exercise all the weights were positive.

(3) Lopsided I -- Low R Low I (attainment unsatisfactory, but distribution satisfactory).

(4) Vicious -- Low R High I (both attainment and distribution unsatisfactory).

The first situation is virtuous because the benefit of literacy has reached almost everybody and the unit is now on the low literacy path. The last case is vicious since here the attainment of literacy is high with a low excluded section. Thus there is very little awareness of the benefit of high literacy. The lopsided R and lopsided I are the medium cases. For lopsided R there is the possibility of social tension arising from the sense of deprivation -- The possibility of living in poverty around plenty. The lopsided I is very similar to the case of ancient egalitarian societies where whatever little there is, is divided among all, thus benefiting nobody disproportionately.

3   Data -- Empirical and Estimated

3.1 Measurement Issues

We have calculated the different measures of literacy with *a priori* weights as well as with PCA adjusted weights for three different sets of data. The first is the Census Report of 1981. This is an exhaustive report covering all the major states of India. The data was first used by Basu and Foster (1998).

For a more recent explanation, most authors have used NSSO data. This may be prompted by the availability of data in the published NSSO report. Mukherjee and Gupta (2003) used the NSSO 43rd round (1993-1994).[5] Further they used a different measure of adult literacy that is different from the standard.[6] We have also used NSSO 64th round unit level (2007-2008) data for our analysis. The data set allows us to estimate "raw" and externally adjusted literacy rates for different states of India. In this paper, we have taken the standard literacy rate (persons aged 7 years and above).

3.2 Data-Driven and the Traditional Measure of Literacy

For the reasons presented above, we have used the data-driven weights to generate the suggested literacy measures. We compare our measures with those obtained by the traditional indicators with the different weight structure. It is evident that our measures of data-driven R^* are well below the exogenous R for all the states for the two alternative specifications of α. Again, a main concern of the debate between the raw literacy rate (R)

and the exogenous literacy rates was that the later unduly influenced the value of literacy, and that this might have negative policy implications. In fact, this was a main reason for the researchers adopting more sophisticated measures that are different from the exogenous R. For a data-driven measure this deficiency is much less. Hence the selection of weight structure plays a very important role in the entire debate.

For example, in Arunachal Pradesh the raw R was 25.60% in 1981, and the traditional Basu and Foster effective literacy rate was 32.63% and 39.65% for two pre-specified values of α (0.25 & 0.5). But in our case the value is 27.80% in 1981. Again in 2007-2008 for the same state the raw literacy rate is 75.65%, the first traditional BF literacy rate is 76.86%, and the second traditional BF literacy rate is 82.14%, while ours is only 71.75%.

Further, the traditional BF measure of literacy penalizes advance states (states with high levels of raw literacy and low levels of proximate literacy) more than the so-called backward states (low level of R and high level of P). Thus BF measures of effective literacy rate with pre-specified weight structure over-compensates the backward states, which sometimes give a misleading picture. In our method the situation is somewhat different. Here the penalization is least in the two most advanced states (Kerala & Meghalaya) compared to other states, like Haryana or Bihar. According to our measure, in none of the states is the difference more than 0.5 percentile.

Similar results also follow from the traditional measure of Subramanian (R^S) and our measure of data-driven Subramanian (R^{*S}). The traditional R^S lies significantly below the raw R. In our case again, even though the deviation is there, the magnitude of the deviation is much less. In most of the cases the deviation is only 0.1 percentile. For example, for Haryana the raw R in 1981 is 43.9% but the R^S is 36.6%, whereas ours is 43.35%. The weights are again the main issue here. Thus Subramanian's measure over penalized the states where the dominance of isolate families is quite high compared to the other literacy-advanced states, which could be corrected in a more positive way if we take into account the data-driven weight structure in the Subramanian measurement of literacy.

The BL measure of literacy with two pre-specified values of α also gives the literacy percentage in various states that are much below than the traditional raw literacy rates of these states. But if we use our data-driven weight in the BL measure of literacy, then the data-driven BL literacy rates in various states come close to their raw literacy percentages. Thus, like the traditional Subramanian

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[5] Some authors have wrongly referred to NSSO 43rd round as their source of data, instead of NSSO 50th round.

[6] Thus their measures are not strictly comparable with other measures in the literature.

measure of literacy, in the traditional BL measure of literacy the over penalization of backward states can be rectified to a great extent by adopting the data-driven weight structure in the model.

In order to test the above measures analytically, we have used a paired-t test to determine the difference between the raw literacy rate and the externally-adjusted rate along with our data-driven measures. This clearly vindicates the rationale of our measures. In almost all the cases, differences between the raw literacy rate and the data-driven literacy rate are insignificant. This is irrespective of the types of literacy rates used in our analysis. On the other hand, the differences between the raw measures and *a priori* specified, externally adjusted measures are significant. It is insignificant only in a few cases. Also, the data-driven measures significantly differ from the *a priori* measures in the majority of cases. Thus it may be safely argued, so far as the Indian data is concerned, that the heat generated in the externally adjusted literacy literature is largely a byproduct of *a priori* specification of the weight.

3.3 Relative Dynamics in Literacy

In the extended version of literacy there are three basic indicators -- The "raw" literacy rate (R), the proportion of proximate illiterates (P), and the proportion of isolated illiterates (I). In general, we observe that in all the states there has been a significant rise in R and a significant fall in I over the years 1981 to 2007-2008 (Table 1 and Table 2 in Appendix). The proportion of proximate illiterates also seems to have declined. This simply means that with the spread in literacy, the proportion of families with zero literacy have declined drastically. Again, the major portion of erstwhile proximate illiterates is changing into real literates. Thus there is expansion both in inter-family and intra-family literacy.

However, the relative ranking shows a bit of interstate dynamics. Some states have improved their relative position, while a few have fallen behind. For example, Gujarat has drastically drifted down from 6th to 14th position in terms of literacy. On the contrary, Sikkim has improved from 15th to 6th position. Interestingly, there is a close contest between two states for the first position -- Kerala and Mizoram. These types of dynamics indicate the complex processes of development changes.

Next, we concentrate on the dynamics of the refined measure -- An issue that is often neglected in the foregoing debate. Though strictly speaking, due to variation of weight across points in time, our measure is not fully comparable,

unlike the traditional measures, where the weight remains unchanged. There is, though, a general trend of the rising magnitude of the externally adjusted literacy rate. Again, there are differences in the interstate dynamics resulting in an improvement of position for one, and deterioration for others. However, this inter-state relative dynamics is the same for the refined measure as well as for the traditional measures. For example, if $\alpha = 0.5$, by the traditional measure of BF literacy, Meghalaya's rank improved from 17th in 1981 to 3rd in 2007-2008. Following the data-driven BF, the condition of Meghalaya improved from 16th to 3rd. Thus, though there are differences in absolute magnitude, the relative position remains the same.

We now turn to the multi-dimensional dynamics of R and I (Table 4 and Figure 1-Figure 3 in Appendix). From this table and figures, it is clear that these types of classifications yield a rich result. In 1981 there were 9 states in the vicious cycle category (including six major states). In 1993 this number was reduced to 8 and remains so in 2007-2008. It is to be noted that of the 9 states in 1981, Sikkim and Meghalaya became virtuous states in 1993 and 2007-2008, while Karnataka went from lopsided I to the vicious cycle category. The persistence of the major states, which are all in the so-called BOMARU region (Roy, 2010), within this category is a warning sign to policy makers in India. In a similar way, Gujarat and Punjab moved from virtuous to lopsided I, while Haryana was consistently in lopsided I. West Bengal moved from a lopsided R to virtuous in 1993, but retrograded to lopsided I in 2007-2008. The virtuous states of India include Kerala, Tamil Nadu, Himachal Pradesh, and many of the North Eastern hilly states.

4   Conclusion

There is a rigorous debate in the educational literature concerning the introduction of externality of education within the literacy index. However, the wide deviation of such an externally induced literacy rate has been a major concern for social scientists working in this field, particularly after the objection raised by Subramanian (2004). Our analysis seems to argue that this wide deviation rests on *a priori* specification of external parameters. However, introducing the data-adjusted literacy rate removes much of the dilemma. Thus this may be a realistic solution for introducing externality into the literacy rate without distorting the reality to a great extent. Our version of the story clearly argues in favor of reducing illiteracy without paying too much attention to the academic nuances of the externality debate in literacy. Since data-driven literacy rates are within the close neighborhood of the "raw" values, this debate looses much of its focus.

A major lacuna of this exercise is the neglect of the dimensionality issue raised in the externally adjusted literacy measurement. The paper by Basu and Foster (1998) opens up a new dimension in the literature on literacy measurement -- The proximity to a literate person. Unfortunately, all the effort up to now has been directed only in aggregating the various dimensions of literacy into a single homogeneous measure. This neglect is unfortunate, since it misses out on some important dynamics in these additional dimensions. The present paper tries to fill this gap by illuminating this neglected issue of dimensionality. Our results shows that there is a complexity in the dynamic structure that is not discernable in the unidimensional exercise. However, some further studies incorporating the micro-level features of literacy externality are required before any final conclusion can be reached (Tables 5-12).

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Appendix

(All tables & figures are based on Census of India, 1981, NSSO 43rd round and 64th round respectively.)

Table 1 Comparison of Literacy Rate Over the Three Decades

Literacy Rate	1981	1993	2007-08
Less Than 30	AP*, RAJASTHAN	AP*	NIL
31-60	BIHAR, UP, MP, AP**, ORISSA, MEGHALOYA SIKKIM, HARYANA, KARNATAKA, PUNJAB, WB, MANIPUR, TRIPURA, NAGALAND, GUJRAT, TN, MAHARASTRA, HP.	RAJASTHAN,MP,AP*,BIAHAR,KARNATAKA,ORISSA,HARYANA,GUJRAT,PUNJAB,MAHARASTRA,TN,HP,WB.	RAJASTHAN
61 & Above	GOA, MEJORAM, KERALA.	MEGHALOYA,SIKKIM.MONIPUR,TRIPURA,GOA,NAGALAND,MEJORAM,KERALA	MP,AP*,BIAHAR,KARNATAKA,ORISSA,HARYANA,GUJRAT,PUNJAB,MAHARASTRA,TN,HP,WB. MEGHALOYA,SIKKIM.MONIPUR,TRIPURA,GOA,NAGALAND,MEJORAM,KERALA

AP*: ARUNACHAL PRADESH
AP**: ANDHRA PRADESH

Table 2 Comparison of Isolate Illiteracy (I) Rate Over the Three Decades

Isolate Illiteracy Rate	1981	1993	2007-08
0.00-5.00	KERALA,MEJORAM	KERALA, NAGALAND.	MEJORAM,MEGHALOYA,NAGALAND,KERALA,GOA,MAHARASTRA,TN,MANIPUR,SIKKIM,TRIPURA,PUNJAB,HARYANA,GUJRAT,WB.
6.00-20.00	GOA,HP,MAHARASTRA,MANIPUR,TN,GUJRAT,HARYANA,PUNJAB,NAGALAND,TRIPURA.	GOA,MEJORAM,MANIPUR,SIKKIM,TRIPURA,HP,MAHARASTRA,MEGHALOYA,HARYANA,PUNJAB,GUJRAT,TN,WB.	KARNATAKA,MP,AP**,AP*,ORISSA,UP,RAJASTHAN,BIHAR.
21 & Above	KARNATAKA,SIKKIM,WB,ORISSA,MEGHALOYA,UP,RAJASTHAN,BIHAR,AP*,AP**	KARNATAKA,UP,ORISSA,MP,RAJASTHAN,BIHAR,AP*,AP**	NIL

AP*: ARUNACHAL PRADESH
AP**: ANDHRA PRADESH

Table 3 Two-Dimensional Dynamics

	1981	1993	2007-08
Vicious	Sikkim, Meghaloy, Orissa, AP1, MP, UP, Bihar, Rajasthan, AP2	Orissa, Karnataka, UP, Bihar, AP1, MP, Rajasthan, AP2	Orissa, Karnataka, UP, Bihar, AP1, MP, Rajasthan, AP2
Low R, high (100-I)	Karnataka, Haryana	Maharashtra, Punjab, Gujarat, Haryana	Punjab, WB, Gujarat, Haryana
High R, Low (100-i)	West Bengal	Nil	Nil
Virtuous	Kerala, Mizoram, Goa, Maharashtra, TN, Gujarat, HP, Nagaland, Tripura, Manipur, Punjab	Kerala, Mizoram, Goa, TN, HP, Nagaland, Tripura, Manipur, Sikkim, Meghalaya, WB	Kerala, Mizoram, Goa, TN, HP, Nagaland, Tripura, Manipur, Sikkim, Meghalaya, Maharashtra

Source: Figure 1, 2, & 3.

Table 4 Comparison of Literacy (Proportion) -- 1981

States	R	exo(.25) BF	exo(.5) BF	Subramaniam	BL(.25)	BL(.5)	Data Driven BF	Data Driven S	Data Driven BL
Andhra Pradesh	0.357	0.43	0.50	0.23	0.32	0.26	0.38	0.35	0.35
Arunachal pradesh	0.256	0.33	0.40	0.14	0.22	0.17	0.28	0.24	0.25
Bihar	0.321	0.40	0.48	0.21	0.29	0.24	0.35	0.31	0.32
Goa	0.653	0.72	0.79	0.60	0.64	0.60	0.67	0.65	0.65
Gujarat	0.522	0.60	0.68	0.44	0.49	0.45	0.55	0.52	0.52
Haryana	0.439	0.54	0.64	0.37	0.42	0.38	0.47	0.43	0.44
Himachal Pradesh	0.512	0.60	0.70	0.45	0.49	0.46	0.54	0.51	0.51
Karnataka	0.462	0.54	0.62	0.36	0.43	0.38	0.49	0.45	0.46
Kerala	0.816	0.86	0.90	0.80	0.81	0.80	0.83	0.82	0.82
Madhya pradesh	0.342	0.42	0.51	0.23	0.31	0.26	0.37	0.33	0.34
Maharashtra	0.558	0.64	0.72	0.49	0.54	0.50	0.58	0.55	0.56
Manipur	0.497	0.59	0.68	0.43	0.48	0.44	0.53	0.49	0.49
Meghalaya	0.420	0.49	0.56	0.30	0.38	0.32	0.44	0.41	0.42
Mizoram	0.740	0.79	0.85	0.71	0.73	0.71	0.76	0.74	0.74
Nagaland	0.503	0.58	0.66	0.41	0.48	0.43	0.53	0.50	0.50
Orissa	0.410	0.49	0.57	0.30	0.38	0.32	0.44	0.40	0.41
Punjab	0.482	0.57	0.66	0.40	0.46	0.41	0.51	0.48	0.48
Rajasthan	0.301	0.39	0.48	0.20	0.27	0.22	0.33	0.29	0.30
Sikkim	0.420	0.51	0.60	0.33	0.39	0.34	0.45	0.41	0.42
Tamil Nadu	0.544	0.62	0.69	0.46	0.52	0.47	0.57	0.54	0.54
Tripura	0.501	0.58	0.65	0.40	0.47	0.42	0.52	0.49	0.50
Uttar Pradesh	0.334	0.42	0.51	0.23	0.30	0.26	0.36	0.32	0.33
West Bengal	0.486	0.56	0.63	0.38	0.45	0.40	0.51	0.48	0.48

