

Research Report

**The International Baccalaureate (IB) Middle Years Programme (MYP):
Comparing IB Diploma Programme outcomes of students who complete the
MYP and other middle years courses of study**

by



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Executive Summary

The International Baccalaureate (IB) is a non-profit education foundation founded in 1968. IB currently works with more than 4000 schools in 147 countries to offer four programmes. The IB Middle Years Programme (MYP) is offered to students aged 11 to 16 years. The programme comprises eight subject groups and utilizes inquiry-based approaches to facilitate learning within and across subject areas. The IB Diploma Programme (DP) offers courses from six subject groups in Language Acquisition, Studies in Language and Literature, Individuals and Societies, Mathematics, Sciences, and The Arts. In addition, students complete three core elements—the Extended Essay (EE), Theory of Knowledge (TOK), and Creativity, Action, Service (CAS).

The Australian Council for Educational Research (ACER) was commissioned by the International Baccalaureate Organization (IBO) to conduct research to better understand the impact and influence of MYP on student outcomes in the DP for students studying in China, Hong Kong, India, Indonesia and Japan.

The study addressed four research questions:

1. To what extent do the final DP scores achieved by students differ between groups who complete their middle years studies in i) the MYP, ii) a state or national curriculum, or iii) other international programmes?
2. How do students who complete their middle years studies in i) the MYP, ii) a state or national curriculum, or iii) other international programme, perform in the DP core requirements: Theory of Knowledge and Extended Essay?
3. What do DP students who complete their middle years studies in i) the MYP, ii) a state or national curriculum, or iii) other international programme, identify as:
 - a. Features of their middle years studies that contribute positively to their DP studies?
 - b. Features of their middle years studies that were less helpful in their DP studies?
4. What are the thoughts and perceptions of DP teachers regarding the contribution of different types of middle year programmes to student performance in the DP?

Research Methodology

A mixed-methods approach was used which involved the systematic collection and analysis of qualitative and quantitative data from second-year DP students and from DP teachers. Quantitative and qualitative data included:

1. DP subject and overall scores,
2. Grades in 'Theory of Knowledge' and 'Extended Essay',
3. Student surveys,
4. Teacher interviews, and
5. Focus group discussions with students and teachers.

The data for this study was collected in two stages. First, a survey was administered to second-year full DP students to understand their experiences in and perceptions of the middle years of education. The students that participated in the study are from 22 schools in five different countries – China, India, Indonesia, Hong Kong and Japan. Survey data was collected from 548 students, and DP and subject scores were obtained from 523 students. Of these 523 students, 408 had participated in the MYP, whereas the other 115 students had participated in another type of middle year programme (state, national or other international programme) (referred to as ‘non-MYP’ hereafter).

In the second stage, interviews and focus group discussions were conducted to further explore the patterns that emerged from student survey responses. Of the students who had completed the survey, 24 students were selected from two schools in Indonesia and one school in India for focus group discussions. A majority of these students (75%) had an IB MYP background, reflecting the makeup of the larger survey cohort. Ten teachers from these schools were also interviewed.

Students’ DP final examination scores were collected to analyse the performance in all subject groups and compare achievement between the MYP cohort and the non-MYP cohort. For comparisons of the two groups’ performances, both the statistical significance of the t-test and effect size of the difference were reported.

Research Findings

1. To what extent do the final DP scores achieved by students differ between groups who complete their middle years studies in i) the MYP, ii) a state or national curriculum, or iii) other international programmes?

Students who completed the MYP were found to perform better in their final DP scores than students who participated in a state or national curriculum or other international middle years programme. Six different subject groups (Studies in Language and Literature, Language Acquisition, Individuals & Societies, Sciences, Mathematics and The Arts) contribute to students’ DP scores. Student performance in Studies in Language and Literature, Language Acquisition, Individuals & Societies, and Mathematics was found to be higher for students participating in the MYP in comparison to non-MYP students.

It must be noted that schools and students in the study came from a wide range of contexts. Moreover, the sample size of non-MYP students included in this study is small. Therefore, the difference in performance is not necessarily attributable to the MYP. Further research with a greater sample of students is needed to explore the reasons behind these differences.

2. How do students who complete their middle years studies in i) the MYP, ii) a state or national curriculum, or iii) other international programme, perform in the DP core requirements: Theory of Knowledge and Extended Essay?

Theory of Knowledge (TOK) and Extended Essay (EE) are two core components of the DP. Students who completed each component were awarded a grade ranging from A to E. A difference between middle years program types was found in the distribution of the grades for Theory of Knowledge. Students who participated in the IB MYP were more likely to receive an A or B grade than students from ‘other’ programs. However, no difference for program type was found in the distribution of

grades for the Extended Essay. It is important to note that any difference in grades is not necessarily attributable to MYP and could have resulted from school level differences.

3. What do DP students who complete their middle years studies in i) the MYP, ii) a state or national curriculum, or iii) other international programme, identify as features of their middle years studies that contribute positively and features that were less helpful in their DP studies?

Features of middle years studies that contribute positively to DP studies

Survey data and information gathered from focus groups were used to identify features of middle years studies that were helpful and those that were less helpful in preparing students for their DP studies. Generally, students who had undertaken the MYP felt that they had developed good critical thinking skills and the ability to analyse and evaluate (higher order thinking skills). MYP students also reported engaging in higher order thinking skills more frequently in their middle years. By contrast, some students from other programs were of the view that the curricula of their middle year studies had little focus on higher order thinking skills. This likely reflects the fact that the MYP framework encourages students to become creative, critical and reflective thinkers.

MYP students also felt they had received useful practice in essay and report writing. English writing skills developed during the MYP were indicated in particular as contributing positively to DP studies, more so than for non-MYP students. They also felt that they had benefited in terms of personal and cognitive development, including being able to undertake reflection, to work with peers, and in meta-cognition (or 'learning how to learn').

Interestingly, during focus group discussions, non-MYP students felt that the focus on exams in their middle years studies had developed their ability to summarise and memorise content, and that they had developed study skills which prepared them well for test taking in the DP. They also felt that their studies had gone into greater depth in terms of subject matter, which again prepared them for the depth of studies undertaken in the DP.

Features of middle years studies that were less helpful in DP studies

In contrast to non-MYP students, MYP students, particularly in science and maths, commented on the lack of focus on content knowledge in their middle years, which had made the transition to the DP difficult. These students also felt that there needed to be a better "bridge" between the MYP and the DP, particularly in terms of preparing them for increased academic expectations and workload.

Further, some felt that the MYP needed more academic rigour and depth, rather than focusing on covering a large number of subjects (breadth). Many students felt underprepared for exam-taking in terms of study skills and question answering techniques, and also felt that the grading systems were inconsistent between MYP and the DP.

Non-MYP students also felt there needed to be a bridge to the DP, particularly to develop their analytical and evaluative skills, which were not generally focused on in non-MYP curricula. They found the Extended Essay and Theory of Knowledge challenging as a result. Students from non-MYP backgrounds felt they had been "passive" learners in their middle years due to a focus on academic theory and rote learning, whereas the DP expected much more active learning and critical thinking. They also felt that in some cases their literacy and English language skills were not well-developed. A possible explanation for these differences may be that nearly 15 per cent of students from other

programmes had a local language as the medium of instruction, and therefore writing projects and lab reports in English was challenging for them.

Ultimately, all students found the DP challenging in terms of workload and high academic expectations. There was a general consensus that better preparation in the middle years – particularly in regards to clarifying expectations in DP– would be useful.

4. What are the thoughts and perceptions of DP teachers regarding the contribution of different types of middle year programmes to student performance in the DP?

Much like the students themselves, the teachers generally agreed that the MYP students had developed critical thinking and analytical skills which could be transferred to the DP. They also cited MYP students' report and essay writing skills as beneficial. However, they felt these students were not always equipped with adequate content knowledge, and were not prepared for the focus on exam-based assessment in the DP. Many teachers felt that MYP students experienced an initial drop in achievement because of these factors.

There was also broad agreement that non-MYP students had good content knowledge and were adept at taking exams. However, many teachers felt that non-MYP students lacked the analytical and critical thinking skills that are required for the DP (including Theory of Knowledge), particularly those from national curricula backgrounds – the IGCSE was thought to prepare students better than other non-MYP programmes.

Further, the teachers were of the view that the assessment processes need to be reviewed, as having no external assessments in MYP impacts on the preparedness of the students to face more rigorous assessment in the DP. With this in mind, teachers expressed a positive view of proposed assessment changes to the MYP that will occur in 2015 and 2016.

1. Introduction

The International Baccalaureate (IB) is a non-profit education foundation founded in 1968. IB currently works with more than 4000 schools in 147 countries to offer four programmes. The IB Middle Years Programme (MYP) is offered to students aged 11 to 16 years. The programme comprises eight subject groups and utilizes inquiry-based approaches to facilitate learning within and across subject areas. It provides a framework of learning which encourages students to become creative, critical and reflective thinkers.

The IB Diploma Programme (DP) aims to prepare students for success at university and life beyond. IB DP students study courses from six subject groups that together provide a breadth and depth of experience and understanding in Language Acquisition, Studies in Language and Literature, Individuals and Societies, Mathematics, Sciences, and The Arts. In addition, students complete three core elements—the Extended Essay (EE), Theory of Knowledge (TOK), and Creativity, Action, Service (CAS), which encourages independent research, critical thinking and engagement in arts and creativity. Students who enrol in the DP include those who have progressed from the MYP, but also students who have undertaken their middle year's studies in state, national and other international programmes (referred as 'non-MYP students' in this report).

Over the past decade, IB programs across the world have grown substantially. Current projections predict there will be 10,000 authorized schools and 2 million IB students by 2020. To support the growth and development of the organization's programs, the IB Research Department commissions studies to identify the impact and value of an IB education. The current project was commissioned under this agenda.

The Australian Council for Educational Research (ACER) was commissioned by IB to conduct a research study to better understand the impact and influence of MYP on student outcomes in the IBDP for students studying in China, Hong Kong, India, Indonesia and Japan. ACER sought to compare and contrast IBDP outcomes achieved by students who complete their middle year studies in: (i) the IB MYP, (ii) a state or national curriculum; or (iii) another international programme by examining the total DP scores, and results in the core requirements EE and TOK. The study also compared the thoughts and perspectives of IB students and teachers regarding the extent to which, and ways in which, completing the MYP contributes to student performance in the IBDP.

The study addressed four research questions:

1. To what extent do the final DP scores achieved by students differ between groups who complete their middle years studies in i) the MYP, ii) a state or national curriculum, or iii) other international programmes?
2. How do students who complete their middle years studies in i) the MYP, ii) a state or national curriculum, or iii) other international programme, perform in the DP core requirements: Theory of Knowledge and Extended Essay?
3. What do DP students who complete their middle years studies in i) the MYP, ii) a state or national curriculum, or iii) other international programme, identify as:

- a. Features of their middle years studies that contribute positively to their DP studies?
 - b. Features of their middle years studies that were less helpful in their DP studies?
4. What are the thoughts and perceptions of DP teachers regarding the contribution of different types of middle year programmes to student performance in the DP?

