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What Happens to the Attainment of Our Bottom 20% of Students at the End of Their nine-year Compulsory Education?

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A number of recommendations have been made by the Hong Kong Government in the last few years to provide additional resources for schools that take in the weakest 20% of secondary students. These policies implicitly imply that the group of students are having special educational needs as they need extra resources for fulfilling their needs in learning. This study is an attempt to investigate into the attainment level of some of the bottom 20% of students at the end of their 9-year compulsory education. A sample of 993 Secondary 3 students from 4 schools all located within the same urban district took part in the study to assess both their attainment level and their intellectual functioning. Over 95% of these students were coming from the bottom 20% group of students within the same district. They were all administered the Raven's Progressive Matrices Test for ascertaining their intellectual functioning in terms of their non-verbal reasoning ability. Each student also took the Hong Kong Attainment Tests on the 3 basic subjects of Chinese, English and mathematics. The tests are devised by the Education Research Unit of the Hong Kong Education Department and are standardised for local Primary 3 to Primary 5 pupils. On the test for looking at their non-verbal reasoning ability, over 60% of the students were at least within the average range of intellectual functioning when their scores were compared with other children of the same age in Hong Kong. Their results for the standardised attainment tests reflected that over 90% of the students in the schools were attaining at or below P.5 level across the two major subjects of Chinese and mathematics and more than 70% of the students were attaining at or below P.4 level in the subject of English. The findings indicated that majority of the students are backward in their attainment by 4-5 years. This reaffirmed the findings of the earlier pilot study (Yung, 1994) on another group of S.3 graduates (n = 435) in one of the sample schools a year before this main study. Findings of both studies indicated that majority of the students in the bottom 20% of secondary students should have average intellectual ability to cope with their schooling. Schools with large intake of students from this stratum of secondary students in Hong Kong might need to reconsider how they can modify their curriculum to meet the educational needs of these students in the light of these findings on their academic achievement after 9 years of compulsory education. The data also reflects the need for educators to review the efficacy of the 9 years compulsory education system especially around the years of Primary 3 and 4 when most of the students from the group seemed to have difficulty to move further by their attainment.

Background

Teachers teaching in secondary schools in Hong Kong with a large intake of students from the bottom or the poorest 20% of students under the Secondary School Places Allocation (SSPA) system often complain about the quality of the students that they have to teach. No teacher will ever dispute the fact that this is a hard-to-teach group. To put it in a more positive perspective, it is a rather challenging task for a teacher to teach in these schools. Many of these brave ones have continued to fight this uphill battle to support this group of students. One has to trace back to the SSPA procedures (Education Department, 1991; 1993a) for finding out how the group is being created by our education system. To simplify a rather complicated picture, primary 6 students in Hong Kong are grouped by the SSPA system into 5 different bands. These bands are grouped according to the ranking of the weighted scores of the students which is a product of their schools' internal assessment result and the schools' overall external assessment results based upon the Academic Aptitude Test (AAT) taken by all the students of the schools participating in the SSPA during primary 6. Band 1 will be the top band constituting the best 20% of students while Band 5 will be the bottom band constituting the worst

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20% of students. Students within the first band after randomisation will be the first group to be processed for allocation to secondary schools in the SSPA system. The obvious consequence of this banding system is that students with a relatively better academic performance in Band 1 will have a greater chance to be allocated to the schools at the top of their choices whereas the weaker students in the last band or Band 5 would be allocated to schools towards the bottom of their choice once the vacancies of the more popular schools are filled up by the students of the higher bandings. This group of students are better known to the public as "Band 5 Students" and the schools they are being allocated to are "Band 5 Schools". But by the official definition, there is no such school as "Band 5 School". A "Band 5 School" is thus only characterised by the proportion of students a school receives from the fifth band. It is a relative conception since the banding of students a school receives from the SSPA procedure is in principle, out of the control of the school and varies from year to year. So one can only differentiate secondary schools using banding as a criteria to indicate the rough banding or average banding from which the majority of students came within a school.

The Education Commission, had in their Report Number 4 (ECR4) addressed this problem and they estimated that the percentage of students needing special education provisions in Hong Kong amounted to about 14% of the student population (Education Commission, 1990). And the Report suggested that in order to meet the educational needs of this group of students, resources mainly in the form of additional teachers would be allocated to those schools with a major intake from the bottom 10% of the students. The Final Report of the Working Group on Support Services for Schools with Band 5 Students made further suggestions on how the Band 5 Students should be supported through curriculum changes within these schools (Education Department, 1993a). This whole group of bottom 20% students is given a new label "academically low achievers" or ALAs in this Report. Additional teacher resources based on the recommendation of ECR4 were allocated to support the bottom 10% of students in 1994 (Education Department, 1994a). One can realise from all these resources recommended that the group of students do have special educational needs as they need additional support for fulfilling these needs.