Table 5 Comparison of Rank -- 1981

States	R	exo(.25) BF	exo(.5) BF	Subramaniam	BL(.25)	BL(.5)	Data Driven BF	Data Driven S	Data Driven BL
Andhra Pradesh	18	18	20	20	18	18	18	18	18
Arunachal pradesh	23	23	23	23	23	23	23	23	23
Bihar	21	21	21	21	21	21	21	21	21
Goa	3	3	3	3	3	3	3	3	3
Gujarat	6	7	8	7	6	7	6	6	6
Haryana	14	14	12	13	14	14	14	14	14
Himachal Pradesh	7	6	5	6	7	6	7	7	7
Karnataka	13	13	14	14	13	13	13	13	13
Kerala	1	1	1	1	1	1	1	1	1
Madhya pradesh	19	19	19	19	19	19	19	19	19
Maharashtra	4	4	4	4	4	4	4	4	4
Manipur	10	8	7	8	8	8	9	10	10
Meghalaya	15	17	17	17	16	17	16	16	16
Mizoram	2	2	2	2	2	2	2	2	2
Nagaland	8	9	9	9	9	9	8	8	8
Orissa	17	16	16	16	17	16	17	17	17
Punjab	12	11	10	11	11	11	11	12	12
Rajasthan	22	22	22	22	22	22	22	22	22
Sikkim	15	15	15	15	15	15	15	15	15
Tamil Nadu	5	5	6	5	5	5	5	5	5
Tripura	9	10	11	10	10	10	10	9	9
Uttar Pradesh	20	20	18	18	20	20	20	20	20
West Bengal	11	12	13	12	12	12	12	11	11

Table 6 Comparison of Literacy (Proportion) -- 1993

States	R	exo(.25) BF	exo(.5) BF	Subramaniam	BL(.25)	BL(.5)	Data Driven BF	Data Driven S	Data Driven BL
Andhra Pradesh	0.387	0.450	0.513	0.248	0.345	0.284	0.397	0.377	0.383
Arunachal pradesh	0.262	0.336	0.409	0.146	0.228	0.181	0.274	0.250	0.259
Bihar	0.390	0.455	0.521	0.254	0.349	0.289	0.401	0.381	0.386
Goa	0.725	0.781	0.837	0.689	0.713	0.690	0.735	0.724	0.725
Gujarat	0.509	0.585	0.661	0.413	0.479	0.428	0.521	0.504	0.506
Haryana	0.486	0.572	0.658	0.403	0.460	0.415	0.500	0.482	0.484
Himachal Pradesh	0.579	0.655	0.730	0.510	0.557	0.518	0.591	0.576	0.577
Karnataka	0.475	0.548	0.620	0.364	0.441	0.385	0.487	0.469	0.472
Kerala	0.904	0.924	0.944	0.890	0.899	0.890	0.907	0.903	0.903
Madhya pradesh	0.384	0.458	0.532	0.261	0.347	0.291	0.396	0.376	0.381
Maharashtra	0.560	0.628	0.696	0.466	0.530	0.479	0.571	0.555	0.557
Manipur	0.673	0.732	0.792	0.613	0.653	0.618	0.683	0.670	0.671
Meghalaya	0.611	0.666	0.721	0.508	0.578	0.523	0.620	0.606	0.608
Mizoram	0.888	0.903	0.917	0.841	0.873	0.843	0.891	0.887	0.887
Nagaland	0.801	0.843	0.886	0.777	0.793	0.778	0.808	0.800	0.800
Orissa	0.477	0.540	0.602	0.347	0.437	0.375	0.488	0.470	0.474
Punjab	0.522	0.597	0.672	0.429	0.493	0.443	0.535	0.517	0.520
Rajasthan	0.328	0.415	0.501	0.221	0.296	0.248	0.343	0.320	0.326
Sikkim	0.653	0.715	0.777	0.588	0.632	0.594	0.664	0.651	0.652
Tamil Nadu	0.567	0.628	0.688	0.459	0.533	0.476	0.577	0.562	0.564
Tripura	0.714	0.757	0.800	0.632	0.688	0.641	0.721	0.711	0.712
Uttar	0.424	0.502	0.581	0.313	0.390	0.336	0.437	0.417	0.421
West Bengal	0.591	0.645	0.700	0.478	0.555	0.496	0.600	0.586	0.588

Table 7 Comparison of Rank -- 1993

States	R	exo(.25) BF	exo(.5) BF	Subramaniam	BL(.25)	BL(.5)	Data Driven BF	Data Driven S	Data Driven BL
Andhra Pradesh	20	21	21	21	21	21	20	20	20
Arunachal pradesh	23	23	23	23	23	23	23	23	23
Bihar	19	20	20	20	19	20	19	19	19
Goa	4	4	4	4	4	4	4	4	4
Gujarat	14	14	14	14	14	14	14	14	14
Haryana	15	15	15	15	15	15	15	15	15
Himachal Pradesh	10	9	8	8	9	9	10	10	10
Karnataka	17	16	16	16	16	16	17	17	17
Kerala	1	1	1	1	1	1	1	1	1
Madhya pradesh	21	19	19	19	20	19	21	21	21
Maharashtra	12	11	11	11	12	11	12	12	12
Manipur	6	6	6	6	6	6	6	6	6
Meghalaya	8	8	9	9	8	8	8	8	8
Mizoram	2	2	2	2	2	2	2	2	2
Nagaland	3	3	3	3	3	3	3	3	3
Orissa	16	17	17	17	17	17	16	16	16
Punjab	13	13	13	13	13	13	13	13	13
Rajasthan	22	22	22	22	22	22	22	22	22
Sikkim	7	7	7	7	7	7	7	7	7
Tamil Nadu	11	12	12	12	11	12	11	11	11
Tripura	5	5	5	5	5	5	5	5	5
Uttar	18	18	18	18	18	18	18	18	18
West Bengal	9	10	10	10	10	10	9	9	9

Table 8 Comparison of Literacy (Proportion) -- 2007-2008

States	R	exo(.25) BF	exo(.5) BF	Subramaniam	BL(.25)	BL(.5)	Data Driven BF	Data Driven S	Data Driven BL
Andhra Pradesh	0.648	0.713	0.778	0.588	0.629	0.593	0.650	0.646	0.647
Aorunachal Pradesh	0.716	0.769	0.821	0.663	0.699	0.667	0.717	0.715	0.715
Bihar	0.576	0.643	0.709	0.485	0.547	0.498	0.579	0.574	0.575
Goa	0.847	0.881	0.915	0.833	0.842	0.833	0.848	0.846	0.846
Gujrat	0.752	0.803	0.854	0.719	0.741	0.720	0.753	0.751	0.751
Hariyana	0.732	0.788	0.844	0.700	0.721	0.701	0.733	0.731	0.731
Himachal Pradesh	0.798	0.842	0.886	0.777	0.791	0.778	0.799	0.798	0.798
Karnataka	0.715	0.773	0.831	0.676	0.702	0.678	0.716	0.714	0.714
Kerala	0.936	0.950	0.964	0.929	0.933	0.929	0.936	0.936	0.936
Madhaya Pradesh	0.705	0.760	0.816	0.654	0.688	0.658	0.706	0.704	0.704
Maharastra	0.815	0.854	0.893	0.791	0.807	0.792	0.816	0.815	0.815
Manipur	0.804	0.845	0.885	0.777	0.795	0.778	0.805	0.803	0.804
Meghalaya	0.927	0.943	0.960	0.920	0.924	0.920	0.927	0.927	0.927
Mizoram	0.962	0.970	0.978	0.957	0.960	0.957	0.962	0.962	0.962
Nagaland	0.915	0.934	0.952	0.906	0.912	0.906	0.915	0.915	0.915
Orissa	0.700	0.757	0.813	0.648	0.683	0.652	0.702	0.699	0.699
Punjab	0.771	0.817	0.864	0.738	0.760	0.740	0.772	0.770	0.770
Rajasthan	0.606	0.682	0.757	0.551	0.588	0.556	0.609	0.605	0.606
Sikkim	0.824	0.860	0.895	0.797	0.815	0.797	0.826	0.824	0.824
Tamil Nadu	0.808	0.848	0.888	0.782	0.799	0.782	0.809	0.807	0.807
Tripura	0.784	0.828	0.873	0.754	0.774	0.755	0.785	0.783	0.783
Uttar Pradesh	0.641	0.709	0.776	0.584	0.623	0.589	0.643	0.640	0.640
West Bengal	0.759	0.807	0.856	0.723	0.747	0.724	0.761	0.759	0.759

Table 9 Comparison of Rank -- 2007-2008

States	R	exo(.25) BF	exo(.5) BF	Subramaniam	BL(.25)	BL(.5)	Data Driven BF	Data Driven S	Data Driven BL
Andhra Pradesh	20	20	20	20	20	20	20	20	20
Aorunachal Pradesh	16	17	17	17	17	17	16	16	16
Bihar	23	23	23	23	23	23	23	23	23
Goa	5	5	5	5	5	5	5	5	5
Gujrat	14	14	14	14	14	14	14	14	14
Hariyana	15	15	15	15	15	15	15	15	15
Himachal Pradesh	10	10	9	9	10	10	10	10	10
Karnataka	17	16	16	16	16	16	17	17	17
Kerala	2	2	2	2	2	2	2	2	2
Madhaya Pradesh	18	18	18	18	18	18	18	18	18
Maharastra	7	7	7	7	7	7	7	7	7
Manipur	9	9	10	10	9	9	9	9	9
Meghalaya	3	3	3	3	3	3	3	3	3
Mizoram	1	1	1	1	1	1	1	1	1
Nagaland	4	4	4	4	4	4	4	4	4
Orissa	19	19	19	19	19	19	19	19	19
Punjab	12	12	12	12	12	12	12	12	12
Rajasthan	22	22	22	22	22	22	22	22	22
Sikkim	6	6	6	6	6	6	6	6	6
Tamil Nadu	8	8	8	8	8	8	8	8	8
Tripura	11	11	11	11	11	11	11	11	11
Uttar Pradesh	21	21	21	21	21	21	21	21	21
West Bengal	13	13	13	13	13	13	13	13	13

Table 10 Comparison of 't' Ratios

	T statistics	P value	T critical one tail
Year-1981			
Raw Vs. exogenous			
Raw VS BF(.25)	-2.01443	0.025051	1.68023
Raw VS BF(.5)	-4.12673	8.06E-05	1.68023
Raw VS Subramaniam	2.015152	0.025012	1.68023
Raw VS BL(.25)	0.665969	0.254454	1.68023
Raw VS BL(.5)	1.684879	0.049547	1.68023
Raw Vs. Data Driven			
Raw VS Data Driven BF(.25)	-0.61805	0.269866	1.68023
Raw VS Data Driven S	0.176309	0.43043	1.68023
Raw VS Data Driven BL	0.072487	0.471271	1.68023
Exogenous Vs. Data Driven			
BF(.25) VS Data Driven BF	1.397889498	0.084577089	1.68023
BF(.5)VS Data Driven BF	3.516240985	0.000514231	1.68023
Subramanian VS Data Driven Subramanian	-1.83359071	0.036742264	1.68023
BL(.25)VS Data Driven BL	-0.59346411	0.277954629	1.68023
BL(.5)VS Data Driven BL	-1.61211359	0.057044042	1.68023

Table 11 Comparison of 't' Ratios

	T statistics	P value	T critical one tail
Year-1993			
Raw Vs. exogenous			
Raw VS BF(.25)	-1.292823659	0.101409807	1.68023
Raw VS BF(.5)	-2.695595708	0.004957594	1.68023
Raw VS Subramaniam	1.633394945	0.054761229	1.68023
Raw VS BL(.25)	0.540306521	0.29585512	1.68023
Raw VS BL(.5)	1.380376758	0.08722183	1.68023
Raw Vs. Data Driven			
Raw VS Data Driven BF(.25)	-0.20721	0.418402	1.68023
Raw VS Data Driven S	0.100354	0.46026	1.68023
Raw VS Data Driven BL	0.04708	0.481331	1.68023
Exogenous Vs. Data Driven			
BF(.25) VS Data Driven BF	1.086732	0.141537	1.68023
BF(.5)VS Data Driven BF	2.493623	0.008239	1.68023
Subramanian VS Data Driven Subramanian	-1.53007	0.066579	1.68023
BL(.25)VS Data Driven BL	-0.49322	0.312155	1.68023
BL(.5)VS Data Driven BL	-1.33316	0.09467	1.68023