The report includes a description of the design and methodology, and an analysis of the data. The *Research Findings* section is structured around the research questions and analyses the qualitative and quantitative data obtained from second-year DP students and from DP teachers, including:

1. DP subject and overall scores,
2. Grades in 'Theory of Knowledge' and 'Extended Essay',
3. Student surveys,
4. Teacher interviews, and
5. Focus group discussions with students and teachers.

All data collection tools are listed in the annexure to the report.

2. Research Design and Methodology

2.1. Research design

A mixed-methods approach was used which involved the systematic collection and analysis of qualitative and quantitative data. Table 1 below presents the research questions this study sought to address along with associated data sources and analysis procedures.

Table 1: Research design: Questions, measures and analyses

Research Question	Measure/analyses	Source
<p>1. To what extent do the final Diploma scores achieved by IB Diploma Programme students differ for groups who complete their middle years studies in i) the IB Middle years programme, ii) a state or national curriculum, or iii) other international programmes?</p> <ul style="list-style-type: none"> - Which types of middle year's programmes are associated with highest and lowest DP results? 	<ul style="list-style-type: none"> - Overall diploma scores (6 to 45) - Subject scores (1 to 7) - Comparison of mean overall diploma scores and subject scores using t-tests - Measure of practical significance: effect size 	IB
<p>2. How do students who complete their middle years studies in i) the IB MYP, ii) a state or national curriculum, or iii) other international programme, perform in the DP core requirements: Theory of Knowledge (TOK) and Extended Essay (EE)?</p>	<ul style="list-style-type: none"> - Theory Of Knowledge (TOK) grades (A to E) - Extended Essay (EE) grades (A to E) - Comparison of TOK and EE percentage distribution and Mann-Whitney U significance test approach - Comparison between higher (A,B) and lower grade distribution using logistic regression 	IB
<p>3. Research Question: What do DP students who complete their middle years studies in the IB MYP and other programmes identify as:</p> <ul style="list-style-type: none"> - Features of their middle years studies that contribute positively to their IB Diploma studies - Aspects of their middle years studies that were less helpful in their IB Diploma studies 	<ul style="list-style-type: none"> - Content analyses of themes based on student responses to open-ended survey questions; and semi-structured interviews or focus groups discussions with a sample of IB DP students from diverse middle years education backgrounds. - Percentages of students that respond to close-ended survey questions - Pearson product moment correlation 	<p>Students' responses to survey questions</p> <p>Student interviews/ focus group discussions</p>

4. What are the thoughts and perceptions of IB DP teachers regarding the contribution of different types of middle years programmes to student performance in the IB Diploma?	- Analyses of interviews with a sample of IB DP and/or some MYP teachers.	Interviews with teachers
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2.2. Methodology

The study was conducted in five countries: China, Hong Kong, India, Indonesia and Japan.

The data for this study was collected in two stages. First, a survey was administered to second-year DP students to understand their experiences and perceptions in and of the middle years of education. The proportion of students that responded to the different questions was examined, and an analysis of responses to open-ended questions regarding aspects of their middle year programs that were helpful and less helpful in preparation for their diploma programme studies was conducted. In the second stage, interviews/focus groups discussions were conducted to further explore the patterns that emerged from student survey responses. Students' IB DP final examination scores were collected to analyse the performance in all core subjects and compare achievement between MYP and non-MYP cohorts.

For comparisons of the two groups' performances, both the statistical significance of the t-test, effect size of the difference and Mann-Whitney U test were reported. Statistical significance tests indicate whether there is a difference between groups and that it is not due to chance. In this study **P-value** below 0.05 reportedly indicates statistical significance while a higher P-value is to be interpreted as having no statistical significance.

The **effect size** indicates the magnitude of the difference between IB MYP students and the non-IB MYP students. A large value of effect size signifies that it is likely that the IB MYP cohort and the non-IB MYP cohort are performing very differently. The effect size value is categorised as:

- < 0.1 negligible difference
- 0.1 < 0.2 small difference
- >0.2 < 0.4 medium; and
- 0.4 large difference in means

Pearson's Correlation is used to measure the strength of association between two variables (in the report this was the association between the extent in which students felt their middle years schooling helped in their studies and their actual performance). The strength of correlation is categorised in this report as:

- < 0.29 small
- > 0.3 < 0.69 medium; and
- > 0.7 large

2.2.1. Research Instruments

ACER developed three instruments for use in this study – a Student survey, Student interview/focus group questions, and Teacher interview questions.

a) Student survey

Existing curricular documents for the MYP, DP and other boards of education were analysed to understand the differences between the various approaches to education. This led to the development of items for the student survey which collected data on:

- student demographics;
- middle years programme previously undertaken;
- perceived usefulness of features of middle years studies in DP; and
- perceived level of emphasis on various pedagogical aspects (e.g., level of interaction in classroom, examinations and assignments, teacher feedback) in the middle years studies

Two open ended questions to gather qualitative data were included in the survey (Q27 and 28), which asked students to identify positive and less helpful features of their middle years studies.

The draft survey was piloted online with 71 second-year DP students, comprising 55 students from Indonesia, 10 students from India and 6 students from Hong Kong. The survey questions worked well and the students responded to the items as expected. No changes were made to the survey following the pilot.

The main survey was conducted in all IB schools that have been offering DP for more than a year, and also offer MYP. At the time of implementation there were 42 target schools in the population in the five countries. Table 2 summarises the number of target schools in each of the five countries.

Table 2: Number of target school population

China	13
Hong Kong	8
India	9
Indonesia	9
Japan	3
Total	42

The ACER research team contacted the school head and DP coordinator in each of the target schools via email to request their participation in the study. In Hong Kong, India and Indonesia, follow up calls were made to the DP coordinators in cases of non-response to the initial email request. In China and Japan, an IB official followed up with the non-responding schools through email. The school DP coordinators were provided with the internet address (URL) for the survey and the guidelines for administration. The survey is attached as Appendix A.

b) Student focus group discussions

A series of questions were developed to use during focus groups with students. The questions aimed to further delve into the findings from the survey data, and thus focused on the themes derived from the survey.

Each discussion group ran for approximately 40 minutes. Two researchers were involved in the discussion process. One researcher led the discussion and took brief notes; and the other took detailed notes. The researchers then shared their notes with each other for cross validation.

Two schools from Indonesia and one school from India agreed to participate in the focus group discussion (FGD). Around 8-12 students from each of these three schools participated in the FGDs, 24 students in total. Focus group participants were selected on the basis of their responses to the survey questions, and in order to provide a representative sample of the middle years backgrounds of the survey respondents. As such, although a majority of these students (75%) have an MYP background, the focus groups have an adequate number of MYP and non-MYP students.

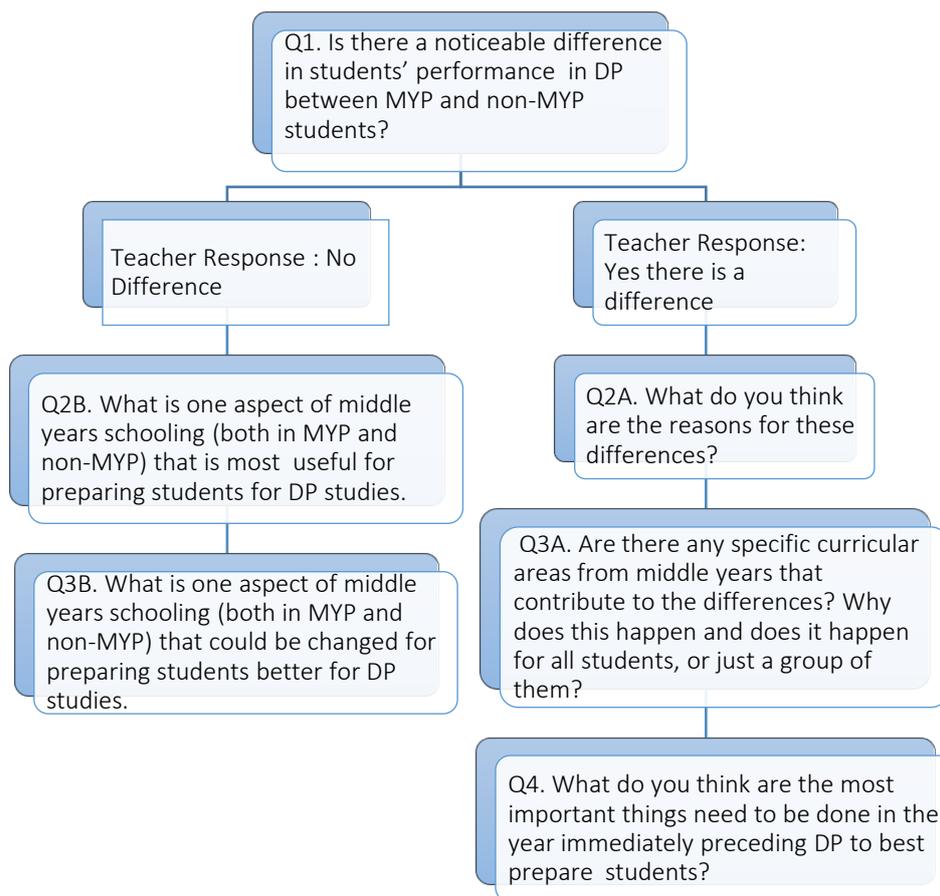
The questions for the FGDs were developed based on the analysis of student responses to the survey. The questions were:

1. Can you tell us a little bit about your middle years of schooling? Where you did it, what you studied and what you thought about it. So, let's start by talking about what you really enjoyed studying. What subjects were your favourites?
2. Thinking about your studies this year, how well do you think you were prepared for them by your previous studies? Why is this the case?
3. What is one aspect of middle years schooling that was most useful for preparing you better for DP studies?
4. What is one aspect of middle years schooling that could be changed for preparing you better for DP studies?
5. What do you think are the most important things need to be done in the year immediately preceding DP to best prepare students?
6. Is there anything else you would like to tell me about your studies – past or present – that would help us to understand how to improve middle years schooling so that students are ready for their DP studies?

c) Teacher interviews

Ten teachers in total were interviewed - three to four from two schools in Indonesia and one school from India. These teachers taught diverse subjects including Sciences, Mathematics and Visual Arts. Some of these teachers have taught MYP in addition to DP. One teacher was the MYP coordinator in the past. One researcher led the discussion and took brief notes. The second researcher took detailed notes. At the end of the interview the researchers cross-validated their notes.

The following questions were framed for teachers:



2.3. Data Analysis

The quantitative data from the student survey was analysed using t-tests, Mann-Whitney U tests and logistic regressions to address the first two research questions.

The qualitative survey data and information derived from the open-ended survey questions (Q27 and Q28); student focus groups; and teacher interviews was then used to answer the remaining two research questions.

2.3.1. Analysis of quantitative survey data

The student level data was provided by IB to allow the surveys to be matched to student diploma scores. Survey was completed by 548 students from 22 schools. Data files received from IB were able to be matched with survey data for 531 students (for 523 students, a match between survey data and final DP scores was found). Of these 523 students, 408 had participated in the MYP, whereas the other 115 students had participated in another type of middle year programme (state, national or other international programme) (referred to as 'non-MYP' or 'Others' hereafter). Table 3 below shows that approximately 75 per cent of the respondents have an MYP background ($n = 426$) and 122 students completed a different type of middle years program (43 students had completed the Cambridge IGCSE, 79 had completed their middle years of education in another programme).