No matter what label one attaches to this group of students or schools, one very common character shared by these students is that they are described by their teachers to be very weak in learning, very hard to teach and very difficult to manage. And the labelling will obviously reinforce teachers' and other peoples' expectations (Hui & Yung, 1992; Lilly, 1992; Ysseldyke & Algozzine, 1995) of the students. And they are obviously not able to catch up with the planned curriculum. Some teachers even complain that the students are not able to write out the English alphabet in the proper sequence. This phenomenon attracted much media attention. The public just cannot believe or accept this to be true of our secondary students. Teachers teaching in these schools are at a loss as many of them are not too sure how they should teach or how they can adjust the curriculum for meeting the educational needs of this particular group of students. This feeling is usually reinforced further by the fact that most of the teachers in Hong Kong are still urged by their senior colleagues to keep up with the syllabus that is strongly geared towards public examination requirements. Not only the teachers feel quite helpless, their students also feel rather helpless (Au, 1995) due to the prolonged failure experience of the students. Nobody seems to be winning in this battle against the weak foundation of the students.

The intention of this study is mainly to answer the question just raised. It aims to give a rough profile of the levels of attainment of this often claimed to be difficult to teach group in Hong Kong. One of the basic assumptions of the study is that by ascertaining the actual level of attainment of the students using locally developed standardised tests, the findings should give an indication of the levels at which the students are attaining across the basic subjects of Chinese, English and Mathematics. The gap between the attainment levels and their present class level should show how much this group of students is falling behind their peers in the same class level in terms of their attainment. Such a profile should provide fundamental clues which teachers and policy makers should use to adjust their curriculum planning policies. This can ensure that the curriculum material presented to the students can be pitched at the level suitable for these students. Teaching and learning can tehn be a happier process to pursue and perhaps winners can be created out of the no-win situation.

Parallel with this profiling of attainment levels, the study also attempts to look at the intellectual functioning of the students in terms of their ability in logical reasoning. The findings can then indicate whether or not these students fall mainly in the below average ability range in their intellectual functioning which might be part of the reaasons for this particular group of students to be encountering difficulties in learning. The Raven's Progressive Matrices Tests (RPMT) will be used as one of the instruments in this study for ascertaining the intellectual functioning of the students sampled for the study. A more detailed discussion will be given later on why this instrument is used. The research data might also indicate whether there is any strong relationship between the attainment scores and intellectual ability. To sum up, the study attempted to answer several questions.

1. What might be the basic demographic characteristics of these students in terms of sex and age distribution?
2. Do "Band 5 Students" have an average or much lower intellectual ability which can be one of the major causes for their learning difficulties?
3 How far behind are the achievements of these students in terms of their attainment in the three basic subjects of Chinese, English and Mathematics?

Method

Sampling Procedure of the Study

The main study was conducted at the end of an academic year in June. Four schools in the Kwun Tong district with over 95% of their student intakes from the Band 5 population took part in the study. As the primary aim of the study was to look at the attainment of students at the end of 9 years of compulsory education, only Secondary 3 (S.3) students were included in the study. All the S.3 students in the sample schools took part in the study. A total of 993 students from the 4 schools completed the tests and questionnaire required for the study.

Table 1 shows the proportion of sample students against the estimated number of Band 5 students enrolled at S.3 level in Kwun Tong and all day schools in Hong Kong. The sample of students taken is estimated to constitute roughly 73.4% of all the S.3 Band 5 students in Kwun Tong. The sample has too been estimated to be constituting roughly 6.9% of the total of S.3 Band 5 students in Hong Kong. The sample should be sufficiently large enough to represent the Band 5 population in Kwun Tong. Moreover, as a result of the randomisation process of the SSPA procedure during the placement of students to secondary schools, students within a school net are randomly allocated to their secondary schools in a band. This random process would have ensured that the students allocated to a school would not be coming from a biased population say the bottom or the top 5% within the same banding. The sample can thus be considered as homogeneous across these schools when they were allocated to their secondary schools.

Table 1
Proportion of Sample Students Against Estimated Number of Band 5 Students Enrolled at S.3 Level in Kwun Tong and All Day Schools of Hong Kong (Education Department 1994)

	Kwun Tong	All Districts
Total Enrollment at S.3 Level	6762	80138
Estimated Bottom 20% of Students	1352	16028
Proportion of Sample (993) Against Estimated Population	73.4%	6.9%

Instruments and Test Design

The primary purpose of the study was to find out the attainment levels of the sample students. And that the findings of the pilot study (Yung, 1994) reflected that the students should have reached roughly P.3 to P.4 level by attainment across the 3 major subjects of Chinese, English and mathematics. Using this as the basis for the design of the main study, the Hong Kong Attainment Tests (Education Department, 1985a; 1985b; 1985c, 1988a, 1988b) devised and standardised by the Education Research Unit of the Education Department are used for looking at the attainment level of the students. Since the Hong Kong Attainment Tests (HKAT) are standardised for the Hong Kong student population, the standard scores obtained would indicate the attainment of students in relation to

the class level at which the test was set. The standardised scores would give an indication of the proportion of students being below, above or within the level of the test being taken.

Even though IQ tests are strongly criticised for its validity in measuring intelligence because of the possibilities of various bias effects in the process of assessment (Jensen, 1980), cultural free tests such as the RPMT are still very popular assessment instruments (Aiken, 1991; Anastasi, 1990; Flynn, 1987; Hui & Yung, 1992; Jensen, 1980; Sattler, 1988; Yung, 1995) for studying the intellectual ability of large groups of people. The RPMT has been standardised for the Hong Kong population (Education Department, 1986). After its standardisation, the RPMT has been used widely as a screening tool by the Special Education Section of the Education Department in Hong Kong for initial detection of school-aged children with learning difficulties. In this sense, the RPMT is still valued for its predictive function of the potential of learning of students in Hong Kong.