Table 12 Comparison of 't' Ratios

| Year-2007-08			
Raw Vs. exogenous			
	T statistics	*P* value	T critical one tail
Raw VS BF(.25)	-1.598560552	0.058537827	1.68023
Raw VS BF(.5)	-3.462555926	0.000601627	1.68023
Raw VS Subramaniam	1.015053791	0.157814768	1.68023
Raw VS BL(.25)	0.353011486	0.362882734	1.68023
Raw VS BL(.5)	0.960665706	0.170984988	1.68023
Raw Vs. Data Driven			
Raw VS Data Driven BF(.25)	-0.047653883	0.481103868	1.68023
Raw VS Data Driven S	0.02245551	0.491093065	1.68023
Raw VS Data Driven BL	0.015783118	0.493739384	1.68023
Exogenous Vs. Data Driven			
BF(.25) VS Data Driven BF	1.551896	0.063926	1.68023
BF(.5)VS Data Driven BF	3.419552	0.000682	1.68023
Subramanian VS Data Driven Subramanian	-0.99273	0.163135	1.68023
BL(.25)VS Data Driven BL	-0.33726	0.368764	1.68023
BL(.5)VS Data Driven BL	-0.94507	0.174892	1.68023
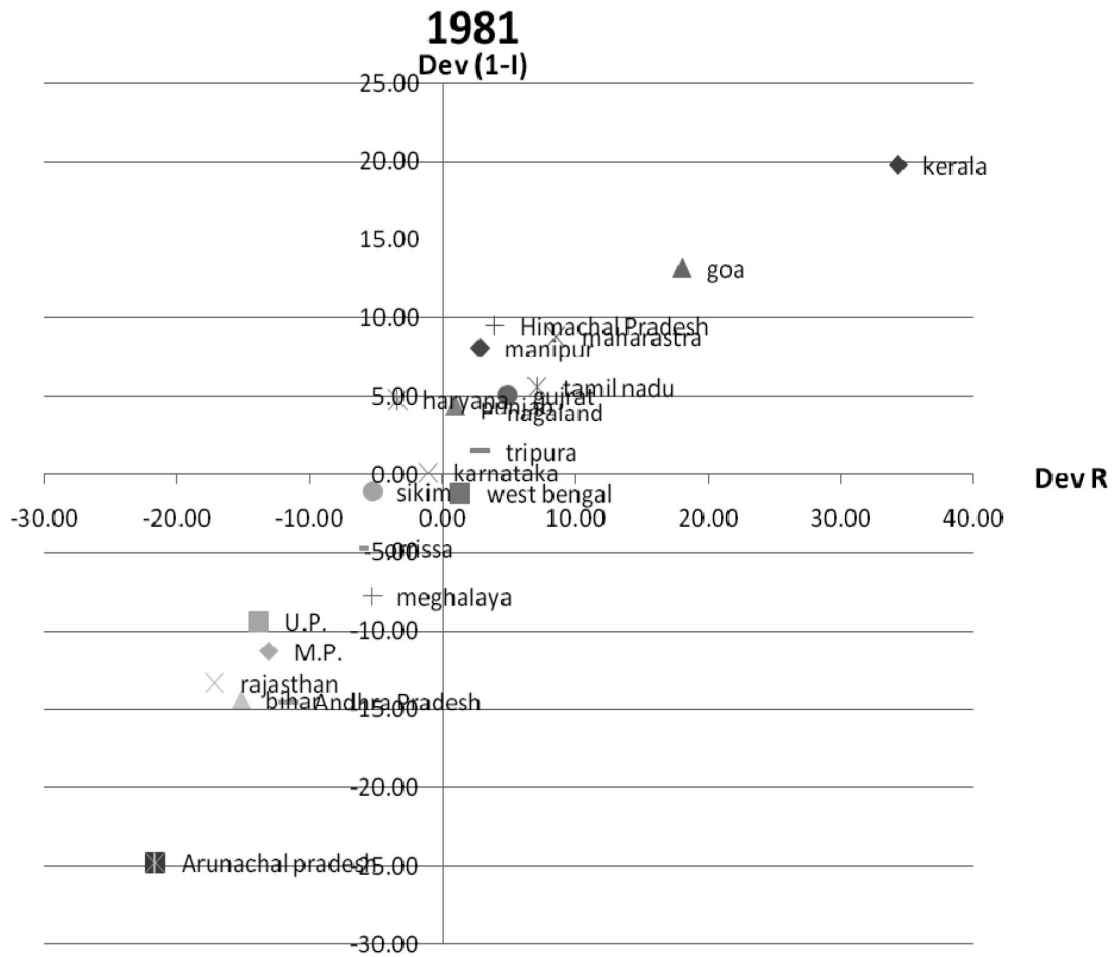
Figure 1 Deviation of R & I from Means, 1981
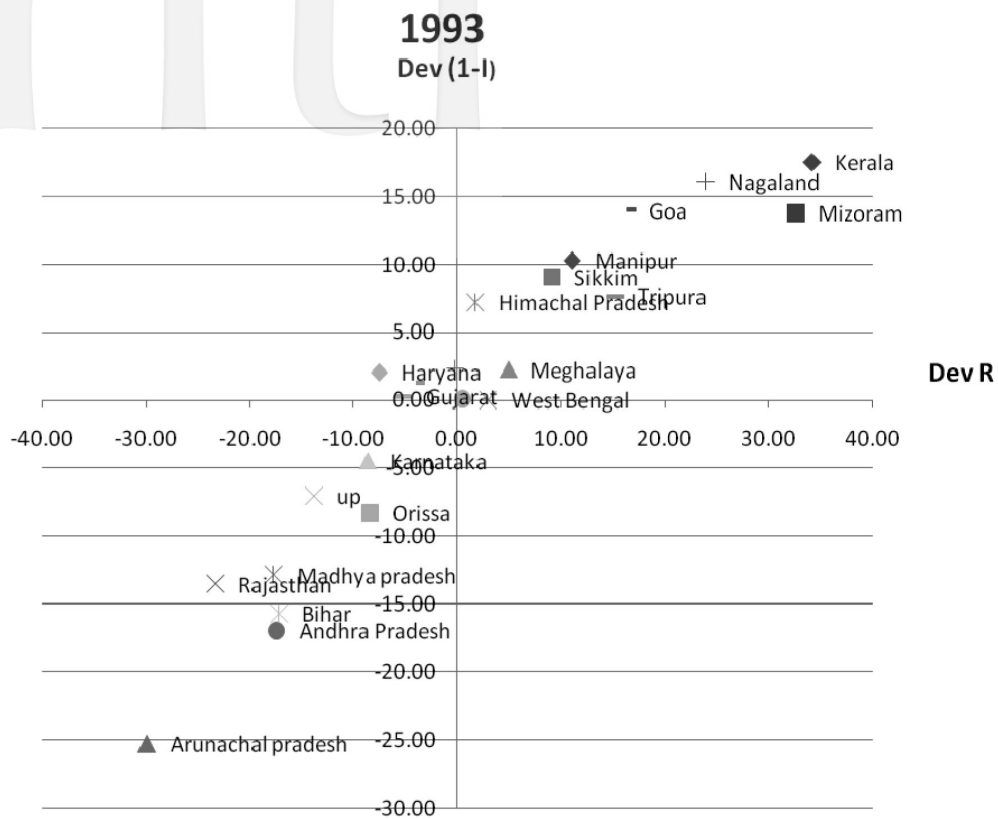
1993
Dev (1-I)

Figure 2 Deviation of R & I from Means, 1993
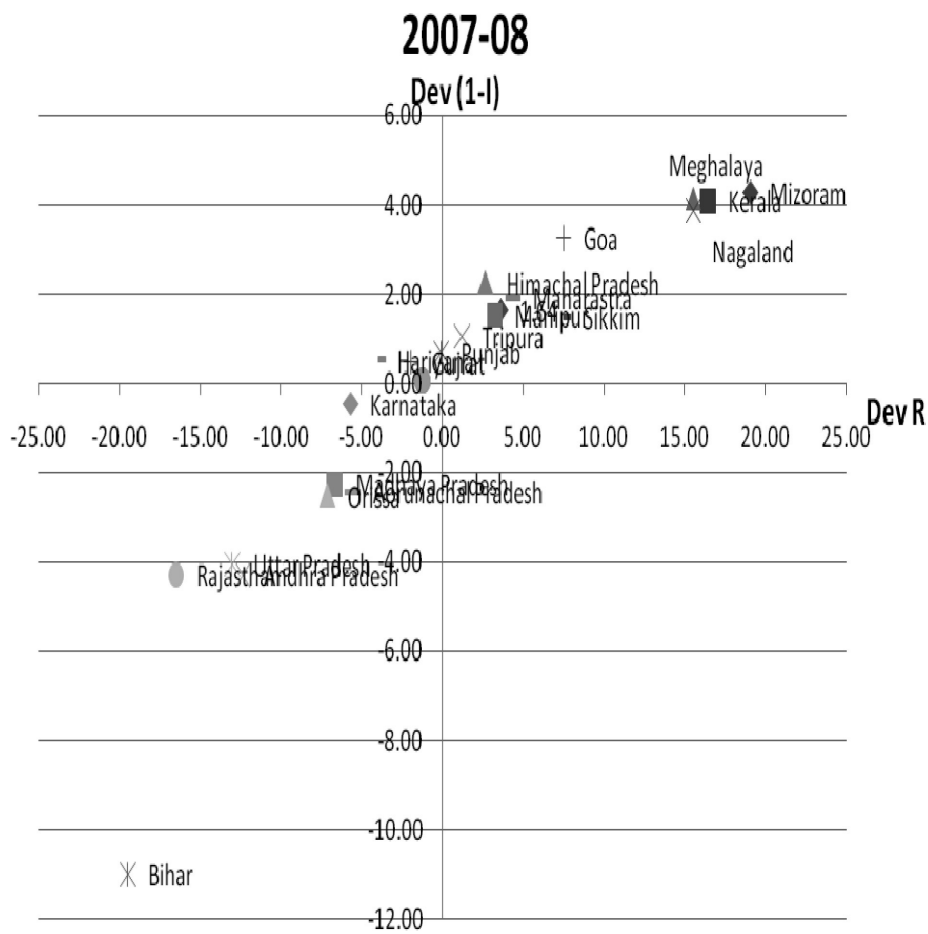
2007-08
Dev (1-I)

Figure 3 Deviation of R & I from Means, 2007-2008

New Attempts for School Improvement and Partnerships in Hong Kong: Business-University-School Partnerships for School Improvement

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Abstract

This paper presents findings from a qualitative study of business-university-school (B-U-S) partnerships for school improvement in Hong Kong, and Project W is selected as the case project, from which the data are generated. The study aims to explore the underlying constructs of the initial stage of B-U-S partnerships from five domains: (1) rationales -- Oals and initial attitudes; (2) operations -- Resources and organizations; (3) roles -- Each party's roles; (4) interactions -- Communications among three parties; (5) expectations -- Expectations and obstacles.

Keywords: school improvement, partnerships, business-university-school partnerships

1 Introduction

As in many other cities, education reform is in full swing in the last two decades, Hong Kong is no exception. All kinds of reform initiatives have been implemented since the year of 2000. Attempts to improve school performance and build up teachers capacity through partnerships among universities, schools, governments and other institutions are emerging. Stated by Hopkins and Reynolds (2001), school improvement has gone through three phases, and Muijs (2010) proposed that practice of school improvement has already moved to a fourth phase: The collaboration. Partnership in education is not a new-born thing. Since the mid-1980s, the upsurge in partnerships forming among schools, colleges, businesses and communities could be characterized as nothing short of an "educational movement" (Wallace, 1993). Initial preparation, as well as lifelong learning of the workforce brings business and education into partnership; likewise, the articulation of school-university programs as well as preservice and inservice teacher education joins school and university (Borthwick, 1995). In recent years, studies on partnerships in education remains a hot topic (Blank, Jacobson, & Melaville, 2012; Dumlao & Janke, 2012; Epstein, 2010, 2011; Faulconer, 2010; Gestwicki, 2013; Sanders, 2006, 2008; Sheldon, 2007; Willems & Gonzalez-DeHass, 2012).

In the academic literature, fruitful studies have been done to analyze U-S (Baker et al., 2011; Clark, 1988; Su, 1990) and B-S partnerships (Johnston, 2009; O'Connell, 1985; Zacchei, Mirman, Haley, Markman, & Murray, 1986), including the partnership categories, the conditions and obstacles for success and so on. However, the studies about B-U-S partnerships are still limited.

This study is a very fascinating and challenging attempt for school improvement through business-university-school (B-U-S) collaboration. Named Project W (2011-2017), the collaboration is initiated by a commercial corporation C in Hong Kong, joint-hand with Project Q. It is a holistic, interactive and organic school improvement project launched by University U. Project W, a 6-year program, started in mid-2011, is a holistic school improvement program targeting 10 secondary schools in Hong Kong, and most students in these schools are classified as Band III[1] students, with low socioeconomic status and academic achievements. Corporation C donated $150,000,000 to this project in supporting development plan of individual school (e.g. teaching and learning, student growth, extra-curricular activity, life-goal planning, teacher development) as well as in sponsoring Project Q's professional school-based support for the 10 schools. Under this pioneering partnership program, participant schools are supported with considerable inputs from various sources (financial, social and professional school-based support). It connects corporate commitment in social responsibility with the professionalism of the university in facilitating students' whole person development and school improvement. The experiences conceptualized in the project are invaluable and insightful for potential development of B-U-S collaboration. The purpose of this study is to identify the underlying constructs of the initial stage of B-U-S partnership. The following research questions are used to guide this study:

- Why do the three parties involve themselves in the B-U-S project?

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[1] In Hong Kong secondary students are categorized according to the academic achievement in the primary school as Band I, Band II or Band III, 33.3% each. Schools accept most Band III students are termed as Band III schools.

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• How does the project operate?
• How do members define their roles and the roles of other members in the process?
• How do the three parties interact with each other?
• What are the members' expectations for the project?

2   Research Context and Framework

A partnership is a mutually supportive arrangement between individual volunteers, businesses, government agencies, and community organizations and a school or school district often in the form of a written contract in which partners commit themselves to specific objectives and activities to benefit students (National Association of Partnerships in Education, 1991). In Hong Kong, since the late 1990s, the local government and the Education Bureau have played important roles in bolstering the partnerships in education. In October 1997, the government established the Quality Education Fund (QEF) to finance projects for the promotion of quality education in Hong Kong. Formally established in 1998 with an allocation of $5 billion, the QEF provides an effective channel for worthwhile projects from the school education sector to be funded. The QEF mainly caters for worthwhile non-profit initiatives within the ambit of basic education, i.e. pre-primary, primary, secondary and special education. With the support of QEF, local universities, business sectors and non-profit organizations have developed many projects to collaborate with schools. In July 2004, the Education Bureau, which was called Education and Manpower Bureau (EMB) at that time, set up the Education Development Fund (EDF) with a grant of $550 million approved by the Finance Committee of the Legislative Council. The purpose of the EDF is to provide schools with professional support and to enlarge their capacity to take forward education reform measures through a variety of school-based professional support (SBPS) programs. University-School (U-S) support programs are important parts of the SBPS programs. For the Business-School (B-S) collaboration, the School-Company-Parent (SCP) program (formerly named as School-Company Partnership) was created by the Young Entrepreneurs Development Council in 2003. Since 2007, the SCP program has been funded by The Hong Kong Jockey Club Charities Trust. Business sectors, secondary schools and parents collaborated in the SCP program and aimed to foster the "Entrepreneurial Spirit" in the young people. Under the auspices of the above funds, U-S and B-S partnerships have developed rapidly. For example, starting from nine companies and schools in the first year of SCP program, over 570 companies and schools have formed "School-Company Partnerships," benefiting over 18,000 students. However, B-U-S partnership is still a new thing, and there is no ready-made experience and pattern in Hong Kong.

Through the literature review, we note that the researches on the development of S-U-B partnerships are also limited. The most detailed description and analysis of B-U-S partnerships is in a series of studies conducted by Borthwick (1994, 1995), Borthwick, Padak, Shaklee, and Peck (1992), Borthwick, Stirling, Nauman, and Cook (2003). Borthwick pursued the development of B-U-S partnerships through his work in the Cooperative Alliance for Gifted Education (CAGE) project, which utilized three partners in Ohio-Kent State University, the Cleveland Public Schools, and International Business Machines (IBM) -- To enhance educational programming for the minority and/or educationally disadvantaged students in both regular and gifted education. Borthwick (1995) sought information about members' expectations for, evaluation of, roles in, and commitment to the CAGE project. Content analysis revealed five domains which encompassed the data: (1) focus -- Goals, context, outcomes; (2) members -- General characteristics, commitment, roles and responsibilities; (3) needs and resources -- Funding, other material resources, connections/sharing/exchanges; (4) interactions -- Interactions, decision-making/action planning; group dynamics, inquiry into partnership process; and (5) stages.

Several other studies on B-U-S partnerships focused on science or mathematic learning. Beyerbach, Weber, Swift, and Gooding (1996) analyzed The Kids at Work project, which was initiated by Project SMART (Science/Mathematics Applied Resources for Teaching) to improve elementary math and science teaching. The Kids at Work involved elementary teachers, business employees, university faculty and parents in designing and implementing community field trips and related classroom activities which helped students understand how science and mathematics concepts were actually used in the real world of work. Henderson and St. John (1997) examined the accomplishments of a collaborative project, entitled "Thematic Mathematics in the Middle School," which was set to enhance student learning and motivation in mathematics in a middle school serving a changing population of students, the majority of whom were Latino. The partnership joined together the mathematics teachers and administrators of the school, university mathematicians and educational researchers, and the management and workers from a research-and-development-oriented electronics firm. The partners in the project believed that a thematic approach to mathematics instruction might address a number of hypothesized causes of low achievement. Evaluation results of these two projects were positive.