A detailed breakdown of middle years programmes by country of current study is shown in Table 3. The number of students for whom survey data was able to be matched to final diploma scores or subject data is displayed in brackets. Inspection of these figures shows that a similar pattern is evident across four countries – China, Hong Kong, Indonesia and Japan – with the majority of

respondents having undertaken the MYP, and the fewest having undertaken a Cambridge IGCSE. In India, although MYP background was most common, the number of students was more evenly distributed across the three programmes.

Amongst the students from 'Other' middle years of education (non-MYP), there were students from India who had completed the All India Secondary School Examination conducted by CBSE or the Indian Certificate of Secondary Education conducted by CISCE ($n = 24$); and students from Indonesia who had completed junior secondary school (Sekolah Menengah Pertama, SMP) ($n = 16$). The remaining students were from various other middle years programmes.

Table 3: Student respondents by country and type of middle years programme (students where survey data was able to be matched to subject / final diploma data presented in brackets)

Country of currently studying in	Number of schools	Type of middle years programme			Total
		IB MYP	Cambridge IGCSE	Other	
China	3	39 (38)	0	16 (16)	55 (54)
Hong Kong	5	145 (139)	3 (3)	8 (8)	156 (150)
India	6	40 (38)	24 (24)	23 (23)	87 (85)
Indonesia	6	179 (170)	16(13)	27 (23)	222 (206)
Japan	2	23 (23)	0	5 (5)	28 (28)
Total	22	426 (408)	43 (40)	79 (75)	548 (523)

Two important considerations about the sample must be noted. The first consideration is that the sample size for students from non-MYP backgrounds is small. There are a total of 122 (115) student respondents from non-MYP background. Since this group size is small, only large differences between the MYP and non-MYP groups will appear to be statistically significant. In other words, there is not much statistical power in this sample for detecting real differences between this and other groups.

Secondly, samples of students from MYP and non-MYP backgrounds were not selected randomly and hence the respondents may not be representative of their respective populations. However, statistical significance tests were conducted to provide guidelines to help interpret the results.

Approximately 52 per cent of the students are male, and most (98%) were aged 15 to 18 years at the time of survey administration. Most of the respondents completed their middle years of education in the country in which they are currently studying. However, some students studied their middle years of schooling in other Asian countries, Europe or North America. The number of students completing the middle years of education in various countries are reported in Table 4, and these are broken down into the type of middle years study undertaken.

Table 4: Country of study during middle years

Country of Origin	Type of middle years programme		Total
	IB MYP	Non-MYP	
China	37	14	51
Hong Kong	142	7	149
India	39	38	77
Indonesia	176	32	208
Japan	19	2	21
Other Asian country	7	10	17
Other non-Asian country	6	19	25
Total	426	122	548

2.3.2. Analysis of student responses to open ended questions

Two open-ended questions in the survey (Q27 and Q28 in Appendix A) asked students to report on features of middle year studies that contributed positively and those that were less helpful for their DP studies. The responses provided were first organised using spreadsheets into MYP and non-MYP background students, and positive and less positive features. Key themes were then identified by the researchers by analysing word, phrase and concept frequency in the student responses. Each of the student responses was then categorised into one of the emergent themes.

2.3.3. Analysis of teacher interview and student focus group discussion data

Student focus group discussion notes were organised by school into MYP and non-MYP students, and positive and less positive features of middle years programmes. Key themes were identified through this process, and differences in responses between MYP and non-MYP students were then analysed. These findings were incorporated into the analysis of responses to the open-ended questions in the student survey as discussed above.

Teacher interview transcripts were organised using a spreadsheet into responses to questions relating to students from MYP backgrounds, and students from non-MYP backgrounds. These responses were then coded into four categories: less positive aspects of middle years programmes; more positive aspects of middle years programmes; neutral comments/statements of fact; and recommendations for improvement and/or discussion of proposed changes to MYP. Comments that referred to middle years programmes generally (MYP and non-MYP) were also identified.

Differences in teacher perceptions of MYP and non-MYP were then analysed, and compared with the analysis of student perceptions.

3. Research Findings

3.1. Research Question 1 – Comparative analysis of total scores achieved by DP students

This section of the report addresses research question 1: To what extent do the final DP scores achieved by students differ between groups who complete their middle years studies in i) the MYP, ii) a state or national curriculum, or iii) other international programmes?

And the associated question: Which types of middle years programmes are associated with the highest and lowest DP results?

The DP consists of six subject groups – Studies in Language and Literature; Language Acquisition; Individuals and Societies; Sciences; Mathematics and The Arts. Scores from subjects within these groups contribute to the final Diploma score. The subsequent section discusses the extent to which the final diploma scores achieved by DP students, and scores in each of the six subject groups, differ between students who complete their middle years studies from i) the MYP, ii) other national or international programmes.

Mean final diploma scores (out of the total of 45) for students who completed the two types of middle year studies (MYP vs non-MYP) are displayed in Table 5. (IB scores were obtained for 523 students out of the 548 students who were surveyed).

Table 5: Mean IB final diploma scores for students according to middle years programme type and significance testing

Program type	N	Mean (Total Exam Points)	Std. Deviation	t-Ratio	P-Value
IB MYP	408	32.64	5.58	3.69	0.00
Others	115	30.47	5.55		
Total	523	32.16	5.64		
Effect Size	0.39				

The table shows higher mean performance for MYP students in comparison to non-MYP students. An independent samples t-test shows that the difference between the two groups is significant, with an effect size of 0.39 indicating a moderate effect. This suggests that middle years program type has an influence on how students perform in the IB final diploma.

To investigate whether the two groups differed in subject wise performance, performance for each of the six subject groups was explored. Mean performance is shown in Table 6. It should be noted that there was a different number of cases available for each subject, and the following analyses do not include students who failed and did not receive a subject score. Subject performance data ranged from 181 students to 531 students across subjects.

Table 6: Mean IB subject scores for students according to middle years program type and significance testing

Subject	IB MYP students		Other students		t-score	Significance (p-values)	Effect size
	N	Mean (SD)	N	Mean (SD)			
Language and Literature	415	5.28 (0.83)	116	4.98 (1.05)	3.24	0.00	0.32
Language Acquisition	311	5.84 (1.03)	102	5.46 (0.86)	3.36	0.00	0.40
Individuals & Societies	409	5.31 (1.13)	118	5.06 (1.13)	2.13	0.03	0.22
Sciences	413	4.60 (1.37)	118	4.42 (1.31)	1.13	0.19	N/A
Mathematics	415	4.97 (1.31)	116	4.59 (1.35)	2.69	0.01	0.28
Arts	157	5.47 (1.03)	24	5.33 (1.01)	0.61	0.54	N/A

Independent samples t-tests on subject performance for the two groups show that MYP students performed significantly better than non-MYP students in Studies in Language and Literature, Language Acquisition, Individuals & Societies and Mathematics. Although a difference was found between groups for The Arts and Sciences, this difference was not found to be significant (the p-value was greater than 0.05).

Summary

Students who completed an MYP performed significantly better than non-MYP students in final diploma score as well as in Language and Literature, Language Acquisition, Individuals & Societies and Mathematics. It should be noted that students in the study came from a wide range of contexts and the sample size of non-MYP students is small. There may be other factors that could potentially contribute to this difference, such as school-level differences. It is suggested that further research with greater sample of students is undertaken to further explore the reasons behind these differences.

3.2. Research Question 2 – Performance of students in TOK and EE

This section addresses research question 2: How do students who complete their middle years studies in i) the IB MYP, ii) a state or national curriculum, or iii) other international programme, perform in the DP core requirements: Theory of Knowledge (TOK) and Extended Essay (EE)?

In addition to the six subject groups discussed in the previous section, students in IB DP complete three core elements – Extended Essay (EE), Theory of Knowledge (TOK) and Creativity, Action, Service (CAS). In the present study, EE and TOK were selected to analyse how MYP students perform in these two core areas in IB DP in comparison to non-MYP students.

Those students who complete the requirements for each area are given a grade that ranges from A to E. The distribution of grades for each group of students for Theory of Knowledge is presented in Table 7 (data available for 520 students).

Table 7: Subject grade distribution (N and relative percentage) for Theory of Knowledge by middle years program type

Program type	Grade distribution (N and relative %)					Significance testing	
	A	B	C	D	E	Mann-Whitney U-test	p-value
IB MYP	52 (12.7%)	134 (32.8%)	162 (39.7%)	58 (14.2%)	2 (0.5%)	19727	0.02
Non-MYP	9 (8.0%)	27 (24.1%)	56 (50.0%)	19 (17.0%)	1 (0.9%)		

MYP students had a higher relative proportion of students achieving a higher grade (A or B) and a fewer relative proportion receiving one of the lower three grades (C, D or E) in comparison to non-MYP students. A Mann-Whitney U test analysis shows that the distributions were significantly different. A logistic regression (a regression where the dependent variable is dichotomous) was conducted to explore whether students from the IB MYP were statistically more likely to achieve a higher grade (A or B), and the results of this regression is presented in Table 8.

Table 8: Logistic regression coefficient for program type for Theory of Knowledge scores

Contribution of program type to model	
Regression coefficient (SE in brackets)	Significance
0.60 (0.22)	0.01

The results show that IB MYP students were more likely to achieve a higher grade for Theory of Knowledge than students who participated in other middle years programs.

The grade distribution of the 530 students with Extended Essay data available is presented in Table 9 according to the program type.

Table 9: Subject grade distribution (N and relative percentage) for Extended Essay by program type

Program type	Grade distribution (N and relative %)					Significance testing	
	A	B	C	D	E	Mann-Whitney U-test	p-value
IB MYP	74 (17.9%)	134 (32.4%)	156 (37.8%)	46 (11.1%)	3 (0.7%)	21919	0.11
Non-MYP	18 (15.4%)	35 (29.9%)	40 (34.2%)	21 (17.9%)	3 (2.6%)		

The table shows a relatively similar grade distribution across the two groups. A Mann-Whitney U test shows that the two distributions are not significantly different.

Table 10 presents the results from a logistic regression which examines whether there are differences between the two groups in terms of the relative proportion of students who were awarded an A or B grade.

Table 10: Logistic regression coefficient for program type for Extended Essay scores

Contribution of program type to model	
Regression coefficient (SE in brackets)	Significance
0.18 (0.21)	0.34

The logistic regression as presented in Table 10 shows that the two groups were not different in terms of the relative proportion of students who achieved a higher grade or a lower grade.

Summary

The overall grade distribution for Theory of Knowledge was found to be different for students who participated in the IB MYP in comparison to other students. Students from the IB MYP had a higher relative proportion of students being awarded an A or B grade in comparison to students from 'Other' programs. However, there was no difference found in the grade distributions for the Extended Essay for students based on middle year program participation. It should be noted that

these results cannot be generalised beyond the study and the differences may not be attributable to the participation in MYP.