The RPMT was selected for the study mainly because of the fact that it is a non-verbal test where verbal and language elements have been reduced. This is rather important for looking at the intellectual ability of the Band 5 population. Verbally loaded intelligence test might put the group in a disadvantaged position. The RPMT should have minimised the language or verbal effect which can be a result of the learning at school influencing the general cognitive ability of the Band 5 students.

Testing Procedure

In order that all the tests could be taken seriously by the students, they were administered in the school halls of the sample schools after the term examinations in June. At the beginning of each testing session, the importance of the test results for showing how well some S.3 students in Hong Kong might have attained during the final month of 9 years compulsory education was stressed. These procedures should have ensured that the students would try their best to complete the tests given. The invigilation process indicated that most of the students took on board the message and completed the tests quite seriously.

Three levels of HKAT in Chinese and Mathematics with the exception of English were randomly assigned to the students during the testing sessions. This was to ensure the homogeneity of students taking each level of tests. Each student took the same level of tests in Chinese and Mathematics. This will provide a consistent profile of a student across the tests of the two subjects on one class level. As the pilot study indicated that most of the students' performance for the English test would cluster around the level of P.4, all the students took the same English test for P.4. Some of the students also took additional tests of other class levels in order that scores of a student on tests on the same subject between different levels can be correlated to see whether there is a positive correlation between them.

Table 2
Effective Sample Size of Students for Each Class Level and Subject of Tests Administered

Class Level(s) of Test	Subject Areas		
	Chinese	English	Mathematics
P3	158	—	159
P4	311	963	310
P5	336	—	334
P3/P4	77	—	74
P3/P5	80	—	80
P4/P5	2	—	—
Total	964	963	957

Table 2 shows the effective sample size of students for each class level and subject of the tests administered. Another questionnaire to look into the demographic factors of the students which might illuminate more about the causes of the learning difficulties of the students was administered to find out the non-academic aspects of their learning problems.

Demographic Data of the Sample

Sex Distribution

Table 3 shows the contrast between the distribution of the sample and the estimated total enrollment of S.3 students in Hong Kong (Education Department, 1994; 1995) by their sex. One can see that the sample constituted a higher proportion of male students than female students. The ratio of male to female students of the sample is roughly 3:2. While the proportion between male and female for the general S.3 population in Hong Kong in 1994 still maintained a rather balanced sex ratio of roughly 1:1.

Table 3
Comparison between the Distribution (%) of the Sample and the Estimated Total Enrollment of S.3 Students in Hong Kong by Sex

Sex	Number of Students in the Sample	Estimated total Enrollment in Secondary 3
Male	618 (62.2%)	40791 (50.9%)
Female	375 (37.8%)	39347 (49.1%)
Total	993 (100.0%)	80138 (100.0%)

Table 4
Distribution (%) of the Students by Sex Across the 4 Target Schools

Sex	School 1 (n=222)	School 2 (n=374)	School3 (n=186)	School 4 (n=211)	Overall (n=993)
Male	61.3% (136)	63.6% (238)	68.3% (127)	55.5% (117)	62.2% (618)
Female	38.7% (86)	36.4% (136)	31.7% (59)	44.5% (94)	37.8% (375)
Total	100.0% (222)	100.0% (374)	100.0% (186)	100.0% (211)	100.0% (993)

Table 4 shows the distribution of the students by sex across the 4 target schools. The ratio of male to female students across the 4 schools is rather consistent indicating a similar distribution of male and female students within these schools. Thus it can be concluded from the sample that there are predominantly more male "Band 5 Students" than their female counterparts as indicated by the consistently unbalanced distribution of the two sexes in the sample schools.

This finding is consistent with the pilot research findings (Yung, 1994) and other research findings (Smith, 1994; Westman, 1990) that learning difficulties if we define it broadly as an indication of failure to attain at the class level of which the student is attending would have higher incidence rate within the male population than the female population. The sample of band 5 students of this study clearly confirmed this disproportional occurrence of male students in the bottom 20% of students in Hong Kong. The findings thus indicated that there was a higher chance for male students to be in the bottom 20% or Band 5 students than for girls when they move up from primary school to secondary school. The causes for this greater proportion of male students at the lower attaining group deserve further investigation by researchers.

Age Distribution

Table 5 to 6 provide the distribution of the age of the students. Because of the strict control of the Primary One Allocation System (Education Department, 1993b), children in Hong Kong can only start primary schooling at or over the age of 5 years 9 months. Therefore the average age range for S.3 students if everything goes smoothly during the 9 years of compulsory education should theoretically be between 14 years 6 months and that of 15 years 6 months at the time of the testing. It follows that those students of 15 years 7 months or above should be overaged students. Table 5 shows the number of students for each of the age cohort of the sample. It can be concluded from Table 6 presenting the cumulative distribution of the students by age that 40.5% of the sample were overaged students.