The B-U-S studies listed above do provide lots of insights for making B-U-S analysis, but as Project W is a

more holistic approach for school improvement (including not just the micro level of enhancing students' learning experiences and motivation, but also the macro level of building a favorable learning environment), we should develop a more adaptable content analysis for Project W based on the literature review. As the purpose of this study is to identify the underlying constructs of the initial stage of B-U-S partnership, we adapted the framework of Borthwick (1994) as Table 1. We added initial attitudes into the framework, as in our pilot study we found that this element would affect the later partnerships.

3 Methodology

This study employed a case study approach. In order to identify the underlying constructs of the initial stage of B-U-S partnership, we chose W as the case project for an in-depth inquiry. Our application of this case study approach was not meant to critique but to understand and provide a thick, rich description of B-U-S partnership experiences and varied perspectives of different parties. We collected data from multiple sources for triangulation of information, including interviews, documents, and observations of several activities.

Project W used "adopt-a-school" approach: The corporation C assigned ten different Business Units (BUs), and each BU took charge of one school and U assigned a team of School Development Officers (SDOs) to provide school-based support for each school. In such

circumstances, we used 40-to-60-minute semi-structured interviews to interview 17 participants from all the three parties, focusing on participants' description of the development and implementation of the project W, roles of each party, activities developed, expectations for the project, and project benefits, barriers and suggestions for the project's future development. The interviewees were listed in Table 2. The interviews were all tape recorded and transcribed for analysis.

Besides the individual interview, we held two group interviews to learn more about core group members' views about the project. One group interview invited core group members from 6 schools ($N = 18$), while the other invited members from 4 schools ($N = 8$).

For the purpose of triangulation, we conducted document analysis (i.e., 2011-2012 year plans about project W and stocktaking reports of ten schools and activities records) and nonparticipatory observations (i.e., committee meetings, S-U meetings, S-B meetings, exposure visits conducted by BUs and some professional support activities conducted by U). All the interviews and observations occurred over the first year of Project W from August 2011 to July 2012. The data analysis was conducted using NVivo 8, and to ensure reliability, the codes and themes required consensus with two additional coders. The data codes are listed in Table 2. Based on the data codes list, each record we used in this paper is given a code.

Table 1 Research Framework for the Initial Stage of B-U-S Partnerships

The initial stage of B-U-S partnership	Rationale	Goals
		Initial attitudes
	Operations	Resources
		Organizations
	Roles	Each party's roles in the project
	Interactions	Communications among three parties
	Expectations	Expectations/How to evaluate the project
		Obstacles

Table 2 The Code List

Data source code	Party code	Interviewee code
Individual interview (I) Group interview (GI) Document (D)	School (S)	Three core group members of one school (L\X\S); Group interview of core group members from four schools (CP4); Group interview of core group members from six schools (CP6)
	University (U)	Seven SDOs (A\B\C\D\E\F\G)
	Corporation (C)	The responsible leader of the project (Y); The project coordinator (N); Group interview of three members from BU1 (BU1); Group interview of two members from BU2 (BU2)

Example: We have different priorities, but we do have a common goal is that we want the best for the kids. (GI-C-BU2)

In the above paragraph, the code *GI-C-BU2* means a quotation from a group interview record of the members from BU2 of Corporation C.

4　Findings

4.1　Rationales

Based on the data collected, the rationales for the project could be analyzed from the following aspects: Goals and initial attitudes.

4.1.1　Goals

In the studies on partnerships, shared goals, agreed goals or common goals are listed among the important elements of successful partnerships (Blank et al., 2012; Borthwick, 1994; Butterfoss, Goodman, & Wandersman, 1993; El Ansari, 2004). Common goals help to sustain partnerships in the long run, enhance community school efficacy, and encourage each stakeholder to clearly define its role in meeting specific goals (Blank et al., 2012). In our study, data analysis reflects that the three parties have different priorities, but they have a common goal for the project: Doing some good to help these students and schools. This belief has been mentioned by different parties.

Business: We have different priorities, but we do have a common goal is that we want the best for the kids. (GI-C-BU2)
University: The business doesn't expect the students get higher academic scores because of the project, while they just want to see the school could change for the better. This belief really impresses me. Our team (Q project) also has the similar goal. (I-U-A)
School: I hope that my students could change for the better, and my school could show a marked improvement. This is my dream… (I-S-L)

4.1.2　Initial Attitudes

Sherif, Sherif, and Nebergall (1965) defined attitudes as "the stands the individual upholds and cherishes about objects, issues, persons, groups, or institutions" (p. 4). Initial attitude appears to be the most important determinant of attitudes after information provision (Frewer, Howard, & Shepherd, 1998). Initial attitudes of different parties are explored in this study as part of the rationales for project W.

Initial attitudes of the business sector. The Cooperation C has always been giving time to charity to demonstrate its corporate society responsibility. In recent years their attitude has changed from passively donation to actively seeking something of social value. In recent years, they initiated many projects to help the youth. Project W is one of those projects aiming at helping students in band III schools. They have done some research on the target group and found that the problems in band III schools were complicated, which could not be solved only by providing resources but the support for teaching and learning were needed. Given this, Q as an experienced school improvement project was included in.

Initial attitudes of the university. From the data we gathered from interviews with SDOs, we found that most SDOs viewed project W as a positive stimulus to schools and felt a strong sense of responsibility to improve schools. However, Some SDOs mentioned that in the beginning they doubt that the business would pay more attention to the profits and expect quick results. But when they began to collaborate with the business, the passion and the attribute shown by the initiators of the business cooperation assured that the purpose of the business was mainly on helping the schools and the students.

At first I'm suspicious of this project. ......The business always has some purposes to consider, especially consider the profits. But after a month, I changed my thought. I think that they have simple purpose and just want to solve some problems in schools. They do the project with heart. Although very busy, they are always ready to offer help. (I-U-F)

Initial attitudes of schools. The initial attitudes of business and university were generally positive, but those of schools were different, which could be divided into three categories:

(a) Welcoming the B-U-S partnership and participating actively in various activities. These schools included two types. One type was previous participant schools of project Q, which have built mutual trust with Q. As they trusted the team of Q, they also trusted this project.

We have collaborated with Q for a long time, so we are familiar with each other. So when they called me, I would not be wary of this project. ......Although we had to decide (whether to join in the project) in a limited time, we processed it quickly. When I talked to the school board about this project, we agreed on the idea and decided to join in it immediately. (GI-S-CP4)

The other type was totally new school. But the principal and the school board viewed this project as a meaningful thing to school, thus they wanted to have a try.

I'm a simple person, and I just think that we will have more money and it (Project W) could help my students. I telephoned our school supervisor and told him the whole thing, and then he said that "it's ok, we can join it." Then it starts. (GI-S-CP4)

(b) Being wary of the partnership and worrying about the intervention by the business sector. In the beginning, this kind of schools expressed reservations about the collaboration with the business.

When we reported it (Project W) to the school board, they are very panic about this, as there had been no such collaboration before in Hong Kong. They doubted that if there would be some hidden purposes that they could not know. For example, would the business utilize our school to do some promotion? Would the business intervene in our school affairs? ......However, although we were wary of the partnership, we could feel that they had a sincere purpose and could provide a lot of money to help our students. At that time, there were conflicting attitudes toward this project in our school. We were on the alert to decide to join in the project. (GI-S-CP4)

(c) Welcoming the financial support provided by the business sector but being reluctant to receive the professional support from the university. This kind of schools misunderstood the project because of the late explanation of Q's roles. In the beginning, some schools viewed Q just as the external committee member and did not know Q would provide professional support. Therefore, these schools expected the resources from the business sector and were not ready to make great efforts to improve teaching and learning through collaboration with Q.

4.2 Operations

Operations of a project, called as program characteristics in some studies, were also the critical factors of partnerships. In effective partnerships, the program should be "well-planned, viable and fit with available resources and organizational size" (Department of Education, Employment and Workplace Relations, 2010). In this section, the operations of the partnership of Project W were analyzed in the aspects of resources and organizations.

4.2.1 Resources

The resources for schools included human, financial, physical and professional support from the other parties. As human resources and professional support will be discussed in the later section, we now focus on the financial resources in this part. In the first year, the resources were allocated in deficiency view. The assumption was that these ten schools entered the program with deficiencies of different kinds, such as the deficiencies of equipment. However, from the data which were collected from the school plans of the second year, we saw the approach direction has changed a little, which meant the focus has been changed from the deficiency to development. In the ten school year plans of 2011-2012, we found that there were four schools listing improving hardware facilities as the top priority program and six schools list hiring more staff (e.g. teachers, teaching assistants and social workers, etc.); while in the year plans of 2012-2013, seven schools listed hiring more staff and three schools listed students cultivating (e.g. art and sport education, etc.). From Table 3, we could see that improving hardware facilities were not the focus in the new plans and the direction pointed to more concerns about teaching and learning and students development.

Besides the school-based resources, there was a resource pool for all schools.

This project will allocate HK$2,500,000 to each project school each year, for a consecutive of six years, of which a total of HK$1,500,000 will be placed in the Resource for collective use. We also fund Q to provide professional support to each school. The idea of Resources Pool is stemmed from the concept of group purchase in business, and we will use this part of money to plan some joint school activities. (I-C-Y)

4.2.2 Organizations

Several delegations from different parties constituted the advisory committee to take charge of the whole project. Under the committee, each party had its own organization to run the program. In each school, there was a core group consisting of principal and middle managers from different subjects; in the Central Office (CO) of the project in corporation C, several people were in charge of the detailed operation work; in each of the ten BUs, a group of volunteers were recruited for the program, whose compulsory services were also calculated as their work load; and in the university U, a team of SDOs of project Q was formed to provide the professional support. Figure 1 portrayed the organization structure of Project W.

Table 3 Proportion of Each Item in the Yearly Budget Plans of Ten Schools

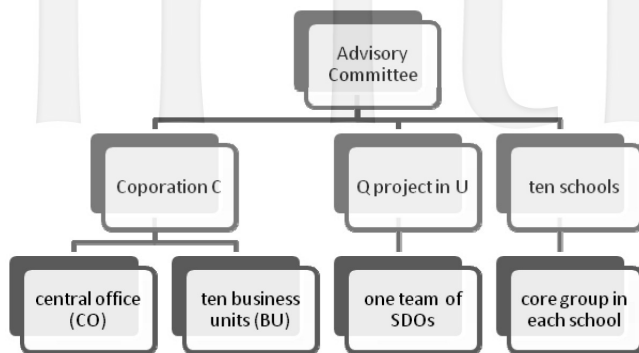| Year	Curriculum and Textbook	Hiring More Staff	Student Development	Career Planning	Student Scholarship	Hardware Facilities	Others
2011-2012	8.08%	32.24%	20.94%	2.96%	5.14%	25.18%	5.47%
2012-2013	8.34%	37.32%	26.47%	3.05%	4.56%	17.86%	3.04%

Figure 1 Organization Structure of Project W

4.3 Roles

In order to smooth the functioning of the partnership, it was necessary to clarify the roles and responsibilities of each party (Borthwick, 1994; Grobe, 1990; O'Connell, 1985; Padak, Shaklee, Peck, Barton, & Johnson, 1994; Wangemann, 1988). We collected from interviewees the data about roles, and they expressed their views about roles of themselves and other parties. We summarized their roles in Table 4.

4.3.1 Roles of the Business Sector

For the business sector, the roles were divided into two parts: CO and ten BUs.

Roles of CO. The main roles of CO can be classified as: Distributor of the funding, manager and monitor of the whole process, developer of the resource pool.

(a) Distributor of the resources. CO was responsible for distributing the resources to ten schools and Q. Meanwhile, CO paired the ten BUs with ten schools to provide counterpart assistance.

(b) Manager and monitor of the whole process. CO has

Table 4 The Roles of Each Party in Project W

Parties	Roles
CO	• Distributor of the funding • Manager and monitor of the whole process • Developer of the resource pool
BU	• Pairing partner of schools • Message conveyer between CO and schools • Implementer of company visit
University	• Expert for schools • Consultant for schools • Interpreter for the business sector • Recorder of the project
Schools	• Beneficiary. • Proposer of the school-based budget plan • Implementer of the plan

done a lot of management work to organize meetings, arrange the company visits and take on the financial work. Meanwhile, CO set up principles for schools to make their budget plans and monitor the process.

(c) Developer of the resource pool. The resource pool was the idea of CO, and they have developed many activities for the students in the first year, such as "Overseas Experiential/Exchange Trip," "Job shadowing in summer" and so on. However, as the capacity was limited, not all of the students had the chance to attend these activities. CO has also arranged many company visit activities for students to broaden their views and help them develop the career plans.

Roles of BU. The roles of BUs included partner of schools, message conveyer between CO and schools, and implementer of company visit.

(a) Pair partner of schools. Each BU was paired up with one school. BUs provided various supports to their pair schools and helped schools to make the yearly budget plans. The various support included raising the funding for partner schools, communicating with other BUs to get resources needed by pair schools, providing unused supplies to schools and practicing oral English with students, and so on.

(b) Message conveyer between CO and schools. Another important role played by BUs was message conveyer between CO and schools. CO regularly organized BUs to discuss policies about the project and BUs conveyed the meeting content to their pair schools, such as guidelines or principles about the budget planning. Meanwhile, BUs reported the project progress to CO.

(c) Implementer of company visit and other career education related works. In project W, CO arranged student visits to BUs. BUs developed the visit program and prepared resources and manpower to implement the visit activities. In most of the visit activities, BUs would arrange some colleagues to share their working experiences and teach students interview techniques.

4.3.2 Roles of the University

The team of SDOs of project Q in university U served a variety of roles in the partnerships, involving expert, consultant, interpreter, intermediary to promote the mutual understanding between schools and business sector, and recorder of the project.

Expert for schools. The most important role of SDOs was providing school-based professional support. SDOs planned the support aspects according to two concerns. First, the needs proposed by schools. For example, if teachers felt that they needed some professional support to improve the mathematics teaching, then project Q would allocate some mathematics SDOs to help them. Second, the support plans suggested by content analysis and SDOs'

professional judgments. Before entering one school, SDOs would try to do stocktaking about the whole school through observation, interviews and questionnaires. Then based on the stocktaking report and discussion with the principal and middle managers, SDOs would judge what areas the school should improve.

Consultant for schools. Besides providing professional support for some specific subjects, SDOs would also give advices on schools' other issues, such as developing plan, administration, facilities and so on. Moreover, SDOs at the same time supported schools from other subprojects of Project Q, so they could organize teaching experience sharing of different schools and school visits activities, if necessary, to enhance exchanges of experiences among schools.

> My role is a consultant. I give advices on every aspect related with Project W, such as facilities, teaching and learning, administration and planning. I hope they could avoid detours. If something has been tried in other schools, I will remind them the possible problems; if they encountered new problems, I could give some suggestions and guides. (I-U-F)

Interpreter for the business sector. CO and BUs had the enthusiasm to support schools, but they had limited knowledge and understanding of the education context. Therefore, SDOs would interpret some education phenomenon for them and give some advices as to how to support the schools, such as the company visit activities.

Intermediary between the business sector and schools. Related with the above roles, the team of Q would adjust business' unreasonable expectations on schools, explain schools' consideration about the budget to the business and inform the business of schools' difficulties and so on.

> I think I'm taking on an interesting post. ......I will explain to the BU what the school would like to do, the reason, the meaning of the budget plan. (I-U-G)

Recorder of the project. Project Q recorded the improvement process of each school to provide some evidence about the project effectiveness, collected data for empirical research, and accumulated experience for future work.