3.3. Research Question 3 – Positive and less helpful features of middle years programmes

This section addresses research question 3 - What do DP students who complete their middle years studies in i) the IB MYP, ii) a state or national curriculum, or iii) other international programme, identify as:

- **Features of their middle years studies that contribute positively to their IB Diploma studies?**
- **Aspects of their middle years studies that were less helpful in their IB Diploma studies?**

Data in this section relates to the 548 students that completed a survey including questions about their background, their middle years schooling, and their experiences in the DP. The survey also included two open-ended questions (Q27 and Q28) which asked students to report on features of middle year studies that contributed positively and less positively to their DP studies:

27. What aspects of your middle years schooling helped you the most with your Diploma Programme studies?

28. What aspects of your middle years schooling were least helpful to your Diploma Programme studies?

For the open ended questions, key themes were identified by the researchers by analysing word, phrase and concept frequency in the student responses. Each of the student responses was then categorised into one of the emergent themes. These included, for example: Higher order thinking; English language skills; Features of the curriculum; Workload and expectations; and Assessment skills.

On the basis of survey responses, 24 students from 3 schools (two in Indonesia, one in India) were also selected as focus group participants, 75 per cent of whom were from an MYP background. During focus group discussions, which were designed to elicit more detailed feedback, students identified a number of features of the MYP and other middle years programs which contributed positively and less positively to their DP studies.

Questions were used as prompts to open-ended discussion about issues of importance to the students. A number of common themes emerged which supported many of the findings from the student survey. There were no significant thematic differences in responses between the schools, or between students in India and Indonesia. Analysis of focus group data is also included in this section.

3.3.1. Features of middle years programmes that contribute positively to DP studies

An analysis of student responses to the open-ended survey question on helpful aspects of middle year schooling revealed some differences between the MYP and other middle year programmes (non-MYP).¹ Generally, students who had undertaken the MYP felt that they had developed good English language skills, the ability to think critically, analyse and evaluate (higher order thinking skills), and had received useful practice in essay and report writing and in making presentations. They also felt that they had benefited in terms of personal and cognitive development, including

¹ As discussed earlier, since only 43 students from Cambridge IGCSE background participated in the study, these students were grouped with students from other backgrounds for the purpose of analysis.

being able to undertake reflection, to work with peers, and in meta-cognition. Time management and study skills were also mentioned as useful.

Interestingly, non-MYP students felt that the focus on exams in their middle years had developed their ability to summarise and memorise content, and that they had developed study skills which prepared them well for the testing focus in the Diploma (in contrast to the feedback from MYP students). They also felt that their studies had gone into greater depth in terms of subject matter, which again prepared them for the depth of studies undertaken in the DP.

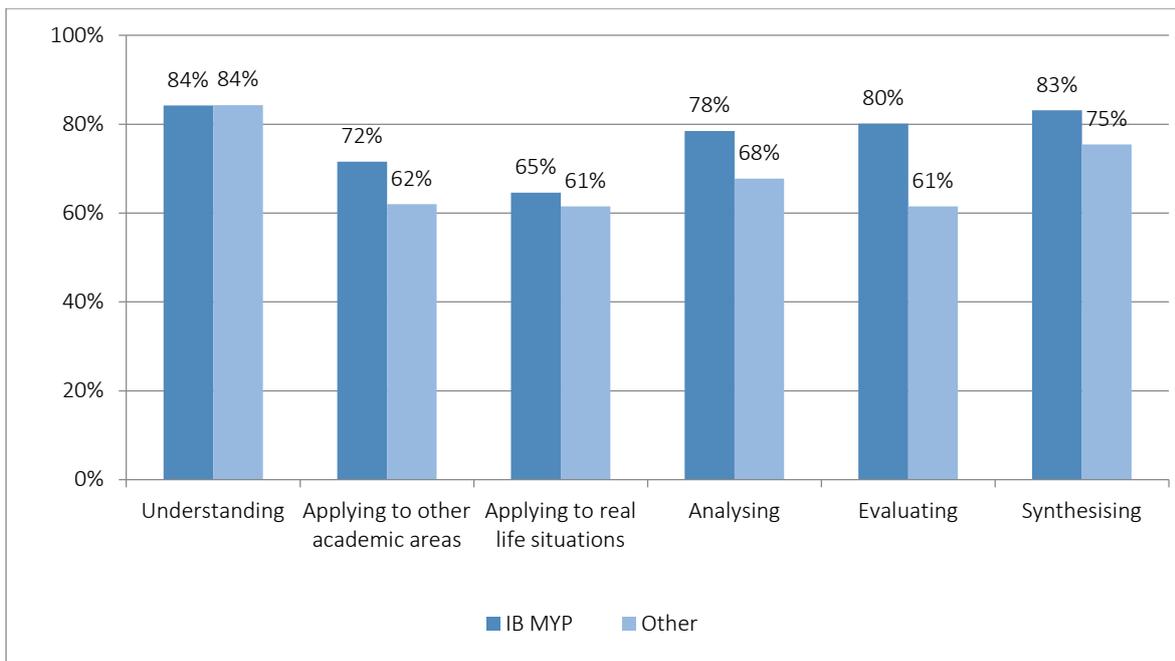
a) Higher order thinking skills

Higher order thinking skills require cognitive processing rather than mere memorising. Higher order thinking skills include critical thinking, understanding, applying understanding to other academic topics, applying understanding to real life situations, analysing subject content (e.g. examining and breaking information into parts), evaluating the merits of arguments and synthesising ideas. In recent years there has been increasing emphasis on higher order thinking skills in school education across the world.

The IB program generally emphasises the development of higher order thinking skills in the MYP and the DP. It is noteworthy that many students from both MYP (19 per cent) and non-MYP backgrounds (16 per cent) reported that higher order thinking skills developed in middle years studies are important for their DP studies.

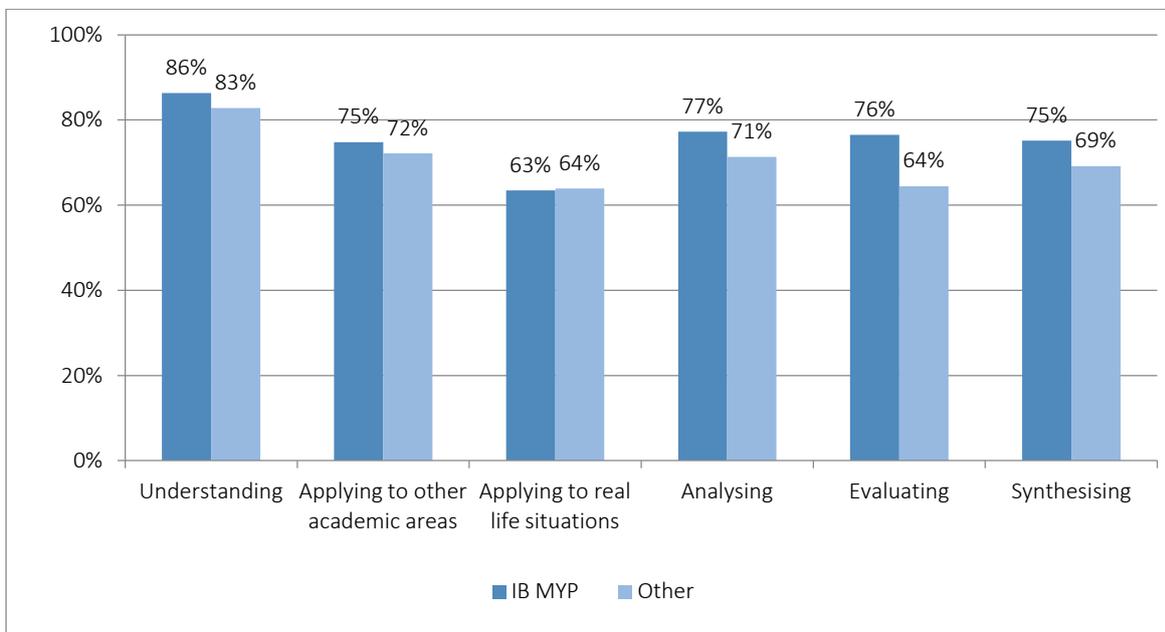
To better understand the emphasis on higher order thinking skills in middle year programs, the survey included questions that asked students to report on the frequency of engagement with skills including analysing, evaluating and synthesizing information (Question 15). Both MYP and non-MYP students noted they engaged with these types of higher order thinking (see Figure 1), however, MYP students generally indicated a higher frequency of engagement with these skills. For example, 80 per cent of the MYP students reported they often or very often evaluated the merits of arguments compared to 61 per cent of non-MYP students.

Figure 1 Proportion of students reporting often or very often engagement in higher order thinking skills in middle years



A similar pattern was seen with the analysis of student responses to questions regarding the focus on higher order thinking skills in learning assessments in middle years studies (Question 24). For example, as can be seen in Figure 2, a greater proportion of MYP students reported engagement with a range of higher order thinking skills in learning assessments than non-MYP students.

Figure 2 Proportion of students reporting often or very often engagement in higher order thinking skills in assessments in middle years



Based on the responses to Q27 of the student survey, approximately 25 per cent of MYP student responses cited that they had developed critical thinking, application, analysis and evaluation skills in their middle years studies which were beneficial for their DP studies. As one student stated:

The nurturing of critical thinking [...] helped me with my intellectual encounters for my IB subjects.

In contrast to the MYP students, only 15 per cent of non-MYP responses to Q27 stated that higher order thinking skills developed during their middle years studies had assisted them with the DP.

During focus group discussions, MYP students generally felt that creative, analytical and evaluative skills had been developed in the MYP and were useful in the DP. Questioning and critical thinking skills were also valued by many students. A student in Indonesia stated that the MYP had been useful in developing the ability to make inferences, which is part of the expected teaching and learning in the DP. There was broad agreement that the inquiry-based focus of the MYP had developed them as active rather than passive learners, and that this approach had assisted them in the DP. Another student also from Indonesia also felt that an active learning stance would likely assist at university level. Some students felt that the MYP encourages a positive attitude towards education, or as one student in Indonesia expressed a feeling of “liking to learn”.

These higher order thinking skills are a major focus of inquiry-based learning promoted by the MYP. Inquiry-based learning has long been identified in the literature as a useful pedagogical approach for middle years students generally, to develop research and questioning skills, to develop meta-cognitive skills (or ‘learning how to learn’), to promote critical thinking and evaluation, and to foster school engagement.²

b) English language, literacy and writing skills

Approximately one fifth (19 per cent) of the students from an MYP background reported that English writing skills developed during the middle years studies contributed positively to their DP studies. In more detailed responses to Q27, around 13 per cent of MYP students cited English skills (speaking, reading and writing) as beneficial to their DP studies, 14 per cent of MYP responses specifically identified the development of writing skills as useful (this percentage was the same for non-MYP students), and 17 per cent mentioned essay skills. The MYP includes a number of research essays and projects, including the ‘One World’ essays and the Personal Project. ‘One world’ essays enable students to gain a better understanding of the role of science in society and allow them to explore the application of scientific developments in local and global contexts. The “personal project” is seen as a culmination of student learning and a focus of the areas of interaction. Students can choose an academic or non-academic topic for their project.

When asked about the specific features of the MYP that were useful for the DP during focus group discussions, students in Indonesia stated that focusing on grammar and punctuation, understanding multiple perspectives and undertaking “close” (analytical) reading of texts was helpful. Others mentioned that research, essay and report writing practice had also assisted them for the EE, and in the case of science, for writing laboratory reports. In Indonesia, students felt that they were familiar with “IB language”, which prepared them for TOK.