Retention of Students in Their Earlier Form

One of the major reasons for this particular group of students to be mostly overaged can be explained by the fact that they might have

Table 5
Distribution (%) of the Students by Age

Age Range (Years Months)	Number of Students (n=973)	Percentage
Over 18	11	1.1%
17/7-18/0	13	1.3%
17/1-17/6	28	2.9%
16/7-17/0	59	6.1%
16/1-16/6	107	11.0%
15/7-16/0	176	18.1%
15/1-15/6	241	24.8%
14/7-15/0	287	29.5%
14/1-14/6	51	5.2%
Total	973	100.0%

Note. Average Age Range for S.3 Students 14/6-15/6

Table 6
Cumulative Distribution (%) of the Students by Age

Age Range (Years Months)	Number of Students (n=973)	Cumulative Percentage
Over 18	11	1.1%
17/7 or above	24	2.5%
17/1 or above	52	5.3%
16/7 or above	111	11.4%
16/1 or above	218	22.4%
15/7 or above	394	40.5%
15/1 or above	635	65.3%
14/7 or above	922	94.8%
14/1 or above	973	100.0%

Note. Average Age Range for S.3 Students 14/6-15/6

encountered some learning difficulties within the 9 years of compulsory education. The obvious consequence is that these students have repeated one or two years of their studies. Allowing students to repeat a level is still a claim amongst some of the local educators and parents for supporting the low attaining group. Table 7 provides the data concerning the proportion of students having reported that they had repeated certain class levels during their 9 years of compulsory education. Around 29.7% of the sample reported that they had at least repeated a class level during the 9 years of compulsory education.

Table 7
Proportion of Students Having Repeated One Particular Class Level

Class Level	Proportion of Students (n=945)*	
Primary 1	4.8%	
Primary 2	4.5%	
Primary 3	7.3%	
Primary 4	7.4%	
Primary 5	3.2%	
Primary 6	0.5%	
Secondary 1	1.9%	
Secondary 2	1.5%	
Secondary 3	5.1%	(Subtotal = 36.2%)
Never have been retained	67.5%	

* Percentages do not add up to 100 as some of the students had repeated twice during the 9 years of compulsory education. Absolute figures reflected 29.7% of the sample had repeated only once, 2.9% had repeated twice and 0.1% had repeated thrice during the 9 years of compulsory education.

About 2.9% of the students had indicated that they had even repeated twice during their 9 years of compulsory education. The findings in Table 7 indicated that primary 3 and 4 levels are the most difficult years for this group of students to jump through as the rate at which students repeat classes during those two years are the highest amongst the 9 years of compulsory education. The low retention rates at P.5 and P.6 are expected since most primary school principals would not normally allow students to repeat in the final two years of their study before secondary school allocation. But this is more of an administrative decision than of sound pedagogical reason. Table 7 also gives a very interesting practice of the policy for retention for these 'Band 5 Schools'. More students repeated S.3 than during S.1 and S.2 in the sample schools.

Table 8 provides a comparison between the proportion of repeaters of the sample and the actual population of repeaters in Hong Kong using the statistics obtained from the Enrollment Survey of Hong Kong for 1993 and 1994 (Education Department 1994b; 1995). To make the comparison more consistent, those students in the sample having repeated two or more times are excluded from the calculations to keep the repeaters confined to the same cohort of students. One can notice that there is a consistently higher proportion of repeaters amongst the sample with the exception of the year in P.6 than the actual population in primary education. However the

Table 8
Comparison between the Proportion (%) of Repeaters of Sample and Actual Population of Repeaters in Hong Kong (1986-1994) Source : Education Department, 1994, 1995 Enrolment Survey

	Year								
	1986	1987	1988	1989	1990	1991	1992	1993	1994
Class Level	P1	P2	P3	P4	P5	P6	S1	S2	S3
Sample	4.4	3.7	6.5	6.9	2.7	0.1	1.1	0.9	4.4
Actual Population	1.3	1.5	2.1	2.2	1.2	0.1	2.9	2.7	1.6

Note. Students having repeated twice or more are excluded from the calculation.

pattern is not the same during the secondary school years. The retention rates of the sample are lower than that of the general population for S.1 and S.2 but the rate for S.3 is much higher for the sample than the rest of their peers in Hong Kong. This might imply that school policy of the sample schools are quite strict towards allowing students to repeat in S.1 and S.2. And the policy for retention is more lenient in S.3. Further discussion of this observation with the principals of the schools indicated that this was the result of the official policy of an annual retention rate of 5% of students of a school. The sample schools prefer to use this quota on S.3 students rather than the students of the lower forms. Students with very strong motivation and potential to continue their studies in S.4 will be given the chance to repeat. Such retention policy might need further discussion and research evidence to justify its effectiveness for supporting the learning of students.

Perception of Students on Class Levels at which They Started to Find Learning Difficult

There is a question within the questionnaire administered enquiring the students about the class level at which they started finding learning to be difficult. Table 9 gives a summary of the perception of the students of the level they started to find learning being difficult to them. Many of the students found S.1 (21.2%) being a difficult period in their learning. Next on the list would be S.2 (17.9%) and the third on the list was P.5 (13.8%). The findings reflected that the majority of the students (48.6%) felt learning to be significantly difficult during the last three years of their compulsory education. Responses of the students to another question asking them to state the most difficult subject amongst the 8 common subjects they were taking indicated that English Language (31.3%), Mathematics (27.9%), Integrated Science or Sciences (15.8%) and History (11.5%) being their most difficult subjects. The three least difficult subjects were Chinese Language (0.7%), EPA (1.4%) and Geography (1.5%). These figures might provide information to the subject teachers of the sample schools about the varying degree of need for curriculum modification.