4.3.3 Roles of Schools

Roles of schools were relatively simple, including beneficiary, proposer of the school-based budget plan and implementer of the plan.

Beneficiary. The initial purpose of this project was to help the students in these ten disadvantaged schools. Therefore, schools were the main beneficiary in this project,

as they could get the resources and support from both the business and the university.

Proposer and implementer of the school-based budget plan. In this project, schools had to propose their own budget plans and they could also discuss the plan with their pair BUs and SDOs to ensure the plan could get permission from the advisory committee. When permitted, they would cooperate with external support to implement these plans, through coordinating the internal staff and resources.

> When join in the project, we know that we would get a lot of money. But it's a question about how to use the money….. First, we used HK$500,000 of the HK$1,500,000, which is a third of the total amount, in teacher and learning and students activities. Second, we need to employ one person to do the coordination which can reduce our administration workload. Our budget for this job's annual salary was HK$250,000, which was equal to a fresh teacher's starting annual salary (we didn't employ a new teacher). We selected three existing teachers to do this work, and cut down one class for each teacher to reduce their teaching workload. Third, we used HK$500,000 to the colleagues and students. Teachers and students could hand in their own proposals, which should be limited from HK$50,000 to HK$80,000. So we can support five or six proposals. (GI-S-CP4)

4.4 Interactions

In this study, interaction meant the communication between or among the different parties. Prepartnership conversations enabled participants to match their expectations about roles and commitments, program content, and external funding. (Borthwick, 1994, p. 85). When negotiated successfully, differences among different parties could be complementary and enhanced partnerships; when handled poorly, differences could lead to negative consequences like hurt feelings, jeopardized outcomes, or wariness about future partnerships (Dumlao & Janke, 2012). Therefore, encouraging open dialogue among multiple partners was an important strategy for building and continuing partnerships (Blank et al., 2012). In the initial stage of Project W, most of the interactions involved two parties, such as S-U, CO-U, BU-U, CO-S, BU-S or CO-BU. The interactions involving all the three parties only happened in individual cases, such as when the schools proposed the yearly budget plans. We summarized the interaction parties and their inter action content in Table 5.

4.4.1 S-U

In the beginning, the interactions between schools and SDOs were largely around doing stocktaking and building trust, especially for those schools which were

Table 5 Interaction Parties and Interaction Content

Interaction parties	Interaction content
S-U	SDOs do the stocktaking to review the whole schools. SDOs communicate with principals and related teachers about the specific aspects to provide professional support. SDOs communicate with teachers about how to prepare the company visits.
CO-U	Senior managers in CO and SDOs discuss and share the progress of each project school.
BU-U	BUs and SDOs could know more about the pair schools from each other, and then they could develop and adjust the supporting points in schools.
CO-S	CO sends emails about the small programs in resource pool to schools and receives schools' replies. CO organizes formal meetings to invite advisory committee and the core group of ten schools to talk about schools' yearly plans.
BU-S	BUs are invited by schools to attend some school meetings and activities, including administrative, academic and ceremonial activities. BUs also invite teachers and students to participate in their activities.
CO-BU	CO organizes the related colleagues in ten BUs to attend regular meetings to share their experiences of the project. CO posts the ideas or principles from the advisory committee to BUs.
B-U-S	The schools' yearly budget plans are proposed by each school to follow the directions made by CO, but in the making process, schools should consult with SDOs and BUs. CO and BUs participate in several school-based professional support activities provided by SDOs.

not familiar with Q. When taking stock of schools, SDOs could interview different parties in one school to get as full a picture as possible, including the principal, middle managers, teachers from different subjects and the representatives of students. As interview covered only a few teachers, some SDOs thought that class observation might be a good chance for them to communicate with most teachers since they could give face-to-face feedback to teachers.

Class observation is a good turning point, because I could have face-to-face interactions with individual teachers and take the project directly to them. As in the beginning, we just communicated with the principal about the budget, did questioners, and interviewed some people. For most of the teachers, the distance between us is far. When we observed their classes, they were nervous in the beginning. But after the observation we could give feedback to them individually and then they found that we could have so much professional interactions with them This made the teachers feel much better. So afterwards, when we prepared the professional day for them, they welcomed our participation. (I-U-G)

After the stocktaking, SDOs communicated with principals and related teachers about the specific aspects to support. When support aspects were set down, SDOs could do the specific collaboration and the interactions remained in the collaboration process when needed. Besides the professional support, in the first year, SDOs have spent a lot of time communicating with teachers about how to prepare for the company visits. Most of the above interactions were irregular, but Q also have held several formal regular meetings and invited the core group of ten schools to receive their feedbacks. These meetings also provided chances for ten schools to share their experiences.

4.4.2 CO-U

Most of the interactions between CO and U were through formal meetings. In these meetings, senior managers in CO and SDOs from project Q discussed and shared the progress of each project school. In some cases, the representatives of each BU also joined in the meetings. Through these meetings, CO could grasp the overall progress and adjusted some directions of the project accordingly.

4.4.3 BU-U

Compared with CO, BUs and SDOs had more interactions with the pair schools. Telephones, emails, informal meetings were the most common interaction channels. Through these interactions, BUs and SDOs could know more about the pair schools from each other, and then they could develop and adjust the supporting points for schools. Some BUs also held regular meetings, for example, once every three months, with SDOs to discuss their pair schools.

The colleagues of BU1 are very positive and warmhearted and they often telephone me. If they knew something special about the school, they will tell me. Also I will tell them what's happening in the school. …...They want to learn more about the school. We have had many long-time telephones. ……The colleagues of BU2 are very interesting, they often invite us to attend their activities. …….I think it's right. Face-to-face meeting is necessary for interpersonal interactions. You cannot communicate with others only through emails and telephones. (I-U-G)

4.4.4 CO-S

The interactions between CO and S were mainly around the resource pool and budget plans. The common interactions channels of their interactions were emails and formal meetings. CO was responsible for sending emails about the small programs in resource pool to schools and receiving schools' replies of their willingness to join in the programs. But there seemed to be some problems with the interactions through emails, as some schools could not reply them in time. CO was also responsible for organizing advisory committee to review schools' yearly plans. They held formal meetings, and core groups of ten schools should report their new plans for the next academic year and reviewed the effects of their last years' progresses. At the end of the first year, through emails CO posted some principles for schools to write the new yearly plans.

4.4.5 BU-S

As CO has not regulated the frequency and channels of interactions between BUs and their pair schools, there were different ways for their interactions. In general, the interactions between BUs and their pair schools were frequent and diverse.

BUs were invited by schools to attend some school meetings and activities, including administrative, academic and ceremonial activities.

Our pair BU is very helpful. He (the leader of the school's pair BU) visit our school frequently, and at least once every month. He has attended many activities. For example, last week we did the lesson study report, and he sit in the meeting from 1 pm to 7: 30 pm. He is very warmhearted. ......Sometimes after he sit in the school board meeting, he would give a brief talk about the meeting to his colleagues and ask them to follow. Because of his attitude and leadership, his colleagues do not dare snub the project. So our interactions are good. (GI-S-CP6)

BUs also invited teachers and students to participate in their activities, such as the annual staff party. Some BUs and their pair schools held some interaction programs, such as sport match; and some BU held regularly luncheons with the principal.

We will have lunch together once every three month. We will communicate with each other about the project. I also send an email about the school information to them every month. The interactions between us are very good. (GI-S-CP4)

4.4.6 CO-BU

The interactions between CO and ten BUs were mainly through internal sharing meetings. CO would organize the related colleagues in ten BUs to attend regular meetings to share their experiences of the project. CO would also post the ideas or principles to BUs, which came from the advisory committee of the project.

We (CO) are responsible some central planning work. For example, for the 2012-2013 school plans, we would organize ten BUs to communicate with schools and prepare the meeting. We will give BUs some overall directions and guidelines. Because we have an advantage, we know what have happened in ten schools. We encourage our BUs to share their experiences and learn from each other. We don't set a standard model for them and encourage them to bring out the sparkle ideas. We value their uniqueness. (I-C-N)

4.4.7 B-U-S

The interactions involving all the parties mainly focused on the schools' yearly budget plans. The plans were proposed by each school, but in the formation process, schools should follow the directions guided by CO and consult with SDOs and BUs. Sometimes, businesses also participated in several professional support activities, such as stocktaking report and class observations.

In the beginning, they (businesses) really liked to directly contact with schools, but afterwards they felt that it was just a passion and they could do limited things. So now we have begun to work together. For instance, when they observe the classes, they don't know what they should observe and what they could do after the observation. Then we would tell them the problems we have observed....... We also explain the problems in schools through stocktaking report. "This is a personal problem, this is an administrative problem and this is a teaching and learning problem......" (I-U-A)

4.5 Expectations

Business, university and school partners come to their joint endeavors "from different worlds" (Dumlao & Janke, 2012). Public schools were Not-for-Profit (NFP) organizations, and NFP organizations believed that "the business sector often does not clearly understand a number of common characteristics of the Not-for-Profit sector. This creates challenges when establishing and maintaining a relationship with a NFP organization" (Center for Corporate Public Affairs, 2008). As mentioned previously, the three parties had common goals for the project. However, their expectations for the effects were different. For example, business sectors would like to see some quantitative results, for instance, the change of students' academic results, while schools thought that most of the programs' effects cannot be quantified, such as the change of students' attitudes and teachers' professional development. In such case, SDOs had to play the intermediary role to balance their expectations. In this section we report outcomes of data analysis related to the expectations of different parties and the potential obstacles in Project W.

4.5.1 The Expectations of Different Parties

The expectations of the business sector. The data analysis showed that the business sector emphasized effectiveness. Colleagues of the business have adjusted their expectations on students' academic achievement through U's interpretation and the contacts with schools, but they still preferred setting up some indicators to describe and record the effectiveness of this project.

> CO: Actually I know that Q is collecting some data base, and then we could track the data. We know that it's difficulty to use key performance indicator (KPI) in schools. For example, you could not say "in this year there are 5% of the students could enter the colleges, and after six years there should be at least 15% of the students could enter" ……But we could track students. For example, we measure their interests in study. In the first year, these students in form 1 were not interested in study, and their scores in this item were 2.5; however, their scores are continuously increasing in the six years. I think it's OK. (I-C-Y)

The above data have shown the concern of the business sector which focused on the effectiveness of students, while some BUs thought that this project should pay more attention to the effectiveness of teachers.

> So it's unrealistic for me to say "okay, by 6 years, we are going to be in Band 2, that's not going to happen, because the location will always be the same, the student makeup will always be the same." It's how we

actually, my kind of idea is, need to really target on the teachers. Because no matter how much we throw at the students, if the teachers are not supportive, if the teachers are not trained properly, their capacity is not enough, the students, end of the day, no matter how many tools, how many equipment we are going to give them, they are going to be able to achieve what we hope they could achieve. So this is my kind of thought. (GI-C-BU2)

The expectations of the university. For the team of SDOs of project Q, they had more rational expectations on the project. They knew that there were many factors affecting schools at the same time, so it was hard to decide whether some changes could be attributed to this project. However, they had some basic expectations.

(a) Expect this project to become a model and play the demonstration function. SDOs expected that schools could make better use of the resources and different parties could learn from each other. Some SDOs hoped that through the efforts, this project could be a model and lead to more B-U-S projects.
    If this project could be well done, it could affect other businesses, as it is the first successful example in Hong Kong. There are many people want to donate, but they can't find the right way. We could be a model to provide some experience if success. (I-U-A)

(b) Expect students to develop in various aspects. SDOs hoped that through this project students could develop in various aspects, not just the academically. What's more, they expected these students could get more career chances in Corporation C.
    If some student's academic scores is very low, but he/she has high social abilities, then he/she could do some summer job in the hotel. His/her English could be improved when doing the job. It would be better if he/she could continue to work in the hotel when graduate. (I-U-A)

(c) Expect teachers to gain more professional development. Teachers were vital to school improvement. Some SDOs expected that through this project, teachers' teaching capacity and attitudes could be enhanced or improved.
    Of course I hope that teachers' professional knowledge could be enriched and they could have more free time and space to discuss the teaching skills and learn more about their students. Now the students have more chances to visit, their performance might be enhanced, and the teachers could get more feeling of success, and then the teachers would get more impetus to develop. ……I hope that through their efforts, the school could be a learning community and develop a sharing culture. (I-U-C)

The expectations of the schools. Most schools resisted against quantitative evaluation, due to their beliefs that it was difficult in education to achieve immediate tangible effects.

> I don't like the evaluation. It's difficult for me to imagine we should review our project every year. Yes, I could report how many activities we have held and the feedback from students. However, we could not get students' real thought. Actually, if you asked me to hand in the report in June, I have to deal perfunctorily with it. I think they (the business) should think more about the effects. (GI-S-CP4)

However, some principals thought it was acceptable if the business sector demanded effectiveness.

> It's very normal for them to (the business) have the expectation. They give HK$12,000,000 to my school, so they must want to see some effects. Their expectation is acceptable. …...My belief is trying my best to do and setting a goal. (I-S-L)

4.5.2 Potential Obstacles

This project has launched for one year and some problems have emerged. In this paper, we tried to recognize the potential obstacles to this project in order to help it run more smoothly in the future. The potential obstacles mainly included four aspects: Expectation discrepancy, deficiency in management, communication gap, and role ambiguity.

Expectation discrepancy. The most notable problem mentioned by interviewees was the expectation between business sector and schools, as it would directly affect how this project was evaluated. Business sector valued the cost and effectiveness, while schools valued long-term efforts. Because of the different values, they had different expectations for the project. SDOs played an intermediary role to balance their expectations, but they still needed more time to come to a mutual agreement.

> I think the biggest difficulty is……Company C has spent so much money in these schools and will last for six years, so they must have some expectations. They must hope that they could see obvious change after six years. But it would take a long time to achieve school improvement, and it acquires various conditions. The HK$1,500,000 is not a big deal for one school, and we are just helping schools, so we cannot ensure that they could get big return. (I-U-B)

Deficiencies in management. Project W was additional works for all of the three parties, and it's difficult for them

to recruit some full-time staff for the project. This problem was much more severe in schools, as most teachers had a lot of daily teaching work to do. The deficiencies in management were primarily concentrated in two aspects: Financial work and resource pool.

(a) Financial work. Business sector and schools had different ways to deal with the financial work. For example, for the budget planning, business sector asked for detailed budgets, while schools were accustomed to rough estimates. For the reimbursement, business sector required clear and detailed forms and supporting documents, while schools were not ready for the administrative procedures. Therefore, in the beginning, some SDOs had to be an intermediary to help them to coordinate with the financial work.

(b) Resource pool. As mentioned before, school teachers had a lot of daily teaching work to do and schools' calendars would be set down before a new school year began. However, some programs supported by the resource pool were developed in an ad hoc manner, so schools couldn't allocate enough time and teachers for these programs. These deficiencies in administration have produced negative influence on the effects of these programs. As schools could not arrange some full-time staff for the management of the activities supported by the resource pool, the effect of each activity could not be guaranteed.