A smaller proportion of non-MYP students (7 per cent) reported English writing skills developed in middle years to be helpful in their DP studies. One possible explanation for this difference is that

² Gibson, H. and Chase, C. (2002) ‘Longitudinal Impact of an Inquiry-Based Science Program on Middle School Students’ Attitudes Toward Science’, *Science Education*, Vol. 86, No. 5

approximately 15% of the students from other backgrounds completed the middle years of education with a local language as the medium of instruction, whereas a greater number of students from the MYP group reported using English in their subjects.

c) Features of the Curriculum

Student responses were analysed to understand what middle years curriculum areas had helped their DP studies. Higher proportions of non-MYP students reported that Mathematics (25 per cent) and Science (13 per cent) curriculum in middle years contributed positively to their DP studies in comparison to MYP students (9 per cent and 5 per cent respectively). Similarly, in responses to Question 27, approximately 28% of non-MYP students identified as beneficial the depth of study in specific subjects – mainly science and maths – far more frequently than MYP students (14%).

In focus group discussions, students who had undertaken an Indian board curriculum in middle years stated that the science and maths component prepared them better for the DP than some of their classmates from the MYP in terms of academic content knowledge. Furthermore, the fewer number of subjects required by the IGCSE and Indonesian Sekolah Menengah Pertama (SMP) was seen by some students as beneficial because they were better prepared for the depth of studies undertaken in the DP. Additionally, while some MYP students reported that learning how to write lab reports in MYP Science helped them in writing reports in DP Science, non-MYP students reported that extensive in-depth coverage of topics in middle years had prepared them well for DP Science.

However, it was felt by many MYP students in focus group discussions that the MYP develops a good understanding of different subjects (Business and Visual Arts were specifically mentioned). Another student felt that the MYP and the DP promoted deeper understanding and exploration of topics, and was not just limited to theory, in contrast to the Indonesian national curriculum.

d) Assessment and study skills

In focus group discussions, the self-expression and presentation skills cultivated in the MYP were seen as useful, both from an academic and also a personal development perspective. Around 14 per cent of MYP survey participants also identified group work, discussion, interaction and collaboration with teachers and peers as a useful and enjoyable aspect of their studies in responses to Q27, whereas this was not often mentioned by non-MYP students. In fact, one non-MYP student stated that:

In Korean middle school, we rarely do any presentation or group works. So this made me very nervous and uneasy whenever I need to do group work/presentation in DP.

The personal project undertaken in the MYP was specifically mentioned by a student from Indonesia as assisting in useful reflection and in setting future goals – as well as assisting in the Extended Essay in the DP. Students from India discussed the fact that the undertaking of projects in the MYP develops investigative skills and leads to a deeper understanding of subject matter.

Approximately 17 per cent of students from the MYP reported in the survey that time management and study skills developed in middle years contributed positively to DP studies in comparison to 9 per cent of students from other backgrounds.

However, non-MYP students stated in focus group discussions that they were more familiar with studying for and taking exams, and were more used to memorisation than MYP students, which

prepared them well for the DP. Ten per cent of non-MYP responses to Q27 identified memorisation as a useful skill they had developed during their middle years studies, whereas none of the MYP students mentioned developing the skill to memorize during their middle year studies. Indonesian students who had undertaken the Cambridge IGCSE felt that they had good subject knowledge, and that teachers had taught the summarisation of topics, which prepared them for the exams and study required in the Diploma.

e) Expectations and workload

Based on further analysis of student responses, it appears that MYP students become accustomed to a high workload and learn to manage time effectively between various activities, which helps them cope well with DP studies. This can be seen in the following MYP student comments about this issue:

“The workload – [I was] much more prepared for the IB workload due to the MYP program.”

“Middle years schooling gave me the confidence to work well and good working habits (ex. exam study, and assignment conduct).”

“The MYP Programme helped me a lot, because it's like a younger version of the DP. The time management skills required in the MYP had a very high standard, and matching up to them was tough, but in the end it paid off, because it is much easier to manage my time now.”

3.3.2. Features of middle years programmes that are less helpful for DP studies

Students were asked through an open-ended survey question to identify factors of their middle years studies that were least helpful for their DP studies (Q28 of the survey). An analysis of student responses revealed that a major theme among student responses, from both types of middle year programs (MYP and non-MYP), was that certain aspects of curriculum in the middle years proved to be less helpful for their DP studies (46 per cent for MYP out of 388 respondents and 25 per cent for non-MYP out of 117 respondents).

Many MYP students felt that there needed to be a better “bridge” between the MYP and the Diploma, particularly in terms of preparing them for increased academic expectations and workload. Further, some felt that the MYP needed more academic rigour and depth, rather than focusing on covering a large number of subjects (breadth). Many students felt underprepared for exam-taking in terms of study skills and question answering techniques, and also felt that the grading systems and curriculum content were inconsistent between MYP and the DP.

Non-MYP students also felt there needed to be a bridge to the Diploma, particularly to develop their analytical and evaluative skills, which were not generally focused on in non-MYP curricula. They found the Extended Essay and Theory of Knowledge challenging as a result. Students from non-MYP backgrounds felt they had been “passive” learners in their middle years due to a focus on academic theory and rote learning, whereas the DP expected much more active learning and critical thinking. They also felt that in some cases their literacy and English language skills were not sufficiently developed.

a) Higher order thinking skills

Twelve per cent of non-MYP responses to question 28 identified the absence of critical thinking and analysis skills as detrimental in their DP studies. Nine per cent also mentioned the fact that they had focused too much on memorisation, and not enough on understanding. As one student expressed:

I think the least helpful aspects of middle years schooling would be the part where I had to follow most instructions and just memorize all of the given information. My previous school, a national school, instilled on us the importance of memorizing subjects but did not encourage us to think critically.

During focus group discussions, non-MYP students mentioned that the Extended Essay and Theory of Knowledge constitute a challenge for them, as they require analytical and evaluative skills that are not necessarily focused on in their middle years studies. Some students suggested that analytical techniques should be taught to non-MYP students as a “bridging” strategy to ensure a smoother transition to the Diploma.

b) Features of the Curriculum

During focus group discussions, MYP students expressed concerns that in some of the subjects, particularly generalist fields such as Science and Humanities, the MYP covers basic concepts which provide a broad overview, but does not adequately prepare students for the conceptual depth covered in the IB DP. This was a commonly expressed concern – that while the MYP aims to introduce students to a number of subjects, and therefore focuses on breadth of curriculum; the IB DP is concerned more with depth.

For example, a student in Indonesia mentioned that because MYP only has one term each of Physics and Chemistry, they did not have a strong foundation for these subjects in the DP. Some MYP students in India and Indonesia stated that the rigour in mathematics was not sufficient to prepare them for the DP, and as a result they had been unable to choose Higher Level mathematics in the Diploma. Another stated that maths in the MYP is “easy and practical”, in contrast to the DP. Another student in Indonesia suggested that undertaking a large number of subjects with limited depth in the MYP can be “overwhelming”.

Although a few students acknowledged that covering a wide range of subjects did give them a chance to decide on their academic interests, the fact that students have to do all ten subjects in the MYP was also considered a hindrance to choosing streams in the Diploma. Several students felt they needed more support in selecting subjects in the DP. One MYP student stated that in preparation for the DP there were:

No counselors as to what I should do, or what I could do. I was confused as to what my academic interest would be and what subject I should take.

Some students suggested they should receive more exposure to Diploma subjects earlier, in order to understand the expectations and level of depth involved. One student suggested that it would be useful during the MYP to have more interaction with current DP students to get their advice and the benefit of their experience. Students generally felt that more clarity around expectations in the DP, and more guidance and support from teachers, would assist in the transition. Others felt the MYP

should be more rigorous and challenging in order to prepare them for the requirements of the Diploma Programme.

Many stated that the DP curriculum is not a continuation of the MYP curriculum. As one student in Indonesia phrased it,

"[the Diploma] is like starting all over again."

Correspondingly, a desire for greater "linkages" between the MYP and DP was frequently expressed, both in terms of skills and content knowledge – subjects lacking appropriate curricular links according to the students included Biology, Physics, Chemistry, Art, Music, History and Maths – but also to ensure student wellbeing and self-esteem. One student said that year ten should be more similar to the DP, or alternatively there should be a bridging program between MYP and the DP, in order to ensure students are adequately prepared.

A student in India who had undertaken the General Certificate of Secondary Education (GCSE) stated that initially the difference in curricula had resulted in a "slow start" in the IB DP, but that it was possible to catch up. Overall, this student felt that middle school had helped in the IB DP over the longer term, as it had developed the core skills needed. Another student in Indonesia stated that most students get low scores in first semester and then "bounce back". This perceived phenomenon, and the positive factors associated with "bouncing back" may warrant further investigation.

Students who had undertaken the Indian curriculum in middle years stated that the MYP is more analytical than the Indian system, which contains more "rote" learning and passive memorisation. Students who had undertaken the SMP also felt that their curriculum had turned students into "passive learners".

Science

Eleven per cent of the MYP students (out of 388 respondents) reported that the Science curriculum in middle years was of little help for their DP studies. Analysis of student responses revealed that some MYP students thought that the Science curriculum was not as challenging and so did not prepare them well for DP Science studies. One student wrote, for example:

"The sciences are extremely weak in the MYP. By studying all 3 sciences at a very basic level is not enough for students to take IB science courses."

"I felt that Science studied at MYP level did not help much with the Biology / Chemistry /Physics courses at DP level. The content covered at MYP level was too minimal and was not deep enough."

"MYP Sciences wasn't in-depth enough."

Student responses to a direct question on how much the IB MYP helped in DP Science were also analysed. Among the MYP students who studied one of the Science subjects in group 4 in DP, a large majority (71 per cent) of the students reported that middle years of education helped 'very little' or only to 'some extent' in their DP studies. This was considerably higher than the proportion of students from other middle years programs (47 percent).

In response to question 28, 29 per cent (out of 388 respondents) identified their science studies in the MYP as either not sufficiently linked with the DP curriculum, or not challenging enough to prepare them for DP science subjects. Some students also felt that they had been forced to study all the sciences in MYP, when they only ended up specialising in one science (either physics, biology or chemistry). Once more, they felt that depth had been sacrificed for breadth.

Mathematics

Of the responses to question 28, around 5 per cent of MYP students each felt that the MYP coverage of economics, maths, humanities and arts had not been sufficient or relevant enough to prepare them for DP. As one student expressed:

What [was] covered in the MYP mathematics subject is not enough to support the continuing study in DP math HL. Moreover, students with a local strict math education background often, and even always perform much better in the exams, which might sound very odd.

Visual Arts

Some students (8 per cent) reported that IB MYP curriculum in the area of Visual Arts was not helpful for their DP studies. A review of student responses revealed that some students did not find art in the MYP helpful based on the fact that they did not choose any Arts subjects in their DP. Some MYP students' responses are reproduced below.

"Personally for me the arts (Art and Music) were the least useful. The classes were entertaining; however in my Diploma Program I did not chose either of them. After experiencing how demanding the Diploma Program is and realizing how important time is, I feel like I wasted time in my Middle Years Program playing in art and music class while I could have been getting prepared for the Diploma Program. Yet, I must say that the class was very fun and adds time to relax in an otherwise very demanding program."

"The learning outcomes in subjects that I did not select for the IB Diploma, for example: Drama, Visual Arts, Film, Computer Technology and Design Technology were subjects that were (although highly engaging and very rewarding) not helpful to my IBDP progress as I did not continue to pursue my studies in these areas."