Table 9
Class Level at which Sample Students Started to Find Learning Difficult

Class Level	Proportion of Students (n=993)
Primary 1	4.9%
Primary 2	4.7%
Primary 3	7.4%
Primary 4	8.7%
Primary 5	13.8%
Primary 6	6.7%
Secondary 1	21.2%
Secondary 2	17.9%
Secondary 3	9.5%
Never find learning a problem	5.4%

Overall RPMT and HKAT Results

Table 10 gives a summary of the descriptive statistics of the standard scores obtained by the students on the RPMT and all the HKAT taken. All the mean standard scores of the sample were within the average range of the tests. One needs to look at the distribution of these scores to arrive at a rough picture of the proportion of students attaining at a particular level of performance on these tests. Table 11 to 17 provide the distribution of the standard scores for the tests given. Each of these distributions of the standard scores will be discussed.

Raven's Progressive Matrices Test Results

The mean score of 93.15 on the RPMT indicated that the overall performance of the sample on the test was well within the average range of the test. Table 11 gives the distribution of the standard scores of the RPMT using the classification system proposed by the Education Department during the standardisation of the test (Education Department, 1986). The figures indicated that there was a greater proportion of students falling within and above the average range than those below the average range.

Table 10
Summary Statistics for Raven's Progressive Matrices Test and All Attainment Tests Administered

Test	Mean	Std.Dev.	Variance	Minimum	Maximum	n
Raven's	93.15	12.48	155.80	65.00	135.00	710
HKAT Maths P.5	93.66	14.11	199.05	69.10	130.70	414
HKAT Chinese P.5	102.75	12.48	155.83	56.70	124.20	418
HKAT English P.4	103.17	16.42	269.77	70.78	140.18	963
HKAT Maths P.4	104.15	15.05	226.40	70.40	132.70	384
HKAT Chinese P.4	110.98	9.83	96.54	62.40	126.20	390
HKAT Maths P.3	112.46	13.09	171.40	76.00	135.80	313
HKAT Chinese P.3	114.80	12.45	155.01	69.15	134.63	315

Table 11
Distribution (%) of the Students by Their Non-Verbal Reasoning Ability on the Raven's Progressive Matrices Test

Non-verbal Reasoning Ability Classification	Equivalent Standard Score	Number of Students (n=710)	Percentage
Superior (at or above 95th Percentile)	Over 125	9	1.3%
Definitely Above Average (at or above 75th Percentile)	110-125	41	5.8%
Average (Above 25th and below 75th Percentile)	90-110	390	54.9%
Below Average (At or below 25th Percentile)	75-90	226	31.8%
Grossly Below Average (At or below 5th Percentile)	Below 75	44	6.2%
Total		710	100.0%

Table 12
Cumulative Distribution (%) of the Students by Their Non-Verbal Reasoning Ability on the Raven's Progressive Matrices Test

Non-verbal Reasoning Ability Classification	Equivalent Standard Score	Cumulated Number of Students (n=710)	Cumulative Percentage
"Superior"	Over 125	9	1.3%
"Definitely Above Average" or above	110 or above	50	7.0%
"Average" or above	90 or above	440	62.0%
"Below Average" or above	75 or above	666	93.8%
"Grossly Below Average" or above	"Below 75"	710	100.0%

Table 12 shows the cumulative distribution of the students by their scores on the RPMT. The figures indicated that 62% of the sample students are at least average in their non-verbal reasoning ability. If one accepts the assumption that the non-verbal reasoning ability of a student can be a predictor of a student's potential in learning, the findings will imply that over 60% of the students should have average potential to learn. And 1.3% of this proportion of students can even be said to be superior in their non-verbal reasoning ability and thus have very high potential in learning. This group of students, following one of the criteria for the identification of the gifted students in Hong Kong (Education Commission, 1990) might need further assessment by educational psychologists for finding out whether they can benefit from enrichment programmes designed for gifted students or not. However the reality is that these students were not attaining as well as they ought to be and was grouped within the bottom 20% of students in terms of their attainment. Clark (1992) described these as underachieving gifted students which can be a loss to the society at large because of their untapped potential.

On the other hand, there is still 38% of the sample population being below average in their non-verbal reasoning ability as indicated by their scores on the RPMT. And 6.2% of the students can be said to be grossly below average in their non-verbal reasoning ability. Again this 6.2% of students in principle needs further assessment by psychologists to ascertain whether they have more specific learning needs than the rest of the students. There was no indication from the sample schools that these two extreme student populations were given special attention as the teachers within these schools were not aware of the procedures for directing these students to receive the services the students deserve.

One needs to note that the actual effective sample size for the RPMT is only 710 out of the full sample of 993 students. The raw scores of 238 students could not be converted to their standard scores because of the fact that the age range for which the RPMT was being standardised was from 5 Years 6 Months to 15 Years 11 Months. Therefore the standard scores for students over the age of 15 Years 11 Months were not available. A strong evidence provided by the results of RPMT is that the sample being looked at contains a large proportion of students with average potential to learn and a lot of these potentials are not fully developed as reflected by their attainment results which will be discussed in the later sections.