> The quality of teachers' support is varying. We could see that some teachers were happy during the visit, like students, but they didn't play the role of leading; while some teachers did very well, and they knew how to lead students and how to attract their attention. We have given the feedback to schools and SDOs, now they are improving. ……There are many small programs in the resource pool, as the natures of programs are different, the leading teachers are varying. Some teachers have lead many times, so they are familiar with the arrangement. However, if some teachers have not led before, their support may not be well. (I-C-N)

Communication gap. Because of the deficiency in management, there were some communication gaps among three parties, such as too many emails, delayed information and so on. The communication gap could cause unnecessary misunderstanding. For example, some colleagues of businesses complained that teachers could not reply their email promptly; while teachers explain that they have too many teaching duties for them to check the mailbox frequently. Some communication gaps were caused by the duty ambiguity. There were no clear regulations of the information delivery. The breakdown in interactions made schools get delayed information and had much less time to prepare for the decision.

I think we have an obvious communication gap among our three parties. I haven't got the information about the submitting date of the plan until yesterday (Wednesday). Next Tuesday we should submit the plan and we should present the plan on 27th. What's the problem? Today our pair BU told me that in the past the interactions work was done by CO, but they did not know the work had been transferred to them, and they did not know how to do it. So now we have to work overtime to finish the plan. (GI-S-CP6)

Role ambiguity. As analyzed, the initial attitudes of schools could be divided into three categories, and the third category was welcoming the financial support afforded by the business but being reluctant to receive the professional support from the university. In the third category of schools, SDOs' expert role has been wakened. Schools' development priority may explain the issue, but the role ambiguity and the incoordinations between the university and the business sector was another important reason. They all wanted to help schools, but they had different approaches and these different approaches have not been negotiated in advance between the two parties, which put schools into predicaments.

Now there are three parties in the project. ...... Businesses do not just give a donation; they will get involved in schools' development. For example, they will invite some staff to teach English in schools and arrange many visits. These are good things. But there is no coordination among the support. For instance, in the past when you were ill, you would see only one doctor and the doctor would prescribe some medication for you. But now you have two doctors and both of them would prescribe the medication for you. However, they have few chances of interactions. Although we have done the stock take and judge the improvement aspects in schools, if the business sector offered other things, schools would not reject and postpone our suggestions. (I-U-D)

5   Discussion and Conclusion

B-U-S partnerships for comprehensive school improvement are new attempts in Hong Kong. In this paper we tried to describe and analyze the underlying constructs of the initial stage of this kind of partnerships, through five domains: (1) rationales -- Goals and initial attitudes; (2) operations -- Resources and organizations; (3) roles -- Each party's roles; (4) interactions -- Communications among three parties; (5) expectations -- Expectations and obstacles. From the research findings, we could also conclude some key points in the B-U-S partnerships.

Different partners' initial attitudes towards the B-U-S partnerships should be taken into account as part of the project development. As far as the rationales are concerned, we analyze the goals and initial attitudes of different parties. In general, the initial attitudes of businesses and the university are positive, but schools' initial attitudes are different. The initial attitudes of some schools are negative, such as worrying about the intervention by the business sector and being reluctant to receive the professional support from the university. Frewer et al. (1998) pointed out that people with negative initial attitudes receiving persuasive information from a distrusted source might become more negative, whilst those with positive attitudes receiving information from a trusted source might become more positive. Therefore, when entering these schools with negative initial attitudes, it's necessary for the business sector and university experts to spend more time building trust with schools.

Resources should be allocated more on teacher leadership building. In our study, we find that in the first year, the resources were mainly allocated in hiring more staff and improving hardware facilities. Although in the plans of the second year, we could see the focus has been changed from deficiency to development, the resources in teacher development were still limited. Teachers are the main driving force of the school improvement project, and are also expected to play a major role in sustaining the achievements of school improvement when the project ends. Therefore, B-U-S project should allocate more resources in improving teachers' capacity to facilitate school improvement and make the achievements more sustainable. Teachers' capacity, especially teachers' leadership capacity is now considered a key element in improving the teaching profession and enhancing school improvement and renewal (Mujis & Harris, 2006; Stone, Horejs, & Lomas, 1997). The leadership every teacher should have involve three interrelated elements: Managing change through collaboration, experimenting with practice and gathering and using evidence (Frost & Durrant, 2003). Given this, different partners of B-U-S project should pay more attention to teachers' leadership capacities when planning schools' yearly budgets.

Clarity of roles and responsibilities are important to maintain the B-U-S partnerships. For the organizations of Project W, there is clear organization structure (see Figure 1).Under the structure, we explore the roles of CO, BUs, SDOs and schools. In general, each partner has its own roles and responsibilities, but role ambiguities still exit in the project. It remains a difficult problem for schools if the SDOs and BUs could not reach a consensus on school development. In such a case, the creation of a position as boundary spanners-individuals who have the skill to

build and manage interpersonal relationships is introduced as a strategy to solve the problem (Sandholtz & Finan, 1998; William, 2002). Boundary spanners are expected to move freely between partners, interpret the language, understand the reward systems, and translate the ideas of those in one culture to those in another (Clark, 1988, p. 61). In this study, university experts have played the role of boundary spanners to a certain degree, for example, they interpret educational issues for the business sector and act as intermediaries between the business sector and schools. However, B-U-S partnership is a complex and long-term process, thus it is necessary to create formal boundary-spanning positions to make the roles of each party more clearly, especially in the initial stage.

Interactions among three parties are necessary for B-U-S partnerships to help improve dialectical thinking and related conversations. For the interactions among different parties in Project W, we find that in the initial stage, most of the interactions always involve two parties, such as S-U, C-U, BU-U, CO-S, BU-S, and CO-BU. The communication involving all the parties is only needed in individual cases, such as the yearly budget plan of each school. The three parties have different ideas on the explorations, for example, the business sector prefers to use indicators to specify the effectiveness of students' outcome and teachers' teaching, while schools don't welcome the quantitative evaluation. We also find communication gap among three parties which results in the information delay. In such circumstances, the interactions among different parties should be encouraged, as dialogue offers different insights into how to "do" conflict collaboratively (Baxter, 2004). Thinking about alternative ways to construct meaning in a partnership, holding learning conversations, and choosing praxical responses are important tasks for all community-campus partners (Dumlao & Janke, 2012).

Regular reporting is an efficient way to narrow the cultural gap. In all partnerships, participants must address tensions from the differing norms, assumptions, cultures, and expectations that each brings (Dumlao & Janke, 2012). NFP organizations experience problems with their corporate partners around accountability, the measurement of the effectiveness of programs, and mutual performance obligations (Center for Corporate Public Affairs, 2008). In our study, we find the similar problems, and most of the problems stem from the varied work cultures, especially the difference between business sector and schools. The business sector expects more sophisticated reports and accountability from schools, but schools could not get used to these expectations. Brown (1999) proposed that "negotiating (corporate/school) partnerships can be difficult. Sometimes a neutral third party is helpful in facilitating the communication between education and corporate communities." As university experts understand

schools' culture, they could help to narrow the cultural gap between the business sector and schools through developing reasonable report framework for schools, which involve annual reports of progress, strategies, financial and operational performance and so on. Then schools could prepare their respective reports based on the framework and present the reports to the advisory committee on the regular meetings. The regular reports will go a considerable way to meeting demands from the business sector for transparency of information and assist the community, including existing and potential business partners, in understanding NFPs better (Center for Corporate Public Affairs, 2008).

Through explorations of the above five domains, we get a preliminary description of the B-U-S partnerships in the initial stage. Our research proves that common goals, sound organizations, proper distribution of resources, clear roles, effective interactions, and reasonable expectations are important for the B-U-S partnerships. These characteristics could also be found in the partnership literatures (e.g. Borthwick, 1994; Clark, 1988; Su, 1990). Muijs (2010) proposed that practice of school improvement has already moved to a fourth phase based on collaboration. Project W has just passed the first year, and it still will last for five years. Borthwick (1994, p. 235) pointed out that the partnership would move through stages of development, stabilization, and institutionalization. We expect to do a longitudinal study to trace the development of Project W and this would be an important line of research about B-U-S partnerships that could enrich the practice and research for school improvement in the fourth phase.

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From Differentiation to Diversity: Reforming Secondary Technical Education in Postcolonial Hong Kong

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Abstract

During Hong Kong's colonial period, secondary technical education to a large extent mirrored that of the British tripartite school system. However, after 156 years of colonial administration in Hong Kong, the Special Administrative Region (SAR) government carried out a revamp of education, in particular, secondary technical education. In view of the handover of Hong Kong's sovereignty to China, one could ask: Was it for political reasons that the SAR government reformed technical education, or was the reform more pragmatically oriented and geared to local needs? This study therefore aimed to determine which of these motives lay behind the changes made to secondary technical education in Hong Kong and the characteristics of such changes. This study revealed that it was because of the need to meet the socio-economic needs of Hong Kong that the existing secondary technical curriculum had to be reformed. In redefining the paradigm of technical education in the New Senior Secondary curriculum, Applied Learning was introduced as an integral part of the school curriculum and offered to all schools without any differentiation. There is no evidence to suggest that the introduction of Applied Learning was a reaction on the part of the SAR government against the colonial legacy.

Keywords: secondary technical education, Applied Learning, decolonisation, reactionary, pragmatic

1 Introduction

During Hong Kong's colonial period, secondary technical education in the colony largely mirrored secondary technical education in Britain's tripartite school system. However, in the 1960s, Britain's tripartite school system was criticised for creating a disparity in education opportunities for young people by segregating them at the age of 11 into three types of schools: Grammar, technical and modern. The subsequent abolition of Britain's tripartite

school system in the 1960s might have made it difficult for the Hong Kong colonial government to continue to use the British model of school education in Hong Kong. At the same time, there were calls for secondary technical education to be made more relevant to Hong Kong society. For example, in the 1960s, the Director of Education, Peter Donohue, in an attempt to solve the problem of the gap between the primary school leaving age and the legal working age, introduced experimental government modern schools to Hong Kong. Likewise, in the late 1960s, the idea of establishing three-year prevocational schools in Hong Kong came from the adviser of the International Labour Organization, Ian Grant, who perceived that it could help to solve the problem of widespread youth delinquency. In addition, in the 1970s, it was due to economic considerations that there was curriculum differentiation by school types. This was revealed in the annual summary of the Education Department (1974), which stated that the immense influx of refugees from China and the rapid development of the manufacturing industry had generated demand for more school places and skills training for youth. At that time, not only did the industrial sector urge the government to provide an adequate supply of skilled and semi-skilled workers and apprentices for industry, but religious bodies also regarded secondary technical education as a viable avenue for underprivileged students to enhance their employability. Therefore, under these circumstances, prevocational schools were retained. In fact, before the 1960s and as far back as the Burney (1935), there had been attempts to relate education in Hong Kong more closely to local needs. Hence, the colonial government, while making reference to the British practice in technical education, continually modified the format of secondary technical education in order to meet local needs (Lau & Kan, 2011). All this shows the pragmatic orientation of the colonial government in its consideration of the format of secondary technical education.

After the handover of the sovereignty of Hong Kong to the People Republic of China (P.R.C.) in 1997, Hong Kong's technical education underwent a major overhaul, and the question is whether it was for the same local needs

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that the SAR government reformed secondary technical education, or whether the reform was politically motivated. It is worth noting that in 1997, unlike decolonised states that became independent, Hong Kong became the Special Administrative Region (SAR) of the P.R.C. Hence, the ways in which the P.R.C. perceived colonialism might have directly influenced the policy of the SAR government in regard to Hong Kong's colonial legacy. It should be noted that for its part, the P.R.C. never acknowledged the colonial status of Hong Kong. For example, in 1972, when the P.R.C. became a member of the United Nations, the P.R.C.'s representative immediately requested the removal of Hong Kong and Macau from a list of territories supervised by a UN 'special committee on colonialism' on the grounds that they were part of China (Miners, 1991). Therefore, it is possible that due to political considerations, the Hong Kong SAR government wished to eliminate all traces of the colonial legacy so as to signify the end of the colonial era, and the education system was an important item on that agenda. In view of the uniqueness of Hong Kong in the decolonisation literature, it is worth exploring the reasons why the SAR government reformed secondary technical education and, at the same time, identifying the way in which it was reformed. In order to position this study in an investigative framework, the following section reviews the two approaches to educational reform in decolonised countries: Reactionary and pragmatic.

2   Decolonisation and Education

It should be noted that decolonisation took place at different times and in different forms; for example, the practice during the 1950s and 1960s differed from that in the 1980s and 1990s. Bray (1994) notes that during the latter period decolonisation had the following characteristics: "More lead time, common integration with the original mother country, fewer military conflicts and lower nationalist sentiment" (p. 38). Regarding educational reform in decolonised countries, there have been basically two approaches: A reactionary approach and a pragmatic approach. The reactionary approach involves the newly-sovereign state doing away with the obviously colonial parts of the existing curriculum and implementing a series of educational reforms that reflect more strongly the country's specific culture and social conditions. Morrisey (1990), Altbach (1992), and Bray (1997) all hold the view that decolonised states would reform the curricula for the sake of removing the colonial legacy and to portray the emergent nations and their rulers in a new light. This approach was more politically than educationally motivated. Bray illustrates this approach in the case in southern Nigeria during post WWII decolonisation.

…The new leaders had to adopt *educational* policies which were self-evidently different from those of their colonial predecessors. This included responsiveness to popular demand for expansion at all levels of the education system and replacement of at least the most glaring parts of the colonial curriculum. (Bray, 1997, p. 110)

According to this school of thought, the reform of secondary technical education in post colonial Hong Kong was politically driven. In replacing the old colonial curriculum with a new one, the emergent SAR government aimed to portray itself in a different and better light. The other approach, a pragmatic approach (Bray, 1994; Morris, Kan, & Morris, 2000; Thomas & Postlethwaite, 1983), involves the new government taking into account the socio-economic needs of society vis-à-vis the existing curriculum in determining the extent to which the curriculum needs to be reformed. In regard to the influence of socio-economic forces in explaining curriculum changes, Skilbeck (1991) states that the curriculum either is, or can be made, directly responsive to forces and trends in the economy. In other words, the reform of the curriculum is part of a wider strategy of economic restructuring and development. For example, Morris (1995) points out that in Hong Kong in the 1950s and 1960s, when factory workers were needed in the manufacturing industry, "the curriculum of schools, especially its hidden curriculum, was well suited to prepare students with these skills [a basic level of literacy and numeration... diligent, dextrous, punctual and obedient]" (p. 129). However, the economy increasingly came to rely on intellectual services, and this led to "growing concerns on the part of employers over students' ability to use English and Putonghua and... computer studies, accounting, commerce and business studies... and the teaching method which encourage competencies such as problem solving and co-operative learning" (Morris, 1995, pp. 129-130). Hence, according to this view, the government had to reform the school curriculum in accordance with the socio-economic needs. With a view to exploring whether the reasons behind the reforms made in secondary technical education in Hong Kong arose from political or from pragmatic needs, the following section first analyses Hong Kong's economic situation and the education reform carried out, particularly in secondary technical education, shortly after the Handover.