However, for those students who had continued to study Visual Arts in the DP, MYP Visual Arts was generally seen as a useful foundation.

c) Students' perceptions and their examination score in the DP

Students were asked to indicate to what extent their education in middle years of schooling helped with each of their subjects (very little, some, a lot, very much) (see for example Question 17d of the survey). Using Pearson correlations, these self-ratings were mapped against actual performance in the subject in question. This type of correlation helps us to determine whether there is an association between perceived assistance of middle year schooling and performance in the subject. Correlations are presented by subject and for each type of middle year schooling (MYP vs non-MYP). It should be noted that the number of students was considerably less in the 'non-MYP' group,

resulting in less power for these correlations (ie. Less likely to be significant due to smaller group size).

Table 11 : Pearson's correlation Analysis between students' perceptions of MYP contribution to subject achievement; and subject achievement by middle years program type

Subject	IB MYP		Non-MYP	
	Pearson's correlation	p_Value	Pearson's correlation	p_Value
Language and Literature	-0.01	0.84	-0.05	0.59
Language Acquisition	0.18*	0.00	0.18	0.06
Individuals and Societies	0.03	0.54	0.00	0.96
Science	0.05	0.30	0.19*	0.04
Mathematics	0.24*	0.00	0.24*	0.01
Arts	-0.13	0.11	0.22	0.30

*indicates that correlation is significant, $p < .05$

The correlation analyses shows that there is some association between the students' *perception* of the level of assistance the MYP subject provided during their DP studies, and their *achievement* in that subject during DP. Students who completed an IB MYP, had an association between expressing that their middle years schooling helped in Language Acquisition and Mathematics and achievement in those two subjects. For non-MYP students, this association was found for Sciences and Mathematics, also a moderate but non-significant difference was found for Language Acquisition (p-value was greater than 0.05). The strength of each of these associations are categorised as small.

A similar correlation analysis was undertaken to map the association between student's confidence to perform well in the DP exam and their actual performance. The results of the Pearson correlation analysis are shown in the table below.

Table 12: Pearson's correlation Analysis between students' confidence in their performance in their DP subject exam with actual performance in exam by middle years program type

Subject	IB MYP		Non-MYP	
	Pearson's correlation	p_Value	Pearson's correlation	p_Value
Language and Literature	0.17*	0.00	0.04	0.66
Language Acquisition	0.51*	0.00	0.37*	0.00
Individuals and Societies	0.29*	0.00	0.16	0.09
Sciences	0.38*	0.00	0.26*	0.00
Mathematics	0.43*	0.00	0.19*	0.04

Arts	-0.02	0.84	0.05	0.81
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Table 12 shows that for students who completed an IB MYP, the degree of confidence in how students believed they were going to perform in their final subject exam was positively associated with actual performance on that exam. This was found for five of the six subject areas, with Arts being the only exception where confidence of performance was not related to actual performance. For non-MYP students, the association was only found for Language Acquisition, Sciences and Mathematics. These results tend to suggest that the expectations of final diploma exam performance by students who participated in an IB MYP were fairly well met. The same could also be said of students who participated in other middle years programs, albeit to a lesser extent.

d) English Language, literacy and writing skills

Several non-MYP students felt their literacy and language skills weren't as well-developed as they needed to be in the DP, especially for students who had English as an additional language (EAL). Around 8 per cent of non-MYP responses to question 28 mentioned the lack of English language skills as a deficit in their middle years studies.

Language is essential to basic aspects of literacy – reading, writing and speaking – but is also integral to the process of thinking and learning itself. As Robin Alexander argues, effective language skills enable students to “think, engage and take decisions about their learning,” which empowers them both “cognitively and socially.”³

Non-MYP students mentioned that the Extended Essay and Theory of Knowledge constitute a challenge for them, as they require analytical and evaluative skills that are not necessarily focused on in their middle schooling. Some students suggested that analytical techniques should be taught to non-MYP students as a “bridging” strategy to ensure a smoother transition to the Diploma.

e) Expectations and workload

Students who had completed the MYP gave feedback that DP represents a “big leap” from the MYP in terms of academic expectations and workload. Many students felt unprepared for this increase in expectations, and stated that this was a cause of stress. As one student expressed:

The MYP was not challenging enough. It gave me the impression that if IB were to be exactly like that then I'd go through it in a breeze. I don't think the workload of MYP prepared us for IB's workload.

Ultimately, both MYP and non-MYP students found the DP challenging in terms of workload and high academic expectations. While externally imposed high expectations are identified in the literature as an important motivator for students, when they are not accompanied by appropriate learning and social support these expectations can have a negative impact on school engagement and students'

³ Alexander, R. J. (2010) 'Dialogic Teaching Essentials', University of Cambridge, adapted from Alexander, R. J. (2008). *Towards dialogic teaching: Rethinking classroom talk*. 4th ed. York: Dialogos. Accessed at <https://www.nie.edu.sg/files/oer/FINAL%20Dialogic%20Teaching%20Essentials.pdf>

sense of self-efficacy. Self-efficacy refers to a student's internal expectations about his or her own capabilities to realise a desired learning goal.⁴

f) Assessment and feedback

A recurring concern expressed by many students in focus group discussions was that although the MYP helped to develop their ability to learn effectively through projects, independent research and reflection, it did not sufficiently focus on more traditional academic skills such as memorisation, content knowledge and exam-taking which are required in the Diploma. Accordingly, some students in India felt that reflection was allocated too much weight in assessments in the MYP, while others felt that reflection was valuable but needed to be better structured to allow students to identify areas for improvement. Students felt that they were not adequately prepared in terms of time management and exam-taking generally. Others wanted more practice in undertaking the kind of assessments utilised in the DP, including analytical essay writing.

Additionally, students in Indonesia and India expressed the view that the grading criteria are not clear in MYP. Some students also felt that grading and feedback systems are inconsistent between the MYP and DP – in the MYP, tests are graded holistically, whereas the DP involves individual question marking, which was initially a “shock” to some students. John Hattie argues that meaningful, consistent, targeted and accessible feedback is central to effective learning, in order to assist students to identify the skills they need to develop further, and to set learning goals⁵

Summary

MYP students indicated they had developed strong higher order thinking, English language and writing skills. However, they felt less prepared for the high-stakes examinations in the DP, and for some subjects, particularly science and maths, believed that they had not covered enough content. The correlation analysis found association between the students' perception of the level of assistance the MYP subject provided during their DP studies, and their achievement in that subject during DP. This was found for students who participated in both the IB middle years program and students who participated in another middle years program, although to a smaller degree for those who participated in non-MYP programs. The expectations of MYP students regarding their performance in the DP was fairly well met, as seen in the positive correlation between the degree of confidence in how students believed they were going to perform in their final subject exam and their actual performance. The same could also be said of students who participated in other middle years programs, albeit to a lesser extent.

Non-MYP students believed they lacked higher order thinking skills – including the ability to analyse and evaluate and think critically – which made TOK in particular challenging. However, non-MYP students also described how they had gained experience in memorising content and taking exams, which they found useful in the DP.

There was a general consensus that better preparation in the middle years – particularly in regards to clarifying Diploma expectations, assisting in subject selection, and providing the opportunity to develop core analytical, language and exam-taking skills as needed – would be useful and assist in

⁴ Bandura, A. (1971) *Social Learning Theory* (Monograph) New York City: General Learning Press.

⁵ Hattie, J. and Timperley, H. (2007) 'The Power of Feedback.' *Review of Educational Research* 77(1), 81-112.

a smoother transition to the DP. It was also suggested by a number of students that better preparation would potentially reduce student stress and increase self-efficacy and wellbeing.

3.4. Research Question 4 – Perceptions of DP Teachers

This section of the report will address research question 4: What are the thoughts and perceptions of IB DP teachers regarding the contribution of different types of middle year programmes to student performance in the IB DP?

Teachers were interviewed in two schools in Indonesia and in one school in India to gain an understanding of their thoughts and perceptions regarding the contribution of different types of middle year programs to student performance in the DP. The other middle year programmes discussed included the Indonesian national SMP, the Indian board national curriculum, and the IGCSE. The teachers interviewed taught a range of subjects: Mathematics, Science, including Physics, Chemistry and Biology, and Visual Arts. They commented both in general terms and in subject specific terms.

Questions were used as prompts to open-ended discussion. A number of common themes emerged which support many of the findings from the student focus groups. There were no significant thematic differences in responses between the schools, or between teachers in India and Indonesia. A number of suggestions for improvement to ensure a smooth transition between the middle years and the Diploma were made, and there was also some discussion about proposed changes to the MYP program that will take effect in future.

Although teachers did identify salient features of different middle years programmes, it should be noted that many teachers commented that differences in student performance may not necessarily be because of the different curricular backgrounds, but might rather be more closely linked to the particular school at which they had previously studied. A maths teacher stated that he had not noticed much difference in performance between MYP and non-MYP students. Another maths teacher said it was difficult to assume a correlation between DP performance and middle years programmes, although it was likely that differences in student experiences in the middle years would impact Diploma studies in some way.

3.4.1. Positive features of middle years programmes

a) MYP – positive features

In agreement with the students, most teachers identified the development of strong critical thinking and analytical skills in the MYP as preparing students well for the higher level thinking required in DP subjects. Several teachers mentioned the fact that MYP students are more analytical (or “open-minded” as stated by a teacher in India) due to the inquiry-learning and investigative focus in their middle years. An MYP coordinator from India stated that MYP students fit easily into the Diploma as they know the requirements and philosophy. Similarly, a biology teacher in Indonesia observed that:

MYP focuses on multiple aspects (holistic development) – academics, community service, co-curricular activities etc. [whereas] other programmes mostly focus on academics.

In terms of assessment, a physics teacher in Indonesia felt that the ‘One world’ essays in MYP are a good practice for the Extended Essay in the DP.

Science teachers also identified that students from the MYP had strong laboratory report writing and experimental skills, which prepared them for the many laboratory hours in the Diploma. A science teacher in Indonesia mentioned the fact that in the MYP students design experiments – formulating research questions, identifying different variables and research methods – rather than just carrying them out.

A biology teacher stated that generally, the Diploma programme requires a lot of content knowledge and application skills to do well, and that students from all backgrounds find this challenging compared to their middle years studies. A physics teacher concurred, stating that Diploma Higher Level Physics is “tough” for all students. She felt that students in general, regardless of their background, needed to have very sophisticated mathematical skills and knowledge to be able to do well in Diploma Higher Level Physics.

An MYP coordinator and Visual Arts teacher mentioned that the MYP has a focus on reflective thinking, and assesses students on the process of making art, rather than just the final product. This process is similar in the DP, and as a result, MYP students are well-prepared for this. A Visual Arts teacher in Indonesia stated that the MYP Visual Arts program is well linked to the Diploma Visual Arts programme. Therefore, if students had undertaken this subject in the three years of the MYP, they had good requisite knowledge – otherwise, they found the Diploma challenging. This teacher concluded by saying that achievement is dependent on the students’ exposure to the subject matter in the middle years, regardless of the curriculum. One teacher commented that in language subjects:

MYP students’ transition easily as the subjects are well aligned to MYP.

b) Non-MYP – positive features

Teachers across the disciplines of physics, biology, and maths, stated that students from non-MYP backgrounds – SMP, Indian board, and IGCSE – generally have good content knowledge. A visual arts teacher in Indonesia stated that IGCSE students have good knowledge and are well prepared for the Diploma, but the Indonesian SMP only provides students with basic knowledge. A biology teacher in India also stated that IGCSE students face the least challenges in the Diploma, because their middle years curriculum focuses on both content knowledge and development of skills.