Hong Kong Attainment Tests (HKAT) Results

Interpretation

Using the estimation put forth in the Education Commission No. 4 (Eduction Commission, 1990) that 14% of our student population is having special educational needs, the proportion of students falling into the lower 14% region on a standardised attainment test i.e., students not catching up with the expected achievement would be students needing additional support. If standard scores are used as a criterion to indicate the range within which this 14% of students should fall, the cutting score will roughly be at 1 standard deviation below the mean standard score of 100. Hence a standard score of 85 will be taken as the lower range for which students are considered as being able to attain at or above one particular level of test. That is, the students with standard scores lower than 85 on a test would be considered as not being able to attain the level at which the test is set and those scoring higher than 85 should be attaining at or higher than that level of test. Conversely, the upper range of 1 standard deviation above the mean or standard score of 115 will be set as the upper range for students to be considered as being able to attain a certain level of test. Those above the score of 115 might be attaining at class levels above the level of test being taken. Although this is a rather crude way of looking at the tests results, the proportion of cases falling below and within the range does provide an indication of how good or poor the students are performing on one particular level of the test for a subject.

Descriptive Statistics of HKAT

The descriptive statistics of Table 10 provides a general idea of how well the students performed on the seven HKATs administered to them. The mean scores of the students indicated that they all fall within the average range of the tests being administered. Performance of the students on each subject will be given individual discussion.

Attainment in Chinese

It can be seen from the descriptive statistics of Table 10 that there was a steady decrease of the mean scores of the Chinese tests of the students from 114.8 to 102.75 as the level of the test

increased from P.3 to P.5. The figures indicated that P.5 would roughly be the level at which the students were performing in Chinese since the average score 102.75 obtained by the students was quite close to the mean score of 100. But a closer look at the variance of the scores indicated that the variation between the students for P.3 and P.5 were quite large as compared with that of the P.4 test suggesting larger discrepancies between the scores of the students at P.3 and P.5 level.

Table 13 reflects that about 4% of the students were not performing up to P.3 level when the standard score of 85 was being used as the criterion for below average performance. And only 35% of the students can be considered as attaining at P.3 level in Chinese. The remaining 61% should have attainment in Chinese higher than P.3 level. The distribution of the scores for the P.4 and P.5 tests confirmed the earlier observation that most of the students were attaining at P.4 (57.7%) and P.5 (76.6%) level. And those students attaining at higher than P.5 level only constituted 13.9% of the sample of students. Table 14 gave the Pearson's r correlation coefficient of the attainment tests scores of the students who had taken both the P.3 / P.4 Chinese HKAT (r=0.76) and P.3 / P.5 Chinese HKAT (r=0.85) at the same time. The coefficients indicated strong positive relationships between the different levels of tests on the Chinese subject. This further reaffirms the fact that the tests are good predictors of the scores for the other tests. Thus it can be concluded from the distribution of the scores that the majority of the group are attaining at P.4 to P.5 level on the subject of Chinese.

Table 13
Distribution (%) of Attainment Tests Scores of Students in Chinese

Range of Standard Score	Class Level P.3	(n=315)	P.4	(n=390)	P.5	(n=418)
Above 115	61.0%	(192)	40.0%	(156)	13.9%	(58)
85-115	35.2%	(111)	57.7%	(225)	76.6%	(320)
Below 85	3.8%	(12)	2.3%	(9)	9.6%	(40)
Total	100.0%	(315)	100.0%	(390)	100.0%	(418)

Table 14
Pearson's r Correlation Coefficient of the Attainment Tests Scores Between P3/P4, P3/P5 Levels for Chinese and Mathematics

Class Levels	Chinese	Mathematics
P.3 / P.4	0.76 (n=77)	0.83 (n=74)
P.3 / P.5	0.85 (n=80)	0.77 (n=80)

Table 15
Distribution (%) of Attainment Tests Scores of Students in Mathematics

Range of Standard Score	Class Level P.3	(n=313)	P.4	(n=384)	P.5	(n=414)
Above 115	50.8%	(159)	29.4%	(113)	6.5%	(27)
85-115	46.0%	(144)	57.6%	(221)	62.1%	(257)
Below 85	3.2%	(10)	13.0%	(50)	31.4%	(130)
Total 100.0%	(313)	100.0%	(384)	100.0%	(414)	

Attainment in Mathematics

Table 15 shows the distribution of the scores of the students in mathematics. Similarly, the majority of the sample of students can be considered as attaining at P.4 to P.5 level on the subject of mathematics. However the pattern of the distribution of the mean score for the mathematics subject in Table 10 indicates that the scores obtained on the whole across the 3 levels are weaker than those of the Chinese subject. Again there was a steady decrease of the mean scores of the Mathematics tests from 112.46 to 93.66 as the level of the tests increased from P.3 to P.5. And P.5 seemed to be the level at which the majority of the students are performing in mathematics. Table 15 reflects that about 3.2% of the students are not performing up to P.3 level in mathematics if the standard score of 85 is being used as the criterion for indicating below average performance. And only 46% of the students can be considered as attaining at P.3 level in mathematics. The distribution of the scores in both the P.4 and P.5 tests confirmed the earlier observation that most of the students are attaining at P.4 (57.6%) and P.5 (62.1%) level. And those students attaining at higher than P.5 level only constituted 6.5% of the sample of students. Table 14 provides the Pearson's r correlation coefficient of the attainment tests scores of the students who had taken both the P.3 / P.4 (r=0.83) and P.3 / P.5 (r=0.77) level mathematics tests at the same time. The coefficients indicated again strong positive relationships between the different levels of tests in mathematics. Thus a general conclusion can be made concerning the attainment of the student sample that the majority of the group are attaining between P.4 and P.5 level in mathematics.