3   Hong Kong after the Handover: Economic Restructuring and Education Reform

In regard to Hong Kong's decolonisation, the following two characteristics should be noted. First, after the signing

of the Sino-British Joint Declaration in 1984, a 13-year transition period began. The long time span of the transition allowed changes that had been planned by the colonial government, including the revision of curricula, to be implemented before the handover of sovereignty. Second, in 1997, Hong Kong became not an independent state, but a Special Administrative Region (SAR) of the P.R.C. Therefore, during the transition period, both the outgoing British administration and the incoming SAR government aimed at a smooth and trouble free transition prior to 1997. In this respect, any changes to be made, such as those to the education system, had to be gradual rather than drastic in order to minimise any threat to the stability of Hong Kong. The Basic Law of the SAR guaranteed that Hong Kong's economic and social systems would not change for 50 years after 1997; in the words of the new SAR government, "the first government of the Hong Kong SAR has not embarked on a radical course of decolonisation in an attempt to excise vestiges of the colonial past" (Morris et al., 2000, p. 244). In addition, before the Handover, Hong Kong had already been a highly successful free market economy, and the concern of the first SAR government was very much on identifying ways in which Hong Kong's prosperity and stability could be continued. However, shortly after the Handover, the tsunami of the Asian financial crisis and the massive speculative attacks against the Hong Kong dollar nearly toppled the local economy, signalling seismic changes on the socio-economic horizon in subsequent years. At that time, Hong Kong also faced the imminent challenges of economic globalization, accelerating progress and increasing outsourcing of labour in intensive manufacturing that had begun in the late 1980s (Sung, 2002). In this context, after the Handover, the Hong Kong government envisaged a process of economic restructuring (Hong Kong SAR Government, 2003), which was in response to the worst economic recession that Hong Kong had experienced since the mid 1960s. At a time of economic setback, Hong Kong, as elsewhere, "increasingly placed education at the centre of the policy agenda as questions were asked about the system's efficiency/value for money and the suitability of schooling in preparing students for the labour market" (Morris et al., 2000, p. 246).

In order to enhance Hong Kong's competitiveness in a knowledge-based, service centred and globalised economy, in 2000, the government launched comprehensive education reforms and tried to galvanise support from the public (Cheng, 2002). The Chief Executive of the Hong Kong SAR, Tung Chee Hwa, said in his 2000 Policy Address that "educational reform is critical in order to meet the expectations of social development and of the community resulting from scientific, technological and economic change" (Tung, 2000, para. 63). This situation required

students to be flexible, communicative and prepared to learn and solve problems (Cheng, 2004; Farrell & Fenwick, 2007). Cheng (2007), commenting on the demands from socio-economic needs that prompted reforms in the education system, observed that economic structural changes significantly affected skills formation in schools and pathways to employment. The new service economy required skills of interaction, problem solving, risk taking and innovation. It was against this background that the education reform initiated shortly after the Handover was aimed at equipping students with different generic skills, such as communication skills, critical thinking skills, creativity, collaboration skills, IT skills, numeracy skills, problem solving skills, self management skills and study skills (CDC, 1999). It should be noted that these skills, in one way or the other, were also objectives of the newly revised secondary technical education in the post Handover period. Therefore, in the revised secondary education system, it was necessary to consider how these generic skills could be merged with vocational experience in a structured curriculum.

In fact, as far back as March 1997, shortly before the Handover, the colonial government had made strenuous efforts to revitalise secondary technical education by reviewing prevocational and secondary technical education. The government attempted to revise traditional technical subjects like Design and Technology and recommended to provide new resources for upgrading equipments and facilities. However, the Review of Prevocational and Secondary Technical Education in 1997 did not suggest altering curriculum differentiation by school types (grammar, technical and prevocational), which meant that technical subjects remained a limited provision to a small number of schools. This differentiation had long been criticised for engendering inferior esteem of secondary technical and prevocational schools as technical education was perceived as second class education (Lau & Kan, 2011). Hence, this Review was unlikely to achieve the aims of senior secondary education laid down by the Education Commission in 2000, which emphasized a holistic learning experience for all students.[1] As the curriculum differentiation by school types was unlikely to gain the support of parents and students, the Education Commission emphasized that "future senior secondary education should provide choices, flexibility and holistic experiences including vocational experiences to students, regardless of their school" (Education Commission, 2000a,

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[1] The latest statistics that classified secondary schools into grammar, technical and prevocational were in the 2000/2001 academic year. The three types of school are numbered 440, 19 and 27 respectively. See Key Statistics for Secondary Education (April 2000) by Education and Manpower Bureau.

p. 28). To achieve this, in 2003, Applied Learning (the name was formally adopted in 2007; before that, it was called Career-oriented Curriculum) was introduced into the school curriculum in all types of schools as a pilot scheme, including in many former secondary technical schools and prevocational schools. This mode of education was embedded in the new academic structure for senior secondary education, aimed at catering to students with different educational needs (EMB, 2004b). The above policy shows that the government aimed at reforming secondary technical education in order to meet the pressing needs of parents, students and the society at large. Before analysing the changes made in secondary technical education and the reasons behind such changes, it is deemed necessary to review the worldwide trends in secondary technical education and determine the extent to which these worldwide trends were manifested in the reform of Hong Kong's secondary technical education after the Handover.

4   Worldwide Trends in Secondary Technical Education

Over the last 30 years, there have been three prominent issues in the development of secondary technical education worldwide: The balance between technical education and general education; the diversification of the curriculum to cater for different abilities; and the articulation of pathways to tertiary education and career development.

Balancing secondary level general and technical education has created serious concerns for educational planning agendas worldwide (Asian Development Bank, 2004; Bray, 1990; Tilak, 2003). While international agencies agree that the inclusion of technical education is a crucial aspect of educational planning universally, it is generally believed that technical education should be a kind of education for all (UNESCO, 2002; World Bank, 2005). The UNESCO report (2002) entitled 'technical and vocational education and training for the twenty first century' explicitly recommended a broad technical education base facilitating horizontal and vertical articulation within the education system and between schools and the world of work (UNESCO, 2002, p. 10). The report highlighted the need to provide appropriate integration of technical and general education at all levels (UNESCO, 2002, p. 9).

Asian experiences have shown that a balance between general and technical education can contribute to economic growth (Gropello, 2006; Tilak, 2003) and that general skills and attributes have become more important in rapidly changing economies (Tilak, 2003). In short, a trend can be identified during the past three decades of a shift towards a tighter articulation between technical and general education.

Technical education traditionally assumed a focus on specific trades and apprenticeships as a terminal pathway for those students with lower academic learning ability. The situation has changed over the past two decades, with reports demonstrating how amid the strengthening of the linkage between general and technical education, efforts have been put into broadening the pathways to tertiary education and professional qualifications. The OECD (1994) study suggested, firstly, avoiding making secondary technical education a residual or terminal pathway and, secondly, providing institutional bridges between secondary technical education and tertiary education. Delors (1996) focused on the tracking of technical education, and suggested the diversification of study courses to accommodate a wide range of intellectual abilities and interests, recognizing that dividing pupils into different tracks could provide alternatives to prevent feelings of failure.

Several reports from international agencies and experts have put forward convergent views on recent trends towards a broader and diversified curriculum, aimed at catering for pupils of different abilities (Benavot, 2006). The OECD (1994) suggested providing institutional bridges between secondary technical education and tertiary education, designing technical programmes for less successful pupils as safety net programmes, and articulating the programmes for later technical training. Green, Wolf, and Leney (2000), based on a report submitted to the European Commission entitled 'convergences and divergences in European education and training systems,' scrutinized the education and training systems in European Union member states. They found that recently, the distinction between academic and technical tracks had become blurred. Technical courses had become increasingly less occupationally specific. The shift from specific to more generic technical courses encouraged young people to avoid overly early specialization. Also, the blurring of technical and academic boundaries increased flexibility for students to enter different pathways to future careers or studies.

This review portrays a common trend internationally: More effort is being put into linking secondary technical education with general education and articulating technical education with tertiary education or vocational qualifications. The following sections analyse the changes made in secondary technical education and the reasons behind such changes.

5   Paradigm Shift of Secondary Technical Education in the Education Reform

The reform of secondary technical education was part of the comprehensive education reform commencing in the early twenty-first century. It helped to break the shackles of limited provision of secondary technical education. For instance, in 2005, fewer than 20 schools (3.9%) offered a significant technical curriculum (Hill, 2005), accounting for less than 5% of the total number of Form 4-7 (grade 10-13) students (Tsang, 2004). Thus, secondary technical education was perceived as a peripheral provision. However, following a 1999 proposal for comprehensive curriculum reform, a paradigm shift from specialization to diversity of learning was foreseeable (Kennedy, Fok, & Chan, 2006). Table 1 shows the important official documents related to curriculum reform in general and secondary technical education in particular.

Education reform also signalled the ending of specialization and curriculum differentiation. The consultation document entitled 'a holistic review of the Hong Kong school curriculum proposed reform' proposed "the substitution of specialization/streaming with holistic approaches, while allowing for some specialized studies (e.g., vocational studies, science, technology, humanities, art) at senior secondary level to cater for different interests and potentials of students" (CDC, 1999, p. 3).

The subsequent government document entitled 'learning for life, learning through life: Reforms proposals for the education system in Hong Kong' (Education Commission, 2000b) sparked a top-level overhaul of Hong Kong's education system, aimed at redefining "the role and functions of education in the new environment" (Education Commission, 2000b, p. 27). The document clearly stated "the direction of curriculum reform is towards avoiding streaming and promoting choice" (Education Commission, 2000b, p. 9). Another significant point signifying a new paradigm was "the new interpretation of vocational education as broadening skills and knowledge" (Education Commission, 2000b, p. 89). The official documents envisioned the future secondary technical curriculum as having pivotal principles of diversity, flexibility and broad foundations. Overall, the document emphasized three main aims of the new school curriculum: First, to enable a balanced and comprehensive learning experience of academic, vocational and other education to prepare students for employment and further studies; second, to provide students with a diversity of choices; and third, to nurture in students a desire for learning, and independent and critical thinking.

Thus, the curriculum reform proposed in 'learning to learn' (CDC, 2001) encompassed a holistic review to cope with the general directions of the education reform -- To provide education for students to attain all-round development and life-long learning. In previous consultations, the secondary education curriculum had been criticized as too academic, narrowing pathways for students. It was expected that through curriculum innovation, students could be encouraged to learn as a result of providing them with diverse learning opportunities (moral, intellectual, physical, social and aesthetic, and career-related experiences) (CDC, 2001). As the Chief Curriculum Development Officer (Life-wide Learning and Library) Yip Yam Wing explained, "career related experience means more than work placements and this is a recognised

Table 1 Official Documents of Education Reform Related to Secondary Technical Education (1999-2006)

Year	Name of Document	Related Issues
1999	A holistic review of the Hong Kong school curriculum proposed reform	To terminate the practice of streaming into prevocational, technical and grammar schools.
2000	Learning for life, learning through life: reforms proposals for education system in Hong Kong	To avoid premature streaming.
2001	Learning to learn: Life-long learning and whole-person development	To advocate diverse learning opportunities (moral, intellectual, physical, social and aesthetic, and career-related experiences).
2003	Review of the academic structure of senior secondary education	To propose a 3-year academic structure for senior secondary education.
2005	Reforming the academic structure for secondary education and higher education-actions for investigating in the future	To state the aims and implementation plan of Career-oriented Studies.
2006	Action for the future- further consultation on career-oriented studies and the new senior secondary academic structure for special schools	To review the difficulties and contentious issues in the pilot scheme.

worldwide trend" (Yip, 2004, p. 1). Therefore in the educational reform, among the eight Key Learning Areas (KLAs) introduced in 2000, Technology Education was included as one of the KLAs. According to the Education and Manpower Bureau (EMB) "the history of Technology Education could be backtracked to the development of the Junior Technical Schools in 1930s, a number of technical subjects in the late 1950s, the prevocational schools and related subjects in the late 1960s, the computing subjects in 1980s, the New Technical Curriculum in 1997, and the Technology Education key learning area in 2000" (http://www.edb.gov.hk/en/curriculum-development/kla/technology-edu/index.html). It should be noted, however, that Technology Education cannot be fully implemented in schools. For example, in the junior level (grade 7-9), amongst the 14 areas of learning, only very few schools can offer autobmobile technology, catering services, design fundamentals, electronics and electricity, fashion design, etc as schools neither have the expertise nor the facilities to teach these subjects. In the senior level (grade 10-12), the five areas of learning, namely, Business, Accounting and Financial Studies (BAFS), Health Management and Social Health, Technology and Living, Design and Applied Technology and Information and Communication Technology are all academically inclined and hence difficult to meet the needs of those academically less able students. Therefore Applied Learning is designed to fill the gap.

It was in this context that, at the senior secondary level, a new curriculum named Career-oriented Curriculum (renamed Applied Learning in 2007) was introduced as a pilot scheme from the 2003/04 academic year to provide a learning platform for students to explore career aspirations in professional or vocational areas. Officially, the Career-oriented Curriculum was described as a curriculum designed for students with interests and inclinations in areas other than those provided by the existing examination subjects. It was aimed at "providing students with the opportunities to explore their orientation for life-long learning and career aspirations in specific areas" (EMB, 2004a, p. 4). The EMB stated: "The Career-oriented Curriculum complements rather than duplicates the New Senior Secondary subjects by offering studies with stronger elements of applied learning linked to broad professional and vocational fields" (EMB, 2006, p. 5). According to the government, "the contents of each Applied Learning course are drawn from a particular professional or vocational field which students can easily access in their daily life, for example, healthcare, hospitality services and performing arts" (EDB, 2008). The Career-oriented Curriculum was a preparation for the implementation of Applied Learning in the three-year New Senior Secondary curriculum.

From the 2003/04 academic year onwards, an Applied Learning pilot scheme was conducted with six

cohorts to gain experience and feedback so as to enhance the effectiveness of the implementation plan. In the consultation paper of the EMB in 2004, named 'reforming the academic structure for secondary education and higher education-actions for investing in the future,' there were three objectives of Applied Learning: "(1) to expand the range of opportunities for students; (2) to enhance students' employability; and (3) to prepare students for further vocational education and training. The major strength of Applied Learning was its appropriateness for students who learnt better through practical application" (EMB, 2004b, p. 52). Hence, it is evident that the changes made to secondary technical education arose from pragmatic considerations and were geared towards redefining the paradigm of technical education in the new senior secondary curriculum. We found no evidence that the SAR government introduced a new form of secondary technical education as a means to distance itself from the colonial education legacy.

6 From Traditional Technical Education to a New Paradigm of Secondary Technical Education

In replacing traditional technical education with Applied Learning, one wonders whether it aimed at removing the colonial education legacy or meeting the local needs. With a view to shedding light on the reasons behind the introduction of Applied Learning, it is necessary to analyse the differences between traditional technical education and Applied Learning. Traditional secondary technical education had lost its appeal to parents and young people by the end of the twentieth century because the technical content was unable to cope with the rapid advancement of technology and change of economic structure. According to S. M. Tsui, the then Senior Assistant Director of Education, who had been the Principal of the Hong Kong Technical Teachers' College (1985-90 on tenure),

Technical education in Hong Kong changed along with economic development. In the 1970s and 1980s, the curriculum of secondary technical schools and prevocational schools coped with the labour intensive production and prosperous manufacturing industry. Students who had learnt practical skills in Metalwork, Woodwork and Technical Drawing could have their employability in industry. Therefore, parents considered that technical education could actually help their children to find jobs. But in the 1990s, as many factories moved to Mainland China, intensive labour production declined. Graduates possessed practical skills no longer guaranteed jobs. Thus, education should be reformed to cope with the new social and

economic situations. (Tsui, personal communication, October 21, 2007)

Therefore, Applied Learning differed significantly from traditional technical education with respect to its aims, target group, delivery, scope, learning, assessment and pathways. Table 2 shows how the fundamental directions of traditional technical education and Applied Learning were distinct. The major difference consisted of the distinction between the ideology of specialization and diversity. In the following sections, three special areas of Applied Learning are discussed: the diversity of learning contexts, flexibility of delivery and curriculum framework design. This analysis helps to illuminate the ways in which the design of Applied Learning was geared to redefining the paradigm of secondary technical education and making it appealing to parents and students.