One physics teacher from Indonesia stated that the emphasis on memorisation in non-MYP provides students with good content knowledge. Another stated that some IGCSE students do well at the start of Diploma Science, because of their greater familiarity with test-taking, and because the DP and IGCSE year 10 curricula overlap somewhat. A maths teacher from Indonesia agreed with this assessment, stating that because the IGCSE focuses on breadth of content coverage, it overlaps with Diploma Maths (in contrast to the MYP):

There is a gap between MYP and DP Maths. MYP emphasises exploration by students, while DP is focused on breadth of content coverage. DP has a detailed curriculum where teachers need to cover breadth of content. On the other hand, there is overlap between IGCSE and DP Maths as both focuses on breadth of content coverage.

In terms of assessment, a visual arts teacher from India felt that students from the national middle years programme are good with time management and studying under pressure, which prepares

them for high stakes external assessments in the Diploma. A biology teacher from India also agreed that students from non-MYP backgrounds are used to taking exams of long duration.

3.4.2. Less positive features of middle years programmes

a) MYP – less positive features

There was consensus that the MYP does not have a focus on content knowledge, and that this can make the transition to Diploma studies difficult, especially in the early stages. For example, a biology teacher stated that because of this lack of content knowledge, MYP students find the initial 2-3 months of the DP challenging. The MYP focus on inquiry-based learning rather than content can cause science and maths students in particular to struggle initially in the DP, according to a maths teacher in Indonesia. This teacher felt that there was a clear gap between MYP Maths and Diploma Maths, in that the MYP encourages exploration by students, whereas the DP is focused on content coverage.

A visual arts teacher in Indonesia stated that if MYP students have not undertaken Visual arts as an elective, they find Diploma Visual Arts challenging. According to this teacher, the Diploma curriculum is more detailed and prescriptive than the MYP curriculum. MYP is far more flexible, and gives teachers more autonomy in choosing what to study in depth. This means that MYP students may not possess certain basic knowledge and skills that are assumed by the DP. A maths teacher in Indonesia also agreed with this, stating that MYP teachers are provided with a broad framework that they are able to flexibly apply, whereas the DP has a detailed curriculum focused on specific content coverage.

Teachers across the sciences, arts and maths felt there was a major difference in the methods of assessment between MYP and DP. According to most teachers interviewed, the MYP focus on essays, reports and posters does not prepare students for the large weight given to exams of long duration in the Diploma.

There is a major difference in MYP and DP Science. In MYP, there are many projects and written reports and only few tests and the tests contribute 8% towards final grade. Whereas, in DP the numbers of tests are more, accounting for about 80% of the final grade.

MYP assessments include mostly written reports, essays and posters. Tests are a very small aspect. Whereas in DP, grades are based predominantly on tests (76% weighting) and a relatively smaller weighting is assigned to written reports (24%). MYP students face challenges in adjusting to this focus on tests in DP.

According to several teachers, this disparity means that students find assessments as a particularly challenging aspect of the DP, and this result in an initial drop in achievement. A visual arts teacher and MYP coordinator in India felt that the Diploma needed to link learning with real life situations in order to be more similar to the MYP, and to smooth the transition.

b) Non-MYP – less positive features

There was broad agreement that the critical thinking and analytical skills of non-MYP students are not as strong or well-developed as those of MYP students, and that they have a stronger focus on academic content knowledge instead. According to a science teacher in Indonesia, non-MYP

students struggle with TOK as a result. Another science teacher felt that non-MYP students are not as adept at writing laboratory reports, and their work sometimes lacks detail and sufficient analysis. A third science teacher contended that non-MYP students do not do as well with experiments. Specifically, a teacher mentioned the fact that IGCSE students are provided with experimental procedures to follow, whereas MYP students are involved in designing their own experiments.

Another teacher stated that sometimes IGSCSE students do well initially in Diploma science because of their aptitude in test-taking and content knowledge, but that later their performance drops.

A biology teacher in India felt that students from Indian board schools needed to become more independent to do well in the DP, and that these students generally do not have well-developed application and analysis skills. Another biology teacher stated that non-MYP students find it challenging to understand multiple perspectives, which is particularly a problem in humanities subjects; and a visual arts teacher and MYP coordinator felt that Indian national curriculum students had difficulty applying their knowledge to new situations. Similarly, a physics teacher in Indonesia felt that non-MYP students were not as adept with practical skills. Another science teacher mentioned that the focus on memorisation in the SMP does not prepare students for the understanding required in the DP.

One teacher summed up the differences between MYP students and those from other backgrounds as follows:

'MYP students are more open minded as MYP is based on inquiry based learning. However, MYP students don't seem to be well prepared related to content knowledge. On the other hand, students from other backgrounds are more prepared with content knowledge.'

[but]

Students from other backgrounds find it challenging to understand multiple perspectives.'

Another teacher summed up similarly:

MYP should include more emphasis on acquiring content knowledge before coming to DP. In DP, there are lots of assumptions about students' previous knowledge.

[but]

Students from other backgrounds need to develop analytical and critical thinking skills, especially for TOK.

3.4.3. Teachers' recommendations for improvement

The teachers discussed the upcoming changes to the MYP and DP curricula, and mentioned that the DP is going to incorporate more critical analysis in future, while retaining a significant emphasis on content. A science teacher in Indonesia spoke positively of the adaptation of the MYP conceptual curriculum to focus on critical thinking, and also mentioned the fact that in his opinion, non-MYP programmes are also moving to incorporate more critical thinking.

A physics and chemistry teacher in India mentioned that the new MYP has more external assessment which would result in a better programme structure. A biology teacher in India also mentioned the

introduction of external assessments to the MYP, which would prepare students for the Diploma exams.

There was general agreement that the exam-focused nature of the DP means that the MYP should include more of this type of assessment to prepare students. Further, study and time-management skills should be taught, according to some teachers. A science teacher in Indonesia recommended that MYP students need to be prepared for the intensity of the DP, perhaps through the allocation of similarly intense two-month tasks in the MYP, referred to by another teacher as a “mini-DP”. Another science teacher felt that while MYP students were used to doing group-work, they need to be able to work more independently, particularly during science experiments.

A science teacher in Indonesia recommended that the assessment criteria used in the MYP be consistent with those used in the DP, so that students are able to better interpret their results and so that they are prepared for the grading system in the DP. Education researchers agree that teaching the use and interpretation of assessment rubrics to students so they can understand areas for improvement and set learning goals is critical to making feedback meaningful. A teacher in Indonesia stated that year 10 is considered “pre-Diploma,” and students are counselled about which subjects to choose in the DP based on their achievement in the MYP. Classes are also segregated by performance, and during the last semesters, MYP students start looking at Diploma rubrics.

Another common recommendation was that MYP students should be better equipped with content knowledge in specific subject areas, and conversely that non-MYP students be assisted to develop analytical and critical thinking skills, especially to prepare them for Theory of Knowledge. Further, there were two comments (from the same school) about teaching non-MYP students about academic honesty and plagiarism.

Generally, it was also felt that students from all backgrounds should be assisted with subject selection in middle years so that they would be better prepared for the content knowledge expected in the DP. For example, one teacher stated that students who plan to do Visual Arts in the Diploma should take that subject in the preceding years.

Summary

Some clear commonalities emerged across disciplines and schools in both India and Indonesia. Much like the students themselves, the teachers generally agreed that the MYP students had developed critical thinking and analytical skills which could be transferred to the DP. However, they also felt these students were not equipped with adequate content knowledge, and were not prepared for the focus on exam-based assessment in the DP. Many teachers did feel that MYP students experienced an initial drop in achievement because of these factors.

Concomitantly, the recommendations made by teachers to improve the transition included: giving MYP students more practice in studying for and taking high stakes exams; ensuring grading methods are consistent across the MYP and Diploma and that students can interpret these to improve their learning; and improving content knowledge in MYP to prepare students for the expectations in the Diploma. Additionally, some teachers felt it was important for MYP students to be assisted to select electives that would prepare them for the subjects they planned to take in the Diploma.

There was also broad agreement that non-MYP students had good content knowledge and were adept at taking exams. However, many teachers felt that non-MYP students lacked the analytical and critical thinking skills that are required for the DP (including Theory of Knowledge), particularly those from national curricula backgrounds – the IGCSE was thought to prepare students better than other non-MYP curricula.

Recommendations by teachers for non-MYP students focused on improving their analytical and critical thinking abilities, and their report and essay writing skills. A few teachers also mentioned that students from all backgrounds found the increase in difficulty and expectations in the DP challenging, and that better preparation to assist students in managing and coping with this change would be useful.

4. Conclusion

Students with an IB MYP background were found to outperform students who participated in other middle years programmes in components of the DP, suggesting that participation in this type of middle-years program may provide an advantage to students who continue on to the DP. It is important that these results and interpretations are made with appropriate consideration of the relatively small number of students, and the fact that performance differences between the groups are likely to be influenced by other factors such as differences at the school level. In order to shed further light on the question of whether participation in the MYP does provide students with an advantage in the DP, future studies may be undertaken that include higher numbers of students, particularly those who did not participate in the MYP and, ideally from a more homogenous program type to minimise contextual variables.

Responses to survey questions, student focus groups and teacher interviews identified a range of areas that are particularly helpful and also some areas that are less helpful with students' DP studies. In particular, higher order thinking skills (which were seen as beneficial for TOK), English writing skills (which assisted with the EE), time management and study skills developed during the MYP were identified as helping students with their DP studies. For non-MYP students, their middle years focus on memorisation and exam-taking skills and experience, and depth of content knowledge, were seen as beneficial for the DP.

These general, transferable skills were emphasised more often by students in comparison to more specific subject knowledge, although science and mathematics were regularly cited as areas that required deep content knowledge in the DP, and that needed to be better 'linked' to the MYP curriculum. By contrast, some non-MYP students felt that they had deeper content knowledge in science and maths.

When asked about aspects of middle year programmes that were less helpful, MYP students mentioned a lack of content knowledge, and a lack of experience in taking high-stakes exams. Teachers and students commented on the difference in assessment marking schemes between the MYP and the DP, and the difficulty this poses for students in trying to assess their own progress and set learning goals.

Non-MYP students felt that they had not developed sufficient higher order thinking skills, and also in some cases mentioned lack of English language ability as a barrier to high achievement. Both MYP and non-MYP students reported struggling to manage the increase in academic expectations and workload in the DP. Students and teachers both mentioned the need for better preparation in the middle years, and "bridging" strategies and student support in order to smooth the transition to the DP.