Table 16
Distribution (%) of P.4 Level English Attainment Tests Scores

Range of Standard Score	English (n=963)
Above 115	28.0% (270)
85-115	53.8% (518)
Below 85	18.2% (175)
Total	100.0% (963)

Attainment of the Sample on the Subject of English

All the students in the study took the English test for P.4 level. The findings of Table 16 shows that the majority of the students (53.8%) are attaining at P.4 level in English. About 18.2% of the sample are below P.4 level and 28% of the students are above P.4 level in their English attainment. Thus it can be concluded that the majority of this group of students should be attaining at P.4 level in English.

General Conclusions from the Attainment Results

Thus the pattern of distribution of the attainment test scores of the sample indicated that the majority of the students were attaining between P.4 and P.5 level in the three basic subjects of Chinese, English and Mathematics. The pattern of the scores suggested that the students were better on the subject of Chinese and comparatively slightly worse on the subjects of mathematics than English.

Correlational Study of the Scores of the RPMT and the HKAT

Tables 17, 18 and 19 give the correlation matrices of the standard scores of the RPMT, Chinese, English and mathematics tests for P.3, P.4 and P.5 levels of HKAT respectively. The assumption that there is a generally stronger correlation between HKAT in mathematics and the RPMT (P.3 r=0.5312, P.4 r=0.4400, P.5 r=0.4607) but weaker relationship between the HKAT in the two language subjects (Range of r from 0.1601 to 0.2436) is confirmed. This reaffirms the fact that the RPMT is a test more related with numerical conceptions i.e., logical reasoning than that of a test on the use of language. It must be noted that all these correlational values are significant at 0.01 level implying that there is a positive relationship between the non-verbal reasoning ability of a student with the scores they obtained across the various levels of HKAT. It should also be noted that the relationship between the two language subjects (r=0.4620) is also quite strong.

Table 17
Correlation Matrix for Standard Scores of Raven's Progressive Matrices Test, Chinese and Mathematics for S.3 Students on Tests of P.3 Level

	Ravens	Chinese	Mathematics
Ravens	1.000	0.2436**	0.5312**
Chinese		1.000	0.5178**
Mathematics			1.000

* $p < 0.05$ ** $p < 0.01$, 2-tailed

Table 18
Correlation Matrix for Standard Scores of Raven's, Chinese, English and Mathematics for S.3 Students on Tests of P.4 Level

	Ravens	Chinese	English	Mathematics
Ravens	1.000	0.2261**	0.1613**	0.4400**
Chinese		1.000	0.4620**	0.4126**
English			1.000	0.4514**
Mathematics				1.000

* $p < 0.05$ ** $p < 0.01$, 2-tailed

Table 19
Correlation Matrix for Standard Scores of Raven's, Chinese and Mathematics for S.3 Students on Tests of P.5 Level

	Ravens	Chinese	Mathematics
Ravens	1.000	0.1601**	0.4607**
Chinese		1.000	0.4041**
Mathematics			1.000

* $p < 0.05$ ** $p < 0.01$, 2-tailed

Discussion

The study is an exploratory one for profiling some of the basic characteristics of the bottom 20% of students at the end of their 9 years of compulsory education. The demographic data of the students revealed that there is an unbalanced sex ratio in the sample of students. The findings confirmed other research findings of an overall predominance of male students with low academic achievement in the bottom 20% of student population in Hong Kong. It would be worthwhile to find out what might be the causes of this gender inclination amongst the low achieving students in Hong Kong and how this might affect the overall academic and career development of students between the two sexes in the long run.

The phenomenon of a rather large proportion of overaged students in the sample also suggested that some of the students in Band 5 were having early obstacles within the 9 years of compulsory education. The retention rate of an education system is sometimes used as a measure to indicate the effectiveness of the system. The study findings supported the discussion raised by Crawford (1990) that such practices do exist in Hong Kong and that 36.2% of the sample students had repeated at least a year of their study during their 9 years of compulsory eduction. The pattern of offering such support during the 9 years of compulsory education as reflected by the official figures (Education Department, 1994b) is relatively lower than the sample ranging from 0.1% to 2.9% (Table 8). Whether the policy of retention is an effective measure of support for low achievers remains an issue to be resolved by later research. But the findings do suggest that the bottom 20% of students tended to have a higher clustering of students being offered the chance of retention.

The findings concerning the intellectual ability of the students confirmed the hypothesis that the group of students did not come particularly from the extreme lower end group with below average intellectual ability. The majority of the students have average or even above average potential to learn. This poses a challenging question to one of the major aims of our education system that claims to "develop the potential of every individual child" (Education Commission, 1993). So what made the students with good intellectual potential fail to make progress within the system where resources (Education Commission, 1990; Education Department, 1987; 1990; 1993; 1994a) are claimed to be adequately supporting? Again this remains another research agenda for evaluating how far the resources provided have achieved the purposes that they have been planned for.