The diversity of Applied Learning implied a holistic diversification of the content of learning, design, delivery and assessment, and learning experiences of students (Wardlaw, 2008). The traditional technical curriculum emphasized specialization in terms of educational institutions, subjects, content of curriculum and assessment. Students were streamed through allocation mechanisms such as Secondary School Places Allocation (SSPA) into secondary grammar, secondary technical or prevocational schools. Transfer routes between grammar, technical and prevocational schools were rare as the latter two offered specific technical or pre-vocational subjects. The scope of the curriculum of traditional technical education was subject based; however, choices of technical subjects in secondary technical and prevocational schools were limited because of constraints stemming from individual schools' facilities and human resources. For example, only

a limited number of prevocational schools provided textile or automobile repairing courses. The delivery of Applied Learning was more diverse and flexible in terms of course providers, and a new way of enhancing the collaboration between secondary schools and post secondary educational institutions, specifically the Hong Kong Institute of Vocational Education (IVE), which was an amalgamation of the former technical colleges and seven technical institutes in 1999.

Secondary technical education and vocational training had been separated in the education system since the 1960s. The former gradually became an integral part of general education and was delivered specifically through secondary technical schools and prevocational schools. The latter was delivered by technical colleges and technical institutes at the post-secondary level (Waters, 1982). The role differentiation between secondary technical schools and technical institutes was distinct, and collaboration was unlikely. Therefore, for traditional technical education, technical subject options in individual schools were limited as it was difficult for a school to offer a wide range of technical subjects. However, Applied Learning emphasized the provision of diversified learning opportunities. It was neither subject-based nor solely provided by an individual school. Instead, it was course-based according to learning areas. Students were offered options from a variety of courses within six learning areas to enable them to fulfil their aspirations and interests. In addition, the role of schools as the sole course providers changed to meet the aim of diversity of courses. IVE and other post-secondary educational institutions and professional bodies became the partners of secondary schools in providing Applied Learning courses. Once boundaries between secondary schools and post secondary institutions had been broken

Table 2 Comparison between Traditional Technical Curriculum and Applied Learning

Characteristics	Traditional Technical Curriculum	Applied Learning
Aim	Specialization for different aptitudes and interests	Diversity of learning experiences and choices
Target Group	Specialized schools/Technical or Commercial stream students	All schools/ Full spectrum of students
Delivery	School teachers	Mainly course providers, e.g. Vocational Training Council, Caritas
Scope	Subject based (e.g. Technical Drawing, Metalwork, Typing, etc.)	Cross disciplinary, course based according to learning areas
Learning	Emphasis on subject knowledge and practical skills	Greater emphasis on flexible competencies, generic skills and self-directed learning
Assessment	Public Examination (Hong Kong Certificate of Education Examination)	Continuous assessment with internal and external assurance mechanism
Pathway	Narrowed pathways for sixth form education and technical institutes	Smoother pathways for the non-university bound students linking to Institutes of Vocational Education and sub-degree courses

down, curriculum choices and flexibility of delivery were likely to be achieved.

Applied Learning additionally differed from traditional technical education in its cross-disciplinary approach and standard curriculum framework. The former Chief Curriculum Development Officer (Applied Learning), Howard Sou (in tenure until 2008) remarked that the learning platform of Applied Learning aimed to address the basic educational issue, that is, the diversified needs of students, through providing students of different aptitudes and interests with a wide range of diversified and challenging courses. These cross-discipline courses could widen students' knowledge through study outside the classroom. Further, Applied Learning was to be a new educational ideology, providing a diversified, broad curriculum catering to individual interests (H. Sou, personal communication, December 19, 2007).

Besides the cross-disciplinary curriculum, there was a standard curriculum framework for all areas of studies. Table 3 shows that the curriculum framework of Applied Learning was similar to that of other key learning areas, in which generic skills, values and attitudes, and knowledge and competencies are equally emphasised.

It was proposed in the Curriculum Framework of Applied Learning that the six vocational fields of applied science, business, management and law, creative studies, engineering and production, Media and Communication and Service would provide the learning context and serve as the learning platform for the development of pupil's generic skills and values, and career related competencies. In fact, Applied Learning was not intended to develop practical skills for future careers; Instead, it was geared towards promoting awareness and understanding of related professions and industries. At the beginning of the twenty-first century, generic capabilities were valued over specific skills in the workplace (Carnoy, 1999; Cheng, 2004; Cheng & Yip, 2006), and thus, the curriculum framework of Applied Learning reflected a paradigm shift from a narrow and specific orientation of tradition technical education to a broader, flexible and competency-based orientation that served to meet the diversified needs of students.

Table 3 Curriculum Framework of Applied Learning

Life-long learning for future studies and/or work	
Foundation Skills	Thinking Skills
Interpersonal & Personal Skills	Values & Attitudes
Career-related Competencies	
Six Vocational Fields as Learning Contexts	
(Applied Science, Business, Management and Law, Creative Studies, Engineering and Production, Media and Communication and Services)	

Source: Sou, (2008).

This analysis shows the paradigm shift of secondary technical education in terms of a new curriculum -- Applied Learning -- Which was aimed at rectifying the undesirable situation created by traditional technical education, such as early specialisation/streaming in the grammar, technical and prevocational school curriculum. As the Curriculum Development Council (1999) stated.

In a knowledge-based society, 'vocational education' should have a new meaning. In formulating our education system, we should not, as far as possible, confine our students prematurely to specialized and narrow-based knowledge or skills as this would not help them lay a broad foundation for future employment. (p. 89)

In other words, Applied Learning served as a transitional learning platform for students pursuing their life-long learning in career or further studies through self-directed learning in different learning areas. Hence, it is due to educational reasons and socio-economic changes that Applied Learning was introduced to replace traditional technical education. To a large extent, the format of Applied Learning is in line with the worldwide trend in terms of diversification of curriculum and articulation of pathways to tertiary education and career development.

7   Development of a Pilot Scheme for Applied Learning (2003-2008)

Before the implementation of Applied Learning in 2009, the government developed a pilot scheme for Applied Learning. Through analysing this pilot scheme, we can better understand whether the introduction of Applied Learning is politically or pragmatically oriented.

In the first three cohorts (2003-05, 2004-06 and 2005-07), the classification of areas of learning was not clear; for example, Performance Arts and Media and Arts were similar, and Information Technology and Engineering more or less belonged to the science discipline. However, as Table 4 shows, beginning with the 2006 cohort, the classification of areas of learning became stable. Moreover, the grouping of different industries into similar areas of learning helped to distinguish between the six areas of learning.

In addition, the courses were designed to suit the interests of students and to be relevant to their careers. With regards to course providers, the Education Bureau intended to diversify the sources, so that each institution would use its own strengths in designing Applied Learning courses, as in the case of the Chinese University, which had long provided university level Chinese medicine

courses. This would help ensure availability of human resources and quality of curriculum design. Furthermore, most of the providers were members of The Federation for Continuing Education in Tertiary Institutions. As such, they had palpable assurance policies and procedures and rich experience in designing study pathways, for example associate degree and higher diploma programmes. Another point worth noting was the engagement of professional bodies like the Hong Kong Institute of Accredited Accounting Technicians Limited (HKIAAT) and corporations like the Hong Kong Aircraft Engineering Company (HKAECO) in providing the courses. Although these provided only one type of Applied Learning course in the pilot scheme, their engagement as course providers demonstrated that Applied Learning could serve as a platform for collaboration between the education and industry sectors. Experience from other countries indicated that this was an effective way to achieve a smooth transition from school to work (OECD, 2000).

The mode of delivery and assessment of Applied Learning were more diversified and flexible so as to suit schools and individual needs. The Education Bureau proposed three modes of delivery of Applied Learning courses according to the place of delivery and teaching staff (Table 5).

The flexibility of the Applied Learning delivery mode meant that schools could choose specific modes of delivery for each Applied Learning course. For example, students might go to the course provider site according to normal school timetables, or take courses on site during school holidays. In addition, schools could also collaborate with course providers on course delivery. For example, for the 2008-10 cohort, Aviation Studies was delivered jointly by various parties. The Hong Kong University School of Professional and Continuing Education (HKU SPACE) prepared the teaching materials, and The Hong Kong Aircraft Engineering Company (HKAECO) provided a training course for teachers. The course, which included theory and practical learning, with visits and field work organized by the HKAECO, was mainly conducted in schools or course provider sites. According to the consultation conducted by the education authority in 2006 and 2009, there was a tendency for schools to choose course provider sites as their mode of delivery, perhaps due to administrative convenience and financial consideration. Furthermore, the Applied Learning courses differed from the Hong Kong Certificate of Education Examination (HKCEE) subjects in that examination skills were not stressed, and there were various forms of continuing assessment to suit the nature of the courses; for example, Aviation Studies students could carry out site visits. In addition, various kinds of assessment including written test, writing exercise, log book progress report, group presentation and workshop practice fulfilled continuing assessment aims.

Concerning accreditation, the pilot Applied Learning scheme was gradually recognised by tertiary institutions and employers, thus facilitating smoother transition to

Table 4 Classification of Areas of Learning of Pilot Applied Learning

Cohort	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10
Areas of Learning	Arts and Media			Media and Communication		
	Business			Business, Management and Law		
	Design			Creative Studies		
	Engineering			Engineering and Production		
	Food Production and Management					
	Information Technology					
	Services			Services		
		Leisure, Tourism and Hospitality				
		Performing Arts		Applied Science		
No of Areas of Learning	7	9		6		

Table 5 Modes of Applied Learning Courses in Schools

Mode 1	Courses take place at the venues of course providers and are taught by the staff of course providers.
Mode 2	Courses take place mainly in schools and are mainly taught by the staff of course providers.
Mode 3	Course providers make arrangements (e.g. provide teaching materials, questionnaires) to entrust other institutions, including schools, to conduct the courses on their behalf, but remain responsible for internal quality assurance of course delivery and assessment.

further studies and employment. As the assessment of the courses of Applied Learning differed from that of HKCEE level subjects, which depended on public examination, a quality assurance mechanism conducted by the Curriculum Development Institute (CDI) of the Education Bureau, the Hong Kong Examinations and Assessment Authority and the Hong Kong Council for Accreditation of Academic and Vocational Qualifications (HKCAAVQ) had been developed to secure accreditation for Applied Learning courses. It was expected that a quality-assured Applied Learning course should meet three requirements: First, the Applied Learning course should have been developed according to the curriculum aims; second, the curriculum should be delivered as planned; and third, the learning outcomes of students should meet the set standards (EDB, 2008). The Education Bureau stressed the advantages of Applied Learning for students, and the fact that quality-assured Applied Learning courses could gain one certificate from the Hong Kong Examinations and Assessment Authority and other certificates issued by course providers. All these certificates could help students to pursue further study and employment. In the press release of the Education Bureau entitled Wide recognition for Applied Learning pilot courses on July 25, 2008, it stated that the qualifications of Applied Learning courses were accepted by the Federation for Continuing Education in Tertiary Institutions and the Civil Service Bureau (CSB) for admission to Form 6 (grade 12) or tertiary education such as pre-associate degree and diploma courses offered by course providers, and for civil service appointments. The above discussion of the course content, course providers, modes of delivery, assessment, qualifications and accreditation of the pilot Applied Learning scheme shows that the SAR government intended to redefine the paradigm of secondary technical education and ensure that the curriculum was designed in such a way to make it appealing to parents, students, schools and the intended course providers. It can be said that Applied Learning is a career oriented curriculum which is designed to meet the needs of a variety of students including those who are not academically inclined. It is difficult to argue that the pilot scheme aimed at removing the colonial education legacy. The former Chief Curriculum Development Officer (Applied Learning), Howard Sou stressed that "in planning the curriculum of Applied Learning, we refer to overseas experiences such as reports of the OECD and UNESCO and our own needs. Applied Learning in any sense, is not technical education. Instead, it is a novel educational ideology to cater for students' needs by providing diversified learning opportunities" (H. Sou, personal communication, December 19, 2007). Applied Learning was a new paradigm of technical education and an integral part of the new senior secondary curriculum. However, it should be noted that notwithstanding the good

intention of the EDB in designing the Applied Learning curriculum, the number of candidates sat for the first Diploma of Secondary Education (DSE) Examination in 2012 was only 6.8% and in 2013, it was 6.5% (HKEAA, 2012, 2013). The unpopularity of Applied Learning reflects students do not find the career oriented nature of Applied Learning appealing. Nevertheless, Applied Learning has provided an alternative avenue for those less academically oriented students. In the long run, the EDB has to review the aims and structure of Applied Learning and its place in the school curriculum.

8 Conclusion

During the colonial period in Hong Kong, secondary technical education was first modelled on that of the British tripartite school system, was later modified in the 1960s, and finally, was reviewed before the Handover. All these developments show that during the colonial administration secondary technical education had already been on the reform agenda. After the Handover, the reform of secondary technical education initiated by the departing colonial government, together with socio-economic needs and society's concerns about the educational equality of technical education, provided the context within which the first SAR government operated. Therefore, the fundamental change in secondary technical education envisaged by the new government was basically a legacy of the colonial government rather than a reaction against and removal of the colonial legacy. We argue that it was for pragmatic reasons that Applied Learning was introduced. Socio-economic needs prompted the government to rectify the inadequacy of the traditional secondary technical education and as a result, the government had to redefine the paradigm of technical education and make it appealing to parents, students and schools alike. There is no evidence to suggest that the Education Bureau had to replace the traditional secondary technical education with Applied Learning merely for political reasons. In addition, it would be difficult to argue that the Education Bureau spent more than 10 years on redefining and refining the curriculum of Applied Learning before its implementation in 2009 as an integral part of the new senior secondary curriculum simply as a reaction against the colonial legacy. Therefore, we argue, the introduction of Applied Learning was at the same time a pragmatically oriented initiative and a continuation of the reforms in secondary technical education initiated before the Handover. Thus, the approach to educational reform in decolonised countries described by Morrisey (1990), Altbach (1992) and Bray (1997), whereby for the sake of removing the colonial legacy, decolonised states would reform the curricula to portray the emergent nations

and their rulers in a new light, has not been the approach in the case of Hong Kong's secondary technical education.

Rather, the pragmatic approach to educational reform has been the case in Hong Kong. We argue that in reforming secondary technical education, the new SAR government evaluated the existing curriculum in the light of Hong Kong's knowledge-based service centred and globalized economy and preferences of parents and students in order to determine the extent to which it needed to be reformed. In redefining the paradigm of secondary technical education, this study shows that the government referred to the recommendations made by international organisations and individual scholars, especially in the following aspects: First, an articulation between technical education and general education; second, a broad and diversified technical curriculum; and third, a broadening of the pathways to work and tertiary education. As a result, Applied Learning reflected a paradigm shift from specialisation to diversity in learning, course delivery, and curriculum framework design.

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      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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