The transition from the middle to senior years of schooling is identified as a challenging time in the literature, regardless of the curriculum. Evidence suggests that the following factors can assist: providing regular quality feedback on student progress; developing strong student-teacher and peer

relationships; systematic learning of key content, skills and understandings in each subject area; and setting clear, achievable goals and expectations and monitoring progress.⁶

There is a clear tension between maintaining a flexible MYP curriculum that promotes inquiry-based learning and seeks to develop critical thinking and analytical skills; but at the same time prepares students for the high content knowledge and exam-taking skills required for the DP. There is also a significant difference, according to teachers and students, between the greater analytical and inquiry skills of MYP students on the one hand, and the greater content knowledge and exam-taking experience of non-MYP students on the other. This is compounded by the differences between specific schools, and the uniqueness of individual students. Any bridging programmes aiming to smooth the transition between middle years and the DP would need to be flexible and suitably differentiated to cater for the variations in prior knowledge brought by each child to the DP.

⁶ Hattie, J. (2009). *Visible Learning - A Synthesis of Over 800 Meta-Analyses Relating to Achievement*, Routledge, New York.

Appendix A: Survey questions

International Baccalaureate Research Study

With an emphasis on continuously improving its offerings, International Baccalaureate (IB) has initiated a research study. As part of the study, students studying in the second year of the IB Diploma Programme (DP) are requested to complete this online survey.

Please answer all questions in this survey to the best of your knowledge and judgment. Your details and responses will be kept confidential. Based on your responses, you may be invited for further discussions in the Jan-Feb 2014 period.

Indicative time for completing the survey: 15 minutes

Section 1: Background information

1. In which country do you go to school currently?

- China
- Hong Kong
- India
- Indonesia
- Japan

2. How long have you been living in this country?

- less than 2 years
- 2 to 4 years
- 5 to 10 years
- more than 10 years

3. Which country(ies) are you a citizen of?

- Australia
- Canada
- China
- France
- Germany
- Hong Kong
- India
- Indonesia
- Japan
- USA
- Other: _____

4. What is the name of your current school?

-

5 a. What is your first name?

Your details and responses will be kept confidential.

5 b. What is your family name?

Your details and responses will be kept confidential.

5 c. What is your candidate session number?

If you have not been allotted the candidate session number yet, please mention your school roll number or any other school identification number.

6. What is your enrolment type in the IB Diploma programme or course?

- Enrolled in full IB Diploma Programme.
- Enrolled in individual Diploma subjects only (not doing the full IB Diploma Programme)
- Other: _____

7. What is your date of birth?

8. Are you male or female?

- male
- female

9 a. What best describes your English speaking skills?

- I rarely speak in English even when required.
- I speak in English only when required.
- I speak in English all the time.

9 b. What best describes your English reading skills?

- I rarely understand English used in the subject content.
- I understand English used in the subject content with some difficulty.
- I easily understand English used in the subject content.

9 c. What best describes your English writing skills?

- My English is often the reason I lose marks when answering academic questions or completing assignments.
- My English sometimes affects my marks when answering academic questions or completing assignments.
- My English is never the reason I lose marks when answering academic questions or completing assignments.

Section 2: Middle years' school education

Think about middle years of schooling while answering questions in this section.

Please consider immediate 2-3 years of schooling prior to joining IB Diploma Programme as middle years of schooling. This includes the following:

- IB MYP years

- grades 7 to 9 leading to Zhongkao in China
- junior high school leading to Zhongkao in China
- grades 7 to 9 in Japan
- lower secondary school in Japan
- Cambridge IGCSE years
- Cambridge O Level years
- grades 9 and 10 in India
- secondary 1 to secondary 3 / 5 in Hong Kong
- Sekolah Menengah Pertama (SMP) grades 1-3 in Indonesia

10. In which country did you complete middle years of schooling?

- Australia
- Canada
- China
- France
- Germany
- Hong Kong
- India
- Indonesia
- Japan
- USA
- Other: _____

11. Which type of middle years programme did you complete?

- IB Middle Years Programme (MYP)
- Cambridge IGCSE
- Cambridge O Level
- Public or private school (other than IB or Cambridge) leading to Zhongkao (China)
- State board school in Japan
- Private school other than IB or Cambridge in Japan
- Sekolah Menengah Pertama (SMP), Indonesia
- Hong Kong Diploma of Secondary Education (HKDSE)
- Hong Kong Certificate of Education Examination (HKCEE)
- Indian Certificate of Secondary Education conducted by CISCE, India
- All India Secondary School Examination conducted by CBSE, India
- State board school in India

12. Did you complete your middle years studies at your current school?

- yes
- no

13. What was the medium of instruction for subjects other than languages?

- English
- a local language
- English for some subjects and a local language for others

14. In your middle years of schooling, how often did you engage in

i. independent projects or research

ii. group projects or research

iii. arts (music, craft, painting, etc.)

iv. physical activity (sports, physical exercise, etc.)

v. community service

vi. critical thinking

vii. discussing subject content with other students (in class)

- never / rarely
- sometimes
- often
- very often / always

15. In your middle years of schooling, how often did you engage in

i. memorising subject content

ii. understanding subject content (e.g. explaining something learned in own words)

iii. applying understanding of subject content to other academic topics

iv. applying understanding of subject content to real life situations

v. analysing subject content (e.g. examining and breaking information into parts)

vi. making judgements (e.g. evaluating merits of arguments)

vii. adding ideas together to help find answers

- never / rarely
- sometimes
- often

- very often / always

Section 3: IB Diploma Programme (DP)

Think about the Diploma Programme years of schooling while answering questions in this section.

16. In your Diploma Programme, how often did you engage in

- i. independent projects or research
- ii. group projects or research
- iii. arts (music, craft, painting, etc.)
- iv. physical activity (sports, physical exercise, etc.)
- v. community service
- vi. critical thinking
- vii. discussing subject content with other students (in class)
 - never / rarely
 - sometimes
 - often
 - very often / always

Diploma Programme subjects

This section seeks to identify the subjects you are undertaking in each subject group. If you are completing two subjects in any group, please select the second subject under 'Subject 6'.

Subject 1 (from group 1: studies in language and literature)

17 a. Please select the group 1 subject you are enrolled in:

- Language A: literature
- Language A: language and literature
- Literature and performance

17 b. At what level are you studying this subject?

- standard level (SL)
- higher level (HL)
- not applicable

17 c. How well are you doing in this subject so far?

- very poor
- fair
- good

- very good

17 d. To what extent has your education in middle years of schooling helped in this subject?

- very little
- some
- a lot
- very much

17 e. How confident are you that you will perform well in the Diploma Programme exam for this subject?

- not at all confident
- a bit confident
- confident
- very confident

Subject 2 (from group 2: language acquisition)

18 a. Please select the group 2 subject you are enrolled in:

- Language ab initio
- Language B
- Classical languages: Latin or Classical Greek

18 b. At what level are you studying this subject?

- standard level (SL)
- higher level (HL)
- not applicable

18 c. How well are you doing in this subject so far?

- very poor
- fair
- good
- very good

18 d. To what extent has your education in middle years of schooling helped in this subject?

- very little
- some
- a lot
- very much

18 e. How confident are you that you will perform well in the Diploma Programme exam for this subject?

- not at all confident
- a bit confident

- confident
- very confident

Subject 3 (from group 3: individuals and society)

19 a. Please select the group 3 subject you are enrolled in:

- Business and management
- Economics
- Geography
- History
- Information technology in a global society
- Philosophy
- Psychology
- Social and cultural anthropology
- World religions
- Global politics

19 b. At what level are you studying this subject?

- standard level (SL)
- higher level (HL)
- not applicable

19 c. How well are you doing in this subject so far?

- very poor
- fair
- good
- very good

19 d. To what extent has your education in middle years of schooling helped in this subject?

- very little
- some
- a lot
- very much

19 e. How confident are you that you will perform well in the Diploma Programme exam for this subject?

- not at all confident
- a bit confident
- confident
- very confident

Subject 4 (from group 4: experimental sciences)

20 a. Please select the group 4 subject you are enrolled in:

- Biology
- Chemistry
- Design technology
- Physics
- Environmental systems and societies
- Sports, exercise and health science
- Computer science

20 b. At what level are you studying this subject?

- standard level (SL)
- higher level (HL)
- not applicable

20 c. How well are you doing in this subject so far?

- very poor
- fair
- good
- very good

20 d. To what extent has your education in middle years of schooling helped in this subject?

- very little
- some
- a lot
- very much

20 e. How confident are you that you will perform well in the Diploma Programme exam for this subject?

- not at all confident
- a bit confident
- confident
- very confident

Subject 5 (from group 5: mathematics)

21 a. Please select the group 5 subject you are enrolled in:

- Mathematical studies
- Mathematics
- Further mathematics

21 b. At what level are you studying this subject?

- standard level (SL)
- higher level (HL)

- not applicable

21 c. How well are you doing in this subject so far?

- very poor
- fair
- good
- very good

21 d. To what extent has your education in middle years of schooling helped in this subject?

- very little
- some
- a lot
- very much

21 e. How confident are you that you will perform well in the Diploma Programme exam for this subject?

- not at all confident
- a bit confident
- confident
- very confident

Subject 6 (from groups 1 to 6)

22 a. Please select the sixth subject you are enrolled in from groups 1 to 6:

- Dance
- Music
- Film
- Theatre
- Visual arts
- Language A: literature
- Language A: language and literature
- Literature and performance
- Language ab initio
- Language B
- Classical languages: Latin or Classical Greek
- Business and management
- Economics
- Geography
- History
- Information technology in a global society
- Philosophy
- Psychology
- Social and cultural anthropology
- World religions

- Global politics
- Biology
- Chemistry
- Design technology
- Physics
- Environmental systems and societies
- Sports, exercise and health science
- Computer science
- Mathematical studies
- Mathematics
- Further mathematics

22 b. At what level are you studying this subject?

- standard level (SL)
- higher level (HL)
- not applicable

22 c. How well are you doing in this subject so far?

- very poor
- fair
- good
- very good

22 d. To what extent has your education in middle years of schooling helped in this subject?

- very little
- some
- a lot
- very much

22 e. How confident are you that you will perform well in the Diploma Programme exam for this subject?

- not at all confident
- a bit confident
- confident
- very confident

Theory of Knowledge (TOK)

22 a. How well are you doing in this subject so far?

- very poor
- fair
- good
- very good

22 b. To what extent has your education in middle years of schooling helped in this subject?

- very little
- some
- a lot
- very much

22 c. How confident are you that you will perform well in the Diploma Programme exam for this subject?

- not at all confident
- a bit confident
- confident
- very confident

Section 4

24. In your middle years of schooling, how often did the questions in examinations and assignments focus on

- i. memorising subject content
 - ii. understanding subject content (e.g. explaining something learned in own words)
 - iii. applying understanding of subject content to new situation
 - iv. applying understanding of subject content to real life situations
 - v. analysing subject content (e.g. examining and breaking information into parts)
 - vi. making judgements (e.g. evaluating merits of arguments)
 - vii. adding ideas together to help find answers
- never / rarely
 - sometimes
 - often
 - very often / always

25. During middle years, did your teachers report on your strengths and weaknesses in a way that helped you improve your grades or marks?

- yes
- no

26. What best describes the classroom teaching in your middle years of schooling?

- mostly teacher-delivered lectures and few student-teacher interactions
- some teacher-delivered lectures and some student-teacher interactions
- very few teacher-delivered lectures and a lot of student-teacher interactions

27. What aspects of your middle years schooling helped you the most with your Diploma Programme studies?

28. What aspects of your middle years schooling were least helpful to your Diploma Programme studies?