The most important finding of the study is the fact that the attainment level achieved by the students were roughly at P.4 to P.5 level in the three basic subjects of Chinese language, English language and mathematics. These findings would not be a surprise at all to some of our teachers facing this bottom 20% of students every school

day. The fact that a large proportion of students in the sample is found to be 4 to 5 grade levels behind their counterparts in the education system might not be too pleasing to the consumers and planners of our educational resources. The consumers would include both the students and their parents. What might be the reaction of the parents of these students if the findings were made known to them? To the policy makers, there is a lesson to be learnt here regarding how the quality of our education system in Hong Kong should be kept in terms of the results obtained by the study. There is obviously a need to locate the causes to the rather disappointing outcome of our students of spending 9 years in schools and then only being able to achieve 4 to 5 years of their learning within this educational process. Pedagogical consideration of how the teachers should react to such a profile of students should be discussed across the different subject specialists to determine the more immediate support that can be given to this group of students. Such considerations might include how the existing curriculum which is obviously not catering for the needs of this group of students, as suggested by Booth and others (1992) should be modified to suit their needs. The conceptual framework introduced in the Final Report of the Working Group on Support Services for Schools with Band 5 Students (Education Department, 1993a) on the notion of having a core curriculum as a means to outline the more essential areas in a subject for learning might be one of the more immediate and practical solutions to tackle the learning difficulties of these students. However, how these core areas should be or can be defined remains a debate amongst the subject specialists. The Curriculum Development Institute (CDI) has already launched their pilot project to work on the school-based curriculum to be developed in schools with a large intake of Band 5 Students. Resources for the School-based Remedial Support Programme for schools with a high intake of the bottom 10% of students in terms of additional teachers and training of these teachers had been allocated to these schools by the Education Department (Education Department, 1994a). Again how the curriculum gap can be bridged (Solity & Bull, 1987) and the correct attitude towards curriculum planning (Morris,1995) remains something to be resolved. The evaluation of these two new support services to the students already in place in the secondary setting remains to be seen to determine how effective these services can improve the situation. The findings of this study should provide empirical evidence for the planning of these projects.

Although the correlational analysis (Table 14) indicated high correlation between the test scores of the tests on the same subject between different class levels, how all the students might perform across the whole range of class levels of tests being administered is not available. This limitation of the research design is to reduce the danger of over-assessing the subjects. Such a full profile if available will provide the evidence of the shift of the standard of each student across the range of tests used. This drawback of the study boils down to the empirical argument of the application and limitations of norm-referenced tests which is not the aim of this particular study. The study only attempts to provide data on the performance of the students relative to the norm-referenced group upon which the standard scores were being based.

One of the obvious by-products of the study after the assessment exercise was the enhancement of the awareness of the teachers within the sample schools in understanding and giving support to this group of students by formulating appropriate school policies to develop the curriculum across the basic subject areas. A rather strong message coming out from the contact with the sample schools after the project was the need to make good use of assessment tools in diagnosing the strengths and weaknesses of the students which reaffirms some of the basic principles (Dockrell & McShane, 1993; Linn & Gronlund, 1995) for assessing students with special needs or moderate learning difficulties and getting correct interpretations from the results. Teachers working in these schools were making rather strong urge for further professional development on this issue of assessment.

Looking into the Future

The findings have definite implications for how curriculum and support services should be planned for this particular group of students. Several of these implications need to be discussed.

1. There needs to be a major review in linking the existing curriculum for secondary students with the primary curriculum to determine how the former can be modified so that underachieving secondary students are

taught with material pitched at their current level of achievement.

2. The planned services for "Band 5 Students" are rather "remedial" in nature. A more preventive or proactive approach has always been considered to be a more effective means for dealing with learning difficulties. A stitch in time saves nine. As the on set of the learning difficulties of these students seems to be around P.3 and P.4, what went wrong or how the students were given support in their primary schools during these 2 seemingly critical years needs further exploration. The existing mechanisms for identifying students with learning difficulties which are targeted mainly at P.1 and P.2 level needs to be refined. This refinement can assist teachers beyond P.1 and P.2 class levels to be more sensitive to the procedure of identification and to seek more professional support where necessary. There is a need to review this policy of identification to encourage schools to extend the identification procedures to higher class levels to ensure that students encountering difficulties in class levels other than P.1 and P.2 can receive the necessary attention and support to overcome their obstacles in learning. Obviously there is a need to look further into the relationship between the causes for the high retention rate at P.3 and P.4 level for this particular group of students to verify the hypothesis that students might encounter more difficulties at these two class levels than others. There is also a need to look at whether retention policies are effective means of support for the students.
3. As the current study only sampled schools from Kwun Tong, there is a need to look further into the learning difficulties of students in other districts to obtain a more comprehensive picture of the overall difficulties faced by the bottom 20% of students in secondary schools across Hong Kong. There is a need too to look at the hypothesis that the attainment of those bottom 20% students in the rural areas might be lower than those in the urban districts. It might too be necessary to find out the proportion of students in the higher bandings e.g. Band 4 that might need similar support services in the long run to ensure that all students with significant learning difficulties will be given appropriate support.
4. The hypothesis of whether this group of students might come from the same cluster of primary schools and how these schools can be given support to overcome these learning difficulties as early as possible needs to be looked at. There is definitely an urge here to find out what has taken place in the primary schools of these "Band 5 Students" to make them become what they are.

For the sake of the learning outcome of our future generations, let us orchestrate well all these efforts to give children with learning difficulties in Hong Kong the necessary support to develop their potential in learning so that we are not faced with a large educational budget but very inefficient educational outcome in the end.

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